City of Louisville
COLORADO • SINCE 1878

Planning Commission

July 11, 2019
City Hall, Council Chambers
749 Main Street
6:30 PM

For agenda item detail see the Staff Report and other supporting documents included in the complete meeting packet.

Public Comment will be limited to three (3) minutes per speaker.

1. Call to Order
2. Roll Call
3. Approval of Agenda
4. Approval of Minutes
   a. June 13, 2019 Minutes
5. Public Comment on Items Not on the Agenda
6. New Business – Public Hearing Items

   a. Lot 3, Block 5, Colorado Technological Center Filing 1 PUD and SRU: A request for approval of a Planned Unit Development to allow construction of a 23,000 sf structure and associated site improvements and approval of a Special Review Use to allow use group 59: Health or Athletic Club at 1776 Boxelder St. (Resolution 13, Series 2019) ***REQUEST TO CONTINUE TO AUGUST 8, 2019***

   - Applicant: Barker Rinker Seacat Architecture
   - Case Manager: Lisa Ritchie, Senior Planner

   b. Speedy Sparkle PUD Amendment: A request for approval of a Planned Unit Development Amendment to allow changes to the signage at 1414 Hecla Way. (Resolution 14, Series 2019)

   - Applicant: Speedy Sparkle Car Wash – Louisville, LLC
   - Case Manager: Felicity Selvoski, Planner/Historic Preservation

   c. 824 South Street/957 Main Street PUD Extension and SRU Amendment: A request for a one-year extension to the 824 South Street/957 Main Street Planned Unit Development and an Amendment to the Special Review Use for outdoor sales of retail goods and eating and drinking establishments. (Resolution 15, Series 2019)

- Applicant: Hartronft Associates, P.C.
- Case Manager: Rob Zuccaro, Director of Planning and Building Safety

7. Planning Commission Comments
8. Staff Comments
9. Items Tentatively Scheduled for the regular meeting August 8, 2019:
    - Lot 3, Block 5, CTC Filing 1 PUD and SRU – Continuance
    - Transportation Master Plan
10. Adjourn

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Planning Commission
Meeting Minutes
June 13th, 2019
City Hall, Council Chambers
749 Main Street
6:30 PM

Call to Order – Chair Brauneis called the meeting to order at 6:33 PM.

Roll Call was taken and the following members were present:

Commission Members Present:	Steve Brauneis, Chair
	Keaton Howe
	Jeff Moline
	Debra Williams
	Dietrich Hoefner
Commission Members Absent:	Tom Rice, Vice Chair
Staff Members Present:	Rob Zuccaro, Dir of Planning & Building Safety
	Lisa Ritchie, Senior Planner
	Felicity Selvoski, Planner/Historic Preservation
	Amelia Brackett, Planning Clerk

APPROVAL OF AGENDA

Moline moved and Howe seconded a motion to approve the June 13th, 2019 agenda.
Motion passed unanimously by voice vote.

APPROVAL OF MINUTES

Howe moved and Moline seconded a motion to approve the April 11th, 2019 minutes.
Motion passed unanimously by voice vote.
Williams abstained due to her absence from the meeting.

Moline moved and Williams seconded a motion to approve the May 9th, 2019 minutes.
Motion passed unanimously by voice vote.
Hoefner abstained due to his absence from the meeting.

PUBLIC COMMENTS ON ITEMS NOT ON THE AGENDA

None.

NEW BUSINESS – PUBLIC HEARING ITEMS

Sireno Neighborhood Child Care Center SRU: A request for approval of a Special Review Use to allow a Neighborhood Child Care Center to provide care for up to 12 children at 224 Front Street (Resolution 8, Series 2019)

- Applicant: Front Street Child Care, Denise Ehrmann Sireno
- Case Manager: Lisa Ritchie, Senior Planner

This application, which was continued from the May 9th, 2019 meeting, has been withdrawn.

Lot 7, Block 4, Colorado Technological Center First Filing (602 Taylor Ave) PUD: A request for approval of a Planned Unit Development to allow the construction of a 22,500 sf building and associated site improvements. (Resolution 10, Series 2019)

- Applicant: RVP Architecture
- Case Manager: Felicity Selvoski, Planner/Historic Preservation

Public notice was met as required.

Selvoski presented the PUD application. The property owner, Elixinol, LLC, currently leases 10,000 square feet in the building at 638 Taylor, immediately south of the subject property, and is applying for a PUD to approve construction of a 22,500 square foot, two-story building at 602 Taylor. The site plan includes a new building, required parking, a screened loading dock, and a detention pond. Selvoski clarified that the color of the building was blue, not purple as it appeared on the computer screen. Staff found that the application met the standards in the IDDSG and Selvoski noted that the applicant was not requesting any waivers.

Staff recommends approval.

Brauneis asked for conflicts of interest. Seeing none, he invited questions of staff.

Hoefner clarified that there were no waivers and no conditions. Staff confirmed there were none requested now.

Bob Van Pelt of RVP Architecture in Boulder offered to answer questions from the Commission.

Williams asked about the materials.

Van Pelt replied that the structure was precast tilt-up concrete painted two different colors with a metal canopy around the front with glass storefronts, white doors, and white metal overhead and man doors. He stated that the construction materials were typical of the buildings in the area. He added that it was a steel structure.

Howe asked if there were any special ventilation systems required.

Van Pelt replied that there were no special requirements since they were not processing anything that would put off large amounts of fumes.

Williams asked about landscaping.

Van Pelt replied that they were planning to follow the IDDSG standards and that there would be a pedestrian area up front with a flower bed with seating that would be about 120 square feet.

Moline asked about the parking lot size and layout.

Van Pelt replied that it was designed to accommodate firetrucks and delivery trucks.

Brauneis asked for public comment. Seeing none, he asked for closing statements, closed the public hearing, and opened commissioner comments.

Williams stated that she did not see anything alarming or out of the ordinary in the application. General consensus from the other commissioners. Howe and Moline thanked the applicant for submitting a proposal that met all the requirements.

Brauneis noted that he would like to hear about water efficiency or landscaping in future project proposals.

Williams made a motion to approve Resolution 10, Series 2019. Howe seconded. Roll call. All in favor. Motion passed unanimously.

Centennial Valley General Development Plan Amendment: Lots 2 and 3, Parcel O, Filing 7: A request for an amendment to the Centennial Valley General Development Plan concerning allowed uses, heights, and densities and other development provisions at 550 S. McCaslin Blvd and 919 W. Dillon Rd. (Resolution 11, Series 2019)

- Applicant: City of Louisville, Seminole Land Holding, Inc., Centennial Valley Properties I, LLC
- Case Manager: Rob Zuccaro, Director of Planning and Building Safety

Public notice was met as required.

Brauneis asked for conflicts of interest. None disclosed.

Zuccaro presented the application, which was a partnership between developers and the City. He explained the history of the Centennial Valley General Development Plan (GDP) for Parcel O, which was originally planned as a “super block” in 1983 and included 882 acres and a mix of commercial/retail and residential. The Davidson Mesa Open Space was dedicated as part of the GDP at that time, as well. There have been 8 amendments to Centennial Valley overall since 1983. The driving factors to updating the GDP now were that the Sam’s Club lot had been vacant for the past 9 years and the Kohl’s lot would soon be vacant. Zuccaro noted that the fiscal health of this particular corridor was vital to the City as a source of sales tax revenue. Based on these issues, the City initiated a redevelopment study in February 2019, which focused on identifying market-supported and financially-viable redevelopment options, regulatory barriers and private restrictions, community-desired redevelopment options, and the fiscal impact to the City.

Zuccaro explained that the study found that there was a lot of retail competition in the area and that there were fewer large format retailers than when the GDP was originally conceived. The study suggested that within the next 10 years there would be market for 150,000 square feet for new development in the entire market area. There was currently market support for 30,000 square feet of new retail. Zuccaro summarized community engagement findings, as well, which found that participants were generally interested in boutique, walkable retail areas with gathering spaces. Zuccaro then summarized the study test scenarios and variables in detail, clarifying that the City was not supporting one particular scenario, but that they were created to test against various factors to predict outcomes. The main recommendations of the study were:

- Modify the GDP to allow greater variety of uses, including multi-family housing to incentivize retail development
- Provide additional density and allow non-sales tax generating supportive uses
- Improve connectivity and provide public amenities and gather spaces
- Focus retail development on community-oriented uses

Zuccaro described the proposed GDP amendments, which were based on the study and community feedback:

- Expand allowed uses – entertainment/commercial amusement and multi-family
- Residential cap – 240 units (incentives up to 384 units)
- Commercial density increase - .2 to .3 FAR
- Retail concurrency with new residential development – every 12 units requires 1,000 square feet of retail/restaurant and 4,000 square feet of other commercial uses
- Public space requirement with new residential development – 7% of area with 80% contiguous
- New multi-modal street and block structure – 400-600 ft street grid
- Height increase – allow 2-3 stories in buffer area and 3-4 stories in core area

Zuccaro shared the 3D models that staff used to explore what different heights could look like under the proposed GDP and he discussed the height proposal. Zuccaro also shared that the City commissioned a traffic analysis to compare development scenarios to current condition and a baseline condition (Sam's Club occupied.) Overall, the modeled scenarios found no adverse impact on intersections and that there would be more traffic during the AM peak than the PM peak.

Staff recommended approval of Resolution 11, Series 2019. Zuccaro suggested making conditional recommendations if there were modifications the Commission wanted to see. He noted that staff could provide more information if the Commission wanted, but he recommended using an overflow meeting in that case to help staff meet the goal of presenting the application to City Council in July.

Moline asked how the City would address an intersection with an F level of service.

Zuccaro replied that there were recommendations in the traffic study related to signal timing that would help the F intersection, as well as adding more turn lanes.

Moline asked what had prevented the Sam's Club lot from redeveloping.

Zuccaro replied that the market study had some information on that, but the private covenants have been a barrier that did not allow a second grocery store in that area, as had the limited demand for new retail, especially big-box retail.

Williams asked for clarification on what this development plan would achieve.

Zuccaro replied that this document would set the baseline zoning for the property, but any development would have to go through a PUD process.

Williams asked if the City would be bound in any financial way based on the proposed GDP.

Zuccaro replied that everything to do with the City would be addressed in the PUD process.

Howe asked if there were any tenants who were already interested in the area being redeveloped.

Zuccaro responded that he was not aware of a particular user, but the main difference at this time from before was that the proposal took 200,000 square feet of retail and trying to turn that into 20-30,000 square feet of retail, 80,000 square feet of non-residential uses, and then having the residential. The City did not think it was ever going to get another 200,000 square feet of new retail.

Brauneis asked how the plan would affect the Downtown area.

Zuccaro replied that staff had heard concern that the redevelopment area could take away from Main Street business, but the fiscal model analysis took into consideration the cannibalization of existing retail, even though the goal was to capture new retail with the redevelopment.

Brauneis asked for the square footage of retail in the redevelopment with Centre Court Apartments.

Zuccaro responded that he did not know, but he noted that the fiscal analysis for the GDP took into consideration cannibalization of retail in its calculations.

Brauneis asked how much retail was included in the Centre Court Apartment block redevelopment. Zuccaro replied that he could find out. Brauneis then asked if there were any alternatives discussed for the streetscape.

Zuccaro replied that staff had not addressed any design elements at this point.

Moline asked for the percentage of the City's revenue coming from the McCaslin trade area.

Zuccaro replied that the area accounted for almost 50% of the City's sales tax revenue, which was not necessarily the correct percentage for overall revenue.

Brauneis asked for public comment.

Jerome McQuie, 972 St. Andrews Lane in Louisville, was concerned that the heights were higher than anywhere else in the city and that the plan allowed for development right up to the sidewalk on Dahlia Street. The height of the Sam's Club and the Kohl's was higher than Dahlia and the condominiums were lower than the elevation at Dahlia, which added more to the elevation differential for people living on Dahlia. He also thought that the plan was not sensitive to the McCaslin Small Area Plan. He understood

that retail was changing, but he wanted to see the heights be more consistent with the rest of the town.

Brauneis asked about the setbacks and elevation around Dahlia and Director Zuccaro offered to get more information.

Teresa Cardoni, 730 Copper Lane #202 in Louisville, agreed with Mr. McQuie about the height. She stated that she had bought her condo because of the view of the mountains and she asked the Commission to consider the long-term residents in the area. She was also concerned about the setbacks. She suggested allowing a basement for people who wanted a three-story condominium rather than allowing three stories. She liked the walkability of the current neighborhood and was looking forward to that part of the redevelopment.

Tom Casey, 780 Copper Lane in Louisville, stated that staff presentation was a great introduction to the project, but he lived in the area across from Kohl's and he agreed with Mr. McQuie and Ms. Cardoni. He added that he was concerned about the traffic study, because the area was a major corridor. Getting across the intersections was amazing and he imagined there would be more problems with the redevelopment plan. The intersection beside McDonald's needed to be eliminated and rerouted.

John Leary, 1116 LaFarge Avenue in Louisville, stated that the Comprehensive Plan was meant to be advisory per state law, but the City specified in Section 17-28-160 that developments will be consistent with the Comp Plan. He stated that it was important to go through a Comp Plan Amendment because it was an intense public and legislative process rather than a quasi-judicial process like the one tonight. He stated that residential units do not pay for themselves. He added that the market-plan consultant was unequivocal that if it was not for the covenants and the current GDP that Sam's Club would be occupied now. The proposal, therefore, was jumping ahead to a solution without removing the barriers to the problem. He observed that mixed-use areas was that it did not attract people from outside the city and he gave examples of cases in which residential had not brought in commercial development. He ended by saying that there was a very high probability that the GDP amendment as written would go to referendum.

Alana Kunzelman, 780 Copper Lane #106 in Louisville, asked if there would be a lot of extra roadways coming out onto Dahlia based on the GDP. She liked the idea of having entertainment, commercial, residential, and walkability in the new development.

Sharon Pauley, 524 Ridge View Drive in Louisville, stated that she and her HOA had been watching various plans come and go and wondered how the Ascent Church news would play into this redevelopment process. She explained that living in the McCaslin area of Louisville felt a bit orphaned. The area was currently quite urban and noisy with the traffic and the loading dock for the grocery store, and there was a tremendous amount of traffic driving fast down Dahlia. She thought it would be a quality of life issue for current residents if the City were to add hundreds of residential units. She added that there was nothing in the plan that addressed senior housing. There were not enough single-story, affordable units for seniors who were independent but looking to downsize, a genuine need in the community. She noted that Sam's Club was high and she

requested that whatever replaced it was attractive and did not tower over the current residents.

Wendy Bohling, 624 Ridgeview Drive in Louisville was concerned that the area would be too dense and would become like Steel Ranch and she wondered if fewer residential structures had ever been considered. The additional residences would also add to traffic. She had a basement and a two-story home, so she agreed that a basement as a way to get three stories was a good idea. The view of the mountains was also important to her. She asked if there could be denser, mature trees along the corridor. She thought the whole corridor would get crazy with this plan. She was also concerned that the plan would increase the need for stoplights along Dahlia. She added that she would like to hear from Ascent Church as a possible developer and that the city did not need another hotel.

Cindy Bedell, 662 West Willow Street in Louisville reminded the Commission that their job was to preserve the small-town way of life, follow the Comp Plan, while maintaining financial stability. She noted that the area was still a positive to the City's finances and so there was no need to panic. The height and the density were not consistent with the 2017 McCaslin Small Area Plan, which reflected public input over many meetings and workshops. The four-story height allowance and the increase in density would not be consistent with the small-town character and would increase traffic. She questioned the traffic study and asked how adding more people to the area would reduce traffic. She noted that this number of residential units was not upheld by the McCaslin Small Area Plan or the Comp Plan. Residential does not pay its way and it permanently displaces tax revenue. She wanted to put in a word for dark night lighting standards, as well. Overall, she requested lower heights, lower densities, and fewer residential spaces. She did not think that the City should bow to pressure from developers who wanted to profit from residential development. She also looked to the church for its development plan.

Jim Candy, 516 Country Lane in Boulder, co-pastor at Ascent Church, stated that he had been surprised by the redevelopment plan. Ascent was under contract with the Sam's Club property. The church did not intend to take tax dollars from the City and they intended to bring alternative uses to the area. Ascent was open to creative solutions, working with residents, staff, commissioners, and Council members to developing the area.

Beth McQuie, 972 St. Andrews in Louisville, agreed with other commenters and she was particularly concerned that the height allowances would destroy the mountain views and would not fit in with the rest of the town. She did not think any developers could guarantee retail. She was curious to see what Ascent had in mind for the area. She liked having an affordable clothing option like Kohl's in town and wondered if the City could incentivize them to stay. She did not think it fit in with the McCaslin Small Area Plan and thought that the process needed more public input. Finally, she stated that the City should not benefit developers at the expense of current residents.

Robert Edward, 517 Ridgeview Drive in Louisville, stated that he and his wife had one of the only straight-on view of the Flatirons. He did not expect that their view would be affected, but he had concerns with the increased density and traffic issues. The new situation with Ascent Church should be a primary factor before considering any other

changes. He wanted to know if the proposal included any traffic mitigation along Dahlia. Without it, there would be car wrecks and pedestrians killed. He also did not like the height increase and the difference between the proposed height allowance and what exists now. He asked for clarification on the scenarios in the staff packet.

Zuccaro replied that the GDP amendment is modeled after scenario 2 as per City Council direction.

Jeff Hancock, 592 Ridgeview Drive in Louisville, expressed an objection to an increase in the height allowance as he also bought his townhouse with the view in mind. He stated that the plan served developers at the expense of current residences. He thought the Small Area Plan sounded good and these proposed changes conflict with the height recommendations in the Plan. He also noted that the Small Area Plan recommended a decrease in the total allowed development in the area from what existing zoning and regulations allowed.

Brauneis asked for further public comment. Seeing none, he asked that two recent emails be entered into the record. Hoefner moved and Moline seconded. Voice vote all in favor.

Zuccaro responded to earlier questions from the Commission. First, square feet of commercial development at the Centre Court Apartment lot, which did not include anything from the Walgreens westward, was 36,000 square feet, with the Alfalfa's being a little over 26,000 of that. Second, the elevation along Dahlia varied between 4 and 10 feet between street grade going up onto the properties. Third, the setbacks for residential development would go to underlying residential zoning and would be negotiated in the design process. For commercial, for a building footprint less than 30,000 square feet, the setback would be 20 feet. Over that would be 40 feet.

Moline asked staff how a developer might respond if the City allowed more units but at a lower height.

Zuccaro replied that the Parcel O market study chose areas that would accommodate the development densities that were in there and it was never contemplated that there would be a four-story development. Staff did not design out a plan under that scenario, but believed that generally the land area could accommodate it. When staff talked to the property owners they said that the project would be better with the four-story allowance to provide for more flexibility within the site design. He also noted that the GDP was trying to create a financially feasible plan for the area.

Williams asked if staff knew if Ascent had plans to stay in the development.

Zuccaro replied that he did not know.

Tom McGimpsey, 671 Manorwood Lane in Louisville, requested that the Commission include studies on noise and nighttime light.

Zuccaro responded that within the commercial development guidelines there were specific lighting standards that had maximum heights and required cut-off fixtures.

There were no residential dark-sky lighting requirements, thought the City is currently updating those requirements and that could change. The City did not have light standards for residential areas or on traffic noise.

Williams asked what would happen if there was no amendment.

Zuccaro replied that based on the market analysis there were limitations on what the City could be expected to see. Someone could come in with a PUD but there were limitations to what could be expected to come in under the current regulations. He added that the current height would be 35 feet, though with the current designed guidelines they were considering having a buffer and allowing three-story structures.

Hoefner asked if the current property owners had a position on this amendment.

Zuccaro replied that they had consented to the application being made, which they had to do, and they were comfortable with it moving forward as is and were curious to hear what the Commission had to say. The City had not had direct coordination with anyone under contract.

Hoefner asked for more information on the private covenants versus City regulations.

Zuccaro replied that there were real barriers in the covenants, including height limitations and the grocery store use limitation. The property owners intended to work to remove barriers.

Hoefner asked if there had been a study about traffic on Dahlia.

Zuccaro replied that the study looked at the major intersections at Dahlia and Cherry and Dahlia and Dillon. It also looked at all transportation and safety issues. They suggested a series of more regional connections and having an improved pedestrian crossing across Dahlia. They did not raise any flags that there would be any particular issues along Dahlia, however.

Hoefner asked how a future PUD would address traffic.

Zuccao replied that the PUD process required a new traffic analysis based on the actual application, which typically included analyses of current conditions, changed conditions at current and future dates, and recommendations on safety improvements and vehicular congestion to accommodate the development.

Hoefner asked if it was possible that an intersection could be changed based on a proposal.

Zuccaro gave the example that sometimes there were full-movement intersections in the area that could be limited if there was too much traffic.

Williams asked if the fiscal models in the staff packet included property taxes and if the model could incorporate a property owner who was tax-exempt.

Zuccaro confirmed that the model did include property taxes and that the model could include tax-exemptions. The Parcel O Study did not have that in the fiscal analysis. He responded to Commissioner Hoefner's earlier question about covenants by directing the Commission to the staff packet for more details on the limitations in the private covenants.

Williams stated that she would like to see a fiscal model where most of the properties were tax-exempt to consider the possible church development.

Zuccaro asked the Commission if that information would be material to the amendment decision, staff could bring that to a future meeting.

Williams stated that Lafayette could have insight into the tax-exempt question.

Howe asked what would happen to lot 3 to be financially feasible if lot 2 was not to be developed.

Zuccaro replied that a hypothetical scenario in which lot 2 were not developed, lot 3 could have 120 residential units as its base, with incentives to get more, required to provide 10,000 square feet of new retail development and 40,000 square feet of other non-residential development. Zuccaro did not know if lot 3 would need 4 stories to achieve the 120 units, but the assumption had been that the land areas might be tight but could probably fit the units without 4 stories, but he had not done a full analysis to test that.

Hoefner asked how long it would take to achieve a result if an offer were placed on a lot or a building.

Zuccaro replied that it varied, each one was individual but it was usually a matter of months.

Brauneis asked for additional questions of staff. Seeing none, he closed public comment and opened commissioner discussion.

Brauneis noted that there had been a newspaper article in the last week that publicized the fact that Ascent Church was under contract with the Sam's Club property and suggested that the Commission address that issue first.

Brief adjournment at 8:49 PM. Reconvened at 8:55 PM.

Brauneis recommended that the Commission address the Ascent Church news, how the plan related to the Comp Plan and the Small Area Plan, height, and setbacks.

Moline stated that he was prepared to act on the amendment as presented tonight regardless of the Ascent Church news. He appreciated Commissioner Williams's concern in wanting to get additional fiscal analysis related to the Ascent news, but he was prepared to move forward.

Howe thanked staff for the presentation and the 3D imaging. His main concern was balancing the small-town values with the long-term revitalization goals. He saw it as an opportunity to create a pedestrian-friendly thoroughfare, improve the attractiveness of Louisville, increase the availability of residential properties, and provide a financial opportunity. These represented opportunities within the proposal to improve the city. He would probably need to agree a condition on height allowance. He added that traffic was of concern. He liked the idea of the entertainment uses and noted that public comment did not approve of the allowance of hotels. Finally, he liked the idea of allowing basements.

Hoefner stated that he thought the private covenants needed action to deal with the development limitations in the area, questioning whether it was appropriate for the City to take action before the property owners had, especially on a contentious project. He also agreed that height was an issue.

Brauneis clarified that the private covenants were not anything that the current owners wanted to enforce and that they were limited by the covenants, as well.

Zuccaro replied that the intent was to work with the property owners to change the covenants and they seemed willing to do so. It required all the owners within a parcel to approve a covenant change.

Hoefner observed that it was hard to consider an amendment against which there was a lot of opposition without having the property owners working on the covenants. He wondered if there could be a way with the setbacks to bring things closer into the core while achieving the walkability feel. Finally, he thought that 5,000 square feet of development was pretty aspirational.

Williams wanted to see more financial models based on specific types of owners. She was also concerned about the buffer to existing residential to make sure that there would be a natural berm, or a gradual height differential, or something similar. She had an issue talking about view corridors when, at the same time, the core would have four stories – those were contradictory goals. She was not in favor of four stories for that reason. She would rather see the cap on residential units a bit lower, like 200, and then adding the residential incentives up to 250. She added that the residential incentive for senior housing meant units no stairs with main living all on one floor. She summarized that she was between alternative 1 and 2. She did not think there was anything wrong with the status quo and the City did not need to rush changes.

Brauneis stated that he was not content with getting worse before getting better and he was happy being proactive on trying to incentivize something that looked like it would work better in the long term for the City. Things as they are now increase the probability of vacancy and that having similar use as now would now be looking toward the long-term needs of the area. When Sam’s Club closed, it was roughly 5% of the City’s general fund. He was concerned about the view shed to a degree. He thought there could be a balance between setbacks and height allowances to preserve views.

Moline stated that one of the things in terms of traffic and safety was underpasses that the City was able to provide, but those kinds of quality-of-life improvements could not

continue without revenue. He was generally in support of the amendment. He agreed with Chair Brauneis that the City had been waiting for something to happen organically and nothing had happened in 9 years so he appreciated that the City was trying to find a solution. He thought the Centre Court example was a good one and he appreciated having a shopping area and a grocery store in the neighborhood. The market study showed that without some form of residential, the City would be unlikely to see that kind of development. He noted that from a design standpoint they were moved away from a corridor plan toward a centered plan that was more walkable and with some open space. He wanted a buffer to the existing residential. He thought going higher in heights in the core area was more appropriate.

Zuccaro reminded the Commission that the 200 was the mixed-commercial buffer at a lower height than the core. From a pedestrian design standpoint, having buildings near the street is always better. He acknowledged that view corridors were important as well. The amendment could be brought down or the Commission could suggest allowing higher allowances with further view analysis.

Moline stated that discussing setbacks was easier at the PUD stage, but the things that were discussed in the Small Area Plan regarding design should be retained as much as possible. He stated that the area was closest to mass transit and the busiest highway, this was the place to draw in regional shoppers to create revenue for the City.

Hoefner stated that if they approved the GDP amendment while allowing the continuance of the private covenants, they were risking having residential development while the covenants continued to prohibit commercial development. He wanted to understand the plan for the covenants and the chance of success.

Brauneis replied that the covenants were not as big a stumbling block for him because the property owners would not want to create a financially viable property.

Hoefner observed that an application a month ago had requested increased residential area in comparison to the previously approved residential-commercial balance in that area.

Moline stated that he was under the impression that the GDP would be drafted to require the commercial commitment to allow residential development.

Hoefner replied that he was under the same impression, but developers could always come ask for a waiver.

Brauneis stated that the covenants were not up to the Commission to change.

Hoefner replied that he did not have a sense of how hard it was to dispense with the covenants and how important they were to the property owner. To allow residential on a property that was previously commercial only was the City giving something, and everyone should be giving something. He read out loud the allowed uses by the covenants, which included office, hotel, hospital, nursing and rest homes, childcare, marijuana sales; limited uses included retail, trade, or service business; cultural facilities; restaurants; one drive-through; and recreational facilities inside and outside.

Brauneis stated that no one wanted to sit on the property without building so there would be a financial incentive for property owners to deal with the covenants.

Hoefner replied that the financial incentive would be to maximize residential development.

Brauneis replied that the proposal allowed residential development alongside commercial.

Howe agreed with the idea that the Commission should move forward with a vision to addressing the vacancies and that the goal for this proposal was to make it easier for a developer to reduce the amount of vacancies to create an opportunity that could benefit the City.

Williams observed that too many times cities include residential to incentivize commercial and lost the mixed-use and commercial. Once you build the residential, it's very difficult to get rid of the residential. She noted that in Superior there was no downtown or Main Street, it was just residential and she would hate to see that happen here.

Brauneis agreed with Commissioner Howe's comment that the Commission was not trying to approve a specific development plan, it was trying to address an area that has been an issue for nine years when the studies said that the area could not support the 200,000 square feet of commercial.

Hoefner stated that other than his objections to the covenants and with changes to setbacks, he was generally supportive of the GDP's easing of restrictions.

Brauneis reopened the public hearing and asked Zuccaro about the City's options for dealing with covenants.

Zuccaro replied that there would likely need to be covenant changes to fulfill the vision. The City does not control covenants at all and condemnation of covenants was an extreme measure that was not part of the discussion with this effort now. Staff was trying to control what was in their power to control.

Brauneis asked what checks the City had in place to giving away the residential without any commercial development.

Zuccaro replied that the goal of the concurrency requirement was to avoid that situation. Technically, future developers could not get a waiver, but they could request a GDP amendment.

Jeff Sheets with Koelbel and Company, 5291 East Yale Avenue in Denver, stated that he owned the Kohl's building and he understood the concerns over the covenants. He explained that it took 100% of the property owners to change the covenants. In his experience, changes to covenants follow changes to zoning so property owners can know what might happen under the new regulations. He thought his building could find

tenants again, but maybe not at 100% occupancy. At the time of the original development, the area was trying to make a regional play, but the area was no longer in competition for regional retail due to developments like Flat Irons and in Boulder. Now it needed to be a community retail space.

Jim Candy added that Ascent wanted to work with Mr. Sheets to amend the covenants and that the owners are interested in amending the covenants.

Brauneis closed public hearing and reopened closed discussion.

Howe stated that as a business owner, he had thought about the risk of an idea versus satisfaction with the status quo, and that it took a risk to change the status quo. He suggested approving the majority of what was proposed with the conditions to include setbacks to preserve view corridors and to create a pedestrian infrastructure that would support the plan no matter how many residential units were built.

Moline agreed with Commissioner Howe's comments and suggested approving the plan with a condition that the 200 foot buffer pulled from the Small Area Plan that the height limitations in that plan be applied to this GDP and he was willing to flex on the eight of the other portions of the plan.

Zuccaro stated that the Small Area Plan didn't specify the depth of the buffer but it set a two-story limit. The Commission could amend the GDP so that the mixed commercial buffer area was limited to 2 story residential and commercial development within the 200 foot buffer, while outside the buffer would allow what's currently written in the plan.

Moline thought that was reasonable.

Howe asked about preserving view corridors.

Brauneis responded that the corridors were undefinable and this would definitely change the views.

Williams stated that she would agree to two-story residential and a 200-foot buffer on Dahlia, but she was not in favor of a four-story residential in the core and she wanted to see a different cap on residential. She added that she still wanted to understand the financial aspect to move forward.

Hoefner agreed with the height statements and didn't have a problem with the four-story core but he did not think the Commission could decide which height allowances to put where on the fly. He stated that there was no way the Commission could ballpark the changes to the covenant so he thought it would be helpful to have something on the record about the intentions of the property owners.

Zuccaro presented an option to the Commission for a condition on the height: Under the current zoning framework, there could be a structure up to 35 feet with two-story commercial within the buffer area, and the Commission could suggest applying that cap to residential, as well.

Moline supported Director Zuccaro's suggestion and asked about height under current regulations.

Zuccaro replied that under current regulations it was 35 feet under all of Parcel O. He clarified that his recommendation would reduce residential from three stories to two stories and from 40 feet to 35 feet while keeping the commercial heights the same. He stated that there was no setback within the GDP. He noted that having a walk-out might create a better streetscape, for example, so staff had wanted some flexibility there. The Commission could say that they did not want any buildings within the Dahlia line, which could provide some protections to the property owners.

Moline noted that there had been no residential use allowed before and there had been commercial uses going all the way up to a street across from residential. He would rather see setbacks develop with the PUD proposals.

Zuccaro stated that the current commercial design requirements would have minimum setbacks and the Commission could make recommendations on the updated commercial design requirements.

Moline stated that he liked Zuccaro's wording for the condition dealing with the 200-foot buffer.

Zuccaro summarized that the Commission could approve the resolution with the condition that the MCB height restriction be reduced for residential from 3 stories to 2 stories and from 40 feet to 35 feet (and 35 feet or 30.)

Howe made a motion to approve Resolution 11, Series 2019 with the condition as stated by Director Zuccaro. Roll call vote. Williams voted nay. All else in favor. Motion passed 4-1.

LMC Amendment – Sign Code Update: A request for approval of an ordinance amending Title 17 of the Louisville Municipal Code regarding sign regulations throughout the City of Louisville. (Resolution 12, Series 2019)

- Applicant: City of Louisville
- Case Manager: Lisa Ritchie, Senior Planner

Notice met as required.

Ritchie presented the sign code update, noting that the consultants and staff were still working through how to handle signs for civic events on City property. She presented the changes to the amendment since the April Planning Commission meeting:

- Additional language for sign purpose in Downtown, taken from Downtown Sign Manual
- Property owners may follow PUD or new sign code
- Removed requirement that building mounted flags count toward wall sign allowance
- Master Sign Program removed
- Waiver criteria, per Planning Commission discussion

- Some specificity for Electronic Message Centers (EMCs) removed
- Properties east of the railroad tracks in Downtown subject to the Mixed-Use standards
- Murals allowed on accessory and other structures
- Up-lit monument signs not permitted
- Sandwich Board signs – removed provision to allow alley-fronting businesses a sign anywhere within the block
- Other minor clarifications

Ritchie explained that the ordinance would repeal all existing sign regulations and adopt the new regulations as a single ordinance. She noted that a Council member wanted to know the Commission's opinion on expanding allowed size for painted wall signs.

Moline asked how that was different from a mural.

Ritchie replied that murals did not have commercial speech.

Staff recommends approval of Resolution 12, Series 2019.

Hoefner thought that the new proposal incorporated the feedback from the previous Commission meeting. He noted that there were compelling public comments about the sandwich board signs for businesses that front onto alleys.

Ritchie acknowledged that the feedback on the boards was not unanimous.

Howe asked about the options for temporary business signs beyond downtown.

Ritchie replied that sandwich boards were allowed beyond downtown, but they could not be on right-of-way and they would have to be on building frontage. Temporary banners were allowed for up to 60 days a year and the size of those signs was tied to the building size up to 60 square feet in commercial areas. There were also sign allowances and requirements for yard and site signs.

Brauneis asked about the logic on the painted signs.

Ritchie replied that her understanding was that it was an aesthetic preference for painted signs.

Hoefner stated that he liked painted signs, but he did not see any need to further incentivize them.

Gerald Dahl of Murray Dahl Beery Renaud LLP, discussed banner signs in the right-of-way. The 2015 Supreme Court ruling meant that cities could no longer regulate signs based on content. Now most people identify signs by type, like banner or roof signs. Exempt signs on public property include city-related communications, like speed signs or city library events signs. There was also concern over regulating the public forum. He stated that there were three choices for dealing with this issue:

- City events only

- Generally civic-related signs
- Using a permit program for the signs, with the City reserving a certain number for itself

He stated that options 1 and 2 were the safest, even though most people went with a middle route. He requested guidance from the Commission as to if the City was interested in allowing limited civic signs beyond just those of the City itself, like from a county library or a private hospital.

Brauneis asked Ritchie about quasi-public events.

Ritchie replied that the current status was to allow city-related events on City property and staff was comfortable with keeping the allowance for city-sponsored or city-related events.

Dahl noted that City-sponsored events were a safer option.

Zuccaro added that city-sponsored meant either contributing money to or using staff time on the event. There were probably some events that people think are city-sponsored that are not.

Dahl noted that codifying that would mean that the City would have to say no to a sign based on the use of the banner.

Moline asked for staff's perspective on the permitted option.

Zuccaro did not recommend that option since it opened up a slew of issues, including people not understanding the limit.

Hoefner asked staff if they received inappropriate signage requests currently.

Ritchie replied that in her experience someone who wanted to put up something controversial typically did not ask for permission from the City.

Zuccaro noted that option 3 would not allow the City to distinguish between commercial and city-sponsored events.

Ritchie added that the City-sponsored event was a clear line that staff could administer.

Dahl replied that he would help codify that desire since it was not in the Code currently.

Howe stated that he was supportive of the city-sponsored idea.

Martin Landers with Plan Tools stated that he had been working with City staff on technical issues and offered to answer questions from the Commission.

Brauneis asked for additional comment from the Commission. None.

Howe stated his support for the proposal because it addressed the needs of businesses and citizens without allowing signs everywhere.

Williams stated that she did not approve of the edit that an alley-facing business could not put their signs on the street.

Hoefner shared that concern.

Hoefner moved to approve Resolution 12, Series 2019. Howe seconded. Roll call vote. All in favor. Motion passed unanimously.

COMMISSIONER COMMENTS

None.

STAFF COMMENTS

None.

ITEMS TENTATIVELY SCHEDULED FOR JULY 11TH, 2019

- Speedy Sparkle PUD Amendment
- Transportation Master Plan
- 824 South Street SRU
- 1776 Boxelder PUD

Adjourn: Chair Brauneis adjourned meeting at 10:36 PM.

ITEM:	PUD-1058-2018 and SRU-0159-2018; Lot 3, Block 5, CTC Filing 1 PUD and SRU
PLANNER:	Lisa Ritchie, Senior Planner
APPLICANT:	Barker Rinker Seacat Architecture
EXISTING ZONING:	Industrial (I)
LOCATION:	1776 Boxelder St
TOTAL SITE AREA:	77,507 Square Feet
REQUEST:	Approval of Resolution 13, Series 2019 recommending approval of request for a Planned Unit Development to allow construction of a 23,000 sf structure and associated site improvements and approval of a Special Review Use to allow use group 59: Health or Athletic Club. **REQUEST TO CONTINUE TO AUGUST 8, 2019**

VICINITY MAP

STAFF RECOMMENDATION:
Staff recommends that the Planning Commission continue the public hearing for a request for a Planned Unit Development and Special Review Use at 1776 Boxelder Street to the August 8, 2019 Planning Commission meeting.

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ITEM:	PUD-0222-2019; 1414 Hecla Way – Sign Program Planned Unit Development Amendment
PLANNER:	Felicity Selvoski, Planner
OWNER:	Car Wash 2, LLC
REPRESENTATIVE:	Chip Weincek CW Associates, PLLC 672 W. Pine Street Louisville, CO 80027
EXISTING ZONING:	Planned Community Zone District – Commercial (PCZD-C)
LOCATION:	1414 Hecla Way; Lot 6, Louisville Plaza Filing 2
TOTAL SITE AREA:	45,687 Square Feet
REQUEST:	Approval of Resolution 14, Series 2019, a resolution recommending denial of an amendment to the sign program PUD for the property at 1414 Hecla Way, and the existing sign shared with 1408 Hecla Way and 1712 Plaza Drive.

SUMMARY:
The applicant, Speedy Sparkle Car Wash – Louisville, LLC, requests approval of an amendment to the existing planned unit development (PUD) to allow for changes to the sign program for the property, which primarily includes changes to the signs for Speedy Sparkle Car Wash, but also changes the sign panel size allocation for the Jiffy Lube. The subject property is zoned PCZD-C and is subject to the requirements of the Commercial Development Design Standards and Guidelines (CDDSG). The current PUD includes a shared monument sign for King Soopers Fuel Station, Jiffy Lube, and Speedy Sparkle, located on the property line between the Jiffy Lube and Speedy Sparkle along E. South Boulder Road. The applicant proposes changes to the existing monument sign to remove their tenant panel signage, the addition of a new monument sign along South Boulder Road, the addition of a second monument sign along Hecla Way, and the addition of menu signs interior to the property.

BACKGROUND:
The subject property is located at 1414 Hecla Way between Hecla Way and E. South Boulder Road, to the east of King Soopers Fueling Station and Jiffy Lube. The planned unit development at 1414 Hecla Way was originally approved as the Black Diamond Carwash in 2000 (City Council Resolution 55, Series 2000). An administrative PUD amendment was approved in 2004 to allow for minor revisions to building elevations to remove decorative elements and changes to the exterior materials. A second administrative PUD amendment was approved in 2017 and allowed for revisions regarding traffic movement, parking modifications, pay stations, and site landscaping.

Two monument signs were originally included on the PUD approved in 2000, a secondary monument sign along Hecla Way, and a shared monument sign along South Boulder Road for the subject property and the former Lehrer's Flower Shop, however these signs are not in place. The PUD approved in 2011 to allow the development of the King Soopers Fueling Station approved the current shared monument sign along South Boulder Road.

The property is subject to the Commercial Development Design Standards and Guidelines (CDDSG) which regulates commercial signage. The current owner purchased the property in 2017. The menu signs shown on the PUD Amendment under review were installed in 2018 without a sign permit.

Speedy Sparkle, south elevation facing E. South Boulder Rd.

Speedy Sparkle, north elevation facing Hecla Way.

ANALYSIS:
The application before the Planning Commission contemplates a PUD amendment that would allow the removal of Speedy Sparkle sign panel from the existing joint monument sign with King Soopers and Jiffy Lube and the addition of a separate monument sign for Speedy Sparkle along E. South Boulder Road in close proximity to the existing monument sign, the construction of a

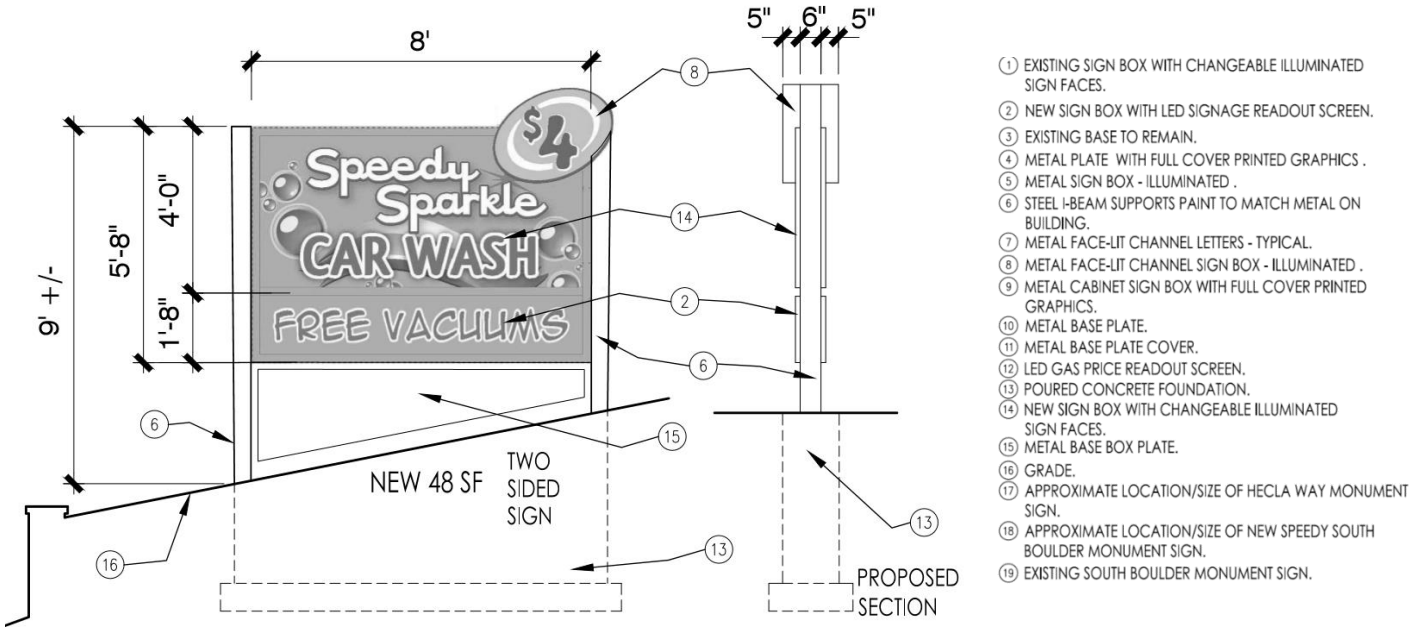
larger monument sign along Hecla Way, and approval of the existing menu signs which were built without approval.

Staff evaluated the application under the existing PUD, the Commercial Development Design Standards and Guidelines (CDDSG), and the draft Sign Code, which staff anticipates will be adopted later this summer or early fall.

PROPOSED SIGNAGE:

E. South Boulder Road Monument Sign:

The applicant proposes to remove the existing Speedy Sparkle sign panel and install a larger Jiffy Lube sign panel on the shared monument sign and construct a separate monument sign (shown below) on their property at 1414 Hecla Way in close proximity to the existing monument sign.



Proposed monument sign along E. South Boulder Rd.

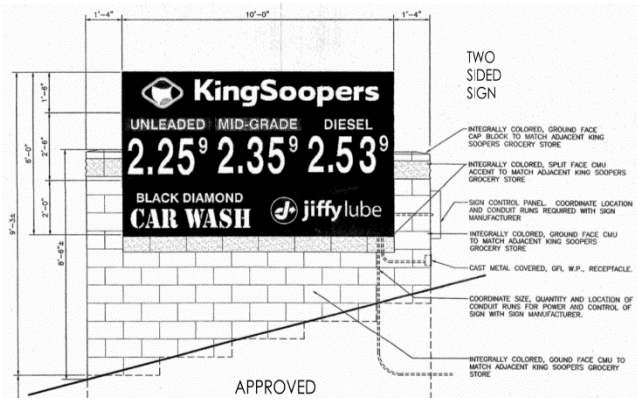
Proposed Sign Specifications:

- Sign Dimension: approximately 9'x9'
- Sign Face: 48 square feet
- Architectural Details: The border of the sign uses steel I-beam supports painted to match the building, with a metal base.
- Sign Face Components:
  - "Speedy Sparkle Car Wash": new sign box with changeable illuminated sign faces
  - "Free Vacuums": new sign box with LED signage readout, which the draft Sign Code refers to as an Electronic Message Center.
  - "$4": metal face-lit channel sign box, illuminated

Existing PUD:

The current PUD allows for a shared monument sign along E. South Boulder Road for King Soopers, Jiffy Lube, and Speedy Sparkle, located on the property line between

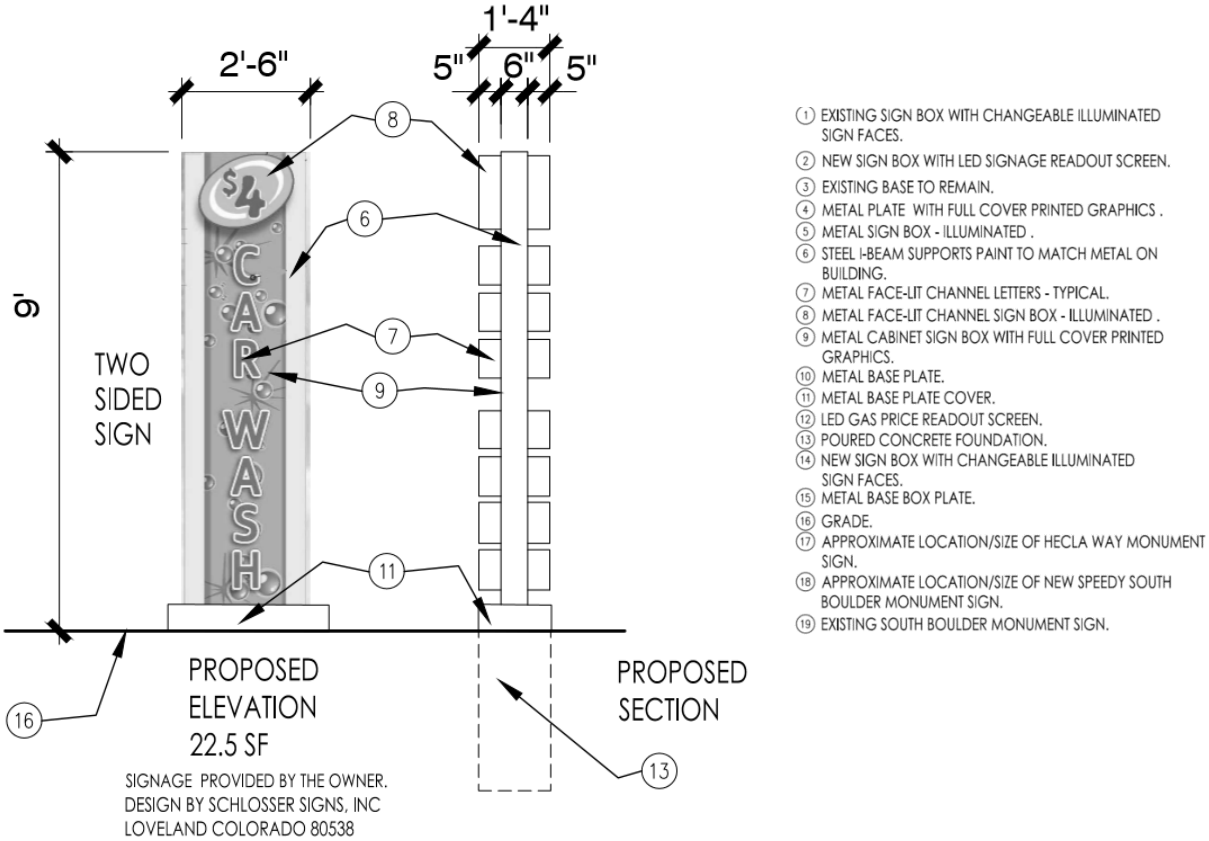
Speedy Sparkle and Jiffy Lube. This sign is currently 60 square feet in area and 9 feet tall at the highest point. Use of a joint monument sign is intended to help reduce sign clutter.



Existing shared monument sign along E. South Boulder Rd.

Hecla Way Monument Sign:

The applicant proposes to construct a second monument sign at the north side of the property along Hecla Way.



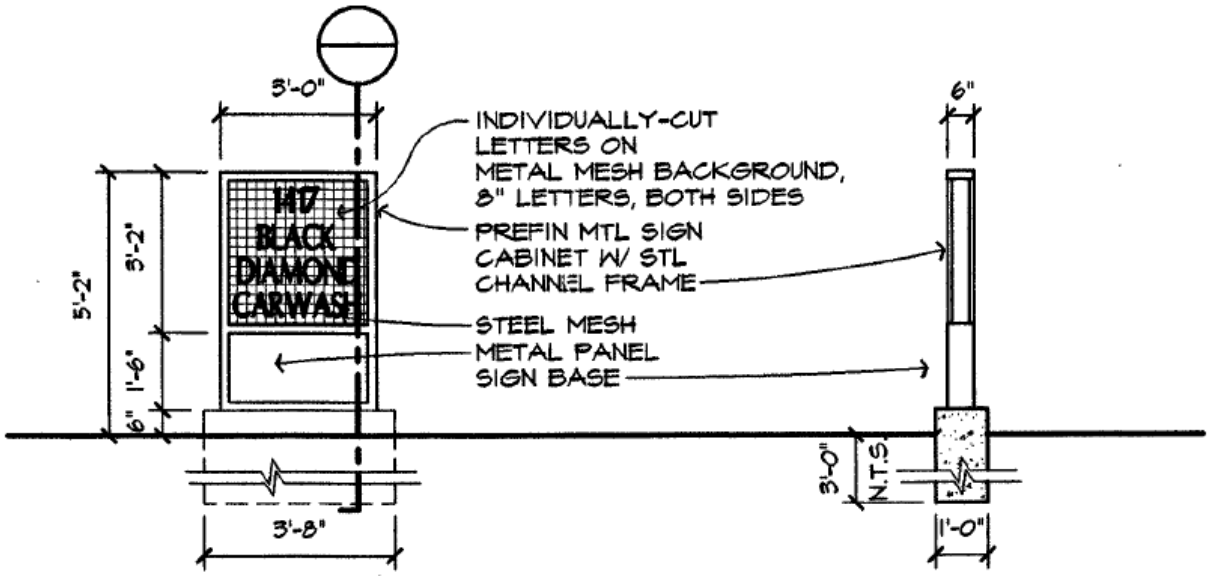
Proposed secondary monument sign along Hecla Way.

Proposed Sign Specifications:

- Sign Dimension: 9’x2’6”
- Sign Face: 22.5 square feet
- Architectural Details: The border of the sign uses steel I-beam supports painted to match the building, and a metal base plate with cover.
- Sign Face Components:
  - “Speedy Sparkle Car Wash”: metal cabinet sign box full cover printed graphics, letters are metal, face-lit channel letters
  - “$4”: metal face-lit channel sign box

Existing PUD:

The current PUD allows for a monument sign along Hecla Way. The approved sign was never built. The monument sign on the current PUD is 5’2” tall x 3 feet wide, with a sign area of approximately 9 square feet.



Approved secondary monument sign along Hecla Way.

CDDSG Standards:
Staff evaluated the proposed monument signs against the applicable Commercial Development Design Standards and Guidelines (CDDSG) Chapter 7, Sign Design. Numerous conflicts between the proposed signage and the CDDSG were found. The following table compares the proposal with the applicable CDDSG regulations:

Sign Criteria: Standards and Guidelines	Consistency with Standards
7.1 Sign Materials A. The sign package must utilize materials, colors and designs that are compatible with the associated structures. (S) B. Sign materials must be of proven durability. (S)	*The freestanding signs shown on the proposal do not utilize a design that is compatible with the associated structure. The regulations require a compatible base and border, as noted below, which this proposal does not provide. Staff believes the sign materials are durable.* ***Staff finds the proposal does not meet standard in Section 7.1.A.***
7.2 Sign Number and Area: The size of signs should be modest and afford businesses sufficient visibility and identification without becoming a dominant part of the landscape or interfering with vehicular movement along the public streets. B.1) One monument sign is permitted for each freestanding building. (S) C.1) Monument signs shall not exceed 60 sf in retail zones. (S)	*The current proposal includes the removal of the Speedy Sparkle sign panel on the shared monument sign with King Soopers and Jiffy Lube, but does not include the removal of that monument sign. This will result in two monument signs in close proximity to each other that are unnecessary, add to sign clutter, and are not modest and necessary for the business to have adequate visibility. The current sign panel for Speedy Sparkly is 10 Sq. Ft. and along with the wall sign for the business, these signs provide clear visibility of passing traffic on South Boulder Road. In addition, the current sign code only allows*

	one monument sign for each free standing building and the proposal is for two monument signs. The allowed sign area of 60 sq. ft. in the CDDSG is intended to be sized for joint tenant signs for multiple businesses. Although the applicant's sign is less than 60 sq. ft., both monument signs together in close proximity greatly exceeds 60 sq. ft. ***Staff finds the proposal adds excessive signage area and number of signs and does not comply with these standards.*** *The proposed secondary monument sign along Hecla Way includes an increase in size from the existing PUD to the proposed PUD.* • *The approved sign is approximately 9 square feet and the proposed sign is 22.5 square feet.* • *The approved sign is 5'2" tall and the proposed sign is 9 feet tall.* ***Staff finds that the proposal exceeds what is necessary for sufficient visibility and identification.***
7.3 Location/Placement/Visibility B. Locate monument signs in a planter setting within a landscaped area. (S) C. Locate signs a minimum of 10 ft from ROW. (S)	*The location of the monument signs are within landscaped areas and are at least 10 feet from ROW.* ***The proposal complies with these Standards.***
7.4 Sign Illumination Sign illumination should complement, not overpower, the image of the building and its immediate landscaping. B. Flashing signs are not permitted under any circumstances. (S) E. When using an internally illuminated sign cabinet, only that portion of the sign face dedicated to the trademark or characters may be translucent. The balance of the sign face shall be opaque. (S)	*For the proposed monument sign along E. South Boulder Rd., the bottom portion of the proposed sign includes an LED signage readout screen. EMCs are considered moving or flashing signs and, except for signs with time or temperature, are not allowed.* ***Staff finds the proposal does not meet this standard.*** *The proposed sign designs do not include enough information for staff to determine what portions of the sign face are translucent and which are opaque. Staff has requested this information from the applicant but the applicant has not provided a response. Per the CDDSG, the only portions of the sign which may be translucent are the characters.* ***Staff finds the application is incomplete***

	and cannot determine if the sign is in compliance with illumination standards.
7.5 Allowable Sign Types The type of sign used should reinforce the urban environment of commercial developments. Signs should be designed as a "family", incorporating similar, compatible materials that reinforce the design and style of the project architecture. The following standards and guidelines apply with regard to the listed sign types. A.3) Affix monument signs to the ground in a continuous connection. (S) A.5) All monument signs using a sign cabinet design shall have an architectural border that integrates a minimum of two sides of the sign cabinet into the base. The architectural base and border shall be consistent with and/or compliment the building materials. (S) A.7) All monument signs shall be constructed of an opaque background and use a uniform color.	*The proposed monument signs identify steel I-beams as the architectural base and border. While steel I-beams are used elsewhere on the property as part of the canopy design, staff feels they do not meet the intent of the requirement and will not be identifiable as a component that is consistent with and/or complimentary to the building materials.* *Staff finds there is no architectural base and border that integrates the sign cabinet, and the sign design does not reinforce the project architecture. In addition, the sign background uses multiple colors (green, white, various shades of blue), which are not colors utilized elsewhere on the site and not uniform in color is required by code.* ***Staff finds the proposal does not meet these standards.***

Proposed draft Sign Code Standards:
Staff also evaluated the proposed signage against the June draft of the updated Sign Code, as reviewed by Planning Commission at their June 2019 meeting. The updated Sign Code is slated for adoption later this summer or early fall. The following table identifies conflicts between the proposed sigge at 1414 Hecla Way and the updated Sign Code. This is provided for comparison and informational purposes only, as the sign PUD needs to be reviewed against the adopted code currently in effect.

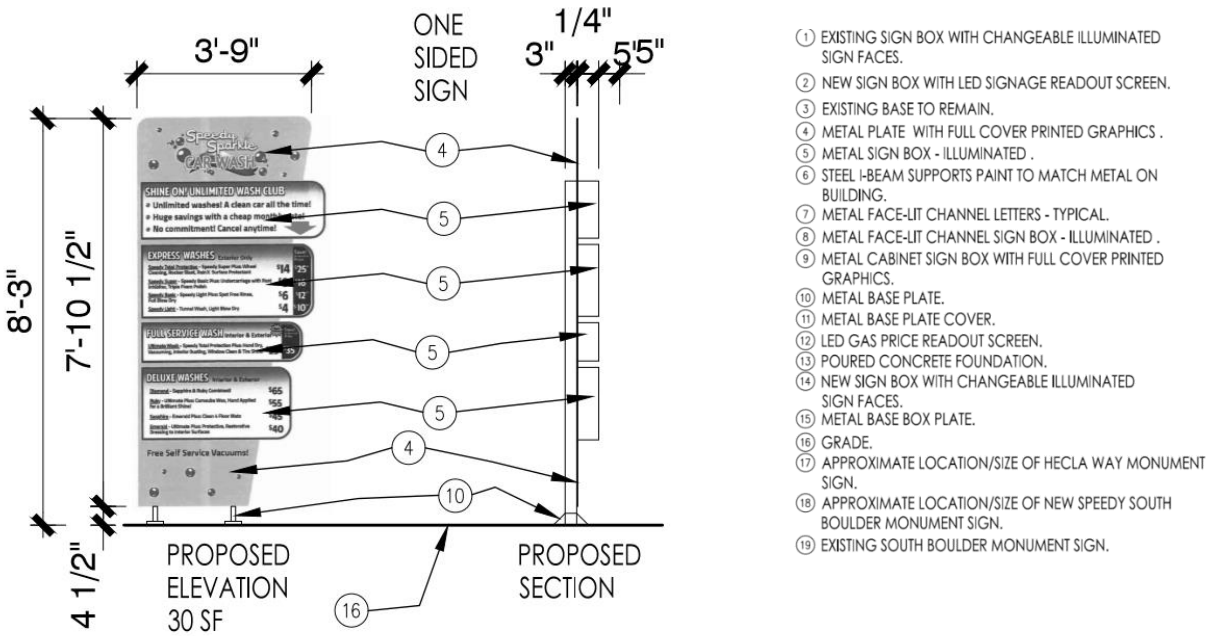
Sign Criteria: Standards and Guidelines	Consistency with Standards
Section 1: General Provisions 1.2 Intent The City has an important and substantial interest in preventing sign clutter (which is the proliferation of signs of increasing size and dimensions as a result of competition among property owners for the attention of passing motorists and pedestrians), because sign clutter: d. Dilutes or obscures messages displayed along City streets through the proliferation of distracting structures and competing messages.	*The current proposal includes the removal of the Speedy Sparkle sign panel on the shared monument sign with King Soopers and Jiffy Lube, but does not include the removal or relocation of that monument sign. The addition of the separate monument sign for Speedy Sparkle results in two monument signs on the property at 1414 Hecla Way adjacent to E. South Boulder Road. Updates to the Sign Code intend to promote the consolidation of signage, as opposed to this proposal which increases the number of signs in this small area along E. South Boulder Road.*

	The current shared monument sign has a sign face of 60 square feet, of which Speedy Sparkle is allocated 10 square feet. The proposed Speedy Sparkle monument sign has a sign face of 48 square feet. ***Staff finds that the proposal is not consistent with the intent of the draft Sign Code.***
Section 3: General Regulations 3.2 Sign Design 3. Materials and textures of signs shall be compatible with the architectural character of the site and building. a. Supporting sign structures of freestanding signs shall match the primary finish and colors of the associated building(s).	*The proposed monument sign identifies steel I-beams as the architectural base and border. While steel I-beams are used elsewhere on the property, staff feels that their use on entrance and exit canopies is minimal and would not be identified as the primary finish of the associated building.* ***Staff finds the proposal does not meet these standards.***
3.3.3 Internally Illuminated Signs a. When an internally illuminated sign cabinet is permitted, only that portion of the sign face dedicated to the trademark or characters may be translucent. The balance of the sign face shall be opaque.	*The proposed sign design does not include enough information for staff to determine what portions of the sign face are translucent and which are opaque.* ***Staff finds the proposal is incomplete, and thus cannot recommend its approval with respect to this standard.***
3.4 Electronic Message Centers 2. Any other electronic message center may be permitted only if expressly authorized in an approved Final PUD plan. The electronic message center in the Final PUD plan shall meet the specific standards in Section 3. and shall include standards and requirements concerning the design and location of the electronic message center, and shall demonstrate exceptional and unique circumstances warranting the use of the electronic message center.	*The bottom portion of the proposed sign includes an LED signage readout screen/electronic message center. While electronic message centers are allowed through approval of a PUD under the draft Sign Code, the applicant has failed to identify which exceptional and unique circumstances warrant the use of the electronic message center on this sign, and does not provide the required details to confirm the proposal meet these requirements.* ***Staff finds the proposal does not meet these standards.***
4.10.b Freestanding Signs in Commercial Areas Freestanding signs in Commercial areas are subject to the following standards. 1. All freestanding signs shall be located along a primary or secondary public street frontage. Only one primary frontage shall be allowed. Sites may	*The current proposal includes the removal of the Speedy Sparkle sign panel on the shared monument sign with King Soopers and Jiffy Lube, but does not include the removal of that monument sign. The addition of the separate monument sign for Speedy Sparkle results in two monument signs on the*

have more than one secondary frontage. Sites with more than five hundred (500) feet of primary or secondary frontage shall be allowed to place an additional sign meeting the secondary frontage standards on that frontage. 3. All freestanding signs must be constructed of an opaque background of uniform color, and shall be of high quality materials that are compatible with the building. Freestanding sign bases and support shall be constructed of brick, stone, wood, decorative concrete, high quality metal, or other similar materials. Maximum Height, Primary: 8 ft. Maximum Height, Secondary: 5 ft.	*property at 1414 Hecla Way adjust to E. South Boulder Road.* *The proposed sign design does not include enough information for staff to determine what portions of the sign face are translucent and which are opaque.* *The proposed monument sign proposes steel I-beams as the architectural base and border. Staff does not feel that I-beams constitute a "high quality metal" and do not rise to the level of brick, stone, wood or decorative concrete.* *For the Hecla Way monument sign, the proposed sign is 9 feet tall, exceeding the maximum height of 5 feet for secondary monument signs.* ***Staff finds the proposal does not meet these standards.***

Menu Signs:

The applicant previously constructed two menu signs on their property that are not included in the PUD currently in effect.



Menu signs, proposed.

Menu signs, currently installed

Proposed Sign Specifications:

- Sign Dimension: 8’3” x 3’9”
- Sign Face: 30 square feet
- Architectural Details: The base of the menu signs includes a metal plate.
- Sign Face Components:
    - Speedy Sparkle: metal plate with full cover printed graphics,
    - Menus: metal sign box, illuminated

Proposed Sign Specifications:
The sign incorporates an illuminated metal sign box with a metal plate with full cover printed graphics.

Existing PUD:
The current PUD does not include menu signs.

CDDSG Criteria:
Staff evaluated the proposed signage against the Commercial Development Design Standards and Guidelines (CDDSG) Chapter 7, Sign Design. Display signs are not included as a sign type in the CDDSG.

Proposed Sign Code Criteria:
Staff also evaluated the proposed signage against the June draft of the updated Sign Code, as reviewed by Planning Commission at their June 2019 meeting. The updated Sign Code is slated for adoption later this summer or early fall

Sign Criteria: Standards and Guidelines	Consistency with Criteria
4.4 DISPLAY SIGNS Display signs in commercial areas are subject to the standards below. Maximum number: 1 per drive-thru lane Maximum area: 32 square feet Maximum height: 7 feet	The proposed display signs are 8’ 3” tall, which exceed the maximum height of 7 feet. The proposed sign area is 30 square feet, while the maximum allowed sign area is 32 square feet. Because the signs fall under the maximum allowable sign area, staff feels that the requested signs are reasonable and meet the intent of these standards.

STAFF RECOMMENDATION:
While staff acknowledges that the purpose of a PUD is to provide for greater variety and choice of design (Sec. 17.28.010 – Purpose for Planned Unit Developments), staff finds that the current proposed PUD Amendment fails to meet many of the standards for high quality signs that are architecturally compatible with the site, as set forth in the CDDSG as well as the draft Sign Code. There are no unique circumstances or hardships related to this particular property that warrant consideration of a request for approval of the PUD amendment as submitted.

Further, staff finds that conditions of approval are not appropriate in this proposal. The PUD amendment under consideration requires substantial revisions in order to comply with the provisions in the sign code. In this case, the applicant has not proposed signs that align with either the CDDSG or draft Sign Code and has not provided sufficient rationale for staff to recommend approval of the request.

Additionally, staff notes that with respect to the sign along South Boulder Road, the approval will result in three monument signs on the property, which is not permitted. Any changes to the existing monument sign requires approval from the adjacent property owner, which has not been provided to date.

Staff recommends approval of Resolution 14, Series 2019 recommending denial of an amended Planned Unit Development to amend the PUD for the property at 1414 Hecla Way.

ATTACHMENTS:
1. Resolution No.14, Series 2019
2. Application Materials
3. Proposed PUD
4. Chapter 7, CDDSG – Sign Regulations
5. Existing PUD with approved signs
6. Staff/Applicant Communication
7. Public Comments

RESOLUTION NO. 14
SERIES 2019

A RESOLUTION RECOMMENDING DENIAL OF A REQUEST FOR A PLANNED UNIT DEVELOPMENT AMENDMENT TO ALLOW CHANGES TO THE SIGNAGE AT 1414 HECLA WAY, LOT 6 LOUISVILLE PLAZA FILING 2

WHEREAS, there has been submitted to the Louisville Planning Commission an application for approval of a request for a Planned Unit Development Amendment to allow changes to the signage; and

WHEREAS, the City Staff has reviewed the information submitted and found that the application does not comply with applicable standards related to signage as part of the Commercial Development Design Standards and Guidelines; and

WHEREAS, the Planning Commission has considered the application at a duly noticed public hearing on July 11, 2019, where evidence and testimony were entered into the record, including the findings in the Louisville Planning Commission Staff Report dated July 11, 2019.

NOW THEREFORE, BE IT RESOLVED that the Planning Commission of the City of Louisville, Colorado does hereby recommend denial of a request for a Planned Unit Development Amendment to allow changes to the signage at 1414 Hecla Way, Lot 6 Louisville Plaza Filing 2.

PASSED AND ADOPTED this 11th day of July, 2019.

By: _____
Steve Brauneis, Chairperson
Planning Commission

Attest: _____
Debra Williams, Secretary
Planning Commission

City of Louisville
COLORADO · SINCE 1878

Department of Planning and Building Safety
749 Main Street • Louisville CO 80027 • 303.335.4592 • www.louisvilleco.gov

LAND USE APPLICATION

CASE NO. _____

APPLICANT INFORMATION

Firm: Speedy Sparkle Car Wash - Louisville, LLC
Contact: Robert Kearney
Address: 1414 Hecla Way
Louisville, CO 80027
Mailing Address: 549 N 4th Street
Berthoud, CO 80513
Telephone: (970) 532-4243
Fax: (970) 532-3603
Email: robert@coloansonline.com

OWNER INFORMATION

Firm: Car Wash 2, LLC
Contact: Robert Kearney
Address: 549 N. 4th Street
Berthoud, CO 80513
Mailing Address: 549 N. 4th Street
Berthoud, CO 80513
Telephone: (970) 532-4243
Fax: (970) 532-3603
Email: robert@coloansonline.com

REPRESENTATIVE INFORMATION

Firm: CW Associates, PLLC
Contact: Chip Weincek
Address: 672 W. Pine Street
Louisville, CO 80027
Mailing Address: P.O. BOX 271033
LOUISVILLE, CO 80027
Telephone: (303) 666-8941
Fax: _____
Email: chip@cwa-architect.com

PROPERTY INFORMATION

Common Address: 1414 Hecla Way
Legal Description: Lot 6 Blk _____
Subdivision Louisville Plaza Filing #2
Area: 44,026 Sq. Ft.

TYPE (S) OF APPLICATION

- ☐ Annexation
- ☐ Zoning
- ☐ Preliminary Subdivision Plat
- ☐ Final Subdivision Plat
- ☐ Minor Subdivision Plat
- ☐ Preliminary Planned Unit Development (PUD)
- ☐ Final PUD
- ☒ Amended PUD
- ☐ Administrative PUD Amendment
- ☐ Special Review Use (SRU)
- ☐ SRU Amendment
- ☐ SRU Administrative Review
- ☐ Temporary Use Permit: _____
- ☐ CMRS Facility: _____
- ☐ Other: (easement / right-of-way; floodplain; variance; vested right; 1041 permit; oil / gas production permit)

PROJECT INFORMATION

Summary: -See Attached-
Amendment to correct and update signage.
For site and neighboring properties.

Current zoning: PUD Proposed zoning: PUD

SIGNATURES & DATE

Applicant: [signature], Manager
Print: Robert E. Kearney, Manager
Owner: [signature], Mgr.
Print: Robert E. Kearney, Manager
Representative: _____
Print: _____

CITY STAFF USE ONLY

- ☐ Fee paid: _____
- ☐ Check number: _____
- ☐ Date Received: _____

Arts & Science of Sign Design

To be an effective form of communication, signs must incorporate sciences behind artistic design principles. Any regulation must also take these factors into consideration to ensure that signs are both effective and safe. This document includes some of the latest research into applicable scientific principles.

signage foundation, inc.

About The Signage Foundation, Inc.

The Signage Foundation, Inc., is a not-for-profit, non-partisan organization dedicated to fulfilling the educational, research, and philanthropic purposes of on-premise signage. SFI was established in 2002 as a 501(c) (3) public foundation through its supporting organizational alignment with the International Sign Association. The Foundation is governed by a board of directors representing the diversity and professional depth within the large community of individuals that believe in the social and economic value of on-premise signage.

The Signage Foundation, Inc. affirms signage as a fundamental component of today's communication system and as a necessity for the development of a visually pleasing, economically healthy, and diverse community. The Signage Foundation promotes intelligent and productive use of on-premise signage and storefronts that benefits every sector of the U.S. economy.

The Signage Foundation, Inc., is committed to expanding the knowledge base on the use and benefits of signage products through peer-reviewed research to facilitate the operation within the marketplace by manufacturers, suppliers, and individuals in their efforts to design, build, and sell innovative products. Each fall, The Signage Foundation hosts the National Signage Research and Education Conference in conjunction with the University of Cincinnati's Colleges of Design, Architecture, Art, and Planning, and Business.

While SFI commissions original research and publishes the results as original treatises, in the interest of promoting signage information to a broader audience, it also condenses and republishes (with permission) existing articles and studies.

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Arts and Science

The following article has been adapted and updated from a version that originally appeared in the 1997 "Economic Value of On-Premise Signage," published by the California Sign Association (formerly the California Electric Sign Association) and the International Sign Association.

Overview

In just a few words, signs convey a lot. They draw attention, communicate a message, compete with surroundings, and reach a driver whizzing by.

But signs are more than an artistic endeavor. The best blend strong design and graphics with a thorough understanding of the science that makes them most effective.

Sign regulations, too, must balance artistic expression with scientific research. Otherwise, the end result could be harm to a business or, worse yet, an unsafe distraction for drivers.

The Federal Highway Administration has developed numerous principles to ensure road signs are safe. While the FHWA's information is aimed at highway signs, the agency includes research that can apply to on-premise signage as well. For instance, the FWHA has determined that 41 percent of accidents occur because of a lack of adequate signage. Further studies have established that the most important consideration in determining the size and placement of a sign is the distance between the sign and the viewer.

Consequently, one blanket sign ordinance is rarely enough to meet the diverse needs based on viewership or location.

Location

A sign will not be viewed by any driver on its own. It will be seen in the context of other structures, landscaping, and visual sight lines in the area. Because of its very nature, on-premise signage is located further away from the roadway than traffic signs. It sits on the property of the sign owner, beyond the lanes of traffic and right-of-way. Signs must be high enough to be seen beyond obstructions, such as cars parked alongside the street and on the roadway.

If a sign is visible from a greater distance, it affords a longer viewing time and is better able to develop an impression. At 55 mph, the viewer travels 80 feet per second. It takes 16.5 seconds to travel a quarter mile. There is little time to draw attention from the road and redirect it to the sign.

If the sign is to be seen by drivers, the speed at which they are traveling is also a factor. Drivers must have time to read the sign, process the information, and safely react. This is called the Decision Sign Distance (DSD) and varies depending upon the rate of speed on the street. A driver must have adequate time to react to the sign, decide to take action, and then safely complete the maneuver. If there are a number of signs in the area, drivers may need additional time to respond.

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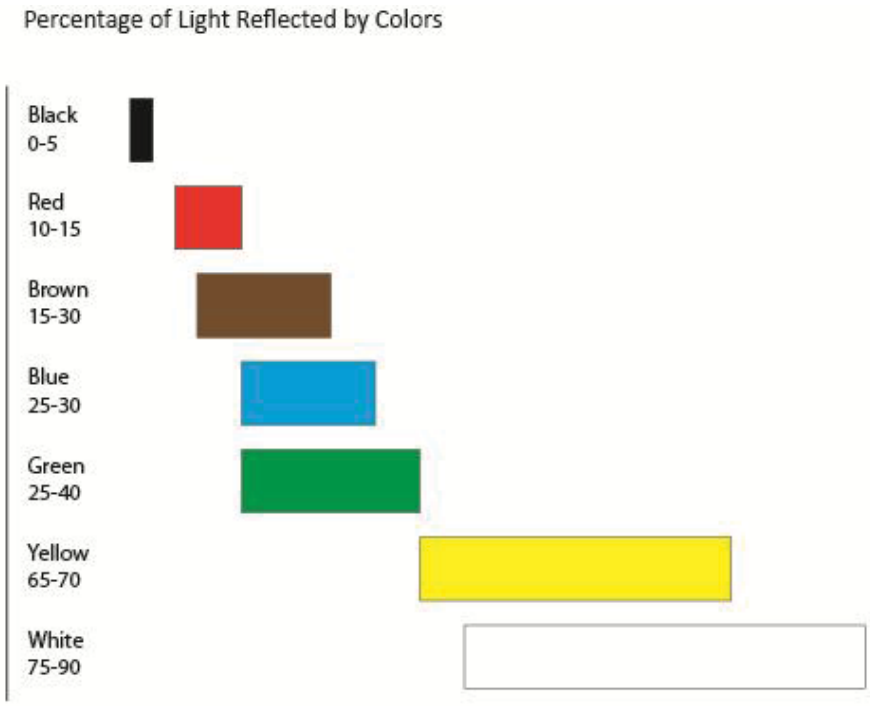
Sign Design

To be most effective, the sign's design must accommodate the location as well. The size of its letters will be affected by how far the sign is from the viewer. It also will vary according to the intended viewer: a pedestrian or a driver.

But other elements can influence the sign reader's ability to comprehend. Signs that feature familiar logos, words, and fonts can be processed more quickly. Because of familiarity, for instance, the current McDonald's sign features only its name and the iconic golden arches. Nowhere on the modern version of the sign does it say "hamburger" or "restaurant," as it once did. Familiarity allows viewers to fill in those blanks because they know the name and the logo.

Color: Color is recognized as part of a corporate logo. Studies have shown that 80 percent of the recognition of a trademark is due to its color. Whether it is an iconic, international brand or a small local store, viewers will recognize the sign in part because of the colors used on it.

Luminance: Color bears another important aspect of sign design. Each color reflects a specific percentage of light striking its surface. This is known as luminance. The chart below shows how various colors rank on the luminance scale. When signs are internally illuminated, those that have a higher luminance scale show brighter.



Light emitted from a light source, such as neon or LEDs, also has varying degrees of brightness. They are, in order, dimmest to brightest: red, blue, green, and yellow. This is known as luminescence.

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For drivers traveling at night, both the reflected light—luminance—and illuminated light—luminescence—factor into the readability of the sign.

Contrast: Most signs include words and objects that are a different color than the background. The contrast between these two items also affects the readability of the sign. This occurs at two points: the exterior and interior of the sign. Exterior contrast compares the sign's edge to the background against which it must be viewed. This might be how the sign's design fits into a multi-tenant sign, or how the sign's edge meets the building to which it is affixed.

The same requirements apply to the interior of the sign—where the copy meets the background. White letters on a yellow background will not be nearly as striking as white on black, for instance.

In the publication *Visual Communication Through Signage*, authors Karen Claus and James Claus ranked the following color combinations, from most to least readable:

black on yellow
black on white
yellow on black
white on blue
yellow on blue
green on white

blue on yellow
white on green
white on brown
brown on yellow
brown on white

yellow on brown
red on white
yellow on red
red on yellow
white on red

Size: The larger the letters appear, the better. The copy of the Snellen eye chart (right) certainly illustrates the relationship between the physical size and the dramatic visual impact. When a sign must be read easily in a minimum amount of time—such as when traffic passes by at a high rate of speed—it is important that the words be large.

To be readable—and to convey its message safely—a sign must be detectable, conspicuous, legible, and comprehensible. A sign reportedly should be 40 feet of distance per inch of letter height, which allows for maximum comprehension and legibility day and night.

Lettering on signs should include strokes— measuring the thickness of the letters—that are one-fifth the letter height for maximum readability.

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The Viewer

Signs intend to communicate with a viewer, of course. But sometimes, viewer limitations get in the way.

It has been well documented that the American population is aging. In 2011, 13 percent of the U.S. population was over age 65 and by 2025, about one in four drivers is expected to be over 65. Eyesight declines with age, and reaction time slows.

It is estimated that 66 percent of American adults wear glasses, contact lenses, or both. As many as 3 million people have glaucoma, and cataracts affect 22 million people over age 40. Most of us see more poorly in low-light conditions. To compensate, signs must be designed to provide better visibility, especially at night.

No matter the age, though, all drivers have a relatively narrow cone of vision. Signs must be positioned within this cone so that the driver doesn't need to take his eyes off the roadway to take in the sign.

The Manual on Uniform Traffic Control Devices—the federal government's standards for signs and signals along America's roadways—sets a maximum height for traffic signals. It is based on the concept that viewers sitting at an intersection can see about 20 degrees from the driver's eye height. Anything else could be lost in the upper portion of the windshield. While these standards apply only to signals and road signs, the science applies to on-premise signage as well. If the sign isn't positioned correctly—or its orientation to the roadway is increased dramatically—it may be illegible if the sign isn't large enough. But for signs to be the clearest, the cone is somewhat more narrow. The absolute clearest viewpoint is a cone of about 3 degrees around where the eyes are focused. Readability is severely limited outside a 10-degree cone.

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Appendix

References

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To Learn More

The Signage Foundation, Inc., has developed document that incorporates all of these factors. To receive a copy of *A Framework for On-Premise Sign Regulations,* visit www.thesignagefoundation.org.

Other publications that may be of interest:

- "Economic Value of On-Premise Signage," 1997
- "Economic Value of On-Premise Signage," 2012

The Economic Impact of Exterior Electronic Message Boards

Prepared for The Signage Foundation, Inc.

By the University of Cincinnati Economics Center

April 2014

Executive Summary

Electronic message boards are increasingly used by businesses as exterior on-premise signage. Are these signs, which allow businesses to communicate more information at a lower cost, associated with better store performance? This research provides new insights into the benefits of investing in electronic message boards, based on the latest performance metrics from a major retailer.

- The analysis used data from 19 stores which implemented an electronic message board sometime between July 2010 and February 2012. During this period, each of the test stores went from having either no message board or a manual message board to an LED message board.

- By using a control-treatment store methodology, the Economics Center found a 2.1 percent increase in weekly store sales in the first year after installing an electronic message board.

- The increase in store performance from the electronic message board was consistent across various measures including: weekly store sales, weekly transactions, and transactions for both convenience sales and destination sales.

- Based on these estimates, the break-even figure for an electronic message board installation may be as low as 3 months and as high as 15 months – depending on labor capacity and other fixed costs. Therefore, in most cases, the installation of such a sign generally pays for itself in less than a year and contributes positively to the business bottom line for the remainder of its life cycle.

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Introduction

Certain types of retail businesses prefer high-traffic locations. Such businesses have long used supplemental message boards to inform prospective customers about their location and products. Businesses like gas stations and banks regularly provide information about the availability and price of particular items, such as gas, convenience items, loans, and savings certificates. The display of this information plays a central role in these companies' business strategies for increasing traffic and sales. Indeed, the value of a corner or other highly-visible location rests largely on the ability to use signs to inform passers-by about the availability of a business' goods and services.

One particularly important characteristic of these supplemental message boards is that they provide key information to consumers, thus lowering their cost of finding products they want to buy. This function has benefits for businesses, consumers, and the communities in which they are located (Rexhausen et al, 2012).

The subject of this case study is one of the largest retailers in its industry, with hundreds of locations across the country. It offers its customers a broad range of merchandise that includes both convenience and destination-type consumer products. This large retail chain operates in a highly competitive industry, where nearly all of the goods and services offered by its stores are also available from other retail establishments. In this environment, providing information to prospective customers about the availability of its products is essential to maintain profitability. Stores are situated in high-traffic locations, with good visibility that enables the company to employ a variety of signage strategies to drive foot traffic and sales.

At most locations, the subject retailer has at least three types of on-premise signage. First, the one or two most visible sides of the building receive standard branding and descriptive wall signage. Second, pylon and/or monument signage with the company's branding is employed along the major thoroughfare. Third, a two-sided electronic message board is placed below the largest corporate logo on a pylon or monument sign.

For the subject retailer, these signs were historically manual message boards, with plastic letters that were changed by store personal to convey new information. These messages were occasionally disrupted by windy weather and vandalism, and repairs or message changes were time consuming. Message consistency across the chain was also difficult to maintain. In recent years, the subject retailer has incorporated electronic message boards as part of its exterior signage program.[1] These electronic message boards are a key element in informing customers about things such as sales on particular products and the availability of new items. The electronic boards can be centrally controlled to ensure proper messaging, while simultaneously being customizable at the store level to provide information of value to the local community.

[1] LED signs are the most common type of variable-message electronic signs, which are sometimes referred to as digital signs.

Previous Research

In a 2011 report on "EMC and Digital Sign Issues," Freeborg, Moeller, and Drury identified a range of business and community impacts that may constitute reasons for expanding the use of electronic message boards. For businesses, these benefits include an enhanced ease of changing the sign message, which creates an opportunity to more effectively respond to the needs of potential customers, and the potential for including images, all of which lead to increased sales.

For communities, the benefits are even more numerous. Increased sales for businesses lead to increased tax revenues. By improving business viability, these signs can also reduce vacancies and blight in commercial areas. Such signs can also serve community interests by improving sign visibility, readability, and attractiveness, and by communicating public service messages. In addition, fears about safety issues appear to be misplaces, because five major studies between 2007 and 2010 found no statistical relationship between vehicular accidents and digital billboards. (Freeborg, Moeller, and Drury, 2011).

In his research, Hendrikus E.J.M.L. van Bulck (2011) surveyed 36 business establishments in Sumter SC, a dataset believed to constitute the majority of electronic sign users in the city. Van Bulck collected data on business and sign characteristics as well as attitudes about the potential benefits of these signs. Using factor analysis, van Bulck found two dimensions that underlie respondents' attitudes about their electronic signs. The first factor – Cost-Effective and Easy – reflects their views about the cost of such signs and the low level of effort required for updating their messaging. The second factor – Helps Customers – captures their attitudes about the value of electronic signs for enhancing the visibility of their businesses. Van Bulck also found that two sign characteristics were significantly related to respondents' perceptions of the signs' effectiveness. His most significant finding was that signs with one-line or three-line messages were considered less effective than signs of other lengths. He also determined that two-sided signs were seen as significantly more effective than one-sided signs (van Bulck, 2011).

Hawkins, Kuo, and Lord (2012) have studied the relationship between the installation of on-premise digital signs and traffic accidents. Through extensive research, Hawkins and his colleagues were able to identify 135 locations with accident data available, and where new digital signs were installed in either 2006 or 2007. Examining this multi-state dataset, which contained 12 times as many sites as the combined count in all related studies in the previous ten years, they found that the installation of these digital signs had no effect on the number of traffic accidents within a tenth of a mile of the sign locations. These findings held for both single-vehicle and multi-vehicle crashes.

In a 2012 study on "The Economic Value of On-Premise Signage," Rexhausen, Hildebrandt, and Auffrey included two case studies that considered the effects of electronic message boards. The first case study examined data from roughly 170 locations of an extended-stay lodging chain. Those with electronic signs had higher average occupancy rates than those with plastic signs, and this difference was most pronounced in the bottom quartile of locations. The study notes that "the performance gain from the use of electronic signs was in the range of one to two percent in the top three quartiles, but in jumps up to a ten percent advantage in the lowest quartile."

The second case study concerned the installation of a pylon video board to promote a car dealer's service business. Positive metrics for the sign change included an increase in the number of customers in the first ten months that averaged 4.5 percent every two months, an overall year-over-year increase of 6.5 percent, and a service revenue growth of 10.8 percent, compared to a 5.5 percent increase in a related national indicator.

In the course of implementing its conversion to electronic message boards, the retailer conducted exit surveys with shoppers to gain a better understanding of their views about message boards. As shown in the tables below, shopper perceptions of message boards were positive overall, and their awareness of electronic message boards was greater than for manual boards.

Table 1

Shopper Perceptions		
	Yes	No
Message board detracts from community attractiveness	7%	81%
Message board shows store cares about community	55%	10%
Message board should have community messages	67%	11%

Table 2

Shopper Awareness			
	Electronic	Manual	Gain
Read the sign	41%	28%	**+13%**
Remember the message	21%	10%	**+11%**

Overall, 30 percent of exiting shoppers read the sign, but the rate was nearly 50 percent higher among those using a store with an electronic board. Among demographic groups, the sign was more likely to be noticed by parents, African Americans, and frequent shoppers. In addition, consumers indicated a preference for monument message boards in suburban settings.

This corporate research also revealed that customers are selective about their use of these electronic signs: they report that such signs are ignored when consumers don't have any interest in store offerings or when the street has congested traffic conditions. Conversely, the messages receive attention when the prospective customer wants the information – at the point of decision about whether to stop at the business.

Finally, it was determined that prospective shoppers want timely messages about "mass appeal" products, and that "item and price" messages have a greater impact on customers. In a controlled test, such a message produced 55 percent more sales than a message that only named the item, with no price information.

Research Data Description

The analysis conducted in this paper utilizes data from 19 test stores (i.e., stores which received a new electronic message board) and 55 control stores (i.e., stores which were similar to the test stores in demographics and sales, but did not undergo a sign change). The test stores did not undergo complete signage makeovers; changes only affected the message boards, which generally represent less than one fourth of a store's total signage area.

The data in this sample ranged from July 2009 through June 2013 and was aggregated on a weekly basis. During this time period, each of the test stores went from having either no message board or a manual message board to an electronic message board. Of the sample of 55 control stores, 22 had electronic message boards and 23 either had a manual message board or no message board.

Weekly data for test stores and their corresponding control stores were normalized relative to the week in which the test store had an electronic message board installed. The week of the installation was denoted as week zero (0). For the analysis, weeks prior to the installation where denoted and -1, -2, … relative to week zero (0) and weeks following the installation were denoted 1,2,… relative to week zero (0). No other normalization techniques were utilized. Each test store was matched with an appropriate control store. For example, for a test store located in an area where residents earn only $30,000 a year, the residents' incomes for the matching control stores were nearly identical.

No data was available on a number of other factors that could affect store performance. Competition, site characteristics, management, and temporary factors such as road construction were not included in the analysis.

Outcomes of Interest

The performance variables examined in this analysis include:

- Total Store Sales
- Total Store Transactions
- Convenience Sales (All sales excluding destination sales)
- Convenience Transactions (All transactions excluding destination transactions)
- Destination Transactions

Summary Statistics

Table 3

Variable	Test Stores (Avg.)	Control Stores (Avg.)
Weekly Store Sales*	96	100
Weekly Store Transactions*	96	100
Median Age	34	34
Median Income	$62,851	$63,370
Percent White	77%	74%
Percent African American	12%	15%

* For confidentiality reasons, the control store sales and transactions data has been normalized to an index of 100.

Methodology

In developing our methodology, the Economics Center utilized an approach similar to a *Differences-in-Differences* model. In this model, we compared the performance of a test store which installed an LED message board across outcome variables for differing time periods relative to one or more control stores. The differences between the performance of the test store relative to the control store(s) was then measured and tested for statistical significance.

Identifying comparable stores to use in the analysis was an essential preparatory step in this study. The research team determined that a multi-faceted set of criteria offered the greatest potential for matching test stores to appropriate control stores. The criteria for identification of control stores are divided into two equally weighted categories: market area characteristics and store performance metrics.

Market area characteristics consisted of income, race/ethnicity, and geographic region. The retailer created a category known as "Demographic Peer Group," which combines all three of these characteristics, and this was given a weight of 0.35. Some examples of peer groups are:

- "Above Average Income ($60-80K), White (>80%), Midwest"
- "Average Income ($40-60K), White (15-40%), African American (15-40%), Hispanic, (15-40%), East."

In addition, the Economics Center decided to place greater emphasis on income compared to other demographics, so median income was given a weight of 0.15.

Store performance metrics (prior to test store changes) account for the other half of the criteria weights. In this case, we used "Weekly Total Convenience Sales" for the 2009 calendar year because this was the last full year prior to the sign changes at any of the test stores. This sales figure was given a weight of 0.35. In addition, we used customer traffic, measured as "Total Transaction Count" for the 2009 calendar year, which was given a weight of 0.15.

Control Store Pairings

Test stores were paired against control stores in three distinct approaches.

One: The sales of each of the three control stores for each test store were averaged together. This control store average was then paired with a corresponding test store for analysis. A test store was paired with the average of the control stores. Two individual underlying control stores were part of the average of multiple control stores.

Two: The Economics Center created a new set of control stores by modifying Approach One above and adding the criteria that the underlying control stores must also currently be stores with an LED message board installed. Besides adding this additional criterion, the approach is the same as in Approach One. One control store was excluded since it had a manual message board.

Three: By using the same three underlying control stores as in Approach One as a basis for each test store, the Economic Center created a set of test-control store pairs based on which underlying control store had the highest total store sales correlation during the 52 weeks prior to the sign change at the test store. For instance, test store "B" was paired with control store "B2" because its correlation, 0.667, was the highest. Detailed correlations are found below.

Result details from all three approaches can be made available upon request. The article will focus on results from approach one since the findings are similar across all three approaches.

Table 4

Test Store	Control Store	Correlation
A	1	0.685
B	2	0.667
C	3	0.651
D	4	0.771
E	5	0.615
F	6	0.800
G	7	0.762
H	8	0.715
I	9	0.894
J	10	0.596
K	11	0.569
L	12	0.746
M	13	0.578
N	14	0.718
O	15	0.668
P	16	0.692
Q	17	0.786
R	18	0.646
S	19	0.693

Time-Frames Modeled

Outcome variables were analyzed across two different time frames:

1. A 4 week duration after the sign change relative to a 4 week duration before the sign change

2. A 52 week duration after the sign change relative to a 52 week duration before the sign change

Results

Analysis of an Initial 4-Week Time Period

As shown in the second data column, the average performance of test stores relative to control stores showed positive results across all outcome variables except destination transactions. However, the p-values in columns 3 and 4 indicate that these results were not statistically meaningful.[2]

Table 5

Performance Variable	Average Difference Between Test Store and Control Store	P(T<=t) One-Tail	P(T<=t) Two-Tail
Total Sales	1.05%	0.335	0.669
Convenience Sales	1.49%	0.382	0.763
Total Transactions	1.42%	0.305	0.609
Convenience Transactions	1.74%	0.301	0.603
Destination Transactions	-0.02%	0.494	0.988

Possible reasons that we find statistically insignificant results from these early returns include: a time period too short for customers to change behaviors and/or an insufficient sample size. In addition, the time of the year when the electronic message board was installed might contribute to the lack of a significant finding. Suppose the electronic message board was installed when there were no major holidays or events upcoming for which consumers would increase their shopping behavior or look for bargains. Accordingly, in the given four week period, the consumer might not notice a new electronic message board. However, consider a period in which the electronic message board is installed just prior to a major holiday sales rush. In this case, consumers might be particularly alert to signage that might offer a bargain to the consumer. While the results of our model are robust given the scope and parameters of our analysis, possible future analysis with a larger dataset and more parameters could provide additional insights into the impact of electronic message boards over shorter durations of time.

[2] The p-value for a one-tail test is the probability that the performance measure (e.g., an increase in sales or transactions) is not greater than 0, which means that a low p-value tells us this probability is low. The p-value for a two-tail test is the probability that the true performance measure is equal to 0, which means that a high p-value tells us there is no difference between the test and control groups.

Analysis of 52-Week Tests

The results of our statistical analysis are more revealing when comparing performance in the year after the electronic message board installation relative to the year prior. Table 6 below shows that one year after installing an exterior electronic message board, stores sales increased by 2.12 percent on average. This increase in store performance holds across total sales, convenience sales, total transactions, convenience transactions, and destination transactions. The p-values for the one-tail t-test are approximately 0.2 or lower. With these results, a business owner should feel reasonably confident (about 80%) of the claim that a store's sales performance will improve after installing an exterior electronic message board, and even more confident (85-90%) that the other performance measures will improve.

Table 6

Performance Variable	Average Difference Between Test Store and Control Store	P(T<=t) One-Tail	P(T<=t) Two-Tail
Total Sales	2.12%	0.203	0.405
Convenience Sales	1.95%	0.141	0.282
Total Transactions	1.97%	0.117	0.234
Convenience Transactions	1.58%	0.137	0.275
Destination Transactions	3.22%	0.112	0.223

Total Store Sales

Total store sales for test stores relative to their paired control stores increased an average of 2.12 percent. Of the 12 test stores whose market area median income was between $35,000 and $75,000, nine of these test stores experienced relative gains in their total store sales, year-over-year, relative to their control stores' average. Of the seven test stores outside this income range, only two test stores outperformed their control store pairing. While this evidence is merely anecdotal, it would suggest that further research in the future should closely consider the impact of electronic message boards with respect to median income.

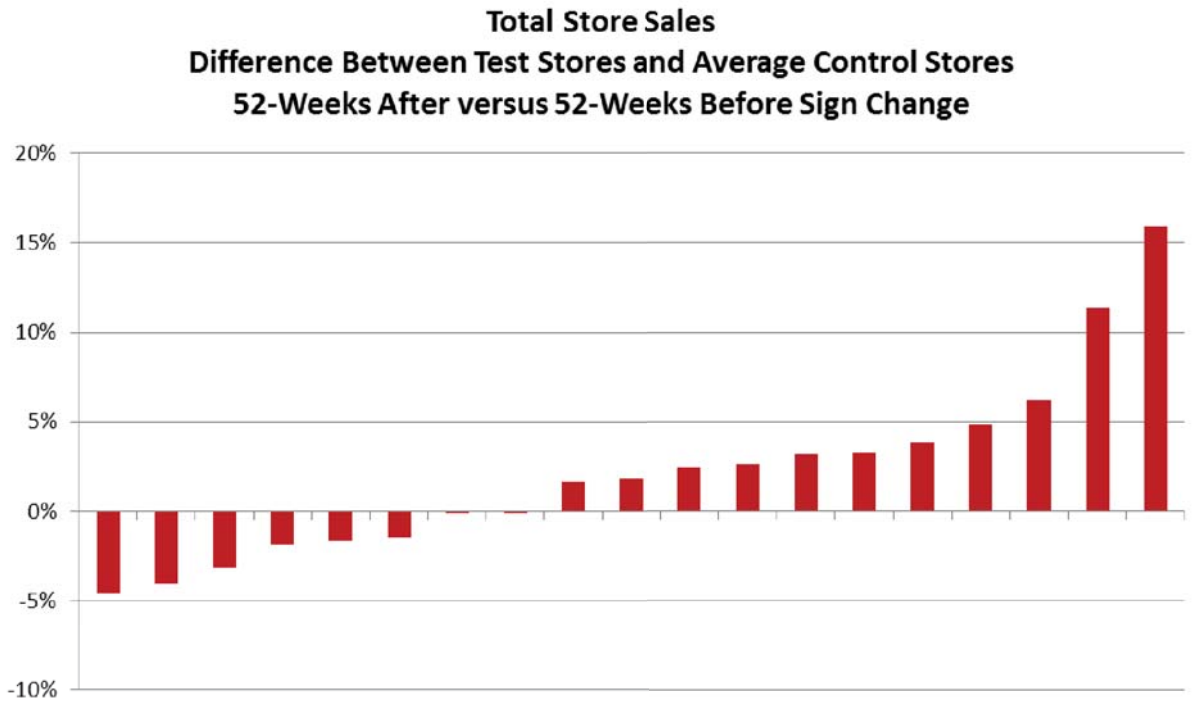
Table 7

Store	Difference-in-Differences
A	-4.06%
B	1.66%
C	2.61%
D	3.28%
E	11.37%
F	4.84%
G	-4.55%
H	-0.12%
I	1.87%
J	3.84%
K	3.21%
L	-3.16%
M	-0.04%
N	-1.87%
O	-1.67%
P	-1.46%
Q	6.21%
R	2.43%
S	15.9%
Average	**2.12%**

P(T<=t) one-tail: 0.2027
P(T<=t) two-tail: 0.4054

Table seven shows that while the average sales lift was 2.12 percent, there is considerable variability across each store. Some stores saw a slight decline, while other stores saw double-digit increases. The advantage of using a difference-in-difference model is that the idiosyncratic difference of each control-treatment store pair should produce the correct estimate on average.

Figure 1


Total Store Sales
Difference Between Test Stores and Average Control Stores
52-Weeks After versus 52-Weeks Before Sign Change
20%
15%
10%
5%
0%
-5%
-10%

Total Store Transactions

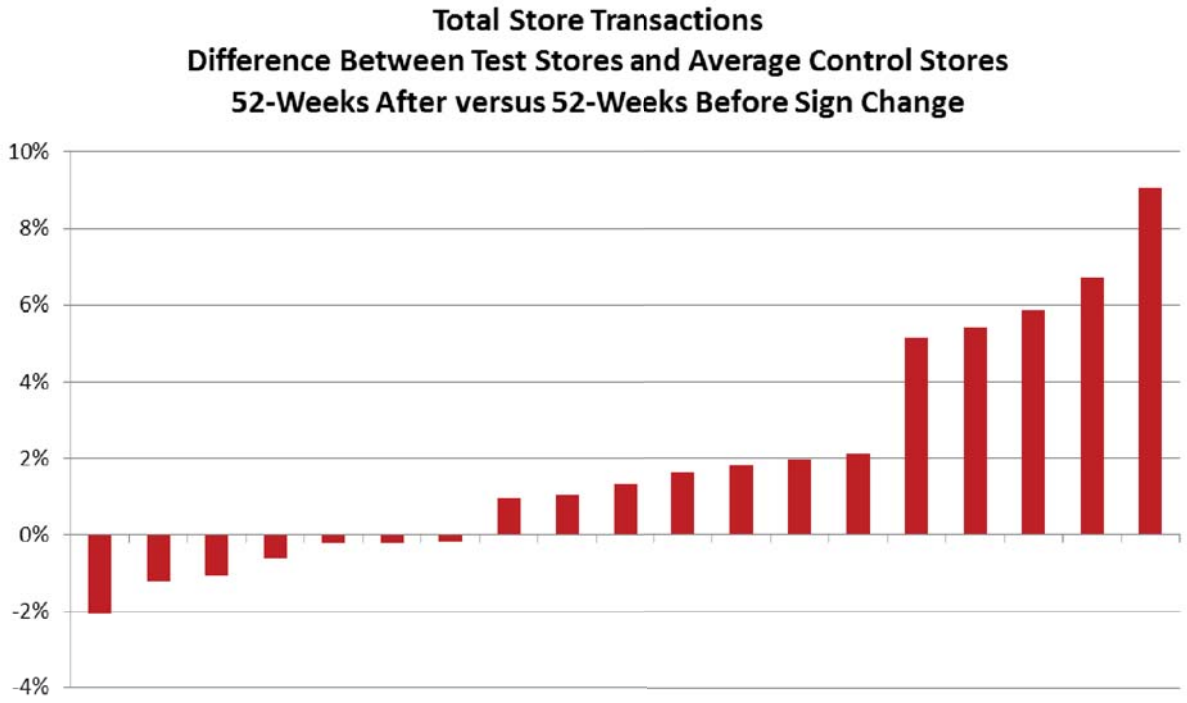
Total weekly transactions for test stores relative to their paired control stores increased an average of 1.97 percent. Of the 12 test stores whose market area median income was between $35,000 and $75,000, nine of these test stores experienced relative gains in their total store transactions, year-over-year, compared to their control store. Of the seven test stores outside this income range, only three test stores outperformed their control store pairing. The statistical significance testing is improved for transactions data relative to sales data. With a p-value of 0.12, business decision makers should feel confident about the ability of an electronic message board to improve weekly store transactions.

Table 8

Store	Difference-in-Differences
A	-2.05%
B	-0.21%
C	5.12%
D	1.81%
E	9.06%
F	2.11%
G	-0.60%
H	-0.19%
I	1.97%
J	1.63%
K	1.04%
L	1.33%
M	-1.22%
N	-0.20%
O	0.98%
P	-1.06%
Q	5.85%
R	5.40%
S	6.70%
Average	**1.97%**

P(T<=t) one-tail: 0.1168
P(T<=t) two-tail: 0.2336

Figure 2


Total Store Transactions
Difference Between Test Stores and Average Control Stores
52-Weeks After versus 52-Weeks Before Sign Change
10%
8%
6%
4%
2%
0%
-2%
-4%

Convenience Transactions

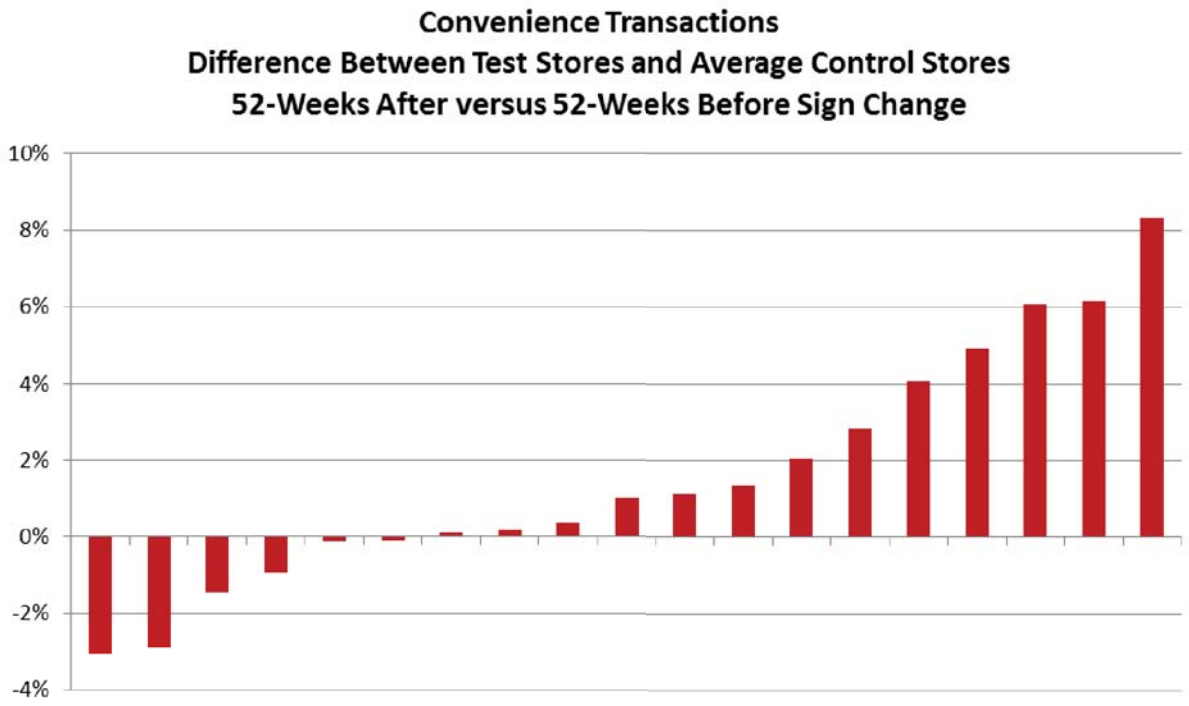
Convenience transactions include every type of purchase outside of destination purchases. Examples of these items include personal care, food, and household products. These purchases could be considered as "impulse" purchases, in that a consumer might be more likely to respond to an electronic message board advertising a price reduction in milk. Convenience weekly transactions for test stores relative to their paired control stores increased an average of 1.58 percent. Of the 12 test stores whose market area median income was between $35,000 and $75,000, nine of these test stores experienced relative gains in their convenience store transactions, year-over-year, compared to their control stores. Of the seven test stores outside this income range, only four test stores outperformed their control store pairings. With a one-tail p-value of 0.14, a decision maker should feel confident about the ability for an electronic message board to marginally improve convenience transactions.

Table 9

Store	Difference-in-Differences
A	-2.91%
B	-0.94%
C	4.91%
D	1.01%
E	8.34%
F	2.85%
G	0.11%
H	0.18%
I	1.36%
J	0.36%
K	-0.09%
L	2.04%
M	-3.05%
N	-0.12%
O	1.14%
P	-1.46%
Q	6.08%
R	6.15%
S	4.09%
Average	**1.58%**

P(T<=t) one-tail: 0.1374
P(T<=t) two-tail: 0.2748

Figure 3


Convenience Transactions
Difference Between Test Stores and Average Control Stores
52-Weeks After versus 52-Weeks Before Sign Change
10%
8%
6%
4%
2%
0%
-2%
-4%

Destination Transactions

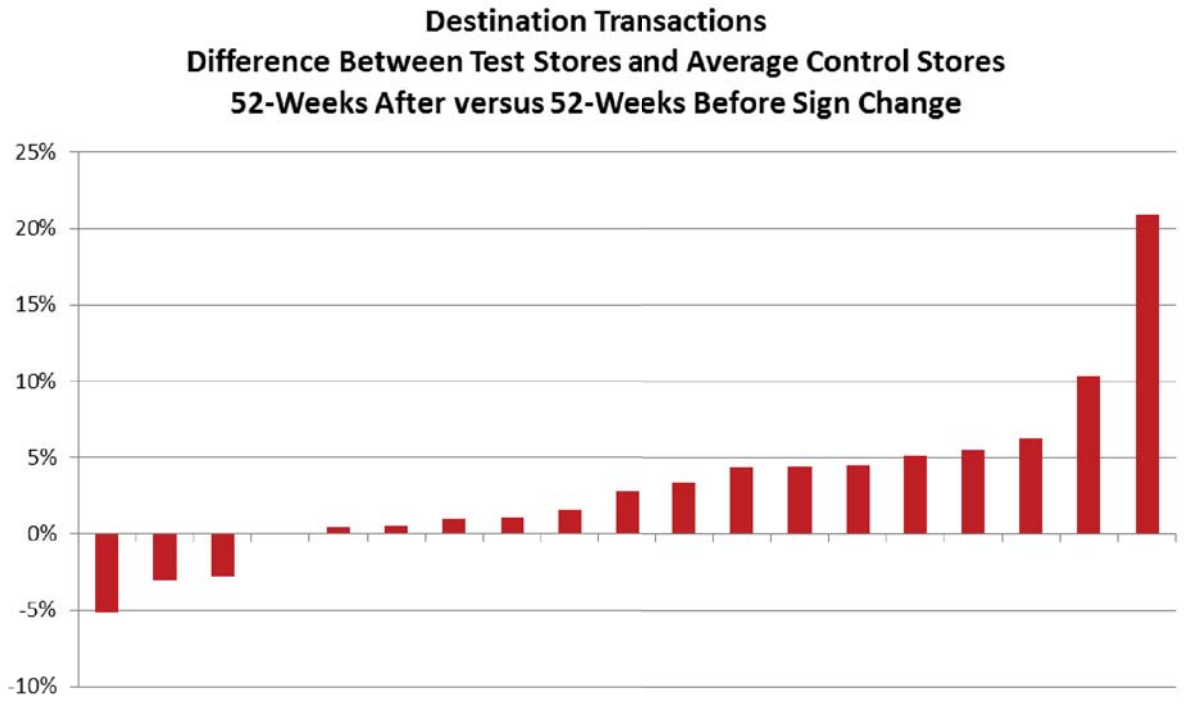
Finally, we present results for destination transactions. These are not "impulse" purchases; consumers will go to a particular retailer to purchase these items. A consumer who makes one of these purchases likely planned the trip and its subsequent purchases in advance. Weekly destination transactions for test stores relative to their paired control stores increased an average of 3.22 percent. The increase in destination transactions is likely due to the retailer advertising destination services on the exterior electronic message boards. The lift in convenience sales transactions is likely driven by the advertisements of convenience sales products, but there is an additional benefit to a retailer with the additional destination sales. These customers are likely a repeat and more valuable customer, suggesting that advertising convenience sale products can generate ancillary benefits.

Table 10

Store	Difference-in-Differences
A	1.01%
B	1.59%
C	4.56%
D	2.81%
E	10.34%
F	0.94%
G	-2.77%
H	-3.01%
I	4.44%
J	5.15%
K	6.23%
L	-5.15%
M	4.37%
N	0.01%
O	0.43%
P	0.52%
Q	5.47%
R	3.36%
S	20.93%
Average	**3.22%**

P(T<=t) one-tail: 0.1115
P(T<=t) two-tail: 0.2230

Figure 4

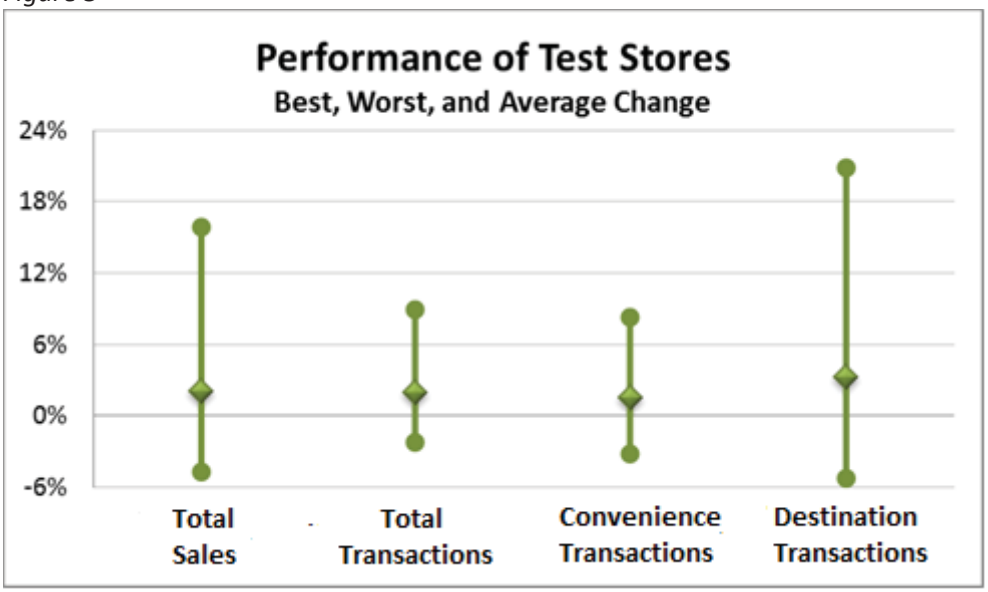


Return on Investment (ROI)

Based on conversations that the Economics Center conducted with sign installation companies, the average cost of a new electronic message board is approximately $13,000. Using the point estimate for our 52 week finding, for a store with annual sales of $10 million, the increase in sales would be close to $212,000. Using the retailer industry's gross margins and operating margins, the break-even for an electronic message board installation may be as low as 3 months and as high as 15 months – depending on labor capacity and other fixed costs. Consequently, in nearly all cases, the installation of such a sign pays for itself in less than a year and contributes positively to the business bottom line for the remainder of its life cycle.

Limitations and Conclusions

Figure 5



The chart above illustrates the improved sales performance from implementing electronic message boards. While the average point estimate across all measures is positive (and the majority of stores saw a positive increase), there is still considerable variability in store performance. Table 11 shows that 3 of the stores saw an increase in sales greater than 5 percent while no stores saw a decrease greater than 5 percent. The strongest increase in sales was over 15 percent in one store while the worst-performing store actually saw a decrease in sales of 4.5 percent after implementing the electronic message board.

Table 11

	Total Sales	Total Transactions	Convenience Transactions	Destination Transactions
Large Increase (> 5%)	3	5	3	5
Moderate Increase (2% to 5%)	6	1	4	5
Little or no change (-2% to 2%)	7	12	10	6
Moderate decrease (-5% to -2%)	3	1	2	2
Large decrease (below -5%)	0	0	0	1

These findings illustrate a potential limitation to the difference-in-differences methodology. The methodology assumes that in the absence of implementing an electronic message board, the growth trajectory of the treatment store would be the same as the matched control store. If a negative event happened at a particular store, it may inadvertently affect the results. For example, suppose that road construction occurred over an extended time period at a particular store and subsequently reduced store traffic or a new competitor moved into the market area. The decline in sales observed in the data,

despite the introduction of an electronic message board, may then be due to the road construction and not the message board. Unfortunately, the Economics Center was not able to control for all of these potential effects that may affect the store performance. Some aspects were controlled: stores were selected from metropolitan areas in the Midwest and South, and test and control stores were matched on the basis of particular market area demographics and similar store performance before the sign change. On the other hand, we had to take what was available: sign changes occurred over a period of nearly two years, in all different seasons, and under varying economic and business competitiveness conditions.

There are a variety of factors that have the potential to affect store performance, in addition to market demographics, including: store and site characteristics, competition, management, seasonality, and temporary factors such as weather and road construction. Unfortunately, we lack data on the degree to which these other variable may explain store performance. However, with a large enough sample of stores, the positive and negative "noise" in the data should cancel out and produce an unbiased estimate of the effect of an electronic message board. Future research might focus on what particular components of an electronic message board drive improved performance (e.g. the frequency of message changes, which products are featured, etc.) None of these characteristics were available to the Economics Center at the time of the study.

In conclusion, exterior electronic message boards offer business a lift in store sales performance and generate a relatively quick return on investment. While the overall 2.12 percent lift in sales is modest, in a high-volume store with low installation costs, the investment returns to using this technology can be significant.

Bibliography

Freeborg, Mark, Wendy Moeller, and Paul Drury. (2011) "Finding Common Ground – EMC and Digital Sign Issues," presentation at the 2011 National Signage Research and Education Conference.

Hawkins, H. Gene, Jr., Pei-Fen Kuo, and Dominique Lord. (2012) Statistical Analysis of the Relationship between On-Premise Digital Signage and Traffic Safety.

Rexhausen, Jeff, Hank Hildebrandt, and Christopher Auffrey. (2012) The Economic Value of On-Premise Signage.

van Bulck, Hendrikus E.J.M.L. (2011) "The Effectiveness of Outdoor Electronic Message Centers," paper presented at the 2011 National Signage Research and Education Conference.

Hey, Chip,

Here is my last official act before vacation.

You have the studies and reports regarding signage. Here are a few excerpts, which may prove useful and illuminating to some of the folks down at Louisville City Hall:

Federal Highway Administration studies indicate that 41% of accidents occur due to lack of adequate signage. The most important element identified by the FHWA is the distance between the sign and the viewer. Of course, we are not putting in roadway control signs, but the idea of having easily readable signs within the cone of vision of drivers is important to road safety.

DSD – is the Decision Sign Distance is the time to read, react, and take safe action.

Minimum sign legibility to meet the DSD is one inch of letter height per 40 feet of distance.

Manual on Uniform Traffic Code Devices For design purposes, considers the cone of vision, which is narrow for drivers, which means sign proximity to the roadway, size and legibility are fundamentally important to safety.

Sign Quality affects ability to attract shoppers –

54% of shoppers failed to find a business in 4 year study due to small or unclear sign!

38.5% of shoppers make quality assumptions about a business based on clear and attractive signs!

Consumers' Issues with signage –

83% say letters too small

71% identify poor sign placement

64% find illumination inadequate at night

53% indicated digital sign messages change too fast

Digital Signage and Traffic Safety study - Statistical Analysis of the Relationship between On-Premise Digital Signage and Traffic Safety - from the Texas A&M Civil Engineering Department in December 2017.

The largest study of digital signage impacts on safety undertaken to date in the USA.

Conclusion – There is no statistically significant change in crashes due to on-premises digital signs. Zero.

Value of On-Premise Signage – from the Economics Center of the University of Cincinnati

This was a National Business Survey of sign changes –

60% of businesses reported a sales increase of greater than 10%

Higher sales lead to employment increases

Signage particularly important to smaller companies' success in local market

Electronic Message Boards Impact on Sales – University of Cincinnati Economics Center

Across multiple industries, message boards lead to an average sales increase of 2.1%

Shopper Perceptions of Electric Message Boards –

Detracts from community attractiveness?	7% Yes	81% No
Shows store cares about community	55% Yes	10% No
Message Board should have community messages	67% Yes	11% No

Item and Price messages generate 55% more sales of that item than Item only messages….in controlled tests.

I hope some of these are helpful to educate the staff, commission and council.

All the best, I will be back in the office June 24th.

Thank you so much!

Robert

From: Robert Kearney [mailto:robert@speedysparklecarwash.com]
Sent: Friday, May 31, 2019 7:01 PM
To: 'Aaron DeJong' <aarond@louisvilleco.gov>
Subject: RE: signage

Aaron,
Thanks, again!
I am attaching a small collection of sign research studies and digital message board studies, which I found fascinating. Here are my five favorite takeaways:

1. FHWA studies confirm inadequate signage leads to 41% of accidents - must be important to commercial signage, too!
2. 54% of shoppers failed to find business due to poor signage!
3. ZERO correlation between digital signage and traffic accidents!
4. 81% of consumers say Electric Message Boards DO NOT detract from community appeal!
5. Signage can generate more the 10% more sales and Digital signage adds an average of 2.1% to sales - Plus, signage is particularly important to success of small businesses!

All the best to you, I will be out of the office for a while this month.
Robert
Robert E Kearney

Speedy Sparkle Car Wash
Loveland and Louisville, Colorado

Robert E Kearney
Cell 303-902-9100
Business Office:
549 N 4th Street
Berthoud, CO 80513

(970) 532-4243
Fax (970) 532-3603

www.speedysparklecarwash.com

From: Aaron DeJong [mailto:aarond@louisvilleco.gov]
Sent: Thursday, May 09, 2019 3:51 PM
To: robert@speedysparklecarwash.com
Subject: signage

Robert,

I did finally get a chance to talk with my colleagues about your signage requests. One of the options that we discussed that I think is a good option to request is for the car wash to be allowed

to build its own monument sign on South Boulder Road at 40 sf. I think that is one of the options we discussed. If you were to request that modification, it would be looked upon favorably.

aaron

Aaron M. DeJong
Economic Development Director
City of Louisville, CO
749 Main Street
Louisville, CO 80027
Phone: (303) 335-4531
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SIGN RESEARCH FOUNDATION™

RETAIL SIGNAGE: PRACTICES TO INCREASE RETURN ON INVESTMENT

Project Methodology

The goal of the Retail Signage: Practice to Increase Return on Investment report is to further explore the connection between high-level design practices outlined in the *Landmark Design Survey and Digital Sign Design Survey* developed by the Sign Research Foundation in 2014 and successful strategies developed by executives, consultants, designers, and fabricators for employing signs to support business success.

Interviews:
An initial survey group was selected across a spectrum of disciplines to develop an overview of sign best practices in two major areas:

Management
Executives in leading retailers and leading consultants were selected after initial discussion with the project team and a review of the business areas where sign decisions were made.

Design Integration
After the initial interviews with executives these participants were surveyed on the specialty areas that were in the purview of sign and identity practices. Architects, designers, retail specialists, display specialists, and digital specialists were selected based on this survey.

These survey subjects also recommended examples that could be used in the summary of the report to illustrate the practices.

The interview subjects were given access to the *Landmark Design Survey and Digital Sign Design Survey* to compare the leading sign practices with standards for design excellence determined by the research. They later used this information to help support making selections of leading case studies.

Identification of Best Practice Case Studies
After the interview session determined the range of best practices and a series of statistical approaches for determining corporate success across a variety of retail groups, the selection process for case studies began. The process started by referencing the practices outlined in the interviews with a report published by the Design Management Institute of leading retailers based on a dollars per square foot (The most commonly used approach to determining retail performance). While all these companies exhibited the design attributes for success found in the interviews and in the previous research surveys the goal was to seek examples across a wide spectrum of industries. Selected case studies were based on research of leading companies across a range of commercial building types followed by recommendations from the steering committee based on the overall best practices derived from the interviews.

Report Content Summary

Introduction - ROI and Design Focused Organizations
Case Studies - Leading Design Focused Organizations
Management Strategies that Are Central to ROI
Case Studies - Leading Small Community Based Organizations
Collaboration Strategies that are Central to ROI
Case Studies - Leading Collaborative Projects including Convenience Stores, Historic Districts, and Digital Signs

Restaurants
A review of the fastest growing new restaurant chains in the last decade followed by recommendations from the survey group.
Apparel
A review of the most successful retailers in the last five years using dollars per square foot as a reference followed by recommendations from the survey group.
Banks
A review of a publication on the leading community banks in America using Return on Equity as a reference followed by recommendations from the survey group.
Convenience Stores
A review of the most successful retailers in the last five years using dollars per square foot as a reference followed by recommendations from the survey group.
Strip Shopping Centers
A review of the literature of leading commercial developments using lease rates as a reference followed by a recommendations from the survey group.
Downtown Districts
A review of the literature of leading commercial developments using lease rates as a reference followed by a recommendations from the survey group.
Digital Signs
Recommendations from the survey group based on successful new commercial developments utilizing digital signs. These signs were too recent to provide statistical background information.

Case Study Analysis
Case studies were analyzed by utilizing the interview results and the results of the previous research survey to determine best practices. Descriptions were based on observation with follow-up questions to the survey group. In some cases executives, designers, and consultants for the case study companies were added to the survey group for follow-up questions and review. Statistical information was also added to paint a picture of how the profiled organizations perform relative to their peers.

Introduction ROI and Design Focused Organizations

Organizations calculate return on investment (ROI) when making investment decisions. Companies establish their own benchmarks for ROI in order to prioritize which media approaches should receive greater investment based on an anticipated return. Signs are physical elements that serve multiple roles for a business. A sign can reinforce an organization's brand, communicate and inform customers, or support an enriched customer experience. While most organizational investment strategies are proprietary, there are three common approaches that companies utilize to integrate ROI in sign decisions:

Return Based on Sales in Dollars Per Square Foot
Retailers make investment decisions based on how much revenue they can generate in a set footprint of space. Developers also invest in properties based on how much they can charge per square foot of space and the entire building value is also based on how much can be charged. Sign design decisions can be extrapolated on how much it is felt that the sign contributes to the retail layout and location's value. This metric used to be more simply applied, but is now clouded by other technological approaches to finding destinations.

Brand Equity
Brand management has become a significant metric on a company's balance sheet for measuring value, particularly if the company is publicly traded. Signs reinforce the quality of a company's brand and have steadily become a major part of a company's overall marketing strategy. Because of advances made by branding firms, signs are often integrated into architecture which increases their overall aesthetic value.

Return Based on Experience Design Analysis
Experience Design is a relatively new management approach, but plays an integral role in the investment process of a company who wants to establish close relationships with its customers. In experience planning, elements of the customer experience are broken into touchpoints and measured. Touchpoints most important to the customer experience receive greater investment.

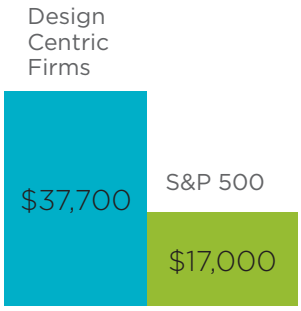
While companies use a combination of the approaches profiled to the left, they all are unique based on their strategy for achieving success. We can analyze how successful companies integrate signs in their value calculations by observing what people consider effective signs and reviewing the companies that employ those signs. In the *Landmark Design Survey and Digital Sign Design Survey* developed by the Signage Foundation Inc. in 2014, a number of attributes were analyzed for their effectiveness.

LEADING ATTRIBUTES INCLUDE

- Legibility
- Enjoyable to View
- Informational
- Quality
- Appropriately Scaled
- Uniqueness

Fortunately many top companies incorporate effective sign design approaches into their development strategies. The Design Management Institute, in its annual report on design-oriented companies, has measured the returns on design-oriented companies and have found they have increased in value at a much faster rate than other companies. In addition, many top retailers employ effective sign strategies, allowing us to provide a closer look at the effects of those strategies.

10-year stock return based on a $10,000 investment in Design Centric Firms Versus the S&P 500



LEADING RETAILERS IN TERMS OF ROI BASED ON $ PER SQUARE FOOT IN SALES (2013)

Apple Stores®
Tiffany & Co.®
lululemon athletica®
Coach®
Michael Kors®
Select Comfort®
True Religion®
Vera Bradley®
Birks & Mayors®
Fairway Market®

Buffalo Wild Wings

Summary
Buffalo Wild Wings is an owner, operator and franchisor of sports-themed restaurants. Its restaurants focus on creating a community around the sports experience including watching sporting events or other programs on its projection and flat screens, competing in Buzztime Trivia, or playing video games. The open layout of its restaurants offers dining and bar areas that provide seating choices for sports fans and families. The restaurants are spread through all 50 states.

Management Team
Buffalo Wild Wings boasts a strong internal design team of in-house designers and architects with a holistic approach to building design that touches every aspect of the exterior and interior. Innovation is led by the senior executives who manage the complete visitor experience. The company works with outside consultants and architects like Fitch on guideline development, with a focus on creating a vocabulary that can be integrated into every aspect of the experience.

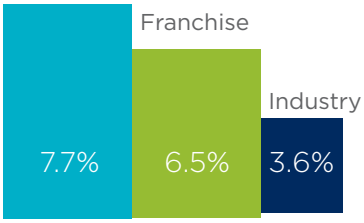
Slightly more than 40 percent of Wild Wings stores (485 of 1080) are managed internally, providing ample opportunities for experimentation. For franchisees, the organization offers extensive design, permitting and documentation support.

Design Strategy
Buildings are developed to adapt to local conditions based on a seven-year rolling plan for organic expansion. The company has an anti-big box approach focused on extensive repurposing of a wide variety of building types at locations near commercial concentrations of power centers, hospitals, movie theaters and college campuses.

KEY STATISTICS

485 of the 1080 Buffalo Wild Wings stores are owned by the company.

Sales Growth in 2014



Key Design Success Attributes:
Buffalo Wild Wings utilizes a sign approach that balances consistent branding adapted to unique environments. Based on visitor research by the Signage Foundation, Inc., as a part of Signs and the Downtown Experience, this approach produces the highest score across a range of design metrics including:

Architectural Integration:
Every Buffalo Wild Wings exterior is designed as a complete building envelope. Signs and architectural elements are designed together and adapted to specific urban and suburban site conditions.

Legibility:
A focus on a diversity of brand elements ensures recognition from a distance, even with relatively small individual elements. A balance of symbol, color, type and pattern ensures the messaging is conveyed from long distances.

Enjoyable to View:
The restaurant uses an ensemble of design elements and creates areas around crowd elements like outdoor seating and dramatic landmark entrance towers.

Well Designed:
Buffalo Wild Wings offers a modern and fresh design approach, focused on simple but effective messaging integrated into the entire customer experience. The graphics approach shares similarities with the most recent design innovations in stadium design, seen at the University of Phoenix Stadium (home to the Arizona Cardinals) and MAPFRE Stadium (home to the Columbus S.C. Crew) and others.

Balanced Illumination:
A combination of internal illumination for tightly controlled messages and external illumination for highlighting architectural elements.

H&M

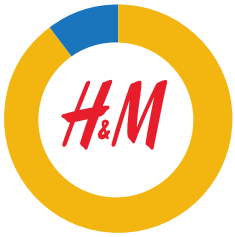
Summary
H&M is one of the largest retailers in the world with a focus on quality discount clothing and accessories. Its key goal is to focus on quality, value and sustainability. To meet these goals, the company has an in-house product design team to stay current and wring efficiency from every level of the process. H&M also has a strong partnership model employing a global supply chain of manufacturers. The company has been on an aggressive expansion strategy, with 400 stores opening worldwide in 2015, mainly in the U.S. and China. Most stores are owned by the company.

Based in Sweden, H&M has more than 3,500 stores in 57 countries.

Management Team
Following its partnership approach from the product side to the building sign design and management team the company employs close loyal partnerships that allow the company to expand quickly and efficiently into new markets. The central management team focuses extensively on keeping costs down while encouraging creativity, which results in extensive experimentation in new materials and lighting technologies.

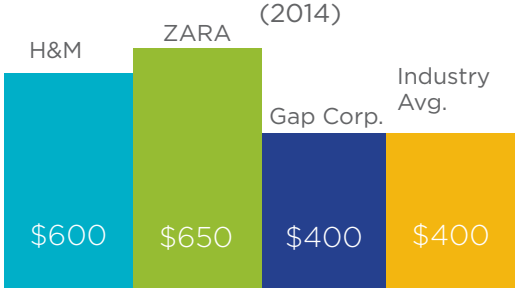
Strategy
In its global strategy H&M has focused on key urban locations with a focus on architectural and interior novelty and sustainable material approaches. Most stores are leased instead of owned to provide speed and flexibility when expanding into new markets. The stores follow a transparent and lean architectural model to keep a tight focus on marketing new product rollouts, which are frequent concentrations of power centers, hospitals, movie theaters and college campuses.

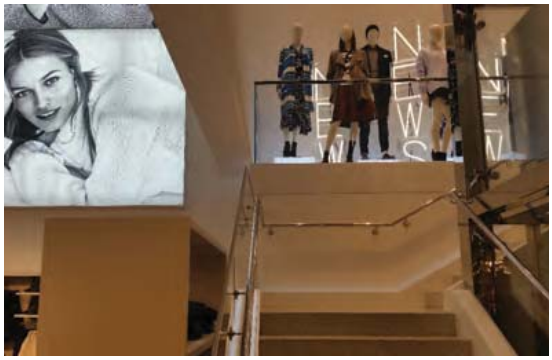
KEY STATISTICS



400 New Stores planned for 2015. An 11% increase

Revenues in Dollars per Square Foot (2014)





Key Design Success Attributes:
H&M has a highly successful formula, focused heavily on anchoring its iconic brand name, integration of high-quality architectural elements and dynamic changing display.

Legibility
The H&M brand name is the only major element in the store that utilizes the icon color and dimensionality, which allows it to contrast starkly with the unique interior and exterior environments. The signs are always among the highest-quality elements and are often used to both anchor building exteriors and serve as central interior icons.

Architectural Integration
While graphics and signs follow a consistent approach, the buildings and interiors are unique with specialty fixtures and high quality materials. Most H&M buildings are highly transparent to allow for the sign/graphic/display vocabulary to be seen from multiple exterior and interior vantage points.

Enjoyable to View
The key to H&M's marketing strategy is the frequent changing of products to reflect new fashion trends. Sign graphics and displays support this dramatic change and provide an exciting customer experience by being refreshed often. Only a small palette of signs stay consistent in the store including neon signs that accent and support specific services.

Varied Illumination
H&M stores utilize a variety of different lighting approaches that liven the building façade including channel letters, back lighting, spot lighting and faux neon.

Management Strategies that are Central to ROI

In interviews with leading executives, architects, designers, consultants and retail industry specialists, we are able to observe the management approaches that companies, developers and even cities employ to achieve greater returns on their investment in design, planning and fabrication. In this report these strategies will be divided into management and collaborative methods.

Management

For signs to be part of a company's value proposition they need to be well integrated into an organization's management practices including the executive level.

Leading Management Practices for Increasing ROI

- Making Sign Excellence a Strategy to Reward
- Integrating Signs into ROI Metrics
- Community Engagement
- Experience Designers Making Signs Central to an Integrated Brand Strategy

Making Sign Excellence a Strategy to Reward

Many companies with effective sign strategies also have tight controls over design development. Many of the leading companies have strong internal staffs that manage and control store development including signs. James Damian of Buffalo Wild Wings® believes that rewarding strong sign and building design through staff accountability, rewards based on brand excellence, and executive recognition leads to stronger sign and building development practices. Many design-oriented companies also collect extensive data on store performance and conduct surveys on customer satisfaction that are included in the compensation process. This has driven many companies to take control of top stores, with tight franchise controls over the store development and approval process.

If you want design excellence you need to reward it.

James Damia, CEO, Buffalo Wild Wings®

Integrating Signs into ROI Metrics

Most major retail companies have developed elaborate metrics to determine ROI when investing in retail developments. These ROI calculations are based on the same metrics used for successful retail development, dollars per square foot. Successful companies usually rate elements such as identity signs and wayfinding signs very high when making ROI calculations.

Linda Lombardi, Head of Global Store Design for Godiva®, explains that ROI metrics govern every aspect of store investment. Better locations receive more money for signs and design improvements and lower revenue locations receive less investment. This is often seen as a self-fulfilling prophecy as the rich stores get richer and the poor are starved of investment. Well-managed companies increase store revenues by making calculated improvements based on increasing ROI in underperforming space.

If you want to see innovation in signs and brand design, observe how companies expend their resources in less conventional locations. This strategy if improvement is a clue that the company is serious about location as a key revenue generator.

Linda Lombardi, Head Of Global Store Design, Godiva®

Many of the companies that utilize sign best practices often have tight controls over the design program of their facilities, with many operating internally or through strict franchise agreements. Crate & Barrel is considered a leader in this area with extensive design management control, allowing for design programs that both flexibly meet criteria in a variety of locations and also fulfill specific standards for identity.

Starbucks® is perhaps the most famous company to upgrade its corporate brand through a deliberate sign and identity strategy. In 2008, its store identity was considered by many customers to be similar to fast food restaurants. After overhauling the graphic and sign identity as part of a unique store strategy, the brand took off again.

Community Engagement

Successful companies have developed strong community outreach strategies for new stores, but less known is the impact on sign design strategy. Christina Galgan, Design Services Manager at Walgreens®, found companies following a strategy focused on extensive community engagement with local stakeholders develop unique design concepts for store signs, which in turn increases customer loyalty. This approach includes having extensive, clearly designed community engagement methodologies as well as a proactive approach to sign design. This requires design standards that are highly flexible and can be adapted to circumstances on the ground. This approach is the mark of communities that have pursued successful design strategies in sign codes by offering stores an approach to the sign development process that reinforces creativity and unique solutions.

> *Once a company commits to a sophisticated community participation process design approaches grow much deeper and unique since a structured participation will impact exterior, interior and even merchandising standards.*
>
> Christina Galgan, Design Services Manager, Walgreens

> *The mistake most designers and customers make is looking at sign or building ROI in isolation of the entire customer experience. When seen as a key touchpoint or as a complement to other experiences that support brand, the qualities that make effective signs become more apparent and its value goes up.*
>
> Leonard Barzsap, Senior Associate, Lippincott

Experience Designers Making Signs Central to an Integrated Brand Strategy

All of the examples profiled had one major characteristic in common. They all involved experience design teams. Leonard Barzsap, Senior Associate at Lippincott, defines these firms as organizations that can conduct consumer research, map complete customer experiences, and visualize and implement solutions from management improvements to complete design overhaul. The rise of experience design firms like Prophet and Lippincott, along with architectural firms that also develop experience research like Gensler, FRCH and Little have enabled retailers to integrate signs into a larger branding approach that includes advertising, architecture and digital initiatives. These firms are also able to develop metrics to measure the specific ROI effectiveness of different aspects of the customer experience. Making signs part of a holistic brand reinforces their importance, both as conveyers of quality and as a complement to a complete branding strategy. Experience strategy is not just utilized by outside firms. Companies have internalized these practices as well with management teams organizing designers and consultants in-house.

Dairy Queen was a large company that completely re-invented its brand through an experience design process working with Lippincott. Gourmet Burger Kitchen is a much smaller company that also developed a complete experience approach working with Prophet. Both companies made identity signs a key part of the overall strategy.

Valley Green Bank, Kens Market/Marketime Foods

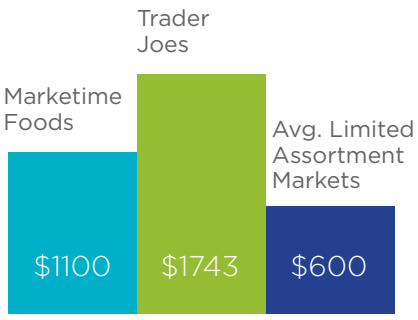
Summary
Small neighborhood businesses today frequently have undertaken major rebranding and redesign approaches including signs in their best practices. With architects, marketing professionals and designers having access to many of the same best practices used by larger organizations, these businesses have been able to achieve many of the same dramatic successes by employing sign excellence in their strategies.

Valley Green Bank
Valley Green Bank opened in 2006 and expanded to three banks in the city of Philadelphia. The bank has a clear strategy of utilizing new bank branches as part of its efforts to rejuvenate urban neighborhoods. The small bank developed a strong brand early, hiring professional branding company Spark5 Design & Marketing to develop its graphic palette, website and all print collateral. Metcalfe Architecture and Design utilized the graphic palette when designing new banks inside of renovated existing buildings, with each of the three community banks reflecting the unique neighborhood character. The bank was purchased by a larger community bank in early 2015, which will utilize many of the design practices developed by Valley Green Bank.

Ken's Market/Marketime Foods
Owned by one family, these two independent supermarkets are located in Seattle neighborhoods. The family grew the store organically over the years, with Marketime Foods being renovated by I-5 Design & Manufacture in 2008 and by LDG Architects in 2015 and Ken's Market was renovated in 2010. Both stores have unique architectural and graphic approaches focused on complementing their communities.

KEY STATISTICS

Return on Equity (2014)
Valley Green was 8th in ROE of 4,000 U.S. Community Banks



Revenues in Dollars per Square Foot

Valley Green Bank branch in South Philadelphia

Marketime Foods

Key Design Success Attributes:
While reflecting different industries, both organizations are focused on creating environments that complement their local communities.

Unique
Both organizations have focused on ensuring each location has characteristics unique to the neighborhood in which it is located. Marketime Foods and Ken's Market each use distinct landmark signs that match the character and scale of the neighborhoods. Valley Green Bank utilizes a common graphic palette, but applies it to three distinct sign approaches.

Architectural Integration
Both organizations take architectural integration of signs and building very seriously by designing signs into awnings, facades and fascia. Valley Green Bank utilizes color and pattern extensively in its bank designs along with opening up the storefronts with larger windows. Ken's Market/Marketime Foods utilizes awnings and overhangs as sign supports and to tie its buildings together.

Graphic Integration
Both organizations incorporate extensive graphic integration into their store design. Valley Green Bank applies iconography as a graphic pattern in both large format graphics and marketing materials. Marketime Foods integrates large format graphics into awnings and window displays.

Shops Around Lenox, Classen Curve and Nichols Hill Plaza

Summary

Shops Around Lennox and Classen Curve are strip shopping centers that are part of much larger shopping complexes that follow dramatically different architectural and sign design strategies. What they share is a desire to utilize sign innovation to elevate traditional car-oriented strip shopping centers into leading retail destinations.

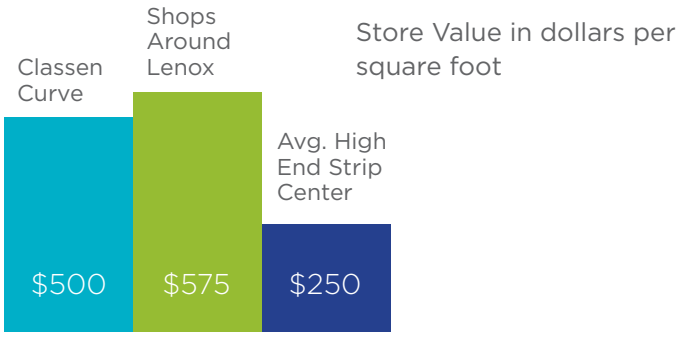
Shops Around Lenox Design Approach

The shopping center was developed as part of a $35 million renovation strategy in 2011 by Healey Weatherholtz Properties. Adjacent to the Lenox Mall in Atlanta, the center was renovated by design firms ASD and Cooper Carry to raise the profile of the aging shopping center which had a 40% vacancy rate. The center is anchored by one key tenant, but all the stores have distinct modern storefronts and signs that share few consistencies beyond modern design and quality materials. The one area with the most consistency is the pylon sign where the different brands utilize a similar background color.

Classen Curve and Nichols Hill Design Approach

Developed in Oklahoma City in 2010, the shops utilize a distinctly modern approach with large areas of glass and display surfaces. Mall tenants must utilize a well-organized sign and display strategy to be successful within the tightly consistent architectural approach. Instead of a pylon sign that communicates all the destinations in the complex, one distinct gateway is utilized. WP Glimcher purchased the retail complex in 2014 and sells the location as a singular destination.

KEY STATISTICS



Shops Around Lenox

Classen Curve

Key Design Success Attributes:

Both developments are fundamentally different in terms of design, planning and location, but they share some of the fundamental best practices for achieving high value utilizing signs and identity.

Legibility

Both complexes use dramatically different approaches towards identifying stores that are equally acceptable. Classen Curve uses only one iconic landmark gateway sign with no support stores listed. The stores themselves have iconic dimensional signs that pop off the high contrast facades. Shops Around Lenox takes the opposite approach. The pylon signs features all the stores but in a consistent graphic approach while each individual store receives its distinct architectural approach.

Quality Materials

Both developments treat signs as high-quality elements that use strong materials, both for the foreground icons and the sign backgrounds.

Architectural Integration

While both developments are fundamentally different, they utilize clear standards for integration of architecture and sign. Shops Around Lenox conceives the sign and façade as one design while Classen Curve has tight standards for integration of sign and façade including illumination, size and placement.

Integration of Display

Both developments take display very seriously as landmark elements that complement signs. Shops Around Lenox utilizes distinct large windows across all stores, even while each storefront has its own individual architectural façade. Classen Curve has consistent glass facades along with specific landmark window elements that allow showcase displays to stand in stark relief.

Collaboration

Increased collaboration between designers and contractors responsible for each area of the retail development process has helped place signs as a value generator. These groups—including architects, visual merchandisers, marketers and fabricators—are increasingly seeing the value of their work as interrelated.

Leading Collaborative Approaches

- Architectural Integration
- Integration and Management of Sign, Print and Display
- Cooperation between Retailer and Fabricator
- Careful Management of Digital Media Content

Architectural Integration

Advances in the integration of architecture, landscape and signs has led developers and retailers to value signs in development projects. Jan Lorenc, Director of Design of Lorenc+Yoo Design believes that this confluence of developers recognizing the premium prices given to mixed-use developments ($100 or more per square foot) and the rise of architecture firms with the ability to integrate signs, graphics and architecture at a higher level has made signs central to the development equation. In addition, the shift of retail from internally focused malls to exterior complexes has put signs at a premium in new renovations. Alan Metcalfe, Principle of Metcalfe Architect & Design, reinforced the idea that retailer's understanding the value of signs as central to building investment has shaped the structure of architecture firms, with even the smallest companies having the ability to bring graphics and architecture into the design process.

ASD | Sky specializes in upgrading retail strip malls, enclosed malls and town centers with integrated architectural façades, streetscape elements, and signs. The close collaboration between sign designer and architects has been one of the major reasons that signs and graphics are seen as fundamental to the improvements in shopping centers.

Integration and Management of Sign, Print and Display

Another new and important strategy that has led to more effective signs is expanding the idea of a sign to go beyond just one on-premise sign to a complete strategy. Anne Kong, Professor of Visual Presentation and Exhibition Design, Fashion Institute of Technology, describes this practice as reshaping sign, architecture and display. Retail buildings are becoming much more transparent, making window and fixture display part of the overall brand identity development process. This also has made sign quality important to the visual merchandising and display teams that control how store design is managed over time.

> *Signs today have become part of the larger display environment which has improved their value significantly. Sign integrated into larger displays use higher quality materials and have a much more extensive use of creative lighting including neon, marquees, and dynamic LED.*
>
> Anne Kong, Associate Professor, Fashion Institute of Technology

Urban Outfitters® has developed a comprehensive design management team that considers architecture, signs and window display on projects. When a sign is treated as part of a display, its value becomes more multi-dimensional. The company has had an impressive rate of return attributed to its overarching design performance.

> *Developers now have clearer ROI metrics on store improvements which has put the integration of architecture and signs as a significant strategy for mall and shopping center renovations.*
>
> Jan Lorenc, Director of Design, Lorenc + Yoo Design

Cooperation between Retailer and Fabricator

Retailing is extremely cost sensitive and many retailers and developers have been known to skimp on material and illumination quality beyond a surface approach. Leading companies are also cost sensitive but have a more nuanced approach to balancing quality and value by having a close relationships with fabricators, who are asked increasingly to take a larger role in the development process. Paul Dudley, President of id Signsystems, believes that advances in the fabrication and project management industry have raised the value of signs as part of the store development process. This includes taking a leadership role in prototype development, value engineering, rollout management and project management.

Transparent buildings have meant interior signs must do double duty as key identity elements, raising both their profile and the need of fabricators to coordinate them closely with the store team.

Very few companies have closely integrated digital content into their signs, but a few companies like Cumberland Farms have been exceptions, experimenting in digital signs as a key component of its marketing strategy.

Successful retailers usually look beyond the race to the bootom approach for sign pricing and implementation to take a more balanced approach between quality and pricing. This produces incredible pressure on fabricators to create value based quality solutions but also has fueled innovation in the industry.
Paul Dudley, President, id Signsystems

Careful Management of Digital Media Content

Gauging the effectiveness of digital media as a complement or replacement to static signage is still a complex evaluation. The biggest dilemma according to Ben Barr, Sales Manager at Watchfire Signs has been investing in both quality signs and ongoing content. Successful retailers make dynamic digital signs central to their marketing and information strategy, with long-term content strategies and an eye-to-design quality equal to physical signs.

The quality of digital signs and their content is so visible in the environment it is dangerous to skimp on this investment.
Ben Barr, Sales Manager, Watchfire Signs

Wawa Convenience Stores, Sheetz Convenience Stores

Summary

Over the last 40 years two convenience store companies in the Mid-Atlantic and Northeast have grown to dominate their local areas while setting a standard for the convenience store industry. While relatively small in the number of stores compared to franchise chains like 7-Eleven, Wawa and Sheetz stores are known for high performance, often having five or more times the revenue of rivals. Both companies also focus heavily on combining gas stations with convenience stores for newer stores to raise their visibility and allow for stores to grow. Both stores are expanding beyond their current base slowly while maintaining ownership.

Management Approach

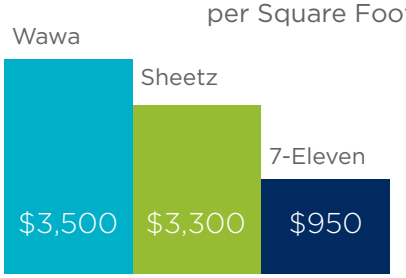
Wawa and Sheetz are privately owned, and own all their stores. This allows for both strong internal design control as well as tight performance metrics for each company. The management approach has resulted in a tight expansion strategies; stores maintain very similar customer experiences when growing into new communities. Store layouts and promotions also stay very consistent along with the growth strategy.

Strategic Design Approach

Both organizations have dramatically different and distinct store design while sharing a number of consistencies when it comes to following design best practices. Both organizations have been focused on combining gas and building architecture in most of their locations, with large distinct canopies for gas and architecturally distinct buildings. Sheetz utilizes a more graphically oriented approach, using red as a key identifier for the larger monument structure and building. Wawa utilizes a strong icon along with a powerful architectural structure and gas canopy and less obtrusive monument lighting.

KEY STATISTICS

Revenue in Dollars per Square Foot (2014)*



*Wawa and Sheetz stores include gas

Wawa

Sheetz

Key Design Success Attributes:
While both stores have distinctly different design approaches, they share similar design attributes which have reinforced their success.

Legibility
Both stores utilize key brand elements that extend beyond signs to reinforce their identity. This allows the stores to be identifiable from long distances. For Sheetz, it is the use of color while Wawa combines a large logo identifier and consistent architecture. Both stores minimize additional sign clutter by having clear guidelines for the use of temporary promotional signs.

Architectural Integration
Both organizations integrate sign design into their architecture in distinctly different ways that are both highly effective. Sheetz uses color on large surface areas and particularly awnings and metal pylons structures. Wawa uses a simple half arch and pitches roof that is reconfigured for a variety of urban and suburban conditions, and is also reflected in monument and wayfinding signs.

Consistency
Both organizations have focused on simple consistent messaging and tight controls of messaging on all of their stores. Tight management control of stores keeps the organization from having too many distinct signs in terms of material, color or logo.

Illumination
Both organization use illumination in distinctly different ways to highlight their identity. Sheetz focuses on the illumination of their awnings and sign canopies. Wawa focuses on internal and external lighting of their key iconic elements.

Larimer Square, Beale Street Historic District

Summary

Historic Districts must balance a careful respect for historic architectural precedence with the need to create a modern, business-oriented district. Historic Districts also require a clear management approach that integrates city guidelines with encouragement of best design practices for revitalizing the community. These two communities share the exciting private and public best practices for the development of signs in historic districts.

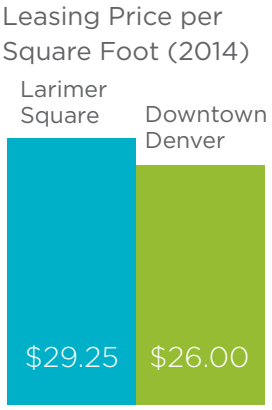
Larimer Square

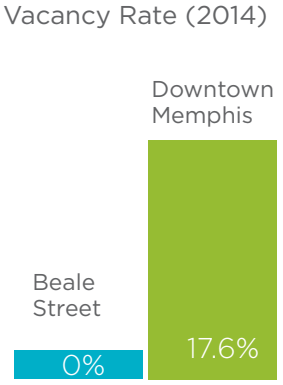
A historic block in Denver that was saved from destruction through the creation of the Larimer Square Associates in 1963 to manage the properties on the block. The block became a historic district in 1971 and was bought by a development company, Larimer Associates, in 1993. The company has encouraged the local stores and restaurants to take modern and creative approaches to the design of their stores. This is matched by progressive historic district sign guidelines from the city which includes best practices. The development company utilizes lighting and street infrastructure to tie the eclectic storefronts together.

Beale Street Historic District

The main commercial street for Downtown Memphis had been in extreme disrepair with nearly every commercial storefront vacant. Historic landmark status was granted in 1966, but little change occurred until the creation of the Beale Street Development Corporation in the 1970s. The city later developed sign regulations that address the unique scale and characteristics of different districts in downtown Memphis, which encouraged more flamboyant and exciting sign design in the historic district and surrounding sports and entertainment area.

KEY STATISTICS





Larimer Square

Beale Street Historic District

Key Design Success Attributes:
Both historic districts represent the blend of aggressive private investment and progressive city codes and infrastructural support. This has resulted in sign excellence in the following areas:

Experience
Both districts looked beyond just the historic architecture of the district to envision how signs could support a vibrant street life and to incorporate these ideas into guidelines and best practices. For Larimer Square, this includes creating a lighting structure that spans and links the street, street-spanning banners and signs that reinforce the major corners. For Beale Street Historic District, this includes major investments in signs for institutions including theaters and public offices which support private sign investment.

Illumination
Both districts make illumination central to sign strategy. For Larimer Square, this includes a more restrictive approach, minimizing individual sign lighting and maximizing streetscape lighting and interior window lighting display. Beale Street allows for eclectic and dynamic lighting approaches using neon and LED light displays as well as projected lighting.

Graphic Display Integration
Both districts encourage the use of multiple graphic approaches in addition to signs, including awnings, window graphics, wall murals and object displays. These practices are also part of the city guidelines for the historic districts. In Larimer Square having more than 100 businesses in a small area requires diverse graphic approaches for locations where large-scale traditional projecting signs are not possible. For Beale Street Historic District, painted building signs and murals with projected lighting adds diversity and minimizes clutter from the large-scale projected illuminated signs.

Taphouse 23, Lit Brothers

Summary

Digital signage is a new area where effective practices are still being explored by leading companies. While there is not yet easy to establish return improvements for companies employing successful digital signage, we can still identify and analyze organizations that are utilizing the new medium effectively.

Lit Brothers Design Strategy

In 2015 Brickstone Realty installed a large digital billboard sign along the roofline of its Lit Brothers retail/office building in Center City Philadelphia. The sign was proposed based on guidelines established by the Market Street East Advertising District which encourages more vibrant signs in the area. In addition to make public investments in return for the large sign, the company had to show the sign was not a safety hazard through a traffic study. The developers also had to show that the sign would not take away from the historic nature of the building, using a design approach in keeping with signs placed on the building in the past. The sign itself was developed using see through GKD media mesh which complements the architecture of the historic building. The company hired a digital media advertising company to ensure that the digital content on the signs will be interesting and reflects the potential of the technology.

Key Design Success Attributes

Architectural Integration

The developers worked with local community officials to make sure the sign was in keeping with the historic nature of the building while updating to a modern commercial environment. The use of a more transparent digital technology allows the sign to have a more subtle presence on the building, and maintains a strong appearance even when the sign turned off.

Legibility and Quality

Prototype testing produced a sign that would appear highly legible from a distance and from multiple view corridors and angles.

Content Management

Working with a specialized media advertising firm succeeds in developing content that takes advantage of the unique features of the sign. In addition the firm develops scripted content when there advertising is not active on the sign.

Taphouse 23 Design Strategy

Creating and managing digital signs are among the most challenging developments for a small business. Gary Johnson, the developer behind Taphouse 23 in Bridgeport, Pennsylvania, focused on making digital signs the cornerstone of the development of the restaurant. The company went through a prototype process with Watchfire Signs to select a digital display, eventually going with a 10mm solution that would have high resolution for both drivers and pedestrians. The developer worked closely with Braun Signs to integrate the digital sign both into a landmark sign pylon and into the architecture of the building and outdoor patio. The developer than worked with the manufacturer and marketing company to develop templates for the digital display that could be applied to concerts and special events.

Key Design Success Attributes

Architectural and Landscape Integration

The digital display is integrated not just into the larger sign, but also into the outdoor seating area of the restaurant. This approach of considering both pedestrian and vehicular users makes the sign a central part of the visitor experience.

Legibility and Quality

Taphouse 23 made a significant investment in a state of the art display to ensure that pedestrians and people sitting in the outdoor areas of the restaurant would be able to read the display at the same level of comfort as a driver viewing from a distance. Creating templates in advance also ensure a high quality and clear image.

Content Management

A formal content display approach utilizing sophisticated templates that take advantage of the high resolution screen keeps the display exciting. Frequent content changes and an event driven approach ensures that the digital sign keeps a central role in the success of the bar.

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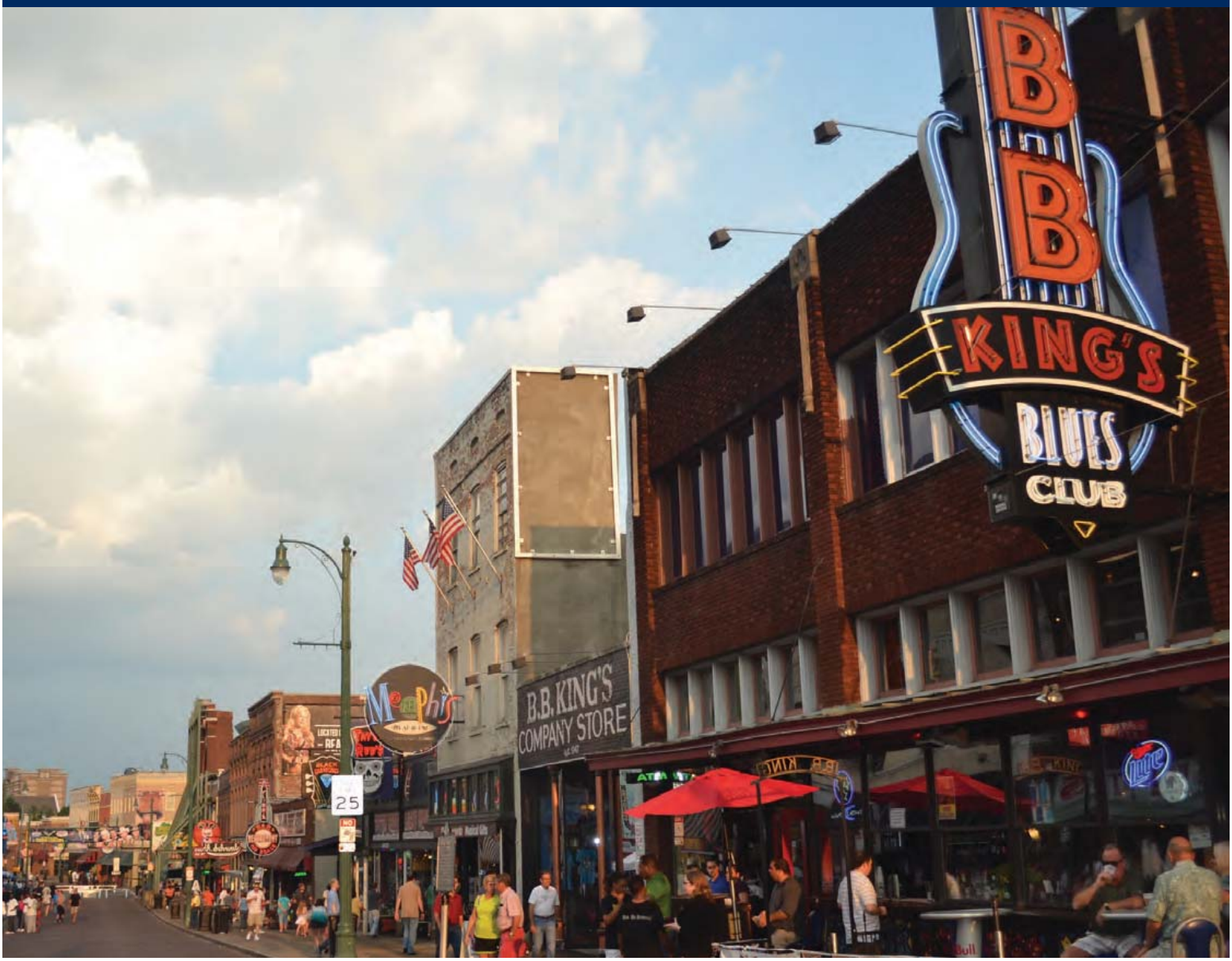

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Executive Summary

Businesses of all sizes and types use on-premise signs to communicate with their customers. It has been suggested that on-premise signs and the regulations that limit them can significantly impact the performance of some types of businesses, yet there has been limited recent research to inform decisions about sign investment or regulation.

To provide more current insight, researchers at the University of Cincinnati conducted a national survey of businesses and a series of case studies. The purpose was to assess how changes in on-premise signage affect business performance. This report provides details about that research's approach and results. Business owners responding to the national survey reported that additional and improved signs are associated with increases in their revenues and profits. The case studies suggest that signage visibility and conspicuousness are especially important, and that signage plays an important role in a business' overall branding and marketing strategy. This research indicates that appropriately designed and located on-premise signage can be an important factor for retail business success. The implication of these results is that on-premise signage indirectly influences the vitality of a community and the quality of life of consumers by providing information about the availability of goods and services.

Examination of one field of economic theory – search theory – and application of this concept to the subject of signage presents a new explanation for why on-premise signs have positive economic impacts, not only for businesses, but also for consumers and communities: namely, signs make it easier for shoppers to obtain the information they need to make a purchase.

A national survey asked businesses about sign changes and the impact of those changes on business performance. In addition, detailed questions inquired about the nature of the business and the use of signs. The survey produced some significant findings regarding both economic impacts and sign preferences.

- Sign changes generally had significant, positive impacts on sales, number of transactions and profits. Roughly 60 percent of businesses reported increases averaging about 10 percent.

- Sign changes also led to small positive impacts on employment. Nearly a quarter of respondents reported hiring more people.
- While most single establishments and small firms have either wall signs or pole signs, most large companies have both. In general, larger companies tend to have more types of signs.
- Helping customers find their location was the most important purpose for respondents. Legibility is the most important characteristic of signs across all sizes of companies.
- Business logos and the size and location of the signs were more important for companies with more establishments, for whom branding is presumably more important, compared with single establishment companies.

Among the case studies, positive business performance was generally associated with greater use of on-premise signage and better quality signs, as the following results indicate.

- The national lodging chain case study found that the use of a digital electronic sign to display pricing was associated with increased average occupancy rates. The impact appeared to be especially strong for properties with lower occupancy rates.
- The national retail banking business case study found that pylon signs were strongly associated with high visibility, monument signs were moderately associated with high visibility, and wall signs contributed to identity but not visibility. In addition, pylon signs were associated with significantly more teller transactions.
- The specialty store small business case study demonstrated the need for signage to reaffirm the value offered by a niche retailer. Sign design must be sensitive to community and customer expectations, and able to reinforce the brand of a small business. The signage should communicate a "promise" of value for a product and/or service that is not commonly found elsewhere.
- The car dealership small business case study found that the addition of a video sign board was associated with increases in both service department revenue and customer traffic. An added benefit was the "goodwill" and reputational gain associated with using the video board for community-related public service messages.

Given the economic importance of signs, regulations should balance community design objectives with full knowledge of how sign design and location impact businesses success. Business success is important because of its impact on a community's tax base, and it ultimately leads to the availability of greater fiscal resources to provide needed community services.

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I. Introduction

Communication is perhaps the single most important activity for the success of human societies (Richmond & McCroskey, 2009). Signs are among the most important elements of visual communication. The visual communication provided by signs on our streets and highways is essential for an effective transportation system to aid in getting us where we want to go. Similarly, the visual communication provided by on-premise business signage is essential for the efficient function of our system of commerce and the success of many businesses. Effective signage can drive job creation, generate tax revenues, and provide quality access to goods and services.

Communities depend on clear, legible and conspicuous signs for direction, safety and information. Businesses have a long established history of using signs to announce their products and services. On-premise business signs are especially important within the context of our highly mobile society where we frequently venture to unfamiliar areas. On-premise signage allows a business to cost-effectively communicate with potential customers who are moving through its trade area. The wayfinding, identification and marketing information provided by on-premise signage is essential for assisting existing and potential customers in finding the goods and services they seek. This connection between customers and businesses is crucial for business success, and the local governments that depend on the employment and tax revenues which businesses generate.

On-premise signs are a potentially powerful medium for commercial communication. Frequently, on-premise signage is a key element, which is often used with other media, to develop and maintain a business brand. The more consistently that brand is communicated, the greater the likelihood that existing and potential customers will associate it with specific expectations for price, product brand, or service quality at specific locations.

On-premise signs that are designed well and properly located are especially important for generating impulse sales. While some goods and services are primarily purchased on the basis of careful consideration and forethought, many others are impulse purchases. Indeed, impulse sales generate an important part of revenue for a wide variety of retail businesses. One study (Conroy 2004) found 68 percent of purchases during major shopping trips were unplanned, and 54 percent on smaller shopping trips. In these cases, on-premise signage is critical.

This study provides current analysis of how on-premise signage is linked to business success. A California study from the 1990s indicated that changes to the number and location of on-premise signage can have a direct impact on business performance (Ellis, Johnson & Murphy, 1997). That study – which used statistical analysis of signage, business performance and location-specific data for two business chains – found that an increase in the number of on-premise signs at a particular site had a significant and positive impact on sales, number of customer transactions, and the amount of the average transaction. Case studies also have been used extensively in the small business and signage trade literature to document the impact of signage on the economic performance of businesses. For example, the New York State Small Business Development Center (Conroy 2004) details a number of case studies. One case, based on the experience of a car wash, documents the association of improved sign legibility and visibility with higher sales, as well as suggesting that the introduction of message boards can lead to increased sales. Another case, based on the experience of a small restaurant, documents the association of improved sign visibility and conspicuousness with increased sales. While these case studies do not provide conclusive evidence of the economic value of on-premise signage, they do provide insight to specific causal mechanisms that may be useful for interpreting the statistical analyses of the survey data.

For decades, alancing the signage needs of individual businesses with the broader concerns of communities has been a concern of local officials, the sign industry, and planning and design professionals. Funding for essential local government services such as police, fire, roads, and education often depend on the success of local businesses. This linkage between on-premise signage, business success, and local government revenues (and the public services they fund) highlights the need for sign regulation process to be informed by research such as is being conducted here. Signs regulations can and should promote designs that promote business success while meeting appropriate local standards.

The impact of on-premise signage is dependent on visual elements that may interact with and complement a business' marketing and branding strategies. Visual characteristics and perceptual concepts related to signs, symbols, semiotics, and the built environment have been addressed in Berger's *Seeing is Believing* (2007) and the two groundbreaking treatises by Tufte (*Envisioning Information* (1990) and *Visual Explanations* (1997)). An appreciation for the layering of economic and marketing roles together with a visual identity program becomes important for understanding the contribution of on-premise signage within a comprehensive marketing strategy.

The research presented in this report provides an analysis of the economic effects of signage within a context of varied scales and types of business. The objective of the study is to provide an updated assessment of the impact of signage on businesses and communities. Several earlier publications have identified key issues and economic factors associated with on-premise signage, with "The Economic Value of On-Premise Signage", "The Signage Sourcebook", and" What's Your Signage" providing reference and guidance for much of the past two decades. Except for the recent work of Taylor (2010; Taylor, Sarkees & Bang, 2012), the value of signage has lacked recent rigorous analysis.

This study uses survey data and case studies to bring the economic impact of on-premise signage into a clearer focus within prescribed theoretical frameworks and a diversity of sign applications. Venturi and Brown in "Learning from Las Vegas" (1971) analyzed the Las Vegas strip, its sign/buildings relationships, and their impact within our urban / suburban environment. Their study systematically assessed the visual impact of signs within a concentrated market area with ever-changing views from the automobile. Venturi was the first to connect on-premise signage to commercial symbols that contained economic value in their meanings beyond the direct communication objective and architectural product. Berger, Tufte, and others have provided additional understanding to advance the symbolic meanings contained in signage and signs. It is within such a broader framework that this research utilizes case studies in combination with economic data to bring the value of on-premise signage into a clear focus. Case studies are used for illustrating the diverse sign typologies and as an analytical interface with communities, brand identity, and the "marketing functions" of signs (Taylor, 2010).

II. Context

A. The Problem

The success of local retail businesses is important for creating jobs, generating tax revenues, and providing access to goods and services in communities both large and small (Blakely & Leigh, 2010). For most businesses, but especially those that sell retail goods and services, on-premise signs can be an important mechanism for attracting new customers and providing wayfinding for returning customers. This is especially true for businesses such as fast food restaurants, convenience stores, and gas stations for which impulse sales represent a substantial proportion of their total revenue (Conroy, 2004). Consequently, for a variety of economic and quality-of-life reasons, it is critical for the signage industry, businesses, and government agencies to maintain a current and nuanced understanding of how on-premise signs contribute to business performance.

B. Research Challenge

The primary research challenge has been to gather sufficient signage and business performance data to be able to reach conclusions about the effectiveness of on-premise signage. The need to collect both signage and performance data from a wide range of businesses, and draw from businesses' own experiences became clear from understanding the strengths and limitations of previous studies. A two-stage online survey model was designed and implemented with an initial survey, coupled with an opportunity for approaching self-identifying businesses to participate in follow-up, in-depth case studies.

Despite the relatively large number of survey respondents that we contacted, few businesses were willing to share detailed information about their signage and business performance. Assurances were given that proprietary information would be kept confidential and, where requested, names of businesses would not be used in any study disclosures. Ultimately, after persistent pursuit of leads from a variety of sources, three national/regional businesses agreed to share the necessary signage and performance data.

C. Previous Research

Research assessing the impact of signage on business performance must begin with an understanding of the fundamental purpose of on-premise signage: communicating with potential customers about where the business is located and the nature of its product or service. As such, signs may serve to establish or fortify a consistent business brand or image (Conroy, 2004). For some businesses, multi-media branding strategies may involve static on- and off-premise (billboard) signs, as well as television, radio, newspapers and flyers. Few small businesses can afford or justify such strategies, and rely on their on-premise signs for much of their marketing, particularly if communicating with potential customers is simply about identifying their product or service and location. New technology is expanding the sign choices available to businesses for communicating with potential customers. Electronic messaging and video displays on signs are becoming increasingly common, especially for businesses whose brand or image requires that they are perceived as cutting-edge in the quality of their products or services (Post & Pfaff, 2007).

On-premise signage is one of the most basic and yet complex forms of visual communication. Signage serves as a multi-purpose media that can identify an organization, business or place while at the same time marketing an idea, service, or product. There are a number of factors that should be considered in choosing a design and location for an on-premise sign because of the different communication purposes and audiences. For example, businesses seeking to capture impulse sales along a major highway will need different types of signage to be successful than those located in a pedestrian-oriented business district (Conroy, 2004).

Previous research has established the importance of well-designed and appropriately-placed signage for generating business revenue and associated tax dollars (Ellis et al., 1997). The exhaustive literature review and annotated bibliography by Christadoulou (2009) is the most comprehensive assessment of the recent signage research literature, containing 227 citations. Edelman (2009), in his presentation of Christadoulou's work, organized the literature into six areas: Business & Marketing, Graphic Design & Architecture, Engineering & Technology, Planning & Urban Design, Law and Psychology. Among these he found extensive overlap that made it difficult for researchers to organize the literature in a meaningful way.

Local governments recognize that sales, property, and income tax revenue are closely linked to the success of their businesses. In part to fortify arguments that signs are important for business success, seminal research was conducted to assess the impact of on-premise signage on the performance of a Southern California fast food restaurant chain and a national specialty import retailer (Ellis et al., 1997). The research used cross-sectional and time-series regression analyses to predict the impact of sign changes on site performance. For the fast food chain, a cross-sectional analysis estimated the effect of sign characteristics and control variables on sales revenue, number of transactions, and average amount per transaction. Among the variables included in the models, various signage improvements were the best predictors for all three outcome variables. For the specialty import retailer, multiple regression and time-series analysis estimated that sign specific changes or addition were associated with significant increases in sales revenues.

While the Southern California studies focused on fast food and specialty import chains, it has been argued that on-premise signage is likely to be even more important for small non-chain businesses (Conroy, 2004). Many small businesses do not have the relatively large marketing budgets and shared electronic media buys of national franchises. These small businesses are more likely to be dependent on their signage for most of their communication with potential customers.

Because the seminal investigation of the economic impact of signage used data from two chains, additional research is needed to determine if similar results extend to a broader range of retail businesses. Subsequent studies have contributed important and useful research in this area, yet none have estimated the economic value of on-premise signs across diverse business and local government contexts (Conroy, 2004). Consequently, important decisions about signage by businesses and local governments are frequently based on limited or no research because the results of existing studies are not adequately disseminated or are simply inapplicable. Indeed, local governments may impose stringent signage regulations based on vague aesthetic concerns, making it difficult for businesses to be creative and effective with their signage as a means of communicating with potential customers and without appreciating the potential economic and fiscal impacts of the restrictions. When a business depends on potential customers from outside of their community, effective signage becomes especially important. In such cases, signage location, visibility, and design are particularly critical. Equally critical is that local sign regulators recognize the need for creative approaches to signage for both business and community success (Blakely and Leigh, 2010).

The idea of communicating a coordinated visual message is important for business performance. A consistent approach to visual communication supports the branding of place by giving it a consistent identity. Businesses are working to sell their image, and local communities are doing the same but on a much larger scale. The ability of a business to successfully market itself is critical for the local economy. Branding serves to establish a base of customers, whether for a business or a community. When a sign is serving a community to its highest potential, such that it is visually appealing and noticed, it also seems to brand the business or organization that it represents. Eventually this image will be a familiar element for its viewers and they may want to know more about it (Heather, 2003). For both businesses and local governments, effectively designed and located signage is an essential part of a branding strategy (Heather, 2003).

D. Research Approach

Given the limitations of the earlier work, there is a clear need for an updated, rigorous study of the economic value of on-premise signage to guide both business and public policy decision-making. The purpose of this research is to address that need.

At the beginning of this project, the research team developed a conceptual framework for identifying possible relationships between on-premise signs and various economic impacts. The left side of this figure illustrates the complexity of on-premise signage. Research must consider more than just the size, number, and placement of signs; other signage and site characteristics can also play significant roles. On the right side, the listing of possible economic impacts suggests that signs may generate economic benefits not only for businesses but also for customers and communities.

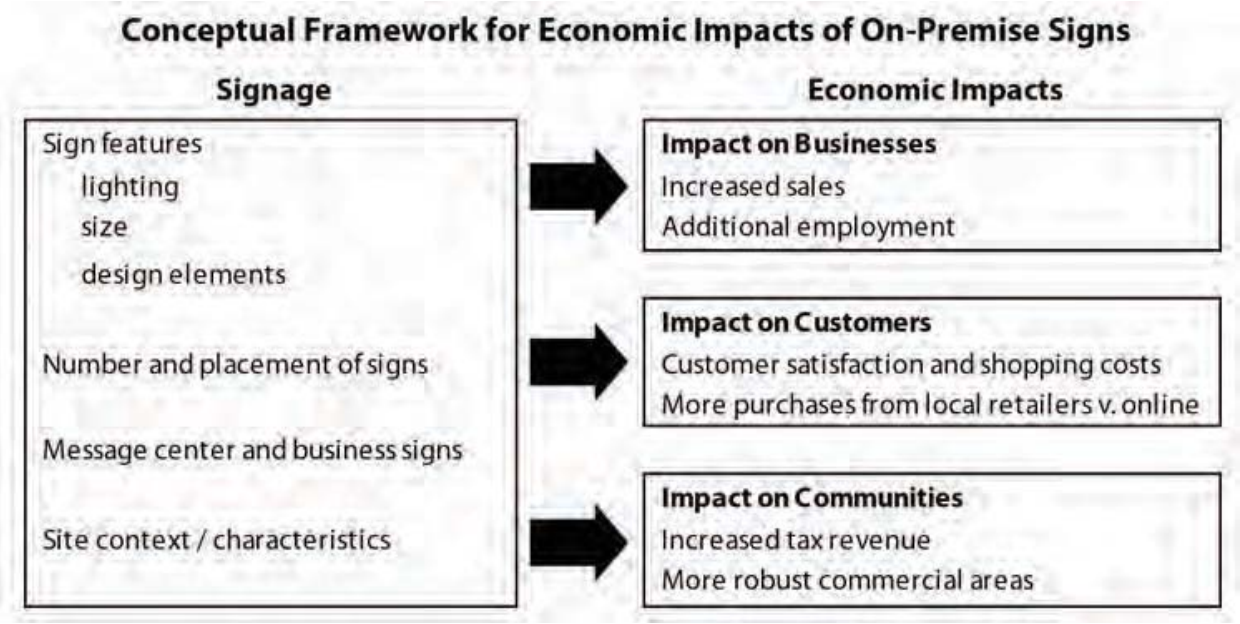

Figure 1: Conceptual Framework for Economic Impacts of On-Premise Signs

While no single research project can examine all of these elements and their interrelationships, this study attempts to move beyond the basic considerations that have characterized most previous research. Toward this end, a multi-faceted approach was selected, which includes applying elements of economic theory, developing and implementing a survey of sign users, and conducting case studies of a diverse set of businesses.

It is clear that on-premise signage is identified as a critical element for retail business and service industry providers for success, and it is also seen as indirectly influencing the vitality of the community. Therefore, this analysis takes a broad approach to considering the economic value of on-premise signage. This study is designed to appeal to a wide audience by attempting to use a common vocabulary to facilitate discussion of these findings among design professionals, regulatory professionals, and the sign industry.

III. Economic Theory and On-Premise Signs

Consideration of how signs benefit customers is an often overlooked, but a highly important dimension of the impact of on-premise signs. The recipients of the 2010 Nobel Prize in Economics were recognized for work in the area of search theory – a field that recognizes that information is not perfectly available, and obtaining it often requires time and other resources. Consequently, buyers often cannot purchase what or as much as they would like, nor can sellers meet these market demands efficiently. This research has implications for the sign industry because the principal purpose of on-premise signs – to provide information to potential buyers – is an area where this theory can be applied effectively.

The most fundamental sign message is typically about a) the existence of willing sellers and b) the types and prices of the items for sale, thus providing the most significant information that customers typically want. To the extent that signs effectively communicate the information sought by prospective customers, they reduce costs for consumers; conversely, when signs fail to communicate this information, they fail to reduce search costs of the consumers, businesses and communities. For businesses, a sign is often the primary way for the consumer to learn that the business even exists (Taylor, 2010). Significant economic research in this field continues today.

Customers' search costs include the value of the additional time spent searching for goods and services that match their wants. The consumer must make a decision—informed by any available signage—about the shopping potential of the store versus the option of continuing to search for other potential opportunities. For this section, we use this well-developed search theory to explain the process of a consumer evaluating prospective stores. This theory can help researchers better understand the effect of information on consumer behavior, such as the impact of a more visible sign on "downstream" businesses. The theory can also help researchers better understand how quality signage can lead to less total driving, increasing safety and reducing travel costs.

This figure provides an overview of the implications of applying search theory to the field of business signage. Just as good signage has a series of three consequences that produce positive economic impacts, impaired signage has a comparable series of three adverse consequences that produce negative economic impacts.

Impacts and Economic Theory: What Search Theory Tells Us	
Good Signage	Impaired Signage
1. Proper signage yields information to potential buyers, reduces transaction costs, improves well-being.	1. Inadequate information has costs for both sellers and buyers.
2. Better information allows buyers and sellers to find each other for a transaction.	2. Consumers are less well-off because of higher search costs.
3. Sign information moves markets toward an efficient outcome.	3. Internet sellers gain at the expense of other sellers and the communities where those sellers are located.

Figure 2: Impacts and Economic Theory: What Search Theory Tells Us

A. Origins of Search Theory

Most students of economics are taught the basic model in which consumers enter a market, a price is determined, and then a subset of these consumers will complete transactions with producers if that price jointly suits them. This outcome depends on a set of assumptions that lead us to a familiar conclusion: that a single price will be established, allowing potential buyers and sellers to choose whether they will take part in a transaction, and leading to determination of how much of the product will be sold. One of these simplifying assumptions – that information is freely available to everyone –does not reflect the realities of imperfect and costly information that business owners and consumers face on a daily basis. In reality, perfect information rarely exists, which often leads to many different prices for the same product.

Economists in the middle of the 20th Century sought to reconcile the theoretical prediction of the basic model with the variation in prices observed all around us. It became clear that adjustments to the basic model would be necessary to gain understanding of a world in which transactions for the same good were being completed at quite different prices, or in which inferior goods were bought and sold for the same price as superior ones.

B. Relevance of Search Theory to On-Premise Signage

Toward this goal, search theory, which examines how people make choices with limited information was pursued most famously by economists George Stigler and John McCall. In order to properly study information, its costly[1] nature had to be recognized. Search theory was originally applied to labor markets in the 1970s by Dale Mortenson and Christopher Pissarides. In 2010 the Royal Bank of Sweden chose to honor Professors Mortenson and Pissarides with a Nobel Memorial Prize in Economic Sciences[2]. In recent years, mainstream circles are recognizing the work that had already been scrutinized and affirmed by numerous scholars and graduate students for a generation.

In the work of Mortenson and Pissarides, search theory considers the employment decision of a job-seeker comparing an offer in hand against the "shadow of the future." The certainty of the offer on the table must be balanced against the prospect of continuing his job search into the future to seek potentially an even greater wage. Continuing the search is risky, and takes time. Because any other offer would begin at a later time, it would have to be at a more lucrative wage to match the value of the offer in hand; and there is always the possibility that future job offers might be at lower wages, not higher.

A well-known finding from search theory is that more uncertainty about the future causes a delay in the searcher's commitment. In other words, an offer in the present may be less attractive compared to a better offer that might occur if the search should continue. The job-seeker balances that potential upside gain by preparing to decline offers that are seen as unfavorable in comparison to anticipated future options.

Thus, in search theory, the searcher – whether a job seeker or a shopper – compares the value of the known alternative against the potential costs and benefits of continuing to search. It is clear that better information about these options makes it easier for searchers to form expectations about the unknown alternatives and whether or not to continue searching, assisting in producing a better match.
In order to connect search theory with signage, suppose that the person is a prospective buyer driving down the street in search of a gift for a friend. She encounters a series of stores that may or may not sell an acceptable item. If business signage is inadequate, learning about a price and other qualities of a potential purchase may involve a costly decision to enter a store, requiring expenditures of both time and travel. It is in this situation that information -- not just about pricing but also about the quality and nature of the goods on sale -- will be useful in sharpening the perception of the future that enables a purchase to take place. In such a situation, higher quality signage reduces these information costs, making buyers and sellers better off.

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[1] Economists use the term "scarce" to recognize something that is inherently limited in quantity, and therefore deserving of a price; information represents different tiers of cost, with some of it being readily available and easily processed, and some being only one of those or neither.

[2] Peter Diamond also shared in the Nobel Memorial Prize in Economics in 2010.

Signs provide signals to consumers. A store's sign may signal price, quality, convenience, and/or reliability. This signaling is illustrated by competing gas stations that post their prices immediately next to each other. Other information on their signs may help them to compete on other factors, all of which assist the purchaser by providing information that reduces consumer uncertainty. This sign information not only helps stores compete with each other but also with internet retailers, who generally have a large advantage over store retailers in providing information to consumers.

Search theory also provides insights about businesses that are trying to complete a transaction with a searcher. In the labor market application of search theory, making a job offer is costly to the employer because he must invest time, first in finding and screening job candidates and then in training a new employee. Because of these costs (and the risk of entrusting key business elements to a new employee whose competence is uncertain), the employer is highly motivated to find effective means in searching for prospective employees. This is comparable to the circumstances in which business owners compete for customers. Although stores and other businesses are searching for customers and clients rather than employees, many forms of advertising -- television, radio, celebrity endorsements -- represent costly signals because advertising space is scarce. Among these, outdoor signage ranks favorably in terms of effectiveness according to surveys of consumers (Kellaris, 2011).

James Kellaris, who holds the Gemini Chair of Signage and Visual Communications in the University of Cincinnati's Carl H. Lindner College of Business has illustrated how good signs reduce search costs by making information more available to consumers. Utilizing data collected in a 2011 survey of over 100,000 North American shoppers, Kellaris found that:

- Shoppers associate sign quality with store and product quality (34%); and
- Shoppers make store choices based on the information communicated by store signs (29%).

Potential customers often lack significant pieces of information. Even when businesses attempt to convey this information through their on-premise signage, characteristics of those signs and the surrounding environment, as well as other impediments, often inhibit the communication of this information. Kellaris also found that nearly half (49.7%) of American consumers have driven by a desired business without finding it because of insufficient signage.

There are significant anecdotal examples where the loss of good signage caused measurable decreases in the value of businesses. When one motel that had a highly visible sign moved to a less conspicuous location, it found that occupancy rates decreased 36 percent, which reduced its $960,000 value by 42 percent (Bass, 2010). Furthermore, the loss of a sign can have consequences that extend to surrounding businesses and the larger community. Real estate appraiser Richard Bass documented the case of a business on the back side of a Florida mall that lost the pylon sign that gave it visibility. The loss of customers eventually led to closing the store. Because surrounding mall businesses relied on the traffic generated by that store, they also closed.

Search theory has explained the role of information and how higher costs of obtaining information reduces the welfare of both the consumer and the producer. For job seekers, lower search costs allow them to be more selective, implying greater productivity shared between worker, firm, and (ultimately) the consumer. For consumers, improving information through better signage will decrease the time and resources needed to investigate another vendor. Reducing information costs effectively makes everyone better off.

By facilitating less costly sales, better information through signage can positively affect the broader community through economic growth (especially through increased employment and wages) and a stronger base for sales, income and property taxes. While others may focus on the intangible impacts on communities of quality signage, such as their contributions to a sense of place and identity, as well as building social capital and community pride, we emphasize that search theory explains the economic benefit of signage.

IV. National Survey

A. Survey Approach

To gain a broad perspective about a variety of on-premise signage considerations, a survey was prepared and distributed to all types of businesses in the US that use signs. The survey provided businesses the option of responding either online or by a mailed response. Questions were asked about sign changes and the impact of those changes on business performance. In addition, detailed questions inquired about the nature of the business and the use of signs (number, size, location, type).

Respondents were initially solicited by email, post cards and personal contacts. Also, newspaper and newsletter articles about the survey included information about the survey's Internet address and asked businesses to complete the survey online. An effort was made to gain responses from a geographically diverse cross section of the different types of large and small businesses that use signs to attract and retain customers. This approach was used in order to collect responses from a wide range of such businesses rather than to produce a random national sample. While the objective of employing this method was to collect data from respondents who have greater awareness of on-premise signage issues, responses did not indicate a response bias toward heavy signage users; in fact, one third of respondents reported no sign changes in recent years.

B. Survey Results

A total of 225 businesses responded to the nationwide survey of business sign users. Of these, 213 were usable responses. Of these respondents, 70 percent had a single establishment, while the remaining 30 percent were classified as either small (2-10 establishments) or large companies (more than 10 establishments). Single establishment businesses are more common among retail trade respondents (84%), and comprise about half of respondents in the accommodation and food service industry (52%).

The following table shows that, as large as these proportions are among survey respondents, single establishment businesses are even more common nationally, based on a census of U.S. businesses. However, these proportions are sufficiently comparable to be able to draw conclusions from the survey about general use of business signage.

Table 1: Single-Establishment Businesses as a Proportion of All

	Survey Respondents	2008 National Data[3]
All businesses	70%	90%
Retail trade	84%	90%
Accommodation and food services	52%	70%

In order to understand whether having multiple signs was important for their perceived impact on business performance, respondents were asked about the number of signs at a typical establishment. As shown in Table 2, over two-thirds of respondents had only one or two signs, a little more than a quarter had three to five signs, and only 4 percent reported 6 or more signs. Larger companies (10+ establishments) were far more likely to have more than 2 signs, with over half reporting 3 or more signs at a typical establishment.

Table 2: Number of Signs at a Typical Establishment by Size of Company

	All (n=213)	Single (n=150)	Small (n=35)	Large (n=28)
1-2 signs	69%	72%	71%	46%
3-5 signs	26%	23%	26%	43%
6+ signs	5%	5%	3%	11%

(Small companies have <10 establishments, Large companies have 10 or more establishments)

Left: Oakley Pub & Grill; Right: Buca di Beppo

[3] These national figures come from the 2008 Statistics of U.S. Businesses (SUSB). The SUSB is an annual series of national economic data by enterprise size and industry. SUSB covers most of the country's economic activity. The series excludes data on non-employer businesses, private households, railroads, agricultural production, and most government entities.

Questions about the types of signs were also included in the survey because this is frequently an issue addressed as part of sign regulations. As shown in Table 3, among the types of signs at a typical location, wall and pole signs were most common. While most single establishments and small firms have either wall signs or pole signs, most large companies have both. In general, larger companies tend to have more types of signs.

Table 3: Types of Signs at a Typical Establishment by Size of Company

	All (n=213)	Single (n=150)	Small (n=28)	Large (n=28)
Wall sign/s	60%	53%	54%	89%
Pole sign/s	53%	46%	49%	86%
Wall & pole signs	27%	19%	23%	75%
Monument sign/s	25%	15%	29%	71%
Other sign/s	30%	28%	31%	39%

(Small companies have <10 establishments, Large companies have 10 or more establishments)

Some of this variation in the amount of signage may be due to the different industry mix among large companies, but even when restaurants are the only category considered, large companies use more signs. This may be the result of a number of factors, such as differences in types of location and different customer markets.

As part of the survey, respondents were asked to rate on a 0 (zero) to 3 scale -- with 0 being not at all important and 3 being extremely important -- the relative importance of their signage for several common purposes of signs. Overall, the two sign purposes with the highest scores are: 1) making their business stand out; 2) helping potential customers find their location. These two purposes received generally high scores across all business size categories.

As shown in Table 4, the size of the company (and presumably access to multiple marketing modes to facilitate "branding") did make a difference. Companies with more establishments perceived 'brand reinforcement' as relatively more important compared to companies with a single establishment ($\gamma = 0.73$)[4]. This was reinforced when businesses were asked which purpose is the most important: 38 percent of large companies identified branding/image, compared to 14 percent of small firms and just 3 percent of single establishments. Other sign purposes showed measurable but weaker association with company size: compared to large companies, single establishments tended to give slightly more weight to using signs to inform about goods/services, and small companies generally use signs a bit more to inform about promotions ($\gamma = 0.16, 0.25$).

[4] A commonly-used statistical test for measuring the strength of association between two variables such as those used in this survey is Goodman and Kruskal's gamma (γ). Gamma measures the proportional reduction in error; it identifies how much the error in predicting variable "y" is reduced by taking variable "x" into account. In general, if $\gamma = 0.60$ or greater, the association is very strong, while a figure of 0.30 reflects a moderate association; if $\gamma = 0.20$, the association is weak.

Table 4: Mean Scores for Perceived Importance of Signs for Common Purposes, by Company Size (n = Number of Respondents)				
	All (n=213)	Single (n=150)	Small (n=35)	Large (n=28)
Help customers find location	2.73	2.75	2.63	2.79
Make business stand out	2.68	2.67	2.68	2.75
Reinforce branding/image	2.42	2.30	2.57	2.86
Inform about goods/services	2.23	2.28	2.17	2.04
Inform about promotions	1.76	1.71	2.03	1.64

(0=Not at all important, 1=Slightly important, 2=Moderately important, 3=Extremely important)

When data on sign types and purposes are compared, those reporting that the sign purposes of "making their business stand out" and "reinforcing their branding/ image" are extremely important were slightly more likely to have pole signs $\gamma = 0.20$, 0.31). Some of the survey's findings about sign quality, number, and readability have been replicated in a more recent survey (FedEx Office, 2012), which found that:

- About three fourths of consumers have entered a store or referred a friend because of a sign that made the business stand out, and two thirds have made a purchase as a result.
- Conversely, most consumers indicate that bad or no signage deters them from entering a store.
- Sign readability is the most important sign factor in causing consumers to try a store's product or service.

Respondents also were asked to rate various signage characteristics in order to determine which specific characteristics were perceived to be most important. As shown in Table 5, among all companies, "being clearly readable" was the most important characteristic. This was true across all sizes of companies. However, again, the size of the companies did make a difference. Among companies with more establishments, and for whom branding is presumably more important, including their business logo was reported as more important compared with single establishment companies ($\gamma = 0.72$). Compared to other businesses, large companies also gave somewhat greater weight to "size / location" ($\gamma = 0.51$). Among small businesses, including single establishments, "conspicuousness" was the second most important characteristic, rated considerably higher than 'size and location' and "logo or branding" ($\gamma = 0.49$, 0.31).

Table 5: Mean Scores for Perceived Importance of Sign Characteristics, by Company Size				
	All (n=213)	Single (n=150)	Small (n=35)	Large (n=28)
Clearly readable	2.90	2.91	2.79	2.96
Conspicuousness	2.75	2.78	2.62	2.75
Size and location	2.64	2.65	2.43	2.86
Illumination	2.56	2.57	2.46	2.61
Logo or branding	2.43	2.30	2.60	2.86

(0=Not at all important, 1=Slightly important, 2=Moderately important, 3=Extremely important

Two of these sign elements were associated with signage types. Those businesses reporting that the sign elements of being 'clearly readable' and 'size/location' are "extremely important" were somewhat more likely to have pole signs (γ = 0.48, 0.44).

In order to assess how actual changes in signage might be related to the perception of the importance of signs, businesses were asked if they had made improvements in their signage over the past five years and their perceptions of the impact the sign changes had on four measures of business performance: (1) sales, (2) number of transactions, (3) profits and (4) staffing. About two thirds (66%) of all respondents reported one or more types of changes. Among the changes, as shown in Table 6, seven in ten of these companies reported making changes in their sign design. More than half (52%) improved sign visibility, while nearly half (47%) increased the number of signs, and three in ten made the signs larger. Because almost all changes consisted of more than one of these types of change, it was not possible to determine whether one change produces greater impacts than another.

Table 6: Types of Changes Made to Signs Over the Past 5 Years

Changed the design of signs	70%
Enhanced the visibility of signs	52%
Increased the number of signs	47%
Increased the size of signs	30%

Most of the companies reporting sign changes indicated that these sign changes had large, positive impacts across three of the four measures of business performance, with smaller but still positive impacts on the fourth measure. As shown in Table 7, between 59 percent and 65 percent of the companies making sign changes reported increases in profts, transactions and sales, with average increases of 9, 11, and 12 percent, respectively. These findings about the impact of enhancing on-premise signage are consistent with findings recently reported by Dr. Charles R. Taylor, John A. Murphy Professor of Marketing, and his colleagues at Villanova University (Taylor, Sarkees & Bang, 2012).

Increases in staffing were reported by a smaller proportion of the companies (23%), with an average increase of 6 percent. Employment growth may have been tempered by the national economic downturn rather than representing a different type of relationship with signage changes compared to sales, transactions and profits.

Table 7: Perceived Impact of Sign Changes on Business Performance

Performance Measure	% Reporting Increase	Average Increase
Sales	65%	12%
Transactions	62%	11%
Profits	59%	9%
Staffing	23%	6%

Additional analysis of the relationship between business performance and various signage factors revealed a number of sign characteristics that correlated with positive economic impacts.

- Businesses emphasizing 'conspicuousness' as a sign element were somewhat more likely to report larger increases in store sales ($\gamma = 0.45$), and those giving a high priority to size/location were slightly more likely to report larger increases in store sales ($\gamma = 0.28$).
- Businesses with pole signs were somewhat more likely to report larger sales gains ($\gamma = 0.42$).
- Those that experienced gains in sales, customers, and profits were much more likely to attribute those gains at least partially to their sign changes ($\gamma = 0.80, 0.74, 0.75$).

Some survey respondents included contact information with their surveys for additional follow-up. Researchers were able to reach roughly one third of those who provided this information (13 of 38), and they provided additional responses to questions during a brief interview. Most of these businesses surveyed were single establishments in free-standing structures or storefronts in a main business district . They were located on a site either having 45-50 mph speed limits and far from curb, or 25-30 mph and within 20ft of curb. Most interviewees indicated that 60 percent or more of their revenues were obtained from regular/repeat customers.

Most of these interviewed businesses added electronic message signs, and they indicated that their new signs had positive business impacts, but the results are skewed by what they characterized as poor general economic conditions. All affirmed that they had experienced an increase in business since they added new signs, but most were not very significant. Three or four contacts reported vast improvements (increases of over 40%) compared to business revenue prior to new signs. When questioned about use of their new signs, these businesses generally indicated that they had become more involved with sign "activities." They referenced very active updating information (a couple times a week), constant design change, and posting community "reputation boosting" information. Illumination at night was mentioned by customers as a great attention-getting advertisement while closed. When asked what they would do differently or what they would do for their next sign update, many said they wanted more electronic messaging capabilities, having already witnessed the impact on business performance. Some wished for a video board, feeling this would dramatically boost business, but couldn't be justified with current revenues and budget. These types of dialogues can serve as yet another foundation for future research.

This survey has generated numerous insights into how on-premise signage affects the business performance of retailers, hotels and eating places in order to inform important decisions about private signage investments as well as public discussions about signage restrictions. This research would have been much easier, and perhaps already completed, if the required data was available as part of public secondary datasets. Unfortunately, this is not the case, and this research has been required to rely on the cooperation of businesses to share proprietary data. Businesses agree to share data, usually on the condition that the results are shared with them, because they appreciate the need for this research for their own benefit as well as that of the communities where they operate.

Given that this survey captured self-reported information about individual businesses, questions may arise about its objectivity and validity. Fortunately, a body of marketing research has established that the self-reports of business owners about the factors that influence the performance of their business are highly correlated with those factors that could be identified using independent, objective data (see Robinson & Pearce, 1988; Venkatraman & Ramanuiam, 1986). Consequently, the results here can be reasonably considered to reflect the role of on-premise signage for a broad range of retail businesses.

V. Case Studies

Four case studies, drawn from a wide range of business sizes and types, offer detailed insights about the economic impacts that on-premise signage can have. Among the case studies, positive business performance was generally associated with greater use of on-premise signage and better quality signs.

A. National Lodging Chain – Value Place

Value Place is the largest economy extended-stay franchise in the country. Founded in 2002, it opened its 100th location in 2008, and its 175th in 2010. All properties have about 120 suites and are newly constructed.

According to the company's website, its properties combine hotel convenience and apartment essentials. Its business model is designed to appeal particularly to small and mid-sized business owners and families who are relocating to a new community.

The company has specific signage standards. The primary sign requirements consist of a wall sign with the company's logo on at least one side of the building, and a pole sign that displays its logo and pricing information.

The company also has several location criteria for its properties. The primary criteria are: interstate visibility, or at least a location along a primary arterial; a middle- to moderate-income area; and strong population density within a five-mile radius. These characteristics made it a useful case study.

Value Place Sign Configurations: Benefit of an Electronic Sign

Value Place has developed a number of pole sign configurations to help it communicate its message to potential customers. Its preferred arrangement utilizes an LED-lit changeable electronic sign. Changeable electronic signs are preferred because they can more effectively communicate multiple messages and because they are considered to be better at attracting attention.
In those locations where sign regulations prevent the use of such signs, Value Place uses signs with large plastic numerals, similar to those that gasoline stations post to advertise their prices. Approximately 73 percent of all properties have changeable electronic signs, while 26 percent use signs with plastic numerals, and the remaining one percent lack any pricing signage.

How does the type of signage affect the performance of various properties? For those with changeable electronic signs, 2010 occupancy averaged 11.2 percentage points above breakeven, while those with plastic signs averaged 9.5 points above this threshold. However, further analysis of this data shows that the advantage attributable to changeable electronic signs is predominately realized by properties in the bottom performance quartile.

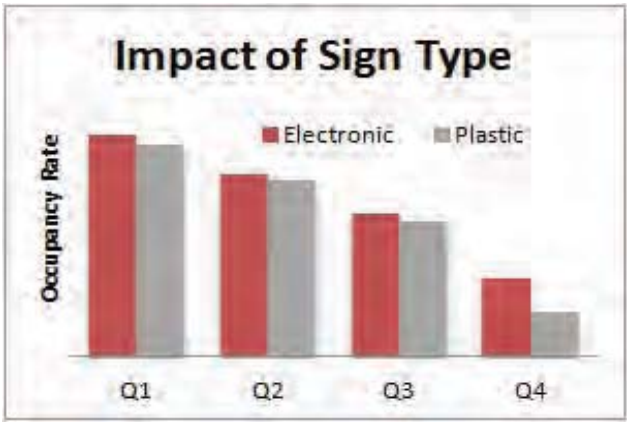

Figure 3: Impact of Sign Type

To perform this analysis, properties were first divided according to the type of sign they use to advertise their pricing. Next, each of these two groups was divided into four quartiles, based on their occupancy rates, and each group was compared with the other on a quartile-by-quartile basis.

As shown in the figure 3, in each quartile, electronic sign properties had a higher average occupancy rate than properties with plastic signs, but the difference was small, except in the lowest-performing quartile (Q4). This graph omits the scale for occupancy rate figure to protect the confidentiality of performance data provided by the company.

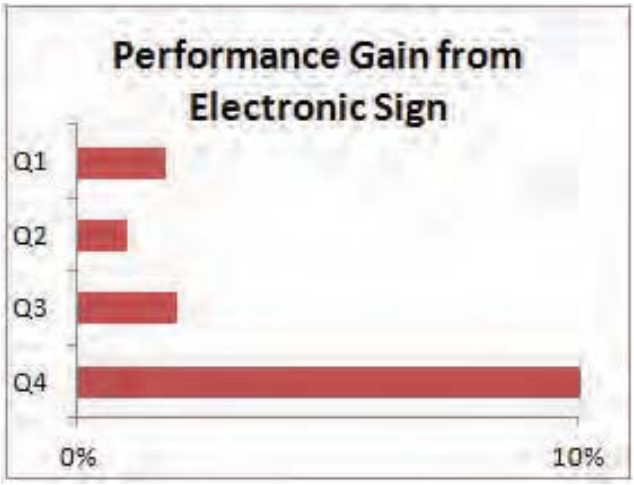

Figure 4: Performance Gain from Electronic Sign

Specifically, the performance gain from the use of electronic signs was in the range of one to two percent in the top three quartiles, but it jumps up to a ten percent advantage in the lowest quartile, as shown in figure 4. This suggests that those locations that are already performing well and have plastic signs are likely to experience limited benefit from the installation of an electronic sign. On the

other hand, such a sign change is likely to produce a substantial boost to the occupancy rates of properties that are currently struggling. This finding about economic benefits is consistent with other research on changeable electronic signs (van Bulck, 2011).

Signage with Price Information: Story of One Property

A second component of this case study involved a signage change at one property. At one Value Place location where local officials prohibited any pricing data on the property's sign, occupancy rates were so low that it was, at best, breaking even. After an extended period of discussions and negotiation, the company reached a compromise with local officials that provided for a multi-tenant sign that included space for Value Place, as the lead tenant in the development, to post its pricing. The new sign was erected in late October of 2010, nearly three years after the property opened.

For this analysis, information provided by the company consisted primarily of three years of monthly data on occupancy rates. Monthly data on posted and actual charged weekly rates were also provided in order to demonstrate that only negligible changes had occurred in prices.

The impact of the new sign has been significant. In the first nine months after its installation, the property has experienced an average occupancy rate that is 19 percentage points higher than the same nine-month period for the two preceding years. As a result, the property has now become consistently profitable, even in traditionally slower months. In addition, the property is now projected to generate an additional $30,000 a year in hotel tax revenues.

B. National Retail Banking Business

A bank with more than 500 branches nationally, which we will call Secure Savings, agreed to provide data about the use of signage as it pertains to Secure Savings' branch characteristics and performance. Secure Savings requested that its identity not be disclosed in the presentation of this case study.

The banking industry uses on-premise signage extensively and spends a great deal of money on branding, design, placement, purchase, and maintenance of its signs. Retail banking is a highly competitive industry, and branch visibility receives much attention and investment.

Some of the operating characteristics in retail banking are similar to those in the retail trade and accommodation/ food service industries. For example, in resource materials prepared for its members, the Bank Marketing Association advises: "Banks need to think more like retailers. Convenience retailers such as restaurants or gas stations know the value of good visibility. If your customers can't see your sign or find your building, they won't visit your branch" (Beery, 2002).

Signage concerns begin at the site selection stage. Selection criteria for Secure National Bank include visibility and convenience of access, along with population density and size. "We need to be visible so that, when people need us, in their minds, they know where we are," stated one of the bank's real estate executives.

Case Study Approach and Data

Secure Savings has extensive data on its branches, which permit a more extensive analysis that explores issues beyond the basic signage considerations that have dominated previous research. As with the previous case study, this analysis focused on 47 locations within a single metropolitan area, which serves to eliminate many non-signage factors that would otherwise be difficult or impossible to control for.

The dataset for this analysis includes details about:

- Standard sign factors: number, type, size, height, design;
- Unique data on visibility and placement;
- Assessments of market factors for each branch location; and
- Business performance metrics.

Two types of analysis are described here. The first examines the relationship between the sign packages for individual branches and an independently-conducted evaluation of branch visibility. The second analysis examines the impact of both of these dimensions on branch performance.

Comparing Signage to Banking Center Visibility

Using the data on these individual banking locations, it is possible to examine the relationship between the visibility score assigned to the banks and their on-premise signage characteristics. These scores were part of a broader six-factor assessment of banking center conditions that was performed by an outside consultant. To illustrate how scores were assigned to banking centers on these characteristics, the description of the visibility categories is presented. For more detail on the remaining categories please see the technical appendix.

The other five characteristics on which bank branches received a score from one to five (with 5 being the best score) were: location, accessibility, and parking for the banking center; and land use pattern (land use mix and density, traffic flow) and life cycle (age and economic vitality) of the surrounding area.

Table 8. Banking Center Visibility Score Categories

5	4	3	2	1
Location is immediately visible from a great deal of distance and is easily found.	Location is immediately visible and can be seen in the traffic patterns with little difficulty.	Is visible but no more or less than surrounding competitors or retailers.	Is partially visible from the surrounding roadway although obscured by impediment like landscaping or other building.	Building is easily missed when driving by and is likely wholly or partially obscured.

Table 12 contains information on the proportion of banking centers in each score category for the factors mentioned above. The great majority of banking centers (nearly 80%) received a visibility score of 4 or better. On the other three banking center characteristics – their location, accessibility and parking – the banking centers showed greater variation. The surrounding areas tended to receive average to strong scores for land use patterns, indicating they generally would be expected to give reasonable support to the bank branches, while life cycle showed greater variation.

Table 9. Banking Center Condition Scores

Score	Banking Center Characteristics				Surrounding Area Characteristics	
	Visibility	Location	Accessibility	Parking	Land Use Pattern	Life Cycle
5	36.2%	23.4%	17.0%	4.3%	40.4%	14.9%
4	48.9%	46.8%	38.3%	34.0%	25.5%	14.9%
3	12.8%	25.5%	40.4%	46.8%	27.7%	44.7%
2	2.1%	4.3%	4.3%	10.6%	6.4%	25.5%
1	0.0%	0.0%	0.0%	4.3%	0.0%	0.0%

The primary question is the extent to which sign characteristics of the banking centers are related to the independently assigned visibility score. The table below contains summary statistics on the sign characteristics of the banking centers, grouped according to the visibility score. Generally speaking, banking centers with higher visibility scores also tend to have more signage. In particular, pylon (or pole) and wall letter signs are more prevalent among locations with the highest visibility score. Across the 17 locations with a visibility rating of 5, there are 0.94 pylon signs, on average. These locations also have substantially more square footage of signage, 226 square feet on average, than lower scoring locations.

Table 10. Banking Center Sign Characteristics by Visibility Score

Visibility Score	Number of Banking Centers	Average Number of Signs				Average Square Feet
		Pylon	Monument	Wall Letters (Vertical)	Wall Letters (Other)	
5	17	0.94	0.29	0.71	1.29	226
4	23	0.30	0.52	0.61	1.17	165
3	6	0.17	0.50	0.67	1.17	108
2	1	0.00	1.00	1.00	1.00	105

The amount and type of signage are not the only factors that contribute to a banking center's visibility score; the characteristics of the physical location and surrounding area also play a role. To examine this relationship, the Economics Center analyzed a statistical model predicting the probability that a banking center would have the highest visibility rating. The model calculated the probability that a banking center location received a visibility level of 5 as a result of the following:

- the number of signs by type (pylon, monument, wall letters);

- the total square footage of signage;
- other banking center characteristic scores (location, accessibility, parking);
- surrounding area characteristic scores (land use pattern, life cycle).

The modeling technique allows for estimating the impact that each included variable contributes to the outcome of interest. Thus, by taking into account what is known about the banking centers and the surrounding areas (condition scores), the model permits an assessment of the added value of the included sign characteristics on the visibility score. The table below contains the results.[5]

Table 11. Probability of Having the Highest Visibility Score

Explanatory Variable	Impact on Probability	Statistically Different From Zero
Number of Signs, by Type		
Pylon	0.91	Yes
Monument	0.38	Yes
Wall Letters Vertical	0.08	No
Wall Letters Other	0.12	No
Total Square Footage of Signage	-0.003	Yes
Banking Center Characteristics		
Location	0.43	Yes
Accessibility	0.08	No
Parking	-0.08	No
Surrounding Area Characteristics		
Land Use Pattern	-0.06	No
Life Cycle	0.12	No

[5] See the technical appendix for a table containing the full regression results.

Factors That Affect Bank Visibility

The statistical analysis indicates that three factors have effects of much greater magnitude than the others. These three –location, pylon signs, and monument signs – are illustrated in the figures 5 and 6.

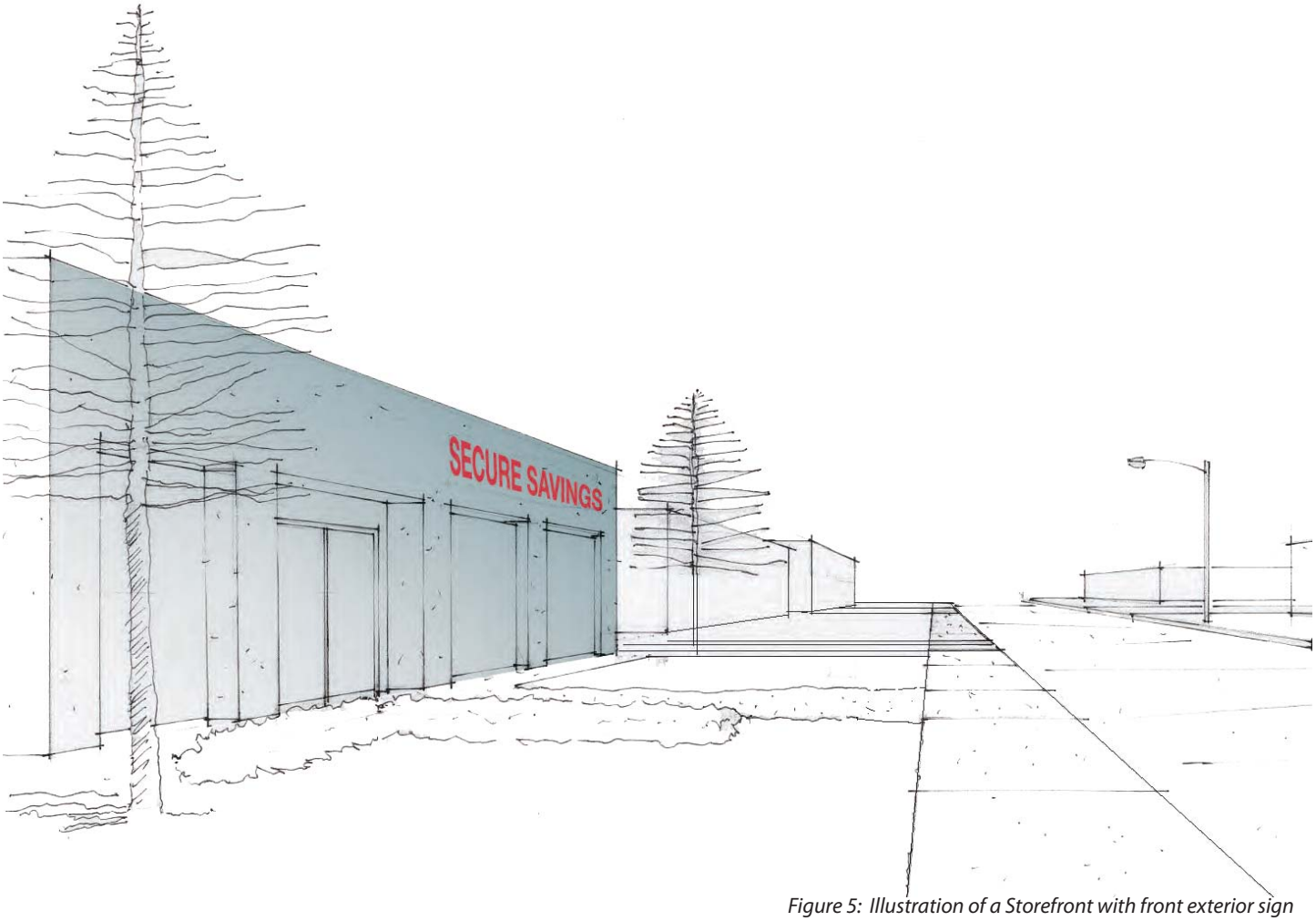

Figure 5: Illustration of a Storefront with front exterior sign

Having the prime location in the market results in a 43% greater likelihood of receiving the highest visibility score, compared to just a good and visible location.

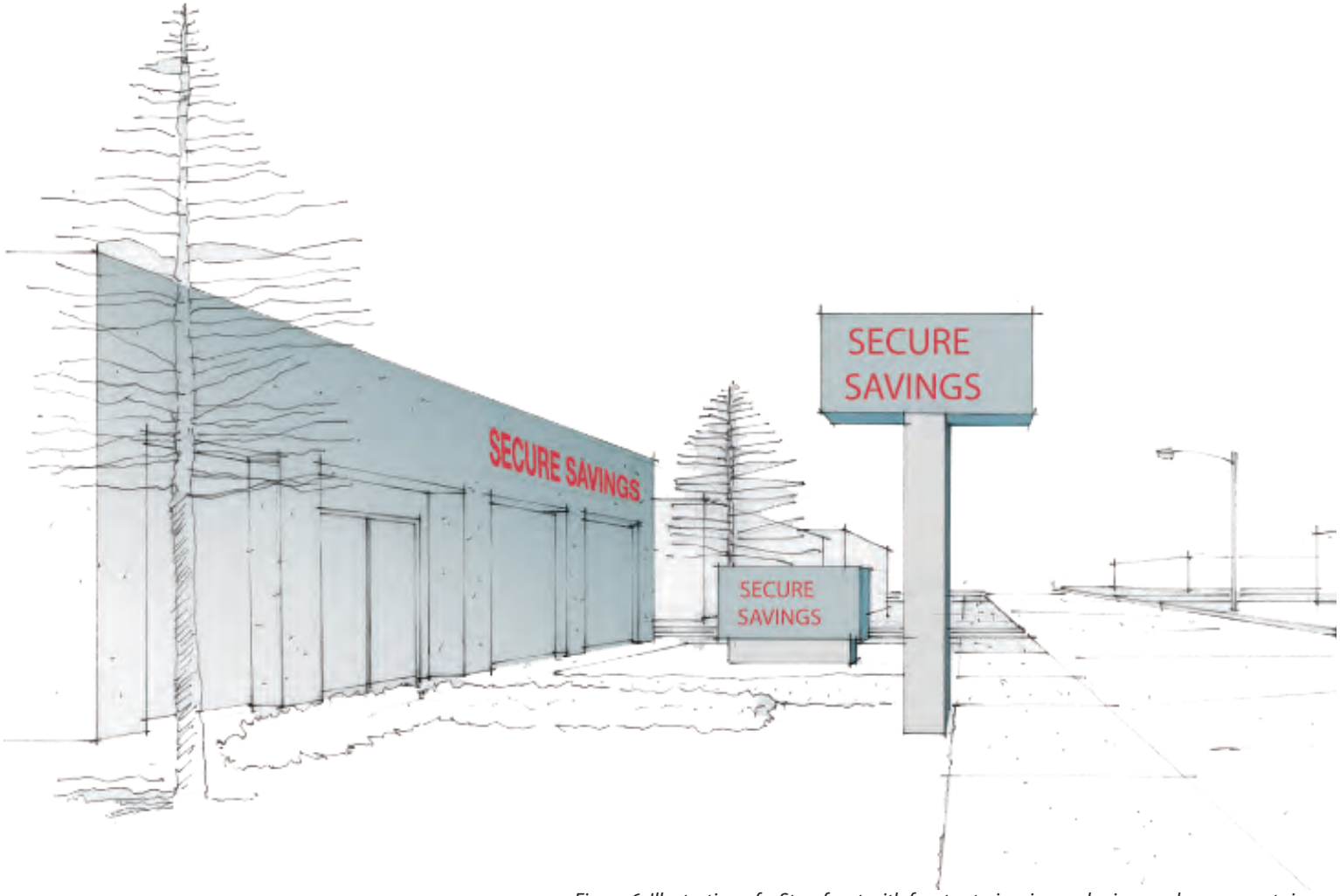

Figure 6: Illustration of a Storefront with front exterior sign, pole sign, and monument sign

The monument sign increases the probability of a maximum visibility score by 38%; the pylon sign increases the probability by 91%.

As shown above, certain on-premise signage has the greatest impact on bank visibility. The presence of pylon and monument signs increases the probability that a banking center has the highest visibility rating, even after taking into account other characteristics of the banking center and surrounding area. Specifically, each pylon sign is estimated to nearly double the probability (91% increase) of a visibility rating of 5, while a monument sign increases the probability by a little more than one-third (38%). According to one bank executive, "Pylon is the first choice because it can be seen from farther away." Acknowledging that mature trees occasionally block views of the signs, he observed that a pylon sign stands out more, which helps customers locate and drive to the bank more easily and safely.

Among the factors included in the model, the only other one that appears to have a significantly positive impact on visibility is one of the banking center characteristics – location – which produces a 43 percent increase in the probability of a top visibility score. The total square footage of signage is estimated to have a weak, negative

relationship to the probability of having the highest visibility rating. Each additional square foot of signage on premise is associated with a decrease of 0.3 percent in the likelihood of the location having the highest visibility rating. This result may occur because banking centers in poorer quality locations are compensating with more signage.

Comparing Signage to Banking Center Performance

The second part of the analysis examines the impact of signage and other condition characteristics on branch performance. The sample consisted of the same 47 banking locations previously analyzed. The outcome of interest was average monthly teller transactions in 2011. This component of the analysis modeled the incremental impacts of on-premise signage and condition characteristics on the number of average monthly teller transactions. The model analyzed teller transactions as a function of:

- the number of signs by type (pylon, monument, wall letters);
- other banking center condition scores (location, accessibility, parking); and
- surrounding area condition scores (land use characteristics, life cycle).

Table 16 contains the results of the model.[6] The results indicate that, when taking into account the other variables, a pylon sign is associated with 1.15 times the average monthly number of teller transactions. The statistical significance of this result is relatively weak, but the magnitude is roughly the difference between a bank having 375 daily teller transactions and 325 transactions. This difference is a considerable impact on monthly transactions, and no other signage characteristics exert a statistically significant impact on the outcome of interest.

Not surprisingly, the rating given to banking center parking is the only other variable that has an impact on teller transactions. As these transactions occur on-site, it is reasonable that banking centers with more available and more easily accessed parking would also tend to have more transactions.

[6] See the technical appendix for a table containing the full regression results.

Table 12. Average Monthly Number of Teller Transactions		
Explanatory Variable	Impact on Monthly Transactions	Statistically Different From Zero
Number of Signs		
Pylon	1.15	Yes
Monument	1.03	No
Wall Letters Vertical	1.09	No
Wall Letters Other	1.00	No
Banking Center Conditions		
Location	0.93	No
Access	1.09	No
Parking	1.15	Yes
Surrounding Area Conditions		
Land Use Characteristics	1.08	No
Life Cycle	1.03	No

C. Specialty Retail Small Business – Bob Roncker's Running Spot

This case study addresses a small business retail establishment in its expansion from one store to four stores in a major Midwestern city. The study examines a local specialty store chain of four small stores specializing in running and walking shoes, accessories, and apparel. These niche specialty retail stores provide an ideal case study for the effectiveness of signage and branding. The four retail outlets have a single owner. The original store has been in business for 30 years, adding three stores over the past several years. A program to refresh store signage in the context of an expanded branding strategy has paralleled the company's bricks-and- mortar growth.

The first Bob Roncker's was established in 1981, offering industry-specific advice and high quality running/walking products. This first store was located in an older streetcar suburb business strip on a busy commuter artery that leads to both the downtown and a major university within the region. The regional trade area has about 1.2 million residents. Early in 2008, a second store was added in a similar, well-established commuter suburb near the outer interstate beltway, a substantial distance from the city core..Later in that year, a third store was opened in an historic suburb located alongside a popular bike / running path. A fourth store opened in 2009 near

a successful riverfront commercial development. All four stores are devoted to retail sales of quality specialty running / walking lifestyle products.

This small specialty retail store case study offers insight into the role of on-premise signs at several levels: as an element of communication within the context of a specific streetscape; as an element of a comprehensive branding strategy within a niche market; and as reaffirming the stores' commitment to quality goods and services. This study also demonstrates how a small retailer can use signage to target a specific, narrow market within an upscale residential community with strict sign regulations. The small retailer has fewer options for communicating with its existing and potential customers. This requires that signage and branding strategies be an integrated package that is consistently applied.

Each of the four stores' building configurations, architectural styles and signage regulations present unique challenges for on-premise signage. Each requires site-specific signage design while maintaining consistency in graphic communication. Graphic composition and sign 'appropriateness' need to be balanced while maintaining conspicuity and legibility.

Store One: The original store location

This two-story brick structure sits close to a major busy street in a small suburban commercial district outside the urban core of a major river city. The modest face-mounted sign has a distinctive logo and san serif calligraphic style typeface. The clarity of the sign itself is due to the careful composition of elements – logo and graphically-stylized business name. The clean design and signature-styled font letters reflect the owner's desire for straightforward business dealings, personal service, and quality products. The well-designed painted sign is constructed and composed to reflect the commitment to customer satisfaction and product quality rather than conspicuity and over -powering visibility. Modesty and visual restraint set the theme for all of the four store signs, allowing consumers to focus on quality and service of their brand over expediency and budget.

Store One has four on-premise signs: a face-mounted building sign on the second floor façade, a small face-mounted door sign providing store hour information, a very small bayonet mounted sign, and a sandwich curb sign for special events and sale announcements. Because of the 10-foot sidewalk set back distance of the building and the parallel curb parking, the two small face-mounted signs are only readable from directly across the street. It is a direct

view perpendicular to the building's brick façade. This doesn't allow visual access to the sign from moving traffic in either direction. A moveable sidewalk sandwich sign provides an opportunity to announce specials, but the curb parking and small sidewalk trees obscure any chance for good readability to the fast moving traffic. The bayonet sign is so small (approximately 9" x 20") and placed under the awning as to obscure the communication value to all but pedestrians within 10 to 20 feet of the store entry.

The store has updated its awning and added a distinctive brand graphic logo and descriptive stylized text that is located on the front of the awning's sloped surface and fascia. The new awning design strategically plays off the color palette of the city's dominant university to reinforce the store's local commitment to its customer base. The awning is the best choice for added signage because regulatory codes allow only limited signage development and is restrictive to face-mount signs. The new awing signage has added a distinctive branding presence to the façade and a new communication identity that the building's other signs are unable to provide. This signage addition also adds a 'freshness' to the façade and provides a point of location for the fast moving traffic. Personal interviews with customers noted that the new signage graphics have helped identify the store from the street and have contributed to their interest in visiting.

Store Two: Expansion store 1999

The first addition to the store chain occurred in 1999. Following the precedent of the original store, modest signs are placed more for communication with pedestrian and slow moving traffic. This attitude and restraint is a response to the context of the small historic commercial district located within a quaint suburban neighborhood. A tenuous free-standing sign and a small, stylized, bayonet sign identify the store entry. Because of the building's setbacks, curb parking, and adjacent buildings, the store window displays and entry are hidden from street traffic. A sandwich sign is also used to announce sales and events. The low-key signage attitude fits with the community's desire for residential scale and historic references to maintain the upscale historic suburban lifestyle. Signage here is only a reminder for the entry and is not intended to take on much of a leadership role in expanding the consumer base. Other branding means are utilized. Signage is down-played with the bayonet-style sign, adding to the traditional small town atmosphere.

Store Three: Expansion store 2009

The established logo and stylized type of the original store helps the on-premise signs take a more prominent role at the third location. Located in a refurbished suburban train station, the signage must reach out to the community to pinpoint the store's location and attract new customers. The abandoned railroad tracks are now a popular biking and running / walking route that generates many retail opportunities. This location allows and requires the signs to pull away from the building and be located for vehicular traffic, bicyclists, runners and walkers. A prominent sign gives motorists good viewing from adequate distances, and a temporary sandwich sign adds to the attractiveness of a quaint business. The ambiance of the park-like setting with generous entry distances allows the building's face sign to be larger and out of balance to the station's low roof profile and large overhangs. This location tolerates stronger on-premise signage with an increased scale. Conspicuity and readability are balanced within the established sign composition that contains the store brand. Impulse purchases happen often as the bike / running path attracts many consumers that require replacement of their specialized running / walking appeal, or are attracted to the new product availability.

Store Four: Expansion store 2009

The last expansion store is located within a revitalized urban setting near the downtown area. A renovated building awning and logo bayonet sign announce the store to pedestrians and vehicular traffic. Located in a popular evening entertainment district, this running store attracts persons that would not be visiting the suburban locations. A large wall sign that faces the active evening retail and entertainment area also helps attract customers to the store for impulse and special sales buying.

The building integration is successful in attracting retail sales in its entertainment district location, with the store offering expanded evening shopping hours. The signs are well-organized and the design quality supports the clean, well-manicured building. At this location the signage supports an image and message of quality retail products, and presents a comfortable 'fit' with the adjacent

businesses. As such, it demonstrates an inviting quality that supports its brand identity. Signage in this location has an opportunity to impact sales. Sales are reported to be increasing, and this store and the original store generate the highest sales per month of the four store chain. It is also important to note that other branding activities are utilized less in this location than in the other stores. It can be inferred that the on-premise signage is a major contributing factor to the store's solid sale performance. On–premise signage is the most developed in this location, with the most signs in number and size as compared to the other three locations.

Overall Assessment

At first glance, small specialty businesses such as Bob Roncker's may not seem to offer much in on-premise signage impact. Closer examination provides a greater understanding of the complex variables in on-premise signage and provides a view of a strategic approach to expansion and signage updating, which could be applied to future research involving the analysis of chain retailers. This case study provides a good illustration of how implementation of a branding plan and retail expansion plan that includes on-premise signage can positively impact business performance. According to the Bob Roncker's business manager, Verne Johnson:
"One of our primary goals, since converting our Glendale shop from a New Balance Concept store in 2008, has been on branding the Bob Roncker's Running Spot name. It continued to be a key element in our marketing and advertising programs as we added stores in Loveland, later on in 2008, and Newport in 2009.

"Store signage has no doubt helped us in achieving that goal; improving the image of the Running Spot brand / identity in the greater Cincinnati marketplace. That, along with our continued focus on customer service and quality solution in footwear, apparel, fitness training programs, and other associated running / walking gear has helped us improve our sales performance at all store locations. This target branding strategy has helped make the Running Spot a successful and profitable business for over 30 years and has allowed the brand to expand into four complete stores."

These comments are consistent with the results of a recent national consumer survey that indicates that potential buyers take note of business signage, and make decisions based on it. Nearly three-quarters of respondents reported that they entered a business because signage caught their attention. Similarly almost 80 percent said that they remembered a business later because of the signs. Seventy-five percent of respondents also referred someone else to a business because of notable signage. (FedEx Office, 2012).

Small businesses like the Running Spot depend upon on-premise signage because of the communication value with potential customers. Better economic performance was reported in stores having the most complete and prominent signage. All stores are on healthy economic footing, with the original store and the store in the urban entertainment district showing the best performance. These two stores have the most complete signage package with fresh, legible signs placed in visible locations. While location and signage differences among the four stores preclude a rigorous statistical analysis of the role of on-premise signage in business performance, there

does appear to be a general correlation between superior signage and superior performance. This is also consistent with the business managers' assessment that their signage has resulted in positive performance because it is able to effectively communicate with large numbers of potential customers.

D. Small Business – Chuck Anderson Ford

Chuck Anderson Ford is located in Excelsior Springs MO, which is part of the Kansas City metro area. The business is located within a typical commercial strip on an arterial highway.

In March of 2011, owner Mike Anderson added a new pylon video board to the existing dealership signage, which includes a traditional Ford-logo pylon sign and other business signage. This sign was added primarily as part of an effort to increase the dealership's service business. The new 30-foot pylon sign has a 96-square-foot full-animation, electronic message center. Previously, that portion of the dealership was identified by a 22-square-foot sign that read "Body Shop."

The new sign was not only larger, but it offered better illumination and design, in addition to its messaging capabilities. The electronic sign draws much more attention to Anderson's business.

For example, in 2011, Anderson used the new sign to advertise a corporate tire sale, and even though a Goodyear Tire Center is located directly across the street, Anderson Ford had the fourth-highest tire sales figure among US Ford dealers.

To assess the economic impact of the new sign, Anderson Ford provided monthly data on service department customers and sales for 2010 and 2011. To smooth out monthly fluctuations, the chart below presents the data as two-month averages. Using a base of 100 for the average monthly customer count during 2010, customer figures during 2011 increased from an index of 90 in January and February (the two months prior to adding the new sign) to 108 in the first two months after the new sign and 119 at the end of 2011, showing an average gain of 4.5 percent every two months.

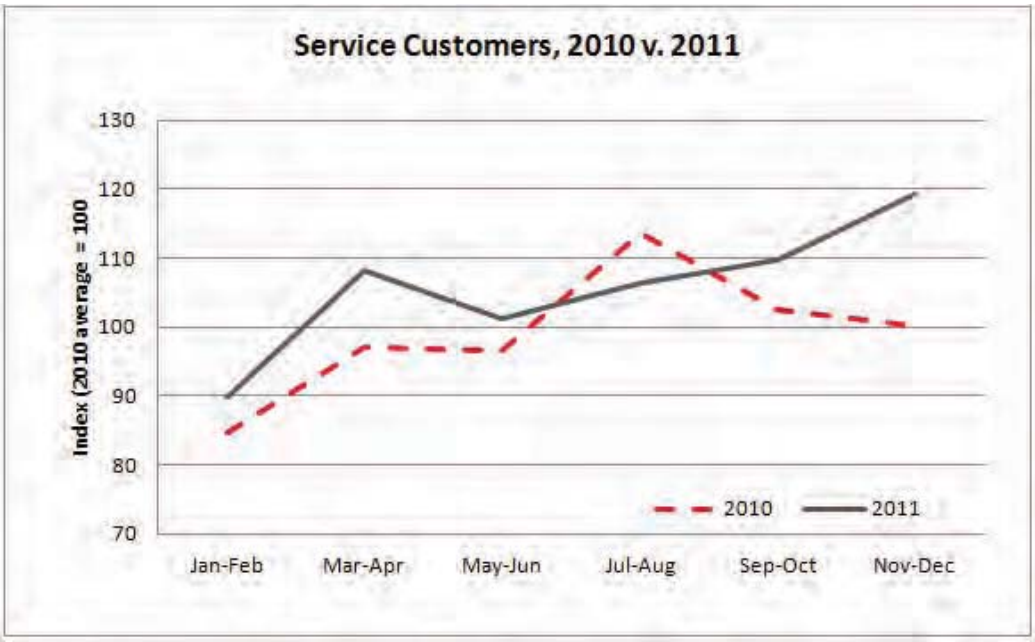

Figure 7: Service Customers, 2010 v. 2011

In figure 7, note that 2011 showed an average year-over-year increase in the number of service customers of 6.5 percent during the ten months after the installation of the new sign.

Mike Anderson indicates that his current service clientele can be identified as 34 percent first-time/new customers and 66 percent regular/repeat customers. This suggests that more customers are learning about his business, and it is reasonable to assume that at least a portion of this new business is coming as a result of the new sign.

A similar analysis was performed on the sales figures, but these numbers were tracked against national auto parts store sales to account for the generally improving national economy. This analysis avoided figures for the winter months (December, January, February) because of the potential for weather-related distortions. Year-over-year figures were compared for the March-to-November periods of 2010 and 2011. This also corresponded well to the introduction of the new sign at Anderson Ford. While US auto parts sales for March-November 2011 were up 5.5 percent over the previous year, Anderson Ford service revenue increased by 10.8 percent in this nine-month period of 2011, compared to 2010. Overall, given the increase in busi-

ness since the sign was installed, Mike has hired three new salespeople, two service technicians and one body-shop person, increasing his employees from 28 to 34, and his business is still growing.

As important as these sales figures are for the dealership, revenue doesn't tell the whole story. The new sign has directly contributed to other positive impacts – on the reputation/brand and visibility of the business. An estimated 30 percent of the new sign's message time is focused on community announcements and public service messages. Examples include:

- Tornado-watch notices,
- The community's annual Oktoberfest,
- A cancer walk-a-thon, and
- Local student recognitions.

These messages generate attention and positive feedback for the business. According to Anderson, "It's about goodwill and being a member of the community. The sign has had a big impact on how we're perceived." When the company first decided to add the new sign, it was seen as an innovative idea that would help to set it apart for its competitors. Now, Anderson says, "The attention I've received has endorsed my decision. The sign has helped us to communicate with the customer on a continual basis. We would for sure do it again!"

VI. Summary of Research Findings

The research shown in this report indicates that appropriately designed and located on-premise signage can be an important factor for retail business success. The implication of these results is that on-premise signage indirectly influences the vitality of a community though the availability of goods and services, jobs and public services. Sign regulations should balance community design objectives with full knowledge of how sign design and location impact businesses success. Business success is important because of its impact on a community's tax base and ultimately leads to the availability of fiscal resources to provide needed services.

We began by providing an intellectual underpinning that uses economic theory to present a new explanation for why on-premise signs have positive economic impacts, not only for businesses, but also for consumers and communities. This explanation can foster more well-informed discussions between sign vendors and users and between sign users and regulators.

The following summarizes this study's findings, based on a national business survey and business cases studies assessing the impact of on-premise signage on business performance.

The national business survey found:

- Legibility is the most important characteristic of signs across all sizes of companies;
- Use of business logos, and the size and location of the signs were more important for companies with more establishments, compared with single establishment companies;
- Sign changes generally had significant, positive impacts on sales, number of transactions, and profits;
- Sign changes had smaller positive impacts on employment.

Among the case studies, positive business performance was generally associated

with on-premise signage changes as the following indicates:

- The national lodging chain case found that the use of a digital electronic sign to display pricing was associated with higher average occupancy rates. The impact appeared to be especially strong for properties with lower occupancy rates;
- The national banking case study found that pylon signs were strongly associated with high visibility; monument signs were moderately associated with high visibility; wall signs contributed to identity but not visibility. In addition, pylon signs were associated with significantly more teller transactions;
- The small specialty store case study demonstrated the need for signage to reaffirm the value offered by a niche retailer. Sign design must be sensitive to community and customer expectations, and able to reinforce the limited brand of a small business. The signage should communicate a "promise" of value for a product and/or service that is not commonly found elsewhere;
- The car dealership case study found that the addition of a video sign board was associated with large increases in both service department revenue and customer count. An added benefit was the "goodwill" and reputational gains associated with using the video board for community-related public service messages.

While many of these findings are statistically significant, larger sample sizes in surveys and case studies should be sought in future research. It is always appropriate to exercise caution when interpreting case study findings because results do not necessarily transfer from one industry or geographic setting to another. While these case study findings about particular individual businesses are not necessarily generalizable, they are important, particularly because the subject is so complex that a comprehensive analysis covering all business types and signage considerations is unlikely to be undertaken. Furthermore, the similarity of some case study findings with survey results suggests that this study deserves careful consideration by researchers, practitioners, and local officials.

VII. Conclusion

The research presented in this report provides current information for better understanding the economic impact of on-premise signage. The national business survey results provide insight to how different types and sizes of businesses use and value their signage. The survey results also provide details about the specific aspects of signs that different types of businesses consider most important. The case study results have reinforced the survey results and provide detailed examples of improved business performance resulting from specific changes in signage.
The ultimate goal of this research has been to provide the signage stakeholders with timely, relevant information to inform their decisions about using on-premise signs to jointly serve the needs of both individual businesses and communities where they are located. As we have attempted to convey, the impact of signage on an individual business location is complicated by a number of factors related to the specific physical, social, and regulatory context of that location, as well as the specific customer base and product offered by the business. Our results suggest that careful identification and consideration of those factors is likely to result in more effective signage. The implication is that with respect to on-premise signage, one size does not fit all, and that to maximize their effectiveness, different types and sizes of business need tailor their signs to their specific needs. Most reputable sign companies already know and appreciate this, though this may be new insight for some businesses. Perhaps the stakeholders that can most benefit from our analyses are some of the sign regulators.

Our work should not be interpreted to suggest that all sign regulations hinder business performance. While this research has emphasized the important role of successful businesses in a community's overall quality of life, we recognize that thoughtful signage design standards can accommodate both the needs of businesses and communities. Indeed, it is clear from our work that sign regulation incentivizing legible, visible, and conspicuous signs can boost business performance, especially for the small businesses that can catalyze growth.

A. Implications for Businesses

Businesses make decisions about their signage within the context of their available financial resources, target customer base, and location characteristics. The results

presented in this report emphasize the importance of carefully assessing the role signage plays in a business' overall marketing and branding strategy given the specific characteristics of a particular location. The specific sign designs and types used to achieve these objectives will depend on multiple factors related to the business location, including view distance, street/road curvature, number of traffic lanes, speed limits, landscaping, building setback, and sightline obstructions from other signs, buildings, poles and berms, and potentially many other factors. The case studies reinforce the idea that particular signs may be effective for one type of business but not be well-suited for another. Clearly the digital electronic signs that work so well for the hotel chain would be ineffective for the specialty shoe store. Likewise, the video sign that works well to enhance sales and community relations for a single-establishment car dealer may be difficult for a banking chain to use at neighborhood branches and integrate into their national branding strategy.

B. Implications for Communities

Both private and public decisions about signs can have important implications for communities. As previously indicated, the results of this study show that signs that are legible, visible, and conspicuous are important for retail businesses. The implication is that sign regulations should balance community design standards with site-specific technical requirements for promoting business success. The alternative is that businesses are less successful and governments have less revenue to support their services. Second, it is important for planners and local officials to understand how the purposes and uses of signs differ for single establishments, small companies, and larger companies. Sign regulations that constrain one purpose may disadvantage the businesses that depend on it. This may be the case especially for smaller, single establishments, which are frequently more dependent on signs as a primary means of communicating their location and products or services to potential customers. On the other hand, regulations that encourage quality signage that communicates effectively at low cost may help small businesses. Given that such small businesses frequently serve as engines of job growth, such policies can be especially appropriate as part of neighborhood economic growth strategies.

C. Implications for Future Research

Taken together, the results of this research have significant implications for businesses and communities, and they suggest important considerations to guide future research in this area. Much of the work reported here is based on data collected directly from businesses, which are an irreplaceable source of information for signage research. Those who attempt to replicate this research will find that most businesses, regardless of size, are hesitant to share such detailed data about individual locations despite extensive assurances of confidentiality. Because research in this field is important for informing business investments as well as public policy, future research will benefit from efforts that would enable business signage and performance data to be made more accessible to researchers. Associations within the signage industry might be able to establish mechanisms or protocols to facilitate data availability while ensuring confidentiality.

This study can serve as a foundation and guide for practitioners and researchers who want to contribute to the development of more effective signs and improved signage practices. For those who are committed to this collaborative venture, new questions will arise from their application of these research findings, and future research will play a key role in the success of their efforts.

Appendicies

1. Survey Instruments

UC Sign Survey

1. Introduction

The University of Cincinnati is examining how differences or changes in on-premise signs affect businesses.

We are using this brief survey, which you can complete in about 5 minutes, to obtain information about the views and experiences of sign users.

If you have any questions or want to contact us regarding this research, please call or email me.

Jeff Rexhausen, Associate Director of Research 513-556-3047
Economics Center, University of Cincinnati jeff.rexhausen@uc.edu

2. Purposes of Signs

Signs play an important role in contributing to business success. Their economic value comes from the impacts they have on business activity. To produce these effects, signs serve a variety of functions.

A. How important is each of these purposes for your on-premise signs?

Importance *(Check one box in each row)*	Extremely	Moderately	Slightly	Not at all
Make your business stand out from others				
Reinforce branding/image				
Help potential customers find your location				
Inform about available goods/services				
Inform about promotions (sales, etc.)				
Other *(describe below)*				

B. What do you consider the most important purpose of your on-premise signs? *(Check one)*

Provide visual identity and uniqueness	
Reinforce brand familiarity	
Show location to potential customers	
Provide information about available goods and services	

3. How important are each of these elements in your sign?

Importance *(Check one box in each row)*	Extremely	Moderately	Slightly	Not at all
Conspicuous ("stands out")				
Clearly readable				
Logo or branding				
Illumination (lighting/brightness)				
Size and location				

3. Your Business

If you have more than one type of business, please limit your responses to the one type for which signs are most important. You may also complete an additional survey for a separate type of business.
To make it easier for you to respond, we encourage you to base answers on estimates or your best recollections, if you don't have specific data at hand.

A. Which of these best describes your business? *(Check one)*

Small business - independent	
Small business - franchise of a chain	
Large retailer (incl. food service and retail banking)	
Other type of business *(describe below)*	

B. How many establishments (business locations) do you have? ☐

C. At a typical business location, which of these types of exterior signs do you use? *(check all that apply)*

Wall sign	
Pole sign	
Monument sign	
Other signs *(describe below)*	

D. At a typical business location, how many exterior signs do you have? *(Check one)* 1-2 ☐ 3-5 ☐ 6 or more ☐

E. Please give a brief description and/or the NAICS or IRS Business Activity Code for your type of business.

4. Sign Changes and Impacts

A. Do you have any business locations at which there have been any of these types of changes to one or more signs in the past 5 years? *(check all that apply)*

Increase in number of signs	
Increase in sign size	
Enhancement of sign visibility (higher, closer to street, placement on building, etc.)	
Change in sign design (refresh look, new type, illumination)	

B. In connection with these sign changes, what business impacts did you experience, and how large were they?

(Check direction and amount of change)	Increase	Decrease	No change	<2.0%	2-4.9%	5-9.9%	10-14.9%	15-19.9%	20% or more	unknown
Total sales volume										
Number of transactions										
Staffing (employment)										
Profits										

C. If sales, staffing, and/or profits increased, what were the top 2 reasons for growth? *(check two)*

New or refreshed signs	
Increased number of signs	
Increased other advertising/marketing	
Increased product/service offerings	
Facilities renovated, refreshed, or expanded	
External factors (the economy, competition, traffic/accessibility, or temporary circumstances) *(describe below)*	

D. Do you have any business locations at which there have been any of these reductions in signs in the past 5 years? *(check all that apply)*

Temporary loss of a sign	
Permanent loss of a sign	
Reduction in sign size	
Loss of sign visibility (obstructed, lowered, farther from street)	

E. In connection with these sign changes, what business impacts did you experience?

(Check direction and amount of change)	Increase	Decrease	No change	<2.0%	2-4.9%	5-9.9%	10-14.9%	15-19.9%	20% or more	unknown
Total sales volume										
Number of transactions										
Other *(describe below)*										

5. Other Information and Interest in Research Findings

A. Please indicate what types of information you might be willing to share about your sign changes. *(check all that apply)*

Details/stories about types of sign changes	
Data on business impacts (data to be kept confidential; no reference to your business in the study)	
Data on business impacts (data to be kept confidential, but naming your business in the study)	

If so, please provide your phone number and/or email for us to contact you

B. Would you like to receive a brief summary of the findings of this research project? *(If "yes," please provide email or other address.)*

Yes		
No		

Thank you for contributing to this research. Please invite your business colleagues to also participate.
The more information we receive, the better the insights we will be able to provide in our report. We also welcome your comments and suggestions.

Return survey to: Jeff Rexhausen, Economics Center, Box 0223, University of Cincinnati, Cincinnati, OH 45217-0223

Impact of On-Premise Signs

2. What do you consider the most important purpose of your on-premise signs?

- Provide visual identity and uniqueness
- Reinforce brand familiarity
- Show location to potential customers
- Provide information about available goods and services

Impact of On-Premise Signs

1. Introduction

The University of Cincinnati is examining how differences or changes in on-premise signs affect businesses.

We are using this brief survey, which you can complete in about 5 minutes, to obtain information about the views and experiences of sign users.

If you have any questions or want to contact us regarding this research, please email me at jeff.rexhausen@uc.edu.

Jeff Rexhausen, Associate Director of Research
Economics Center, University of Cincinnati

2. Purposes of Signs

Signs play an important role in contributing to business success. Their economic value comes from the impacts they have on business activity. To produce these effects, signs serve a variety of functions.

1. How important is each of these purposes for your on-premise signs?

	Extremely important	Moderately important	Slightly important	Not at all important
Make your business stand out from others				
Reinforce branding/image				
Help potential customers find your location				
Inform about available goods/services				
Inform about promotions (sales, etc.)				
Other (describe)				

Other:

Impact of On-Premise Signs

2. What do you consider the most important purpose of your on-premise signs?

- Provide visual identity and uniqueness
- Reinforce brand familiarity
- Show location to potential customers
- Provide information about available goods and services

3. How important are each of these elements in your sign?

	Extremely important	Moderately important	Slightly important	Not at all important
Conspicuous ("stands out")				
Clearly readable				
Logo or branding				
Illumination (lighting/brightness)				
Size and location				

3. Your Business

If you have more than one type of business, please limit your responses to the one type for which signs are most important. You may also complete an additional survey for a separate type of business.

To make it easier for you to respond, we encourage you to base answers on estimates or your best recollections, if you do not have specific data at hand.

1. Which of these best describes your business?

- Small business - independent
- Small business - franchise of a chain
- Large retailer (incl. food service and retail banking)
- Other type of business

If other, please specify

2. How many establishments (business locations) do you have?

(number)

Impact of On-Premise Signs

2. What do you consider the most important purpose of your on-premise signs?

- Provide visual identity and uniqueness
- Reinforce brand familiarity
- Show location to potential customers
- Provide information about available goods and services

Impact of On-Premise Signs

3. If sales, staffing, and/or profits increased, what were the top 2 reasons for growth?

- New or refreshed signs
- Increased number of signs
- Increased other advertising/marketing
- Increased product/service offerings
- Facilities renovated, refreshed, or expanded
- External factors (the economy, competition, traffic/accessibility, or temporary circumstances)

If "external factors," please specify

4. Do you have any business locations at which there have been any of these reductions in signs in the past 5 years? (check all that apply)

- Temporary loss of a sign
- Permanent loss of a sign
- Reduction in sign size
- Loss of sign visibility (obstructed, lowered, farther from street, etc.)

5. In connection with these sign changes, what business impacts did you experience?

	Change	% change
Total sales volume		
Number of transactions		
Other		

If other, please specify:

5. Other Information and Interest in Research Findings

Impact of On-Premise Signs

2. What do you consider the most important purpose of your on-premise signs?

- Provide visual identity and uniqueness
- Reinforce brand familiarity
- Show location to potential customers
- Provide information about available goods and services

Impact of On-Premise Signs

1. Please indicate what types of information you might be willing to share about your sign changes. (check all that apply)

- Details/stories about types of sign changes
- Data on business impacts (data to be kept confidential; no reference to your business in the study)
- Data on business impacts (data to be kept confidential, but naming your business in the study)

If you have information, please provide your phone number and/or email so that we may contact you.

2. Would you like to receive a brief summary of the findings of this research project?

- Yes
- No

If "yes," please provide email address.

3. Thank you for contributing to this research. Please invite your business colleagues to also participate. The more information we receive, the better the insights we will be able to provide in our report.

Please go to "http://business.uc.edu/uc-sign-survey-extra" to answer a few more questions about sign impacts.

We also welcome your comments and suggestions.

2. Retail Banking Technical Appendix

To examine the impact of signage and location characteristics on the visibility score, a binary variable taking on a value of 1 if the location received the highest score, and 0 otherwise, was constructed. Assuming that the probability of the outcome of interest is normally distributed gives rise to a standard probit model. As the coefficients from a probit model are not directly interpretable they have been transformed into marginal effects. The marginal effects displayed in the table below give the change in the predicted probability of having the highest visibility rating for a given one-unit change in the explanatory variable.

Dependent Variable: Visibility Score of 5			
Explanatory Variable	Marginal Effect	Coefficient Estimate	z-value of Coefficient Estimate
Number of Signs, by Type			
Pylon	0.91	14.411**	1.99
Monument	0.38	6.010**	1.96
Wall Letters Vertical	0.08	1.314	1.01
Wall Letters Other	0.12	1.959	1.42
Total Square Footage of Signage	-0.003	-0.053*	-1.79
Banking Center Characteristics			
Location	0.43	6.777**	2.09
Accessibility	0.08	1.318	1.15
Parking	-0.08	-1.236	-1.09
Surrounding Area Characteristics			
Land Use Pattern	-0.06	-0.929	-0.95
Life Cycle	0.12	1.822	1.43
Intercept		-35.011**	-1.97
Pseudo R^2		0.7952	

*** significant at the 1% level
** significant at the 5% level
* significant at the 10% level

The measure of banking center performance selected for analysis was the number of average monthly teller transactions in 2011. Because the outcome of interest is a quantity that takes on discrete, nonnegative values, a count regression assuming a negative binomial distribution was used. The functional form assumed that the variance of the outcome was a linear function of the mean. The coefficient estimates are not easily, directly interpretable. The transformed impacts are the estimated change in the number of teller transactions for a one unit change in the corresponding explanatory variable. The estimate for "alpha" appearing in the table below is statistically significant, indicating that the conditional variance of the dependent variable is over-dispersed relative to the conditional mean, confirming the use of a negative binomial distribution as opposed to a Poisson distribution.

Dependent Variable: Number of Average Monthly Teller Transactions

Explanatory Variable	Impact on Monthly Transactions	Coefficient	t-value
Number of Signs, by Type			
Pylon	1.15	0.144*	1.73
Monument	1.03	0.027	0.27
Wall Letters Vertical	1.09	0.084	1.08
Wall Letters Other	1.00	-0.004	-0.09
Banking Center Characteristics			
Location	0.93	-0.071	-1.03
Access	1.09	0.086	1.54
Parking	1.15	0.138**	2.1
Surrounding Area Characteristics			
Land Use Pattern	1.08	0.081	1.25
Life Cycle	1.03	0.03	0.6
Alpha		0.101***	4.91
Intercept		7.981***	21.02
Log-Likelihood		-429.52	

*** significant at the 1% level
** significant at the 5% level
* significant at the 10% level

There are several important potential sources of biases that impact the reliability of the results. As mentioned previously, the datasets analyzed were small and also focused on a single type of business in one industry. The small number of observations may render the point estimates themselves inaccurate. Additionally, there may be important variables that have been omitted from the analyses due to lack of data. These omitted variables may be another source of inaccuracy. It is possible that, where data available, inclusion of these variables would change the sign, magnitude or significance of the remaining variables. Finally, as the data were not a random sample of businesses the results are not necessarily applicable to other industries or indicative of the impacts of business signage generally.

Banking Center Condition Analysis Scorecard

	Score Descriptions				
	5	**4**	**3**	**2**	**1**
Visibility	Location is immediately visible from a great deal of distance and is easily found.	Location is immediately visible and can be seen in the traffic patterns with little difficulty.	Is visible but no more or less than surrounding competitors or retailers.	Is partially visible from the surrounding roadway although obscured by impediment like landscaping or other building.	Building is easily missed when driving by and is likely wholly or partially obscured.
Location	Banking Center is in the prime location within the immediate submarket or trade area. Easily accessible.	Banking Center is in good and visible location within the trade area, although it is not on the prime corner.	Banking Center is serviceable. Its location is generally acceptable and would be easily found by those looking for it.	Banking Center location is flawed in some way (i.e. poor traffic patterns, development moving traffic away from site).	Immediate trade area has moved away from this location or deteriorated in that it is not servicing the customer base.
Access	BC is immediately accessible from either direction from the roadway for both entry and exit. Traffic signal at access. Easy left, in & out.	BC is accessible from either direction although may have shared easement with contiguous retailer. Easy to modestly easy left, in or out.	Is generally accessible, however is susceptible to traffic issues at peak times. Tough to moderately tough left, in or out.	Has some consistent access issues attributable to traffic or easement points. Tough left, in or out.	Access is poor due to constant traffic issues or shared egress points that are far away from BC location. No left, in or out.
Parking	Immediate parking around the banking center is abundant. Plenty of parking even at peak times.	Parking is plentiful. As long as employees park in designated spaces, there is typically enough spaces.	Parking is generally good, however at peak times customers pay have to use surrounding retail for overflow parking.	Parking is tight and at peak times it is likely customers have to wait on spaces.	Inadequate or no designated parking.
Land Use Pattern	Trade area is strong mix of residential, retail and business. Marked by density and high traffic. Compact.	High density and good traffic flows, however, is either retail heavy or residential heavy.	Trade area has strong commuter traffic but is not buoyed by a strong retail cluster. Sprawling.	Trade area is retail destination location. Sometimes termed "On an Island".	Trade area is spread out and not buoyed by a dominant strong traffic path or retail destination.
Life Cycle	Trade area is growing quickly. Expectations for considerable amount of population and retail growth in the immediate area.	Strong trade area. Expectation for modest growth and improving surrounding development.	Mature trade area. Growth has plateaued due to lack of space that constrain further development.	Declining trade area. Demographics are declining and surrounding retail vacancy is increasing.	Trade area is marked with high vacancy of both retail and residential.

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Statistical Analysis of the Relationship between On-Premise Digital Signage and Traffic Safety

by

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ABBREVIATIONS

The abbreviations shown below are used in this report.

AADT	Annual Average Daily Traffic
ADT	Average Daily Traffic
AASHTO	American Association of State Highway and Transportation Officials
AIC	Akaike Information Criterion
ANOVA	Analysis of Variance
BIC	Bayesian Information Criterion
CEVMS	Commercial Electronic Variable Message Signs
CG	Control Group
DF	Degrees of Freedom
EB	Empirical Bayes
EBB	Electronic Billboard
FHWA	Federal Highway Administration
HSIS	Highway Safety Information System
HSM	*Highway Safety Manual*
LCD	Liquid Crystal Display
LED	Light-Emitting Diode
MS	Mean of Sum of Squares
MSE	Error Mean Square
MST	Treatment Mean Square
RTM	Regression to the Mean
SAR	Spatial Autoregressive Model
SEM	Spatial Error Model
SFI	Signage Foundation, Inc.
SPF	Safety Performance Function
SS	Sum of Squares
SSE	Sum of Squares for Error
SST	Total Sum of Squares
TTI	Texas A&M Transportation Institute

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EXECUTIVE SUMMARY

The use of digital on-premise signs, which are typically business-related signs that have the ability to change the displayed message, has increased significantly in recent years. On-premise digital signs are located on the same property as the businesses they promote, and some part — or a significant part in some cases — of the sign contains a digital display that can be programmed to change the message at pre-set intervals. Because the use of these signs has increased, jurisdictions have used local sign codes or ordinances to regulate the manner in which digital messages are displayed. Jurisdictions typically justify these regulations by citing traffic safety impacts. However, no comprehensive and scientifically based research efforts have evaluated the relationship between on-premise digital signs and traffic safety.

In this study, researchers collected large amounts of sign and crash data in order to conduct a robust statistical analysis of the safety impacts of on-premise digital signs. The statistical tools used the latest safety analysis theory developed for analyzing the impacts of highway safety improvements. The research team acquired the crash data from the Highway Safety Information System, which is a comprehensive database of crash records from several states. One of the advantages of these data is that they also include information about roadway characteristics, such as the number of lanes, speed limit, and other factors. The research team then acquired information about the location of on-premise digital signs from two sign manufacturing companies. Through significant effort by the researchers, these two datasets were merged into a single dataset that represented potential study locations in California, North Carolina, Ohio, and Washington. Of the initial set of over 3,000 possible sites, the research team was able to identify 135 sign locations that could be used for the safety analysis. Potential sites were eliminated from consideration due to any of the following factors:

- The sign location was not on a roadway that was included in the crash dataset; only major roads were represented in the crash data.
- The sign location provided by a sign manufacturing company could not be verified through online digital images of the location.
- Only signs installed in calendar years 2006 or 2007 could be included in order to have adequate amounts of crash data before and after the sign was installed.

The research team then used the empirical Bayes method to perform a before-after statistical analysis of the safety impacts of the on-premise digital signs. In a before-after study, the safety impact of a treatment (in this case, the installation of an on-premise digital sign) is defined by the change in crashes between the periods before and after the treatment was installed. However, simply comparing the crash frequencies (known as a naïve before-after analysis) is not adequate to account for factors such as regression to the mean (a statistical concept that explains why after data can be closer to the mean value than the before data) and to provide a means of controlling for external factors that can also cause a difference in crash frequencies. The empirical Bayes method represents the recommended procedure for evaluating the impacts of safety treatments because it overcomes the deficiencies of the naïve method. The safety impacts are represented by the safety index, which is indicated by the symbol θ. In simple terms, the safety index represents a ratio of safety in the after period compared to safety in the before period, although it is not as

simple as dividing the crashes in the after period by the crashes in the before period. A safety index greater than 1.0 indicates an increase in crashes in the after period, and a value less than 1.0 indicates a reduction in crashes in the after period. However, because of the variability in the crash data, the analysis must have statistical validity. Statistical variability is established by defining the 95 percent confidence interval for the safety index, which is based on factors such as sample size and the variability of the data. If the 95 percent confidence interval includes the value of 1.0, then there is a 95 percent chance that there is no statistically significant change in crashes between the before and after periods.

The results of the statistical analysis are presented in Figure 1. This figure shows that the safety index for all of the states was 1.0 with a 95 percent confidence interval that ranged from 0.93 to 1.07. This indicates that, for the 135 sites included in the analysis, there was no statistically significant change in crashes due to the installation of on-premise digital signs. The same can also be said about the results for each of the four states on an individual basis because the confidence interval for safety index for each state includes 1.0. The larger confidence intervals for some of the states are due to greater variability in the data and/or smaller sample sizes. The researchers also analyzed single-vehicle and multi-vehicle crashes and found the same result of no statistically significant change in crashes. Finally, the researchers performed an analysis of variance for the sign factors of color, size, and type of business and found no statistically significant differences in the mean safety index values for individual factors.

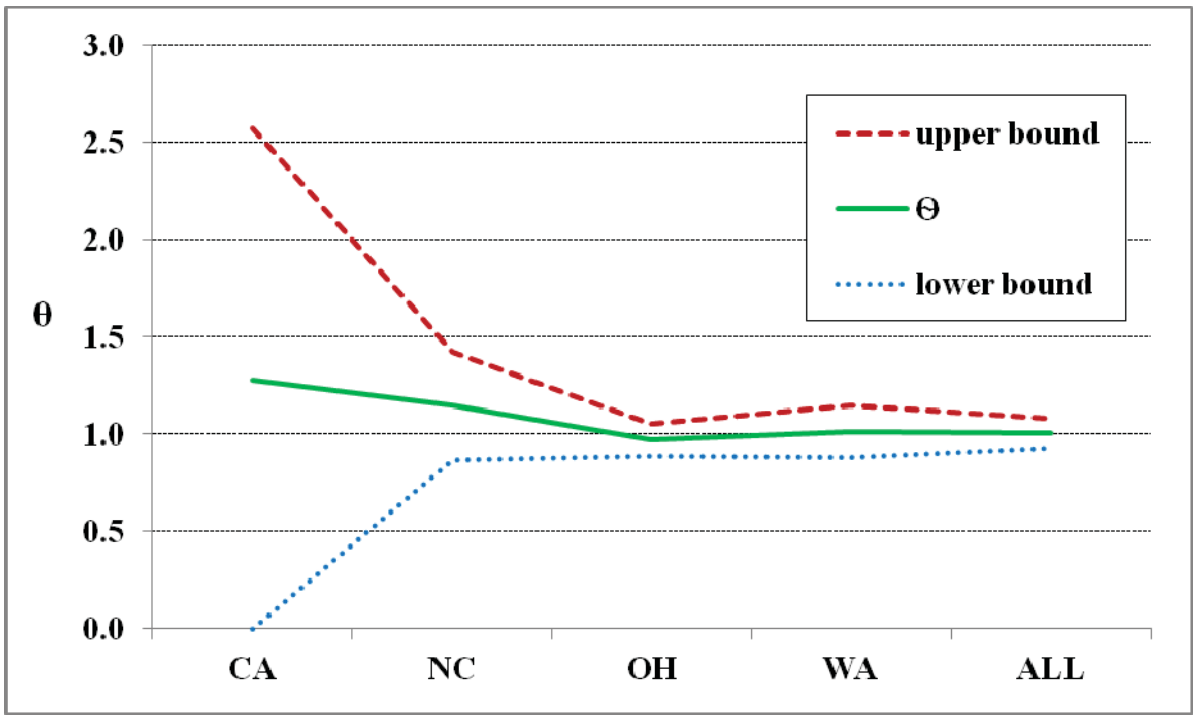

Figure 1. Summary of study results

The results of this study provide scientifically based data that indicate that the installation of digital on-premise signs does not lead to a statistically significant increase in crashes on major roads.

CHAPTER 1:
INTRODUCTION

For many generations, most signs — including both traffic and business signs — were static. They displayed only one message that did not change with time. Advances in information display technologies in recent years have led to an increase in the use of many types of digital signs, particularly in the area of on-premise and off-premise business signs. On-premise digital signs provide the ability to communicate a wide variety of messages and to change the manner in which the message is presented over time. As such, these digital signs represent a significant advancement in communication technologies and the ability to deliver valuable marketing information to potential customers. However, some groups have raised questions related to the traffic safety aspects of business signs that change messages on a frequent basis. The traffic safety concerns are often related to issues of potential driver distraction from the roadway due to the dynamic nature of these signs. These safety concerns are sometimes addressed through local regulation of these types of signs, which may prohibit or limit the use of on-premise digital signs. These regulations tend to be developed at the local level and do not have a significant level of scientific, nationally based research supporting the regulations.

The traffic safety concerns associated with on-premise digital signs have existed for some time, but there has been little research, particularly on a national level, that directly addresses the safety impacts of on-premise digital signs. In part, this is due to the fact that the use of such signs has grown only in the last 5–10 years. The research described in this report was conducted to provide a scientifically based, national analysis of on-premise digital signs so that the traffic safety impacts of such signs can be better understood.

RESEARCH APPROACH

The basic research method used in this study is a before-after statistical analysis of the change in traffic crashes at locations where digital signs were installed. The research team used digital sign installation information provided by sign manufacturers to identify locations in selected states where digital signs had been installed in the 2006–2007 time frame (this time frame was selected to provide adequate numbers of crashes in both the before and after periods). The analysis locations were limited to California, North Carolina, Ohio, and Washington because these states are part of the Federal Highway Administration (FHWA) Highway Safety Information System (HSIS). The HSIS is a database of crash records that includes detailed information about the roadway and crashes, including such factors as the number of lanes, the speed limit, crash severity, and other factors. The researchers then mapped the sign sites to the crash datasets to identify locations with crashes. These locations were then analyzed to compare the crashes before installation of the digital sign to the crashes after installation of the sign using statistical analysis procedures.

DESCRIPTION OF A DIGITAL SIGN

For the purposes of this study, a digital sign is defined as a sign that uses an electrical display, such as a liquid crystal display (LCD) or light-emitting diode (LED), to provide changeable

messages or graphics. There are several types of digital signs, including digital billboards, indoor video advertisements, and street-level advertisements (such as LED signs on bus shelters). For this study, the researchers focused only on on-premise digital signs, which are signs located on the same property as the business with which they are associated. The research effort did not include or address off-premise signs or billboards.

RESEARCH ACTIVITIES AND REPORT ORGANIZATION

There were five major activities associated with this research effort. The study began by reviewing and evaluating previous research on the safety aspects of digital signs and the statistical methods that other researchers have used to evaluate the safety aspects of signs. Chapter 2 describes the results of the review of background information. The researchers then began to collect information related to digital signs and crash data in the selected states. The sign information included the location and date of installation, and the crash data included the location and date. The researchers then devoted extensive effort to matching the locations and dates of the signs and crash datasets. Chapter 3 describes the sign and crash data and how the two datasets were merged together. Once this was accomplished, the next step was to develop a valid and scientifically based statistical analysis procedure to determine if there were any statistically significant changes in crashes after installation of digital signs. Chapter 4 describes the development of a statistical methodology, including a comparison of the advantages of the different options for conducting the statistical analysis. Finally, the research team used the results of the statistical analysis to define the key study findings, which are described in Chapter 5. Chapter 6 presents the conclusions and recommendations for the research study.

CHAPTER 2:
BACKGROUND INFORMATION

This chapter provides a review of the literature related to on-premise digital signs and their impacts on traffic safety. The review also includes a summary of statistical methods that can be used for evaluating the safety effects for these types of signs. Although the majority of the work has been related to off-premise digital signs, key studies associated with off-premise signs are nonetheless briefly discussed here. It should be pointed out that compared to other types of roadway-related operational and design features, such as access point density on urban arterials or on-street parking designs, the number of documents that are related to either on- or off-premise signs is relatively small.

On-premise signs are signs that are located on the same property as the activity described in the sign, while off-premise signs are located away from the activity identified in the sign. Off-premise signs are also known as third-party signs or outdoor advertising, and the most common example is a billboard. In general, off-premise signs have a larger visible area, which is attributed to the fact that these signs usually have greater surface areas and have higher mounting heights than on-premise signs. Furthermore, off-premise signs have a larger viewership because they are usually located adjacent to freeways and major highways with higher traffic volume. On the other hand, on-premise signs are installed on private property where a company conducts its business, and most are located along urban streets or local roadways. According to *The Signage Sourcebook* (U.S. Small Business Administration, 2003), the viewing opportunities for outdoor advertising (typically 333,350 cars per day) are much greater than those for an on-premise sign (30,000 cars per day).

The literature review is divided into two sections. The first section summarizes studies related to on-premise digital signs. The second section presents the summary of two key studies associated with off-premise digital signs.

ON-PREMISE DIGITAL SIGNS

This section describes the characteristics of the studies that have examined the relationship between safety and on-premise digital signs. To the knowledge of the authors, only two studies have investigated this relationship. It should be pointed out that the safety relationships identified in these research documents were not based on crash data but more on opinions and hypotheses, which limits their value as a direct measure of on-premise sign safety. The first study was conducted by Mace (2001). This author performed a literature review and listed two hypotheses about how on-premise signs can influence crash risk. The first hypothesis states that on-premise business signs distract drivers' attention from their primary driving tasks, resulting in higher crash risks. The second hypothesis asserts that on-premise business signs may mask the visibility of regulatory and warning road signs, which also can negatively influence crash risk.

On the other hand, Mace (2001) noted positive effects associated with commercial signs. He reported that commercial signs could reduce unnecessary traffic exposure by providing adequate navigation information for drivers, such as providing restaurant information for hungry drivers.

However, only measuring the frequency and duration of drivers' distraction may not represent the safety impacts of on-premise signs because a study published earlier showed that half of the objects that drivers see are not related to driving tasks (Hughes and Cole, 1986). In other words, besides on-premise signs, other roadside features may also distract drivers. The possible solution to minimize the negative effects of an on-premise sign, but still keep its positive effects, is to separate the sign's content to primary (navigation) and secondary (commercial) information.

Although, in the past, on-premise signs and off-premise signs were treated as distinct signage, they are becoming more homogeneous in terms of characteristics. In the second study, Wachtel (2009) mentioned that more roadside businesses, especially those with multiple users (e.g., shopping centers, auto malls, sports complexes, and entertainment places), now install larger-sized on-premise digital signs because of the lower cost and better performance of the LED display. Wachtel indicated that the largest digital advertising sign in the world is an on-premise sign in New York City. This sign is 90 ft tall and 65 ft wide, and is mounted on a 165-ft-tall steel post on the roof of the warehouse. The visible distance is over 2 miles. Wachtel also suggested that some on-premise signs affect traffic safety more than some off-premise digital signs because the locations and elevations of on-premise signs might be closer to the road users. In addition, the angles of on-premise signs may be out of the cone of vision and require extreme head movements to read.

In summary, these two studies showed more research is needed for understanding the relationship between on-premise digital signs and crash risk.

OFF-PREMISE DIGITAL SIGNS

This section is divided into two parts. The first part describes two key studies that have examined the safety effects of off-premise digital signs. The second part covers methodologies that have been used for estimating these effects.

Safety Effects

There are two reports that provide reviews of the findings, methods, and key factors related to the safety effects of off-premise digital signs. The first systematic study related to the impacts of off-premise signs was conducted 11 years ago by Farbry et al. (2001). Their study reviewed earlier reports and analyses (including those about electronic billboards and tri-vision signs) and provided the foundation for the second study written by Molino et al. (2009). In the second report, Molino et al. (2009) reviewed 32 related studies, which included those initially reviewed by Farbry et al. (2001), and noted that the majority of studies reported a negative effect between digital billboards and traffic safety. Although the number of studies that showed harmful impacts is five times more than the number of studies that showed no harmful impacts, the authors suggested that this ratio may not be strong evidence to prove the negative effects linked to electronic billboards (EBBs). The individual studies considered by these researchers had very different study methods and statistical powers, which can have a significant effect on the quality and results of the research.

Another important finding in the Molino et al. (2009) report is that drivers usually have spare attention capacities, and they can be distracted from their driving tasks by roadside objects (such as EBBs). However, these distractions may be riskier when the driving demands increase, such as in fixed hazard areas (e.g., intersections, interchanges, and sharp curves), in transient risky conditions (e.g., adverse weather, vehicle path intrusions, and slow traffic), or when other important information is processed at the same time (e.g., an official traffic sign). In other words, not only will the sign's internal characteristics (overall size, legend size, color, contrast, luminance level, etc.) affect crash risk, but so will external environmental factors (type of road, speed, weather conditions, time of day, etc.). Hence, Molino et al. list all possible key factors and suggest further studies to examine how they could influence safety. These factors are categorized into two groups: independent and dependent variables. The independent variables are separated by subject into five subgroups: billboard, roadway, vehicle, driver, and environment. It should be noted that the relationship between EBBs and on-premise signs is discussed in the environment subgroup, and dynamic factors of on-premise signs, such as change rate, motion, video, and sound, are listed as extremely important. The dependent variables are separated into vehicle behavior, driver/vehicle interaction, driver attention/distraction, and crash categories. Since there are hundreds of related key factors, the authors claimed that "No single experiment can provide the solution" and suggested future research programs to address the following topics: (1) determining when distraction caused by commercial electronic variable message signs (CEVMSs) affects safe driving, (2) investigating the relationship between distraction and various CVEMS parameters, and (3) examining the relationship between distraction and safety surrogate measures, such as eye glance and traffic conflicts.

Table 1 summarizes the literature review results from these two reports. This table shows that the results of crash studies are not consistent, and most studies have some important weaknesses, such as neglecting biases related to the regression to the mean (RTM) (discussed below) and site-selection effects (using the naïve method), low statistical power, and analysis results based on erroneous assumptions. It should be noted that only post-hoc crash studies are listed here because this study focuses on the change of crash rate caused by on-premise digital signs.

As mentioned, Table 1 shows that the results related to the safety effects of off-premise signs are inconsistent. The inconsistencies can be fully or partly attributed to various study limitations. For instance, the studies in the Wachtel and Netherton report (1980) and Wisconsin Department of Transportation report (1994) both used a naïve before-after study methodology (methodology approaches are described in Chapter 4), and they did not account for the RTM bias, which may change their estimates of crash rate and safety effects of signs. The general idea of RTM is that when observations are characterized by very high (or low) values in a given time period and for a specific site (or several sites), it is anticipated that observations occurring in a subsequent time period are more likely to regress toward the long-term mean of a site (Hauer and Persaud, 1983). Also, these studies should provide the variance of estimators (that is the uncertainty associated with the estimator) for judging the statistical significance of their results. Moreover, grouping studies where the objectives or types of signs are different is not appropriate. For example, the goal of the report prepared by Tantala and Tantala (2007) was to study the safety impacts caused by converting traditional billboards to digital billboards, while other studies focused on the safety impacts after installation of new digital billboards. Those are two distinct effects that are examined and should not be grouped together to evaluate the safety effects of on-premise digital

signs. Wachtel (2009) also noted other limitations in Tantala and Tantala's study, such as a lack of adequate before-after and comparison group data; no clear definition and reasonable calculation of the visual range and legibility range of EBBs; and no crash data related to adverse weather, impaired drivers, and interchanges.

Table 1. Safety effects of off-premise digital signs

Study	Methods	Data Type	Results	Location	Sample Size
Wachtel and Netherton (1980)	Naïve before-after study	Crash frequency	The crash reduction of target area was 10% less than the overall reduction (after the installation of the signs)	Tele-Spot sign, Boston	Not provided
Wisconsin Department of Transportation (1994)	Naïve before-after study	Crash frequency, Average daily traffic (ADT)	Crash rate (eastbound): all crashes increased 36%, sideswipe crashes increased 8%, and rear-end crashes increased 21%	Milwaukee, Wisconsin	2
			Crash rate (westbound): all crashes increased 21%, sideswipe crashes increased 35%, and rear-end crashes increased 35%		
Smiley et al. (2005)	Before-after study (empirical Bayes)	Crash frequency, ADT, safety performance function	Downtown intersection sites: no significant change in crash rate (all crashes increased 0.6%, injury crashes increased 43%, and rear-end crashes increased 13%)	Toronto, Canada	3
	Before-after study (control group)	Crash frequency, ADT, control group	Rural sites: no significant change in crash rate based on most compared sites	Toronto, Canada	1
Tantala and Tantala (2007)	Naïve before-after study	Crash frequency, control group, ADT	No significant change in crash rate	Cuyahoga, Ohio	7
Tantala and Tantala (2009)	No description of the method		No significant change in crash rate	Cuyahoga, Ohio	7

The second shortcoming in Tantala and Tantala (2007) is that they used a simple correlation analysis between sign density and crash rate to examine safety effects of billboards. Using this approach, they found that the correlation coefficients among the scenarios analyzed were very low (around 0.20), indicating that the installation of billboards did not increase the number of crashes. This may well be true, but they did not use the right analysis tool. For investigating the relationship between sign density and the number of crashes, it is more appropriate to develop one or several regression models since the safety analyst can have a better control over other factors that can influence the number and severity of crashes (Lord and Mannering, 2010). In a regression model, several independent variables can be included, which is better to estimate the variable of interest (such as the installation of digital signs). However, it should be pointed out that the before-after study, as performed in this study, still remains the best methodological approach for estimating the safety effects of an intervention.

Among all studies in Table 1, Smiley et al. (2005) provides the more reliable results since they used a before-after method using a control group (CG) and empirical Bayes (EB) approach. The

only limitation is related to the small sample size. The authors of the study only evaluated three sites. Even with a small sample size, the EB method can still be successfully used to evaluate the safety effects of an intervention, as was done by Ye et al. (2011). Ye et al. (2011) used the EB method to estimate the safety impacts of gateway monument signs, which can be categorized as one type of off-premise sign. Gateway monuments are roadside structures used to introduce a city or town. These monuments usually have the name of the city or town and are located at the city limits.

According to Wachtel et al. (2009) and Farbry, (2001), using crash data might not be a precise method because crashes usually have multiple causal events, which are difficult to extract from crash datasets. For example, they noted that sign internal variables (such as size, brightness, viewing angle, etc.) might play main roles in drivers' distraction or ignoring of official traffic signs, while other external factors affect conflicts and crash risk. Although those reasons may be legitimate, utilizing crash data is still the best approach for evaluating the safety effects of interventions as well as those associated with operational and design features (Hauer 1997). As stated by Hauer, "*It follows that, in the final account, to preserve the ordinary meaning of words, the concept of safety must be linked to accidents.*" Furthermore, using crash data have other advantages: lower cost and fewer artificial errors. Firstly, the cost of conducting a before-after crash study is much lower than human-centered methods because the researchers do not need to purchase equipment and hire participants for conducting driving tests. Secondly, crash data are based on crash reports, which can provide a more accurate measure of safety than surrogate measures such as speed, driver behavior, or other measures. Only by conducting a before-after crash study can one provide results that combine multiple casual variables in the real world. Other methods cannot displace the above advantages, which explain why the research team selected the before-after methodology for estimating the safety effects of digital signs.

Characteristics of the Evaluation Methods Used in Previous Studies

This section describes the characteristics of other methods used in previous studies for examining the safety effects of off-premise digital signs. In addition to a crash before-after study approach, the most common study methods that have been used for examining the safety impacts of off-premise signs include eye fixations, traffic conflicts, headways and speeds, and public surveys. Most studies used one or more of the above methods to examine the impacts of off-premise signs (Molino et al., 2009). For instance, Smiley et al. (2005) used four different methods (eye fixation, conflict study, before-after crash study, and public survey) for examining a video sign located in Toronto. On the other hand, Lee et al. (2007) used eye fixations and a questionnaire for their study. It should be noted that the results from multiple measurements are usually inconsistent.

Briefly, the eye fixation study method uses an eye-tracking system to record drivers' eye movements. The results (e.g., eye glances and durations) can provide direct evidence of where drivers are looking while driving, leading to assumptions as to whether drivers are distracted when they are driving near or toward a sign (or at other roadside features). Traffic conflicts, often referred to as surrogate measures of safety, can be used for identifying risky driving behaviors, such as braking without good reason, inappropriate lateral lane displacement, and delays at the start of the green traffic signal phase. Headways and vehicle speed can be used to

assess distracted drivers since those drivers tend to have shorter headways and higher speed variances.

Most details about experiment design, such as the participant number, study site size, driving route length, and experiment duration can be found in Appendix B of the report prepared by Molino et al. (2009). In the current study, the researchers focus the discussion on the before-after crash data study method for two reasons. First, Molino et al. (2009) did not provide a detailed experimental design for using crash data, and some studies were criticized for inappropriate methodology (Tantala and Tantala, 2007; 2009). Second, the costs associated with other experimental methods are significant and are greater than the resources that were allocated for the current research study. According to Molino et al. (2009), the budgetary costs to conduct research using other experimental methods vary between $0.4 million and $0.8 million for using on-road instrumented vehicles, $2 million and $4 million for conducting a naturalistic driving study, and $1 million and $3 million for using an unobtrusive observation approach.

CHAPTER 3:
STUDY DATA

To conduct the safety analysis, the research team had to develop plans for collecting the necessary data, manipulating the data into a format that could be used for the safety analyses, and then conducting the statistical analysis to identify the safety impacts of on-premise digital signs. The success of this project relied upon the ability to acquire two distinct sets of data and the robustness of the individual datasets. The two datasets needed for the analysis included (1) information regarding the location and installation dates for on-premise digital signs, and (2) data regarding crash histories on the roadways in the vicinity of the on-premise digital signs. The latter also included information about operational (e.g., traffic flow and speed limit) and geometric (e.g., functional class and lane width) design features located at and adjacent to the on-premise digital signs. From the beginning of the project, the research team expected to use the HSIS crash data for the crash history dataset. The real challenge of this project was identifying specific information about on-premise digital signs for the states represented in the HSIS, and the researchers encountered numerous challenges in acquiring this information. Once the data for both groups were acquired, the researchers had to overcome differences in the datasets so that the data could be merged into a single dataset for analysis. The activities associated with the acquisition of the crash data, acquisition of the sign data, and the merging of the two datasets are described in this chapter.

CRASH DATA

The HSIS is operated and maintained by the FHWA, and is widely used for safety research programs that provide input for public policy decisions. The HSIS is a multistate relational database that contains crash, roadway, and vehicle information. Crash information/files contain basic crash information, such as location (based on reference location or mile-point), time of day, lighting condition (e.g., daylight, dark and no lighting, dark and roadway lighting, etc.), weather conditions, crash severity, the number of related vehicles, and the type of crash (e.g., head-on, right angle, sideswipe, etc.). Each row in the spreadsheet file contains crash information for individual crashes and a unique ID number, and each column represents a variable. The roadway information/files provide traffic and geographic information for each roadway segment, such as annual average daily traffic (AADT), speed limit, beginning mile-point, end mile-point, number of lanes, lane and median width, shoulder width and type, rural or urban designation, and functional classification. The vehicle information/files contain driver and vehicle information, such as a crash identification number, driver gender, driver age, contributing factor (possible casual factor), vehicle type, and others. These individual file types can be linked together as a whole dataset. For example, crash files and road files can be linked by their location information (route number and mileage), or crash files and vehicle files can be linked together by their crash identification number.

Currently, there are seven states that actively participate in the HSIS: California, Illinois, Maine, Minnesota, North Carolina, Ohio, and Washington. However, the HSIS has an upper limit on the amount of data that can be requested by researchers (including the number of states, the request area, and total variables). To maximize the value of the crash data that they could request, the

research team held discussions with the research advisory panel to identify the states (from the list of seven HSIS participating states) where there would be higher concentrations of on-premise digital signs. Based on this input, the research team requested HSIS data for California, North Carolina, Ohio, and Washington in order to get a maximum number of study sites. All crash datasets were downloaded from the HSIS website and stored in a spreadsheet format. The definitions for the variables in a state's crash data were found in the HSIS guidebooks. It should be noted that each state has its own guidebook and data record format. In other words, one specific variable might be available for some states, but this variable may have different meanings or category types, or even be unavailable for other states. The inconsistent definitions among different states' crash datasets can affect the quality of analysis and results when selecting specific variables for identifying target crashes (such as rear-end crash) needed for more advanced analysis. The differences between states also create challenges when trying to merge data into a single dataset for analysis.

Although the HSIS dataset provides the most comprehensive crash data from different states, the HSIS has some limitations. First, the HSIS only includes crashes that occur on major roads, such as interstate highways, U.S. highways, and state highways. The HSIS dataset may not include crash-related data for secondary roads in rural areas or city streets in urban areas, including arterial streets that are major roads in a city but are not on the state highway system. Table 2 identifies the level of crash coverage and roadway length for each state selected for the analysis.

Table 2. HSIS crash coverage and roadway length by state

California	1. More than 500,000 crashes occur each year; HSIS includes about 38% of those crashes. 2. HSIS includes 15,500 miles of mainline (non-ramp) roadways.
North Carolina	1. About 230,000 crashes occur each year; HSIS includes 70% of those crashes. 2. Of the 77,000 miles of roadway on the North Carolina state system, approximately 62,000 miles are included in the database.
Ohio	1. About 380,000 crashes occur each year; HSIS includes 40% of those crashes. 2. In Ohio, about 116,000 miles of highway in total; HSIS includes approximately 19,500 miles of roadway.
Washington	1. 130,000 crashes occur each year; HSIS includes 37% of those crashes. 2. HSIS contains 7,000 miles of mainline (non-ramp) roadway.

Another limitation of the HSIS data is that the dataset is not continuously updated. The HSIS data represent the final crash datasets from each state after the state has processed the crash data. As a result, the HSIS dataset may not include the last several months or more of crash data from a state. Currently, the most updated HSIS crash data are through 2009 (California is updated to 2008), so the most recent one or two years of crashes are not included in the HSIS data. Also, the oldest HSIS crash data extend back only through 2004. Limiting crash data to the period from 2004 to 2009 was a significant consideration in this research project because the large growth of on-premise digital signs is relatively recent, having mostly grown since the mid- to late 2000s. The lack of data for the last two to three years created challenges with respect to developing a robust statistical analysis procedure. For a comparison of safety impacts of a treatment (such as installation of a digital sign) to be meaningful, both the before and after analysis periods need to be about equal and as long as possible. This meant that, to have two-year analysis periods (two years before and two years after) in the safety analysis, on-premise digital signs needed to be

installed in either 2006 or 2007. In order to focus the safety analysis on the long-term impacts of on-premise digital signs, the researchers did not include the calendar year of installation of a sign in the analysis. For example, if a sign was installed in 2006, the before period was calendar years 2004 and 2005, and the after period was calendar years 2007 and 2008.

An additional limitation of the HSIS crash data is that the crash location within the HSIS is identified to the nearest 0.1 mile (528 ft) on the roadway. This required the safety analysis to be conducted for the tenth of a mile length of roadway that a sign was located within. The level of accuracy is the primary reason that 0.1 miles was chosen as the effective area of the sign.

The researchers viewed the limitations mentioned above as minor and ones that had minimal impact on the study results. There are no comparable crash datasets available to researchers that could be used for a similar type of analysis of crashes. The only alternative available to the researchers would have been to try and obtain crash data from individual agencies where on-premise digital signs have been installed. Such an approach may have provided more specific data about individual signs and site characteristics, but would have resulted in an extremely small dataset. The researchers felt that such small sample sizes would not provide sufficient robustness for statistical analysis and that the approach using the HSIS data provided greater scientific validity and robustness, as discussed in the previous chapter.

SIGN DATA

With the acquisition of the HSIS data, the research team had information to analyze crashes but had no idea about where to conduct the analysis. Determining the location for the crash analysis required information regarding the location of on-premise digital signs. Furthermore, due to the date limitations of the HSIS data, only sign sites where the sign was installed in 2006 or 2007 could be used for the crash analysis. So the research team began the process of identifying locations in California, North Carolina, Ohio, and Washington where on-premise digital signs had been installed on major roads in 2006 or 2007.

Initial attempts to identify sign locations focused upon getting information from the Signage Foundation, Inc., (SFI) research advisory panel. However, the results did not provide a large enough sample size for a robust statistical analysis. The research team began to contact sign installation companies but encountered challenges in acquiring the large amount of data needed to conduct the research. The primary challenge associated with contacting sign installation companies (which are the same companies that market the signs to individual businesses) was the proprietary nature of the business information the research team was requesting. Another challenge was the large number of individual companies that needed to be contacted to develop a robust sample size.

Because of the challenges of working with sign installation companies, the research team shifted the focus to sign-manufacturing companies. Eventually, the research team was able to work with two electronic sign-manufacturing companies to get a list of on-premise digital signs installed in any of the four study states during 2006 or 2007. Each of the two lists was converted into datasets for use in the research effort. The first dataset (dataset #1) contained 2,953 sign sites and 27 variables, which included the characteristics of signs and roads, such as sign order date, sign

address (road, county, and state), the nearest cross street and its distance from the sign, the nearby cross street with the highest volume and its distance from the subject intersection, and traffic volume on the subject road. The research team did not use the road information from dataset #1, relying instead upon the road data in the HSIS crash dataset. This ensured consistency in the approach with the different sign datasets. Also, the sign installation date was considered to be the sign order date plus two weeks. This assumption was based on input from the sign-manufacturing company. Since the entire year that the sign was installed was excluded from the analysis, this was considered not to be a critical issue.

The second dataset (dataset #2) had 63 site addresses and 10 variables. Unlike the first dataset, most variables in dataset #2 were related to product information, such as installation data, sales representative, product name, matrix, color, customer ID (address), and status of signs.

For the analysis, these two datasets were combined as one for use in analyzing the crashes by individual state. The combined dataset was further refined by removing all sign locations that were not installed in either 2006 or 2007. The calendar year that a sign was installed was treated as the construction year, and the crashes that occurred in that year were removed from the analysis. The entire calendar year was removed from the analysis due to uncertainty over the actual installation date of the sign since the data provided only the order date for the sign. Removing the entire calendar year associated with installation also eliminated the novelty effect associated with implementing a new feature. The second variable, the sign installation address, was used to select related crashes by the sign's location and default sign-effective areas. For example, the researchers defined the crashes located within 0.1 miles from the target signs as related crashes. In reality, the effective area could be larger or smaller depending upon the sign size. The procedure used for this analysis did not adjust the effective area based on sign size or other factors. Overall, significant effort was put into ensuring the accuracy of the sign datasets because the quality of the data had a huge impact on the precision and accuracy of the analysis.

DATA-MERGING PROCEDURE

The previous sections explain how the researchers obtained their study data (the sign dataset and the crash dataset) and the characteristics of each dataset. This section gives more details about the dataset-merging procedure. Several steps were involved in merging the crash and sign location datasets into a single dataset that could be used for statistical analysis. The early steps focused on confirming that the digital sign was still in place and near the road that it is related to. This was needed because a site could have an address on one road but have the sign facing traffic on another road bordering the site property. The later steps focused upon converting the street address of the sign location to a route and milepost value that could be used with the crash dataset. This complex effort was necessary due to the fact that the sign and crash datasets used different location methods. The sign dataset was based on the site address, while the crash database was based on route number and milepost. For example, a location in the sign dataset would record a location with "1234 North Highway 101, Anytown, WA 98584," but the HSIS would show the same location as "route number = 23101" and "mile post = 335.72." In order to define the related crashes that were adjusted to the target signs, the researchers needed to transfer sign locations into the HSIS location system. The basic steps are described below and illustrated in Figure 2.

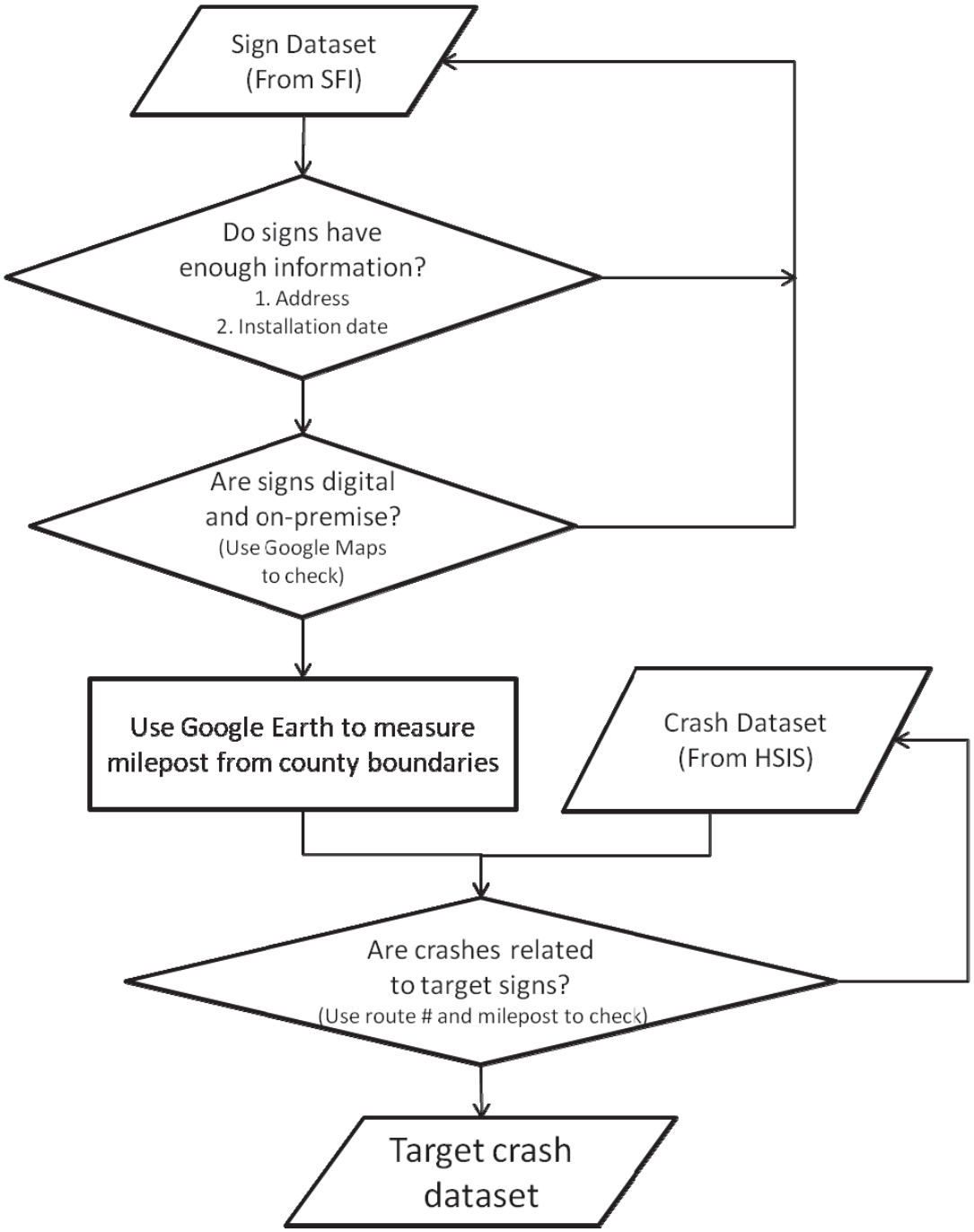

Figure 2. The flow chart for data collection and merging procedure

1. For each record of the combined sign dataset (3,016 total records), the research team evaluated the location information (typically a street address) and the sign order date. Records with missing or incomplete location information or with assumed sign installation dates that were not in 2006 or 2007 were deleted from the dataset.

2. Research team members then verified the location of the sign using the site address in the sign dataset and taking the steps listed below. Figure 3 shows an example table that the researchers used for the above data collection, including screenshots of Google Maps and Google Earth (Google Earth, 2008). Columns 1–3 are the address information given by the sign companies. Columns 4–7 are determined through Google Maps, and Columns 8–11 are determined through Google Earth.
    a. The sign was located in Google Maps using the site address.
    b. Using the Street View feature of Google Maps, a member of the research team identified the sign on the site or deleted the record with a note that the on-premise digital sign could not be identified. There were some challenges associated with finding digital signs using the Street View pictures from Google Maps, including fuzzy pictures with low resolution, which made it difficult to evaluate some signs, and digital signs that were not obvious during the daytime (Street View provides only daytime pictures).
    c. The screen image of the subject sign was saved, and basic sign characteristics were identified and/or estimated. Examples include sign color, size, and business type.
    d. An initial determination was made as to whether the sign was located on a major road that would be part of the HSIS crash dataset. If the road was not expected to be a major road, the record was deleted from the dataset.
3. The sign location was entered into Google Earth to determine the county in which the sign was located and the mileage from the county border. This included identifying the county identification code in the appropriate HSIS manual for a given state. This provided the milepost location information needed to relate the sign location to the location information in the crash dataset. Defining the milepost information required doing the following:
    a. Identifying the neighboring county, which was used to determine in which direction the mileposts were increasing.
    b. If the county had mileposts restarting at zero at the county borders, determining in which direction they were increasing, based on the number of lanes at the borders. If the direction could not be determined, a general rule of increasing from west to east or south to north was used.
    c. Using the path tool in Google Earth to measure the distance from the county border to the sign. This distance and the beginning milepost at the county border established the milepost of the sign.

An example (using the above procedure) can be founded in Appendix A. After target sign locations were transferred into the HSIS locating system, a statistics software package, “R,” was used to select the related crashes among the whole HSIS dataset.

Sign ID	Address	Installation date	Google Map				Google Earth				Note
			Picture	Color (Single/ Multi.)	Dimension	Business Type	County ID	Route #	Distance	Mile post	

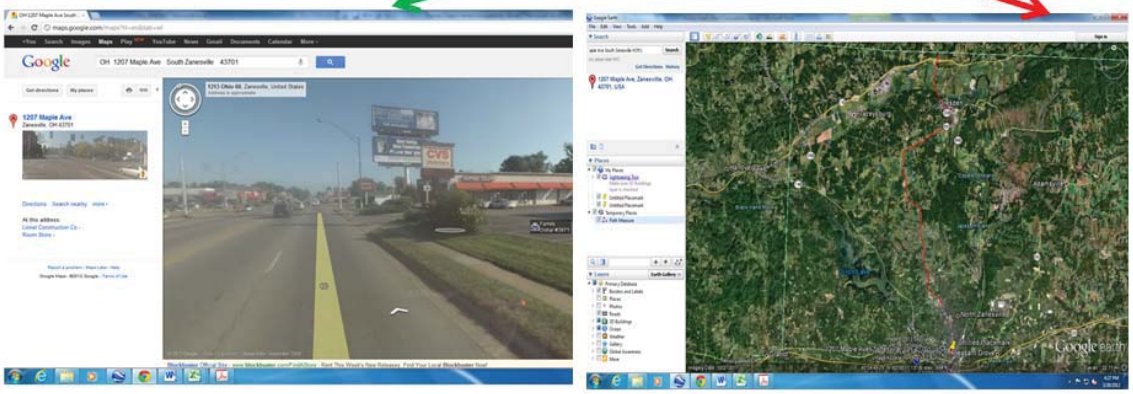

Figure 3. Example work table of site data collection

CHAPTER 4:
STUDY METHODOLOGY

Evaluating the effects of treatment on the number and severity of crashes is a very important topic in highway safety. For the last 30 years, various methods have been proposed for evaluating safety treatments (Abbess et al., 1981; Danielsson, 1986; Davis, 2000; Hauer, 1980a; Hauer, 1980b; Hauer et al., 1983; Maher and Mountain, 2009; Miranda-Moreno, 2006; Wright et al., 1988). The methods are classified under two categories: the before-after study and the cross-sectional study. In a before-after study, the safety impacts of an improvement or treatment at a given location are determined by comparing the change in crashes before and after the improvement/treatment was installed. In a cross-sectional study, crashes or crash rates on two different facilities with similar characteristics except for the improvement of interest are compared. The before-after study is typically more desirable because it provides a more direct evaluation of the safety impacts. Although they have been used by some researchers (Noland, 2003; Tarko et al., 1998), cross-sectional studies are more difficult to conduct because different facilities are rarely identical in all features except the one of interest. Hence, the cross-sectional approach was not used in this research. The before-after type of study can be further divided into several types:

- naïve before-after study,
- before-after study with control group,
- before-after study using the EB method, and
- before-after study using the full Bayes approach.

The before-after study using the full Bayes approach is a more recent development in statistical safety analysis, developed and used by several noted safety researchers (Hauer and Persaud, 1983; Hauer et al., 1983; Hauer, 1997; Li et al., 2008; Persaud and Lyon, 2007). The advantages and disadvantages for each of the above before-after methods are described in more detail in this chapter.

A BEFORE-AFTER STUDY AND A CROSS-SECTIONAL STUDY

As mentioned previously, observational crash studies can be grouped into two types: the before-after study and the cross-sectional study. The selection of the study type is based on the availability of historical crash data, traffic volume, or the comparison group. The following sections provide details about the before-after methodology.

The Before-After Study

The before-after study is a commonly used method for measuring the safety effects of a single treatment or a combination of treatments in highway safety (Hauer, 1997). Short of a controlled and full randomized study design, this type of study is deemed superior to cross-sectional studies since many attributes linked to the converted sites where the treatment (or change) was implemented remain unchanged. Although not perfect, the before-after study approach offers a

better control for estimating the effects of a treatment. In fact, as the name suggests, it implies that a change actually occurred between the "before" and "after" conditions (Hauer, 2005).

As described by Hauer (1997), the traditional before-after study can be accomplished using two tasks. The first task consists of predicting the expected number of target crashes for a specific entity (i.e., intersection, segment where an on-premise sign was installed, etc.) or series of entities in the after period, had the safety treatment not been implemented. In other words, the before-after approach described by Hauer compares the expected number of crashes in the after period with the treatment installed to the expected number of crashes in the after period had the treatment not been installed. The calculation for each expected number of crashes is based on numerous factors, including the actual number of crashes in the before condition, the actual number of crashes in the after period, and incorporation of site-specific and statistical considerations. The symbol π is used to represent the expected number of crashes in the after period (a summary of all statistical symbols used in this report are presented in Appendix B). The second task consists of estimating the number of target crashes (represented by the symbol λ) for the specific entity in the after period. The estimates of π and λ are $\hat{\pi}$ and $\hat{\lambda}$ (the caret or hat represents the estimate of an unknown value). Here, the term "after" means the time period after the implementation of a treatment; correspondingly, the term "before" refers to the time before the implementation of this treatment (an on-premise digital sign in this study). In most practical cases, either $\hat{\pi}$ or $\hat{\lambda}$ can be applied to a composite series of locations (the sum of *i*'s below) where a similar treatment was implemented at each location.

Hauer (1997) proposed a four-step process for estimating the safety effects of a treatment. The process is described as follows (see also Ye and Lord, 2009):

- Step 1: For $i = 1,\ 2,\ ...,\ \mathrm{n}$, estimate $\lambda(i)$ and $\pi(i)$. Then, compute the summation of the estimated and predicted values for each site i, such that $\hat{\lambda} = \sum \hat{\lambda}(i)$ and $\hat{\pi} = \sum \hat{\pi}(i)$.
- Step 2: For $i = 1,\ 2,\ ...,\ \mathrm{n}$, estimate the variance for each, $Var\{\hat{\lambda}(i)\}$ and $Var\{\hat{\pi}(i)\}$. For each single location, it is assumed that observed data (e.g., annual crash counts over a long time frame) are Poisson distributed and $\hat{\lambda}(i)$ can be approximated by the observed value in the before period. On the other hand, the calculation of $Var\{\hat{\pi}(i)\}$ will depend on the statistical methods adopted for the study (e.g., observed data in naïve studies, method of moments, regression models, or EB technique). Assuming that crash data in the before and after periods are mutually independent, then $Var\{\hat{\lambda}\} = \sum Var\{\hat{\lambda}(i)\}$ and $Var\{\hat{\pi}\} = \sum Var\{\hat{\pi}(i)\}$.
- Step 3: Estimate the parameters δ and θ, where $\hat{\delta} = \hat{\pi} - \hat{\lambda}$ (again, referring to estimated values) is defined as the reduction (or increase) in the number of target crashes between the predicted and estimated values, and $\hat{\theta} = \hat{\lambda} / \hat{\pi}$ is the ratio between these two values. When θ is less than one, the treatment results in an improvement in traffic safety, and when it is larger than one, the treatment has a negative effect on traffic safety. The term θ has also been referred to in the literature as the index of effectiveness (Persaud et al., 2001). Hauer (1997) suggests that when less than 500 crashes are used in the before-after study, θ should be corrected to remove the bias caused by the small sample size using

the following adjustment factor: $1/[1+Var\{\hat{\pi}\}/\hat{\pi}^2]$. The total number of crashes was over 500, but the adjustment factor had to be applied when subsets of the data, such as single- or multi-vehicle crashes, were analyzed.

- Step 4: Estimate the variances $Var\{\hat{\delta}\}$ and $Var\{\hat{\theta}\}$. These two variances are calculated using the following equations (note: $Var\{\hat{\theta}\}$ is also adjusted for the small sample size):
  - $Var\{\hat{\delta}\} = Var\{\hat{\lambda}\} + Var\{\hat{\pi}\}$ (Eq. 1)
  - $Var\{\hat{\theta}\} = \dfrac{\hat{\theta}^2[(Var\{\hat{\lambda}\}/\hat{\lambda}^2) + (Var\{\hat{\pi}\}/\hat{\pi}^2)]}{[1+(Var\{\hat{\pi}\}/\hat{\pi}^2)]^2}$ (Eq. 2)

The four-step process provides a simple way for conducting before-after studies. Three common before-after methods will be introduced in the following sections. All three methods use the same four-step process.

COMMON METHODS FOR CONDUCTING A BEFORE-AFTER STUDY

Having selected the before-after study approach, the research team then needed to decide which specific before-after method would be the most appropriate for analyzing the safety impacts of on-premise digital signs. This section of the report describes the methodologies and data needs associated with three before-after study types: naïve before-after studies, before-after studies with a CG, and the EB method.

Naïve Method

Among all the before-after methods, the naïve method is the simplest. The estimation of θ is simply equal to the ratio between the number of crashes in the after period and the number of crashes in the before period (which is used to predict the number of crashes in the after period if the treatment was not implemented). Equation 3 illustrates how the index of safety effectiveness is calculated. This method is very straightforward, but it is seldom used in the current safety study because it does not account for the RTM bias. Not including the RTM bias could overestimate the effects of the treatment or underestimate the safety impacts. The naïve method does not account for external factors that occur at the local or regional level, such as changes in weather patterns or economic conditions.

$$\hat{\theta}_{naive} = \frac{\hat{\lambda}}{\hat{\pi}} = \frac{\sum_{i=1}^{n}\sum_{j=1}^{t} N_{ij2}^{T}}{\sum_{i=1}^{n}\sum_{j=1}^{t} N_{ij1}^{T}} \quad \text{(Eq. 3)}$$

Where

$\hat{\theta}_{naive}$ = the estimate of safety effectiveness by using the naïve method,

$\hat{\pi}$ = the predicted number of crashes for the treatment group in the after period,

$\hat{\lambda}$ = the estimated number of crashes for the treatment group in the after period,

n = the sample size,

t = the time period,

N_{ij1}^{T} = the observed response for site i (T = treatment group) and year j (in the before period), and

N_{ij2}^{T} = the observed response for site i (T = treatment group) and year j (in the after period).

The result can be adjusted when the traffic flow and time interval are different between the before and after periods. It is adjusted by modifying the predicted number of crashes as shown in Equation 4:

$$\pi = r_d r_f \sum_{i=1}^{n} \sum_{j=1}^{t} N_{ij1}^{T} \qquad \text{(Eq. 4)}$$

Where

r_d = the ratio of the duration between the after and before periods, and

r_f = the ratio of the traffic flow between the after and before periods.

Control Group Method

The CG method can be used to help control for external factors. The number of crashes collected at the control sites is defined as μ (before) and ν (after). The adjusting factor, the ratio of ν to μ, is used to remove the effects caused by other external factors from π in the theorem. Equation 5 illustrates how to adjust the naïve estimate. It should be pointed out that the RTM could technically be removed if the characteristics of the control group are exactly the same as those of the treatment group. However, getting control group data with the exact same characteristics may not be possible in practice, as discussed in Kuo and Lord (2012). Collecting control group data usually adds extra cost and time compared to the naïve method since more data needs to be collected.

$$\hat{\theta}_{CG} = \frac{\hat{\lambda}}{\hat{\pi} \times \frac{\hat{\nu}}{\hat{\mu}}} = \frac{\sum_{i=1}^{n} \sum_{j=1}^{t} N_{ij2}^{T}}{\sum_{i=1}^{n} \sum_{j=1}^{t} N_{ij1}^{T} \times \sum_{i=1}^{n} \sum_{j=1}^{t} \frac{N_{ij2}^{C}}{N_{ij1}^{C}}} \qquad \text{(Eq. 5)}$$

Where

$\hat{\theta}_{CG}$ = the estimate of safety effectiveness by using the control group method,

$\hat{\lambda}$ = the estimated number of crashes for the treatment group in the after period,

$\hat{\pi}$ = the predicted number of crashes for the treatment group in the after period,

$\hat{\nu}$ = the estimated number of crashes for the control group in the after period,

$\hat{\mu}$ = the estimated number of crashes for the control group in the before period,

N_{ij1}^{T}, N_{ij1}^{C} = the observed responses for site i (T = treatment group and C = control group) and year j (in the before period), and

N_{ij2}^{T}, N_{ij2}^{C} = the observed responses for site i (T = treatment group and C = control group) and year j (in the after period).

Empirical Bayes Method

The EB method is recommended in the *Highway Safety Manual* (HSM), published by the American Association of State Highway and Transportation Officials (AASHTO) and approved for use by the FHWA (AASHTO, 2010). The HSM is a recent document that defines standardized procedures for conducting safety analyses of highway safety improvements. The EB method combines short-term observed crash numbers with crash prediction model data in order to get a more accurate estimation of long-term crash mean. The EB method is used to refine the predicted value by combining information from the site under investigation and the information from sites that have the same characteristics, such as range of traffic flow, number of lanes, lane width, etc.

As an illustration, Hauer et al. (2002) use a fictional "Mr. Smith" to illustrate use of the EB method: Mr. Smith is a new driver in a city. He has no crash records during his first year of driving. Based on past crash histories for the city, a new driver in that city has 0.08 accidents per year. Based only on Mr. Smith's record, it is not reasonable to say that he will have zero accidents or have 0.08 accidents for the next year (based on the average of all new drivers but disregarding Smith's accident record). A reasonable estimate should be a mixture of these two values. Therefore, when estimating the safety of a specific road segment, the accident counts for this segment and the typical accident frequency of such roads are used together.

The index of safety effectiveness is illustrated in Equation 6. With the EB method, the analyst first estimates a regression model or safety performance function (SPF) using the data collected with the control group. Then, the model is applied to the sites where the treatment was implemented to get a preliminary predicted value for the after period. The EB method is then used to refine the estimate to account for the RTM bias and the external factors. It is possible for the EB method to be biased if the characteristics of the treatment and control groups are not the same (Lord and Kuo, 2012).

$$\hat{\theta}_{EB} = \frac{\hat{\lambda}}{\hat{\pi}} = \frac{\sum_{i=1}^{n}\sum_{j=1}^{t} N_{ij2}^{T}}{\sum_{i=1}^{n}\sum_{j=1}^{t} M_{ij1}^{T}} \qquad \text{(Eq. 6)}$$

Where

$\hat{\theta}_{EB}$ = the estimate of safety effectiveness based on the EB method;

$\hat{\pi}$ = the predicted number of crashes for the treatment group in the after period;

$\hat{\lambda}$ = the estimated number of crashes for the treatment group in the after period;

M_{ij1} = the expected responses for site i for the EB method,

$$\mathrm{M_{ij1}} = \mathrm{W} \times (\hat{\Lambda}_1) + (1 - \mathrm{W}) \times (\sum_{\mathrm{j=1}}^{\mathrm{t}} N_{\mathrm{ij1}});$$

W = the weight for sites for the EB method, $W = \dfrac{1}{1 + \hat{\Lambda}_1 \times \hat{\alpha}}$;

$\hat{\Lambda}_1$ = the estimate for the average number of crashes of all sites in the before period; and

$\hat{\alpha}$ = the estimate of the dispersion parameter.

$\hat{\Lambda}_1$ and $\hat{\alpha}$ can be estimated using two different approaches (Hauer, 1997). They can be estimated based on a regression model or the method of moment. Both are calculated using data collected as part of the control group. For this research, the average number of crashes and dispersion parameter were estimated using a regression model.

CALCULATION PROCEDURES AND EXAMPLES

The EB before-after method was applied to this study with the regression models or SPFs selected from the HSM (AASHTO, 2010), which includes road types from two to five lanes. As for sites located on wider roads (six lanes and eight lanes, which are not covered in the HSM), the researchers used the SPFs from a Texas A&M Transportation Institute (TTI) study (Bonneson and Pratt, 2009). The number of crashes in each year during the before period (Λ_i) was estimated using the regression model shown in Equation 7:

$$\Lambda_i = \exp(a + bLn(AADT_i) + Ln(L_i)) \qquad \text{(Eq. 7)}$$

Where
Λ_i = the estimator for the average number of crashes per year for site i,
a, b = the coefficients in the regression model,
$AADT_i$ = the average daily traffic volume for site i,
L_i = the road length for site i, and
Ln = natural logarithm.

Table 3 shows the regression coefficients (a, b) used in Equation 7 for multi- and single-vehicle crashes.

One of the sign sites in Ohio provides an example of the detailed calculation of $M_{i,EB}$. This site is on an urban 4-lane divided highway segment in Allen County. As shown in Table 3, its intercept is -12.34 for multi-vehicle crashes and -5.05 for single-vehicle crashes, while the coefficients for the AADT are 1.36 and 0.47, respectively. For the analysis used in this report, a multi-vehicle crash is one involving two or more vehicles in the same collision.

Using the EB method, the analysis procedure to get the expected number of crashes in the before period has the following steps:

1. Identify the route number and milepost by the site's address. More specifically, the address of the example site is "1234 ABC St, Name of City, Allen County, OH." Follow the data analysis procedures discussed in Chapter 3 to identify that the route number is 657676309 and the milepost is 7.58.

Table 3. Coefficients for multi and single-vehicle crash regression model

Crash Type	Road Type*	Regression Coefficients		Dispersion Parameter (α)
		Intercept (a)	AADT (b)	
Multi-vehicle	2U	−15.22	1.68	0.84
	3T	−12.4	1.41	0.66
	4U	−11.63	1.33	1.01
	4D	−12.34	1.36	1.32
	5T	−9.7	1.17	0.81
Single-vehicle	2U	−5.47	0.56	0.81
	3T	−5.74	0.54	1.37
	4U	−7.99	0.81	0.91
	4D	−5.05	0.47	0.86
	5T	−4.82	0.54	0.52

Note: *U = undivided road, T = road with two-way left turn lane, D = divided road.

2. Based on the route number and milepost obtained above, use R statistical software to select the related crashes and road files from the HSIS dataset, which includes (1) the observed crashes near the target sign site, (2) the observed crashes in the control group sites (10 sites, which are adjusted to the target sign site on the same road), and (3) the target road file, such as traffic volume, the number of lanes, and median type. For example, the number of observed crashes at the example site is 1 in 2004, and the crash counts of the related 10 control group sites are 0, 0, 1, 1, 0, 0, 0, 0, 1, and 1. The AADT of the site is 19,753 (vehicles/day), and it has four lanes.
3. Use Equation 9 to predict the crash number of the example site:

   $$\hat{\Lambda}_{2004} = \exp(a + b(Ln(AADT)) + Ln(L)$$

   $$\hat{\Lambda}_{2004,\text{multi}} = \exp(-12.34 + 1.36 \times Ln(19753) + Ln(0.2)) = 0.61$$

   $$\hat{\Lambda}_{2004,\text{single}} = \exp(-5.05 + 0.47 \times Ln(19753) + Ln(0.2)) = 0.13$$

   $$\hat{\Lambda}_{2004} = \hat{\Lambda}_{2004,\text{multi}} + \hat{\Lambda}_{2004,\text{single}} = 0.74 \text{ (crashes/year)}$$

   The estimated crash counts of the site and its control group sites are 0.74 and 6.64, respectively (the estimated multi-and single crash counts of its control group are 5.36 and 1.28).
4. Due to using the SPFs from the HSM instead of the local SPFs from any existing studies conducted in the same study area, it is necessary to multiply the results by a calibration factor to adjust the prediction value (refer to Appendix A in the HSM for more details). The calibration factor of single-vehicle crashes at the example site in 2004 is 3.13, which is equal to the ratio of observed crashes in the control group divided by the predicted crash number in the control group (3.13 = (1×4+0×6)/1.28). By multiplying the above calibration factor, the final crash number estimation for the example site in 2004 should be 0.42 (=0.13×3.13). A calibration factor was calculated for each site and each year included in the study.

5. Repeat steps 3 and 4 to get the final prediction crash number for the example site for each year in the before period. By doing so, the estimated multi- and single-vehicle crash counts of the site in 2005 are 4.65 and 0.21, respectively. Using the summary of this prediction crash number and dispersion parameter (obtained from Table 3) results in the weights (*W*) for this site for the multi- and single-vehicle crashes, which are 0.07 and 0.65, respectively:

$$W = \frac{1}{1+\hat{\Lambda}_1 \times \hat{\alpha}}$$

$$W_{multi} = \frac{1}{1+(5.43+4.65)\times 1.32} = \frac{1}{1+10.08\times 1.32} = 0.07,$$

$$W_{\text{single}} = \frac{1}{1+(0.42+0.21)\times 0.86} = \frac{1}{1+0.63\times 0.86} = 0.65$$

6. Because traffic volume and other explanatory variables may change between the before and after periods, the researchers used one factor to account for this difference. The crash counts of the example site in 2007 and 2008 can be estimated by repeating steps 3 and 4. The estimated multi- and single-vehicle crash counts of the site in the after period are 0.84 and 0.67, respectively. Factors are estimated by:

$$r = \hat{\Lambda}_{after} \big/ \hat{\Lambda}_{before}$$

$$r_{i,multi} = (12.76/3)/(10.08/2) = 0.84$$

$$r_{\text{i,single}} = (0.63/3)\big/(0.63/2) = 0.67$$

Also, if the time periods (*Y*) of the before and after periods are different, one factor is needed to adjusted it. Here, the before and after period are both two years:

$$t_i = Y_{i,after} \big/ Y_{i,before} = 3/2 = 1.5$$

7. Using the EB method, the expected total number of crashes that would occur during the after period had the on-premise digital sign not been installed was 2.63:

$$\mathrm{M}_{\text{i,EB}} = \left[\mathrm{W} \times (\hat{\Lambda}_1) + (1-\mathrm{W}) \times (\sum_{\text{j=1}}^{\text{t}} N_{\text{ij1}}) \right] \times r_i \times t_i$$

$$\mathrm{M}_{\text{i,multi,EB}} = \left[0.07\times 10.08 + (1-0.07)\times 0\right] \times 0.84 \times 1.5 = 1.14$$

$$\mathrm{M}_{\text{i,single,EB}} = \left[0.65\times 0.63 + (1-0.65)\times 3\right] \times 0.67 \times 1.5 = 1.49$$

$$\mathrm{M}_{\text{i,all,EB}} = 1.14 + 1.49 = 2.63$$

8. The variance of the EB estimate at the example site is calculated by:

$$\mathrm{Var}(\mathrm{M}_{\text{1,EB}}) = (1-\mathrm{W}) \times \mathrm{M}_{1,EB} \times r_i \times t_i$$

$$\mathrm{Var}(\mathrm{M}_{\text{1,multi,EB}}) = (1-0.07) \times 1.14 \times 0.84 \times 1.5 = 1.31$$

$$\mathrm{Var}(\mathrm{M}_{\text{1,single,EB}}) = (1-0.65) \times 1.49 \times 0.67 \times 1.5 = 0.54$$

$$\mathrm{Var}(\mathrm{M}_{\text{1,all,EB}}) = 1.31 + 0.54 = 1.85$$

9. The safety index of the example site is:

$$\hat{\theta}_{EB} = \frac{\hat{\lambda}}{\hat{\pi}} = \frac{\sum_{i=1}^{n}\sum_{j=1}^{t} N_{ij2}^{T}}{\sum_{i=1}^{n}\sum_{j=1}^{t} M_{ij1}^{T}} = \frac{9}{2.63} = 3.43$$

10. The 95 percent confidence interval of the example site is given as.

$$\hat{\theta} \pm Z_{0.25}\sqrt{Var\left(M_{1,EB}\right)} = \left[3.43 \pm 1.96 \times \sqrt{1.85}\right] = \left[0.76, 6.10\right]$$

The same method was applied to other locations using the appropriate SPFs. The next chapter provides the final results of the completed safety analysis.

CHAPTER 5:
RESULTS

The previous chapter explained why the research team chose to use the EB analysis procedure and provided an example of how the EB analysis was conducted. The first section of this chapter provides the results of the before-after study for each state and all the states combined. The second section provides more details about how digital on-premise signs impact traffic safety for multi-vehicle and single-vehicle crashes. The third section provides a description of an analysis of variance of the means of the safety index (θ) among the different sign characteristics such as sign color, sign size, and type of business.

INDIVIDUAL AND COMBINED RESULTS

As described in Chapter 3, the research team acquired the sign dataset from sign manufacturers. However, many signs were excluded from the analysis because of missing information in the dataset provided by the sign manufacturers or limitations in the HSIS crash dataset. The researchers retained only sign sites satisfying the following conditions:

1. the sign was located in Washington, North Carolina, Ohio, or California;
2. the sign was installed in 2006 or 2007 in order to have adequate time in both the before and after analysis periods to compare crash histories; and
3. the sign was located on a major road because the HSIS crash dataset usually does not include crashes that are located on minor roads or private driveways.

Table 4 shows the progression in sample sizes based on sites meeting the conditions identified above. For example, the original dataset for Washington included 413 site addresses that might have an on-premise digital sign. In order to make sure there was an adequate before-after crash data period for further analysis, the researchers had to filter these site addresses. The first filter excluded sites where the sign was not installed in 2006 or 2007, which was needed so that there was adequate time before and after the sign was installed to perform the safety analysis. About 40 percent of the Washington sites (159 sites) met this criterion. Then, the research team used the Street View function in Google Maps to double-check whether a digital sign was present at the given addresses and whether the sign was on a major road since the HSIS crash dataset only included crashes on major roads. Only 33 sites fit this criterion. The result was that in Washington, the research team was able to use about 33 of the 400 original sites, giving an 8.0 percent yield on the raw data.

Chapter 3 mentions that the main advantage of this study is the large sample size of data and advanced statistical methods that provide more accurate results than in similar studies. Figure 4 shows the sample size of this study in relation to other published papers and reports. This study has 135 sites from four states, a number much higher than the sample size of other similar studies. Hence, the results of this study are more robust and accurate.

Table 4. Sign site sample size yield

Number of Sites	California	North Carolina	Ohio	Washington	All States
Included in original list from sign manufacturers	86	249	372	413	1,120
Sign installation time between 2006–2007	27	94	178	159	458
Digital signs & located on major roads	6	40	73	34	153
With HSIS crash data (all crashes)	6	33	63	33	135
Data yield rate	7.0%	13.3%	16.9%	8.0%	12.1%
With HSIS crash data (multiple-vehicle crashes)	6	31	61	33	131
With HSIS crash data (single-vehicle crashes)	6	32	63	33	134

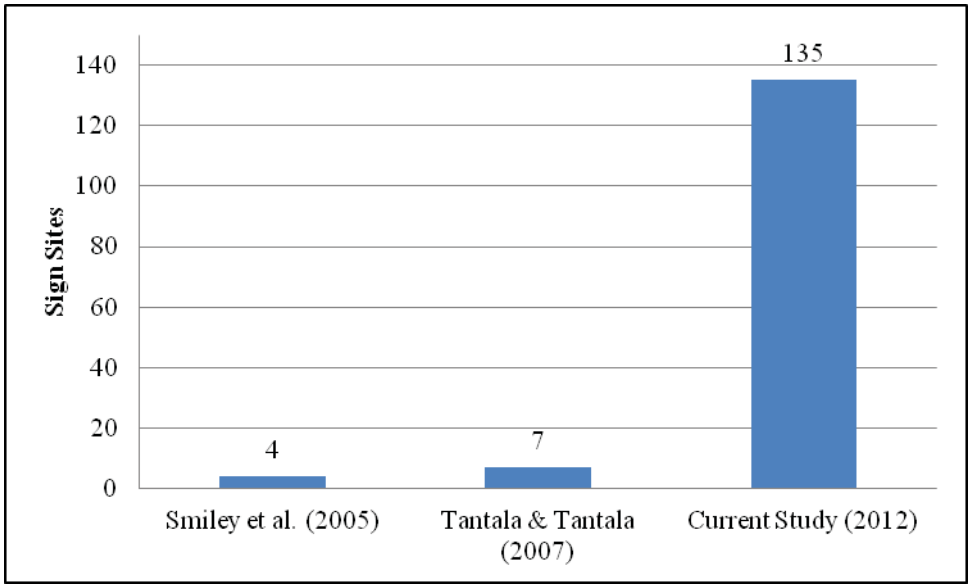

Figure 4. A comparison of sample sizes from similar studies

Table 5 presents the before-after results from the EB and the naïve statistical analysis methods. The naïve method results are provided only for comparison purposes as the naïve analysis method does not provide as meaningful results as the EB method. The results are also presented graphically in Figure 5. A safety effectiveness index (θ) of 1.0 indicates that there was no change in crashes between the before and after conditions. An index greater than 1.00 indicates that there was an increase in crash frequency in the after condition, while a value less than 1.00 indicates a decrease in crash frequency. The upper and lower bounds indicate the limits of statistical significance. If the value for θ is between the upper and lower bounds, then the change in crashes is not statistically significant at a 95 percent confidence level. A larger sample size usually leads to a smaller difference between the upper and lower bounds, but this may not always be the case since it is also governed by the variability observed in the data.

Table 5. Results of statistical analysis of before-after crash condition

State	EB Method			Naïve Method		
	Lower Bound	θ	Upper Bound	Lower Bound	θ	Upper Bound
California	0.00	1.25	2.53	0.28	0.85	1.41
North Carolina	0.87	1.14	1.41	0.88	1.13	1.39
Ohio	0.89	0.97	1.05	0.95	1.05	1.15
Washington	0.88	1.01	1.15	0.79	0.90	1.01
All states*	0.93	1.00	1.07	0.93	1.00	1.07

Notes: *"All states" represents the combined data of the four states.
Naïve method values provided for comparison purposes only.

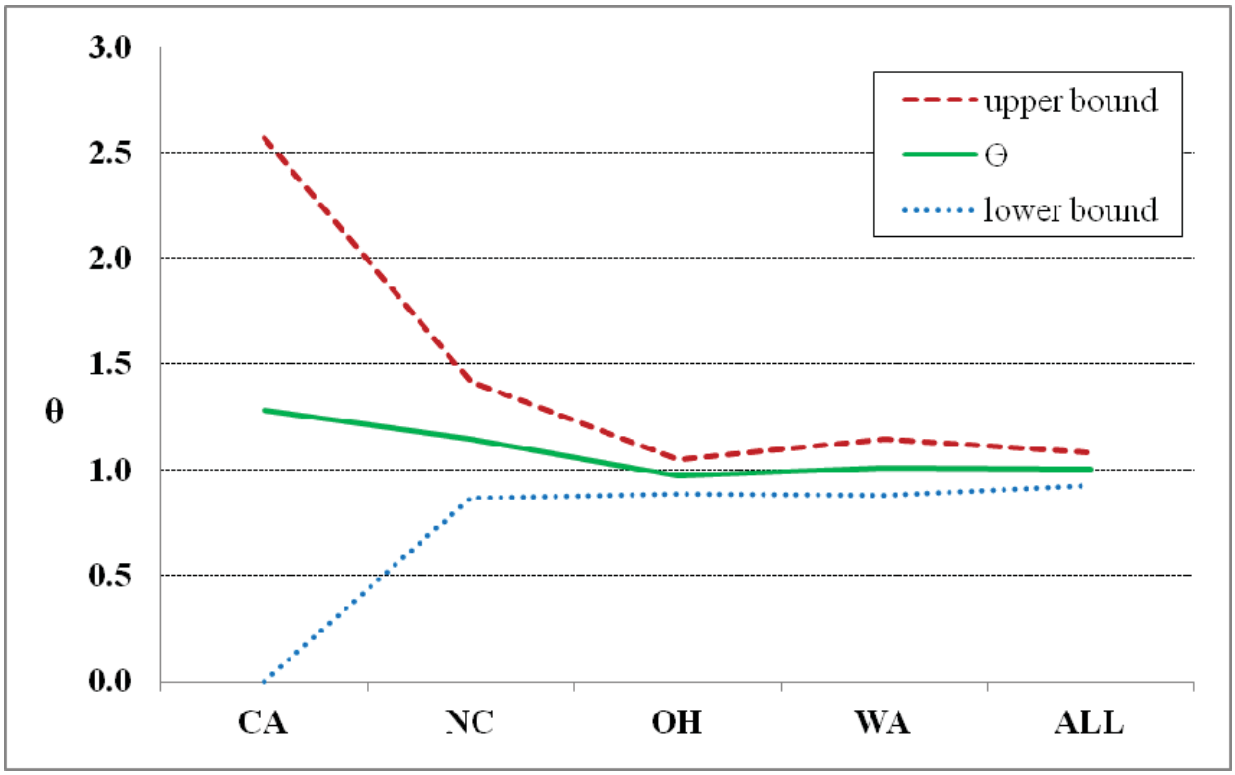

Figure 5. The safety effectiveness index and the 95 percent confidence interval for each state (all crash types)

The overall results show that there is no statistically significant increase in crash frequency after installing the on-premise digital sign because the safety effectiveness index (θ) for the entire dataset (all states) is 1.00, and the 95 percent confidence interval is 0.93–1.07 (which includes the index value of 1.00). The results for individual states are similar: no statistically significant safety impacts were observed after the installation of digital signs. In addition, one can see the width of the 95 percent confidence interval is largest for the California data. This is due to the variability of the California data and the small size of the sample set (only 6 sites). Comparing the width of the confidence intervals, from the widest to narrowest, the order is California > North Carolina > Washington > Ohio > All States.

RESULTS FOR CRASHES RELATED TO MULTIPLE AND SINGLE VEHICLES

The next analysis effort evaluated the possible safety impacts of on-premise digital signs on different types of crashes. There are several common methods to group crashes into different categories, such as the number of related vehicles, the injury levels, the collision types, and so on. Such groupings may provide some insight into the safety impacts of specific crash types, but the estimated impacts might not be precise because of a smaller sample size.

The additional analysis separated crashes into two subgroups: single- and multi-vehicle crashes. All calculations and notations were the same as used previously. By using the EB method to analyze crash data related to multiple vehicles, the researchers determined that the safety effectiveness index is equal to 1.00 for all states, and the 95 percent confidence interval varies between 0.96 and 1.21. Because the confidence interval of the safety effectiveness includes 1.00, there is no statistically significant change in crash frequency after installing the on-premise digital sign. Figure 6 graphically illustrates the results for multi-vehicle crashes. The 95 percent confidence intervals are slightly larger in this figure than in Figure 5.

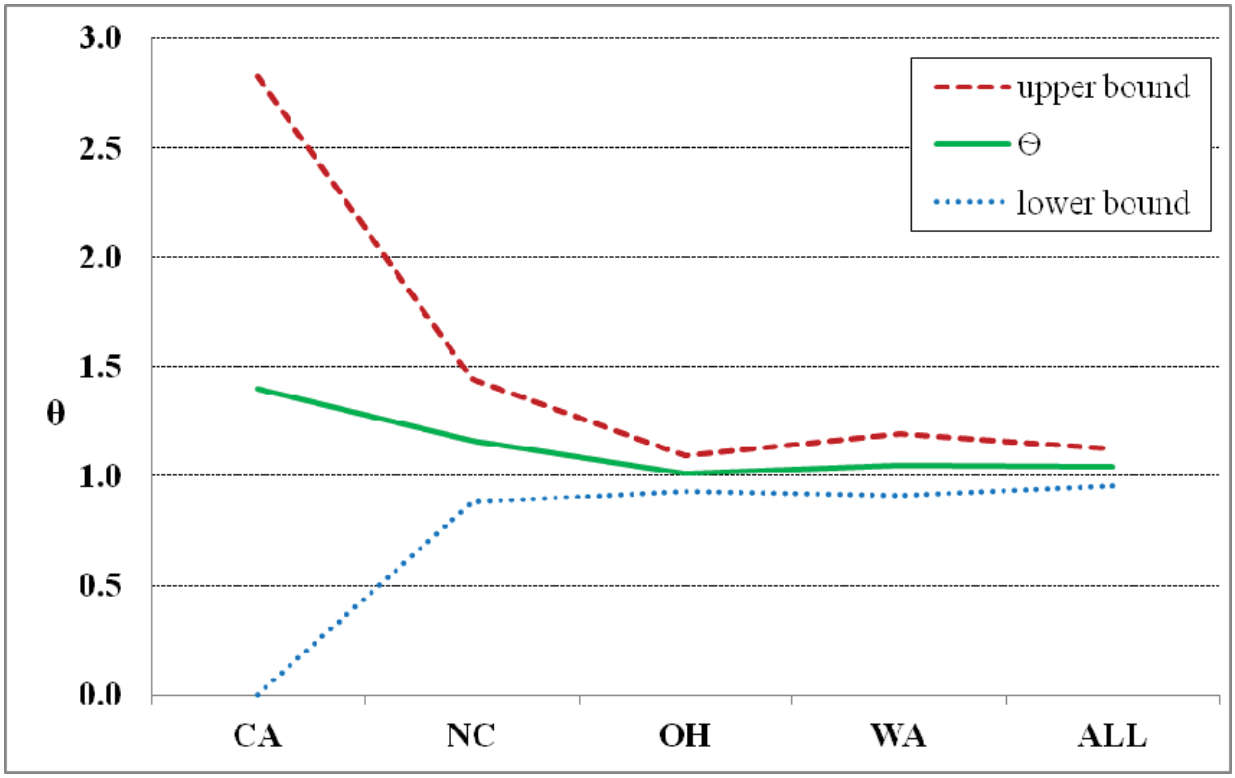

Figure 6. The safety effectiveness index and the 95 percent confidence interval for each state (multi-vehicle crashes)

The results for single-vehicle crashes are presented in Figure 7. The overall results are the similar: there are no statistically significant safety impacts from digital signs, except for California. The California results for single-vehicle crashes indicate a statistically significant decrease in crash frequency in the after period. Although the before-after results of California show a decrease in the after period, it does not affect the overall result because the low sample

size (6 sites) makes it more difficult to establish statistical significance in the analysis results. It is also worth noting that the North Carolina data has the largest confidence interval, due to the variability in the North Carolina single-vehicle crash data.

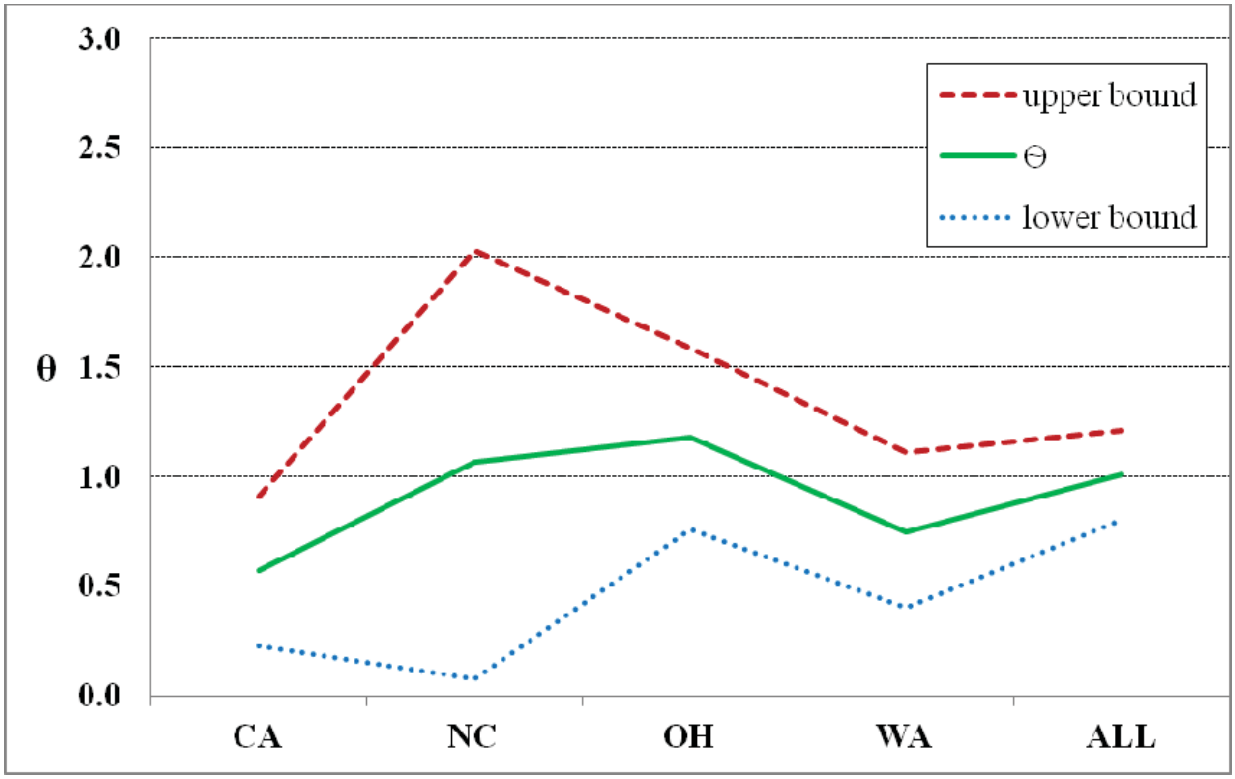

Figure 7. The safety effectiveness index and the 95 percent confidence interval for each state (single-vehicle crashes)

RESULTS FOR CRASHES RELATED TO DIFFERENT TYPES OF SIGNS

The research team also conducted an analysis to investigate the impacts of specific on-premise digital sign characteristics on the safety impacts of those signs. Specific sign characteristics that the research team evaluated included color (single or multi-color), size (small, medium, or large), and type of business. The research team used the analysis of variance (ANOVA) analysis method to evaluate whether the means of the safety index (θ) among the different characteristics of signs are equal.

An ANOVA is one of the most common statistical methods used to compare two or more means in the analysis of experimental data. In short, ANOVA provides a statistical test of whether or not the means of multiple groups are all equal, while a t-test is suitable only for the two-group case because doing multiple two-sample t-tests would increase the risk of a Type I error (for datasets containing more than 30 observations). In addition, when there are only two means to compare, the t-test and the ANOVA are equivalent. As a result, the research team chose the one-way ANOVA as the study tool to simplify the methodology, although some digital sign characteristics, such as sign color, have only two subgroups (i.e., single color and multi-color).

The theory of an ANOVA test is to separate the total variation in the data into a portion due to random error (sum of squares for error [SSE]) and portions due to the treatment (total sum of squares [SST]). Table 6 shows the typical form of a one-way ANOVA table. If the calculated F value (= treatment mean square [MST] / error mean square [MSE]) is significantly larger than F (k-1, N-k), the null hypothesis is rejected. F (k-1, N-k) is the critical value when the means of each group are equal. Most statistic software will also provide the corresponding p-value for researchers making their decisions in different confidence intervals.

Table 6. The typical form of a one-way ANOVA table

Source	SS	DF	MS	F	P(>F)
Treatments	SST	k-1	SST / (k-1)	MST/MSE	
Error	SSE	N-k	SSE / (N-k)		
Total (corrected)	SS	N-1			

Notes: *SS* = sum of squares, *DF* = degrees of freedom, *MS* = mean of sum of squares, *F* = F-distribution (because the test statistic is the ratio of two scaled sums of squares, each of which follows a scaled chi-squared distribution), *P(>F)* = the p-value when the F value (= MST/MSE) is larger than F (k-1, N-k), *k* = number of treatments, and *N* = total number of cases.

There are three data assumptions for applying the ANOVA method:

1. Independence: The study data are independently, identically, and normally distributed.
2. Normality: The distributions of the data or the residuals are normal. This assumption is true when the sample size is larger than 30.
3. Homogeneity of variability: Equality of variances — the variance of data between groups — should be the same.

If the above conditions do not exist, the ANOVA results may not be reliable. However, if the sample size of each group is similar, one can usually ignore independence and homogeneity problems. Or statisticians may transform data (such as into the logarithmic form) to satisfy these assumptions of the ANOVA.

Based on the existing sign dataset, the research team focused on three digital sign characteristics: color (single color or multi-color), sign dimension (small, medium, or large), and business type (restaurants, pharmacies and retail stores, hotels, gas stations, auto shops, or others). The definitions of sign dimension level are based on the balance principle (making the sample size of each group equal). Figure 8 shows the distribution of signs as a function of different dimensions, and the research team defined signs with an area less than 10 ft^2 as small signs. The medium sign size had an area of at least 10 ft^2 but no more than 15 ft^2, and the large sign size had an area greater than 15 ft^2. The sign size represents the area of the electronic display, not the overall size of the complete sign. It was estimated from the Street View image in Google Maps and may not be an accurate assessment of the sign dimensions.

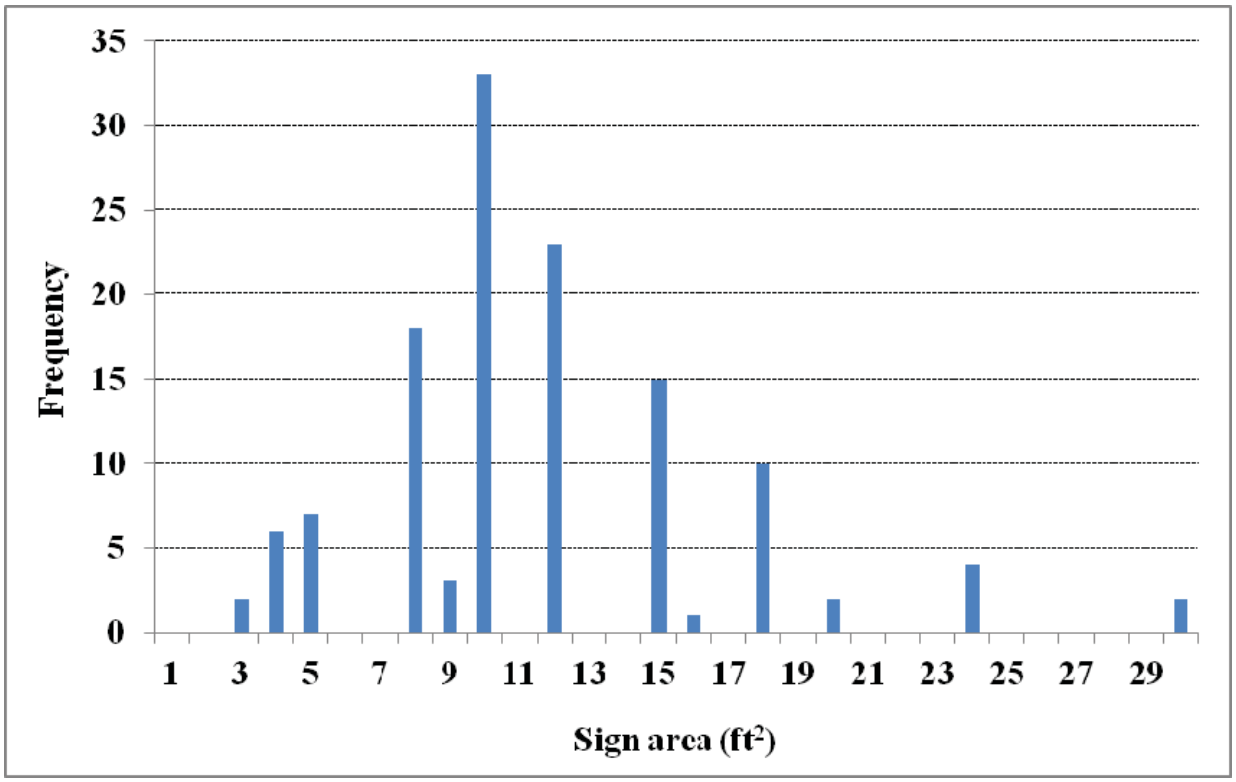

Figure 8. The histogram of digital signs for each sign dimension

Using the ANOVA method to analyze crash data related to specific design characteristics of the sign led to the conclusion that there is no statistically significant difference among the population means of the safety effectiveness index. The following descriptions provide more detail for each of the digital sign characteristics:

- **Color:** According to images obtained from the Street View feature of Google Maps, 89 signs are single-color signs, and 37 signs are multi-colored signs. Table 7 shows the ANOVA results. The test statistic (F value) is 2.07, and its p-value is 0.1527. Because the probability is larger than the critical value (0.05 for 95 percent confidence interval), the null hypothesis of equal population means cannot be rejected. In other words, the ANOVA table shows no significant difference between the mean of safety index (θ_{EB} = crash mean in the before period/crash mean in the after period) among signs having a single color or multiple colors.
`

Table 7. Analysis of variance table (color)

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
Group	1	4.464	4.4640	2.0704	0.1527
Residuals	124	267.352	2.1561		

- **Sign dimensions:** In the final sign dataset, 36 signs have a sign area less than 10 ft^2, 56 signs have a sign area 10–15 ft^2, and 34 signs have a sign area greater than 15 ft^2. In Table 8, the F value is 0.7767, and its p-value is 0.4622. Because the probability is larger

than the critical value (0.05 for 95 percent confidence interval), the null hypothesis of equal population means cannot be rejected. Accordingly, researchers conclude that there is no (statistically) significant difference among the population means.

Table 8. Analysis of variance table (sign dimension)

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
Group	2	3.39	1.6950	0.7767	0.4622
Residuals	123	268.43	2.1823		

- **Business type:** In the final sign dataset, 7 signs are for restaurants, 18 for pharmacies and retail stores, 3 for hotels, 3 for gas stations, 7 for auto shops, and 84 for other business types. Based on Table 9, the F value is 0.5401, and its p-value is 0.7455. As with the above types, the null hypothesis of equal population means cannot be rejected because the p-value is much larger than the critical value (0.05). The sample size of some business type groups is less than 30, so the research team combined all categories of business types with less than 20 samples into one large group, the "other" category. The resulting ANOVA analysis (Table 10) provides similar results: there is no significant difference among the population means.

Table 9. Analysis of variance table (six business types)

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
Group	5	5.983	1.1966	0.5401	0.7455
Residuals	120	265.833	2.2153		

Table 10. Analysis of variance table (two business types)

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
Group	1	0.728	0.7289	0.333	0.5649
Residuals	123	271.088	2.18619		

IMPACT OF SIGN HOLD TIME

As an additional effort for this research effort, the research team worked with members of the SFI advisory panel to identify the potential impact of hold time on the relationship between on-premise digital signs and traffic safety. One of the advantages of digital signs is the ability to change the displayed message. The minimum length of time that a message must be displayed is often an element of local sign codes because some believe that frequent changing of sign messages can increase driver distraction and lead to increased crashes. Because the researchers were working with a large number of individual sites and crash records for the after period that spanned two years, it was not possible within the available resources of this project to determine what message(s) were displayed at the time of a crash or the hold time used at a particular site at the time of a crash.

As a surrogate for including hold times as part of the individual site characteristics, the research team acquired information for the hold time regulations in the jurisdictions where the signs were

located. The 135 sign sites were located in 108 jurisdictions. A member of the SFI advisory panel contacted these jurisdictions and was able to identify hold time regulations for 66 of them. The hold time regulations of these 66 jurisdictions are summarized in Table 11. Input from the advisory panel indicated that when a jurisdiction has no statutory language regarding digital sign hold times, it most often means that sign users are able to program their sign to change messages as often as they see fit. In some cases, it could mean that the state standard for digital signs applies, which ranges from 6 to 8 seconds in the four states included in the analysis.

Table 11. Summary of sign hold times

Minimum Hold Time	Number of Jurisdictions
2–6 seconds	14
7–10 seconds	12
20 seconds	3
1–60 minutes	2
24 hours	2
Variance required*	4
No specific restriction	29
Total	66

* Hold times were established by variance on a case-by-case basis.

CHAPTER 6:
SUMMARY AND CONCLUSIONS

While there have been significant amounts of research devoted to the safety impacts of geometric design features and other aspects of the publicly owned transportation infrastructure, the same cannot be said about research on the safety impacts of privately owned signs that are directed to users of public roads. This research effort focused on addressing the safety impacts of on-premise digital signs. Previous research by others has documented the safety effects of on- and off-premise digital signs and their potential influence on crash risk to some extent. However, the results of recent crash studies are not consistent, and most studies have some important weaknesses, such as neglecting biases related to the regression-to-the-mean effects, low statistical power, and analysis results based on erroneous assumptions. In addition, Molino et al. (2009) report that the results from these studies are not comparable because of their different study methods, statistical powers, and cares of execution, which affected the quality of the research.

The research effort described in this report examined the safety impacts of on-premise digital signs using a large sample size of data and advanced statistical methods that provide more accurate results than previous studies. With the help of sign data provided by sign-manufacturing companies and crash data obtained from the Federal Highway Administration Highway Safety Information System, the research team obtained extensive datasets for signs and crashes in four states. The research team began the safety analysis with 1,120 potential study sites, but only 135 sites were usable due to limitations related to the individual signs or the related crash data. Although the yield of usable data was only 11.3 percent, the final sample size of 135 sites was much higher than the sample size of other published papers and reports related to on- and off-premise signs, indicating the results of this research are more robust and accurate.

The research team used the empirical Bayes (EB) statistical analysis method, which is the method recommended in the *Highway Safety Manual*, to conduct the safety analysis described in this report. The *Highway Safety Manual* is a recently published document that is recognized within the transportation profession as the authoritative document for analyzing the safety impacts of various transportation improvements or treatments. The EB analysis procedure uses a before-after approach, with the before and after values modified to address local safety characteristics, regression to the mean, and other factors. The EB method reports the safety impacts through the use of a safety index indicator (represented by θ). A value greater than 1 indicates an increase in crashes, and a value less than 1 indicates a decrease in crashes from the before to the after period. However, for the results to be statistically significant, the θ value must be outside the limits of the 95 percentile confidence interval.

For the entire sample size of 135 sites, the results from the EB method show that there is no statistically significant change in crash frequency associated with installing on-premise digital signs because the safety effectiveness index (θ) is determined to be 1.00, and the 95 percent confidence interval is equal to 0.93 to 1.07 (which includes 1.00, indicating no statistically significant change). The research team also conducted the analysis for each of the four individual states and obtained the same results: there are no statistically significant safety impacts from

installing on-premise digital signs. In addition, the researchers analyzed the safety impacts related to both single- and multi-vehicle crashes. The results for these analyses were also the same: there is no statistically significant increase in crashes associated with the installation of on-premise digital signs. Chapter 5 includes plots that illustrate the safety index values and confidence intervals for all of these results. As a final analysis, the research team performed an ANOVA to evaluate whether the means of the safety index (θ) varied as a function of sign factors (color, size, and type of business). The color analysis evaluated whether there was a difference in the means of the safety index for single- and multi-colored signs, and the results did not find a difference. The size analysis divided the signs in the study into three categories (<10 ft^2, 10–15 ft^2, and >15 ft^2), and the results did not find a difference. Signs were also categorized by the type of business (restaurants, pharmacies and retail stores, hotels, gas stations, auto shops, and others). Once again, there were no differences in the means. Overall, the ANOVA analysis did not identify any factor that led to an increase or decrease in traffic safety for the subcategories evaluated in the ANOVA.

Based on the analysis performed for this research effort, the authors are able to conclude that there is no statistically significant evidence that the installation of on-premise signs at the locations evaluated in this research led to an increase in crashes.

CHAPTER 7:
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APPENDIX A:
STEP-BY-STEP INSTRUCTIONS FOR STUDENTS TO RECORD SIGN DATA

1. Open one SFI sign dataset (e.g., "Washington_2006-2007.xls"). This dataset includes about 150 signs located in the state of Washington during 2006–2007.
2. Input the address information (such as Primary Street Address, City, ZIP Code, County Name, and State) of each sign in Google Maps and use the Street View function to identify the target signs. Please see this link, http://maps.google.com/help/maps/starthere/index.html#streetview&utm_campaign=en&utm_medium=et&utm_source=en-et-na-us-gns-svn&utm_term=gallery, for a demo about how to use the Street View. If you did not find any on-premise digital signs near this site, please make a note in Table 12. Check the characteristics of each sign (including colors, dimensions, and business types) and fill out Table 12. Then, use the "Print Screen" button to copy each sign's picture, and paste it in this document (such as Figure 9). The different business types are classified as (1) Restaurant, (2) Pharmacy and Retail Store, (3) Hotel, (4) Gas Station, (5) Auto Shop, and (6) Other.

Table 12. Example work table of site data collection procedure

Sign ID	Address	Installation Date	Google Maps				Google Earth				Note
			Picture	Color (Single/ Multi.)	Dimension (Estimated)	Business Type	County ID	Route #	Distance	Mile-post	
79016	19330 N US HIGHWAY 101 Shelton 98584 Mason County, WA	2006/9/15	Fig 2	S	3 ft × 6 ft	6	Mason (23)	101	19.3	335.72	

3. Then, use Google Earth to determine the county and route number, and to measure the distance between the closet county boundaries and sign location along the route (recorded in the distance column). The corresponding ID for county and route number is based on the HSIS data manual (file name: guidebook_WA[1].pdf). Then, estimate the milepost value of the sign by the distance and the milepost of the route in the boundaries (based on the HSIS road file, such as wa04road.xls). Take Figure 10; for example, the end mile point of Highway 101 in the county boundary is 355.18, and the distance between the sign and the county boundary is 19.3; so, the milepost of our sign is 335.72. Generally, the milepost value increases from south to north and from west to east. However, the best way to check it is to compare the value of the milepost of adjusted counties. For example, the milepost of US 101 in Mason County is 313.96~355.18, and the milepost of US 101 in Thurston County (located south of Mason) is 355.18~365.56. So, it is known that the mileposts increase from north to south in Mason County. The above variables will be used in the R software to select target crashes from HSIS crash datasets.
4. Write down any questions or comments in the note column. Feel free to ask us if you have any questions.

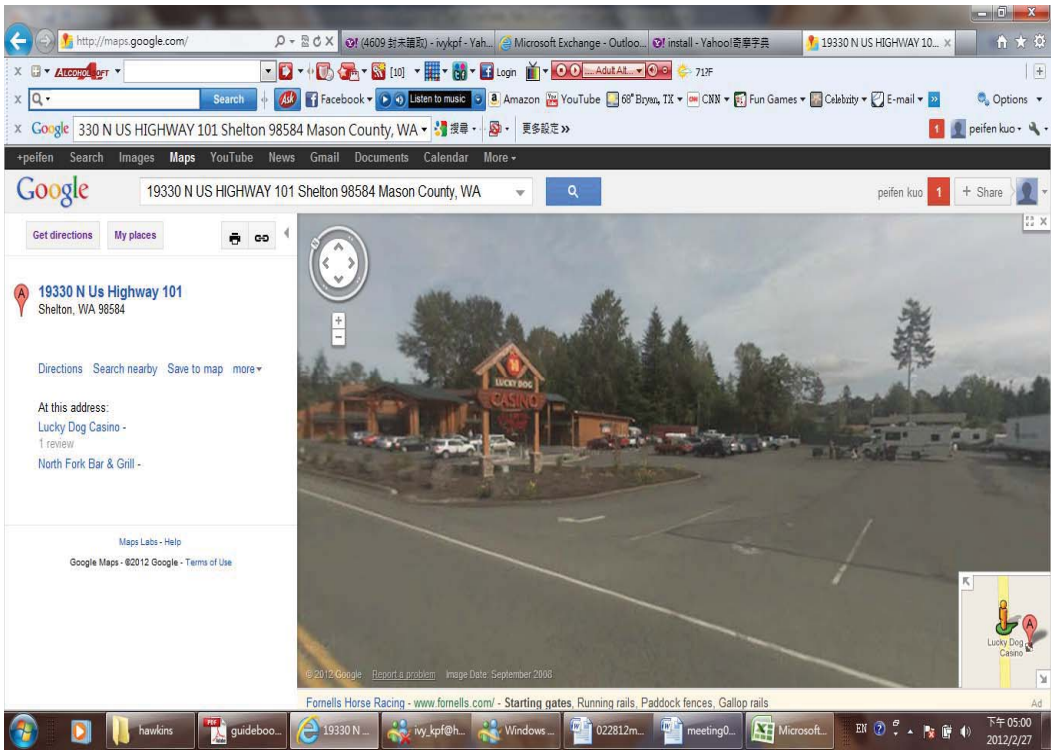


Figure 9. Example screenshot of Google Maps

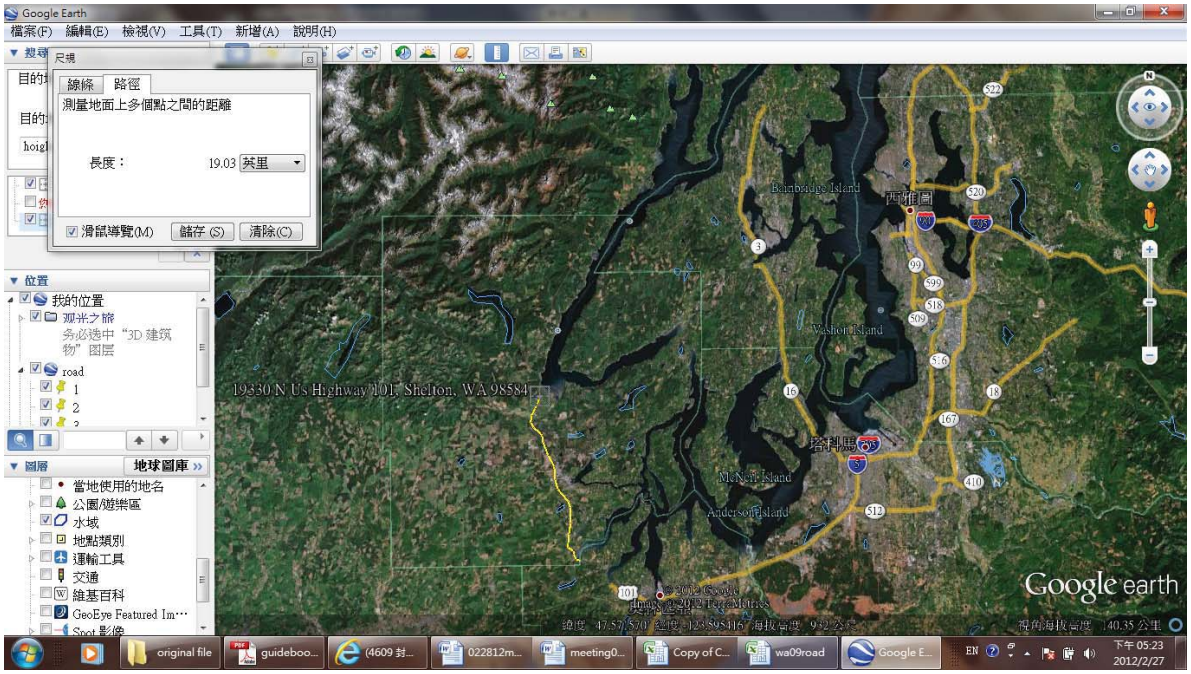


Figure 10. Example screenshot of Google Earth

APPENDIX B:
STATISTICAL SYMBOLS

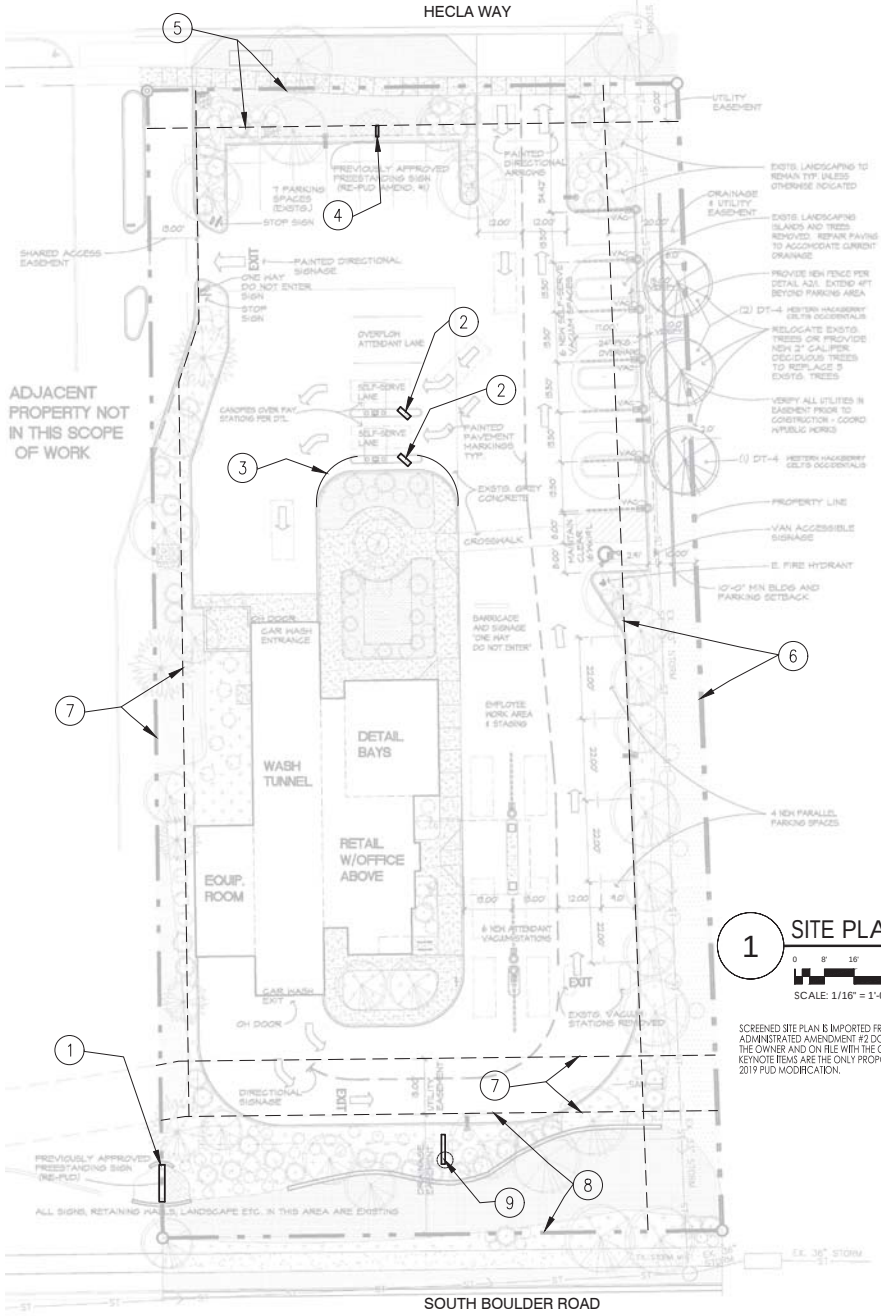
The following statistical symbols are used throughout this report.

θ = the safety effectiveness, $0 < \theta \leq 1$ (can be theoretically higher, but not in this study).
n = the sample size.
α = the dispersion parameter (of the negative binomial model).
t = the time period.
$\hat{\theta}_{CS}$ = the estimate of safety effectiveness by using the CS method.
$\hat{\theta}_{naive}$ = the estimate of safety effectiveness by using the naïve method.
$\hat{\theta}_{CG}$ = the estimate of safety effectiveness by using the control group method.
$\hat{\theta}_{EB}$ = the estimate of safety effectiveness by using the EB method.
$\hat{\lambda}$ = the estimated number of crashes for the treatment group in the after period.
$\hat{\pi}$ = the estimated number of crashes for the treatment group in the before period.
$\hat{\nu}$ = the estimated number of crashes for the control group in the after period.
$\hat{\mu}$ = the estimated number of crashes for the control group in the before period.
N_{ij1}^{T}, N_{ij1}^{C} = the observed responses for site i (T = treatment group and C = control group) and year j (in the before period).
N_{ij2}^{T}, N_{ij2}^{C} = the observed responses for site i (T = treatment group and C = control group) and year j (in the after period).
M_{ij1} = the expected responses for site i for the EB method,

$$\mathrm{M}_{\mathrm{ij1}} = \mathrm{W} \times (\hat{\Lambda}_1) + (1 - \mathrm{W}) \times (\sum_{\mathrm{j=1}}^{\mathrm{t}} N_{\mathrm{ij1}}).$$

W = the weight for sites for the EB method, $W = \dfrac{1}{1 + \hat{\Lambda}_1 \times \hat{\alpha}}$.

$\hat{\Lambda}_1$ = the estimate for the average crash rate of all sites in the before period.
$\hat{\alpha}$ = the estimate of the dispersion parameter (from the negative binomial model).



1 SITE PLAN

SCALE: 1/16" = 1'-0"

SCREENED SITE PLAN IS IMPORTED FROM THE 2017 PUD ADMINISTRATED AMENDMENT #2 DOCUMENTS AS PROVIDED BY THE OWNER AND ON FILE WITH THE CITY OF LOUISVILLE, CO. KEYNOTE ITEMS ARE THE ONLY PROPOSED CHANGES WITH THIS 2019 PUD MODIFICATION.

PLANNED UNIT DEVELOPMENT P.U.D. AMENDMENT #3

Project Data

PROJECT: P.U.D. AMENDMENT - SITE SIGNAGE MODIFICATIONS
ZONING: PLANNED COMMUNITY COMMERCIAL
LOT SIZE = 45,687 SF
USE: CAR WASH
LEGAL: LOT 6, LOUISVILLE PLAZA SUBDIVISION, FILING No. 2
LOUISVILLE, COLORADO
COUNTY: BOULDER COUNTY

Project Team

OWNER: **ROBERT KEARNEY**
SPEEDY SPARKLE CAR WASH - LOUISVILLE
549 N. 4th STREET
BERTHOUND, COLORADO 80513
970-532-4243 - phone
robert@colorsonline.com

ARCHITECT PLANNER: **CWA - CW ASSOCIATES, PLLC**
672 WEST PINE STREET
LOUISVILLE, COLORADO 80027
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CONTACT - CHIP WEINCEK, AIA
chip@cwa-architect.com

SURVEY: **FLATIRONS, INC.**
BOULDER, COLORADO
303-936-6997 - phone

PLANNING: **CITY OF LOUISVILLE**
PLANNING DEPARTMENT
749 MAIN STREET
LOUISVILLE, COLORADO 80027
303-335-4594 - PHONE
CONTACT - FELICITY SELVOSKI, PLANNER
fselvoski@louisvilleco.gov

Signatures

Ownership Signature Block

By signing this PUD, the owner acknowledges and accepts all the requirements and intent set forth in this PUD. Witness my/our hand(s) seal(s) this ___ day of _____ 20___.

_____
Owner Name and Signature

_____ (Notary Seal)
Notary Name (print)

_____
Notary Signature

My Commission Expires _____

Clerk and Recorder Certificate (County of Boulder, State of Colorado)

I hereby certify that this instrument was filed in my office at _____ o'clock, ____ M., this _____ day of _____, 20____, and is recorded in Plan File _____. Fee _____ paid _____ Film No. _____ Reception _____.

_____
Clerk & Recorder

_____
Deputy

Planning Commission Certificate

Approved this ___ day of _____, 20___, by the Planning Commission of the City of Louisville, Colorado.
Resolution No _____ Series _____

City Council Certificate

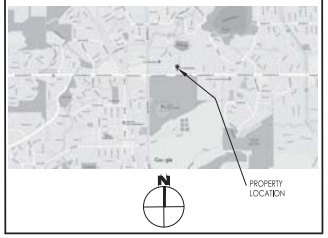
Approved this ___ day of _____, 20___, by the City Council of the City of Louisville, Colorado.
Resolution No _____ Series _____

_____ (City Seal)

_____
Mayor Signature

_____
City Clerk Signature

Vicinity Map



KEYNOTES:

1. EXISTING AND MODIFIED PROPOSED SOUTH BOULDER ROAD MONUMENT SIGN. EXISTING SIGN WAS APPROVED WITH THE KING SOOPER CITY OF LOUISVILLE PUD PLAN AMENDMENT 2011. REFERENCE THE ATTACHED DETAIL 1/A2.0 FOR THE APPROVED SIGN AND THE PROPOSED SIGN DESIGN.
2. EXISTING/PROPOSED MENU SIGNS. REFERENCE THE ATTACHED DETAIL 2 & 2a/A2.1 FOR THE EXISTING/ PROPOSED SIGN DESIGN.
3. AS-BUILT EXISTING CURB LOCATION.
4. PROPOSED HECLA WAY MONUMENT SIGN. REFERENCE DETAIL 1 & 2/A2.2 FOR THE APPROVED SIGN DESIGN AND NEW PROPOSED SIGN DESIGN.
5. 10' UTILITY EASEMENT - SEE SURVEY.
6. 20' DRAINAGE EASEMENT AND ACCESS EASEMENT - SEE SURVEY.
7. UTILITY EASEMENT - SEE SURVEY.
8. UTILITY AND DRAINAGE EASEMENT - SEE SURVEY.
9. NEW SPEEDY SPARKLE CAR WASH SOUTH BOULDER MONUMENT SIGN. SEE DETAIL 1&1a/A2.1. REMOVE ONE EXISTING BUSH FOR NEW SIGN.

NOTES:

1. PLANNED UNIT DEVELOPMENT (P.U.D.) CAR WASH HISTORY:

   BLACK DIAMOND CAR WASH PUD
   5 SEPT 2000
   RES. 55 SERIES 2000
   RECEPTION NO. 2126651

   BLACK DIAMOND CAR WASH ADMIN PUD
   30 MAY 2001
   RECEPTION NO. 2160401

   BLACK DIAMOND CAR WASH ADMIN 2 PUD
   28 SEPT. 2017
   RECEPTION NO. 03617546

2. PLANNED UNIT DEVELOPMENT (P.U.D.) KING SOOPERS FUELING STATION; PUD APPROVAL - OCTOBER 2010. FOR SOUTH BOULDER MONUMENT SIGN.
3. THESE ARE PLANNING DOCUMENTS. CONSTRUCTION DOCUMENTS NOT INCLUDED.

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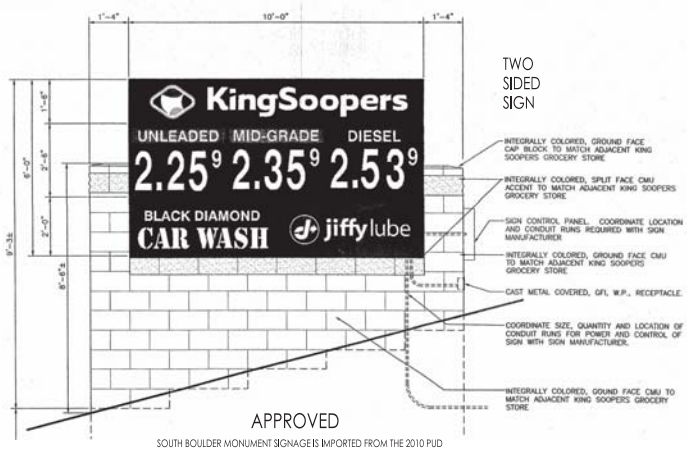
No	Date	Revisions
1	11-26-18	Progress Set
2	12-11-18	Progress Set
3	1-15-19	PUD Submittal
4	5-20-19	PUD Modification
5	6-4-19	PUD Amen. #3 Modifications

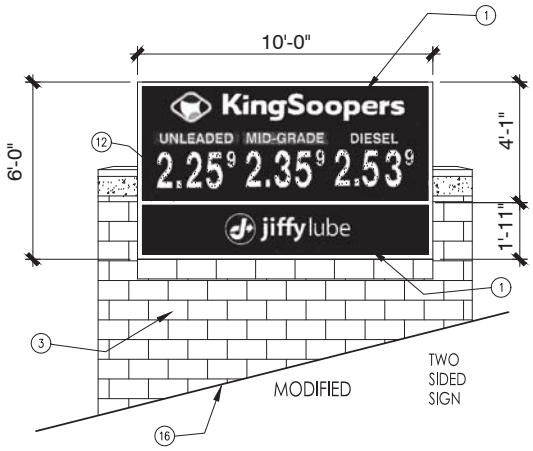
SPEEDY SPARKLE CAR WASH
1414 Hecla Way
Louisville, Colorado 80027
TITLE
COVER SHEET & SITE PLAN

Date:	11-26-18
CWA #	18021
Drawn:	CWA
Checked:	CW
Phase:	PUD AMENDMENT
Sheet:	A1.0



APPROVED

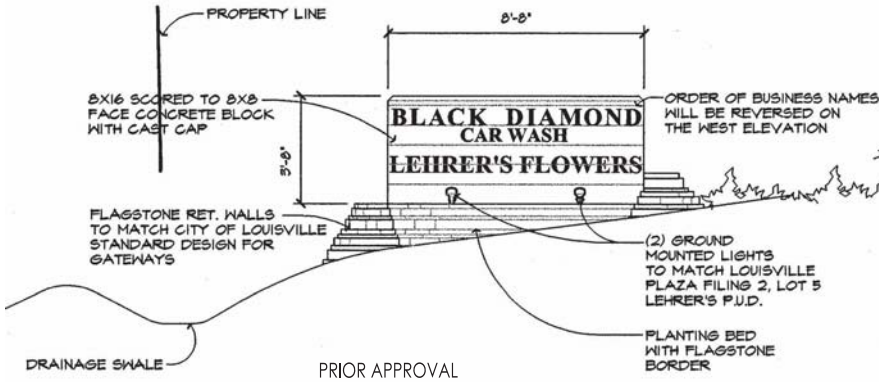
SOUTH BOULDER MONUMENT SIGNAGE IS IMPORTED FROM THE 2010 PUD DOCUMENTS AS APPROVED BY THE CITY AND ON FILE WITH THE CITY OF LOUISVILLE, CO. SIGNAGE IS WHAT IS CURRENTLY BUILT AT THE SITE.



1 SB RD MONUMENT SIGN

0 1' 2' 4'

SCALE: 1/2" = 1'-0"



PRIOR APPROVAL

SIGNAGE IS IMPORTED FROM THE 2000 PUD DOCUMENTS AS PROVIDED BY THE OWNER AND ON FILE WITH THE CITY OF LOUISVILLE, CO. NOT BUILT.

2 SB RD MONUMENT SIGN - Original Approval

0 1' 2' 4'

SCALE: 1/2" = 1'-0"

KEYNOTES:

1. EXISTING SIGN BOX WITH CHANGEABLE ILLUMINATED SIGN FACES.
2. NEW SIGN BOX WITH LED SIGNAGE READOUT SCREEN.
3. EXISTING BASE TO REMAIN.
4. METAL PLATE WITH FULL COVER PRINTED GRAPHICS .
5. METAL SIGN BOX - ILLUMINATED .
6. STEEL I-BEAM SUPPORTS PAINT TO MATCH METAL ON BUILDING.
7. METAL FACE-LIT CHANNEL LETTERS - TYPICAL.
8. METAL FACE-LIT CHANNEL SIGN BOX - ILLUMINATED .
9. METAL CABINET SIGN BOX WITH FULL COVER PRINTED GRAPHICS.
10. METAL BASE PLATE.
11. METAL BASE PLATE COVER.
12. LED GAS PRICE READOUT SCREEN.
13. POURED CONCRETE FOUNDATION.
14. NEW SIGN BOX WITH CHANGEABLE ILLUMINATED SIGN FACES.
15. METAL BASE BOX PLATE.
16. GRADE.
17. APPROXIMATE LOCATION/SIZE OF HECLA WAY MONUMENT SIGN.
18. APPROXIMATE LOCATION/SIZE OF NEW SPEEDY SOUTH BOULDER MONUMENT SIGN.
19. EXISTING SOUTH BOULDER MONUMENT SIGN.

NOTES:

1. SIGN MANUFACTURE WILL BE RESPONSIBLE FOR FINAL SIGN PANEL DESIGN, PERMIT AND CONSTRUCTION.

CWA

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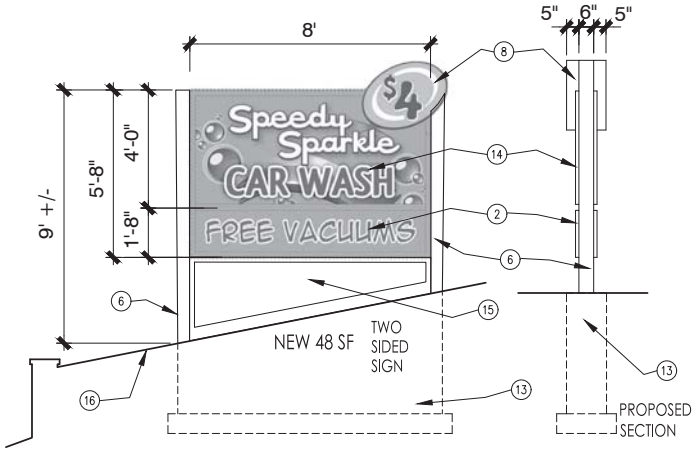
No	Date	Revisions
1	11-26-18	Progress Set
2	12-11-18	Progress Set
3	12-19-18	SB Monument LED
4	12-27-18	SB Monument King Soopers
5	12-28-18	SB Monument King Soopers
6	1-15-19	PUD Submittal
7	5-20-19	PUD Modification
8	5-28-19	PUD Modification
9	6-4-19	PUD Amen. #3 Modifications

SPEEDY SPARKLE CAR WASH
1414 Hecla Way
Louisville, Colorado 80027

TITLE: SIGNAGE

Date:	11-26-18
CWA #	18021
Drawn:	CWA
Checked:	CW
Phase:	PUD AMENDMENT
Sheet:	A2.0



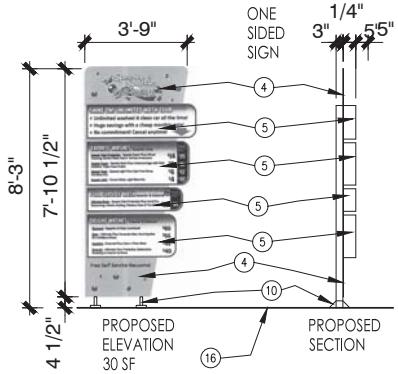
1 SB ROAD MONUMENT SIGN - SPEEDY

0 1' 2' 4'
SCALE: 1/2" = 1'-0"

SIGNAGE PROVIDED BY THE OWNER. DESIGN BY SCHLOSSER SIGNS, INC LOVELAND COLORADO 80538

1a SB ROAD - SPEEDY

PROPOSED PRELIMINARY SIGN SHOWED IN APPROXIMATE SIZE/LOCATION IN EXISTING PHOTO.



2 DRIVE-UP MENU SIGN

0 1' 2' 4'
SCALE: 1/2" = 1'-0"

SIGNAGE PROVIDED BY THE OWNER. DESIGN BY SCHLOSSER SIGNS, INC LOVELAND COLORADO 80538

2a DRIVE-UP MENU SIGNS

SIGNS SHOWN AS-BUILT

KEYNOTES:

1. EXISTING SIGN BOX WITH CHANGEABLE ILLUMINATED SIGN FACES.
2. NEW SIGN BOX WITH LED SIGNAGE READOUT SCREEN.
3. EXISTING BASE TO REMAIN.
4. METAL PLATE WITH FULL COVER PRINTED GRAPHICS .
5. METAL SIGN BOX - ILLUMINATED .
6. STEEL I-BEAM SUPPORTS PAINT TO MATCH METAL ON BUILDING.
7. METAL FACE-LIT CHANNEL LETTERS - TYPICAL.
8. METAL FACE-LIT CHANNEL SIGN BOX - ILLUMINATED .
9. METAL CABINET SIGN BOX WITH FULL COVER PRINTED GRAPHICS.
10. METAL BASE PLATE.
11. METAL BASE PLATE COVER.
12. LED GAS PRICE READOUT SCREEN.
13. POURED CONCRETE FOUNDATION.
14. NEW SIGN BOX WITH CHANGEABLE ILLUMINATED SIGN FACES.
15. METAL BASE BOX PLATE.
16. GRADE.
17. APPROXIMATE LOCATION/SIZE OF HECLA WAY MONUMENT SIGN.
18. APPROXIMATE LOCATION/SIZE OF NEW SPEEDY SOUTH BOULDER MONUMENT SIGN.
19. EXISTING SOUTH BOULDER MONUMENT SIGN.

NOTES:

1. SIGN MANUFACTURE WILL BE RESPONSIBLE FOR FINAL SIGN PANEL DESIGN, PERMIT AND CONSTRUCTION.

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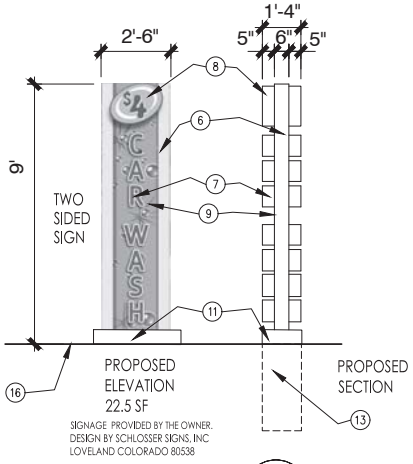
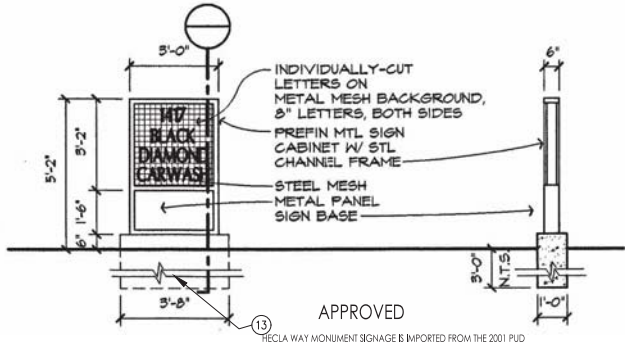
SPEEDY SPARKLE CAR WASH
1414 Hecla Way
Louisville, Colorado 80027

TITLE
SIGNAGE

Date:	11-26-18
CWA #	18021
Drawn:	CWA
Checked:	CW
Phase:	PUD AMENDMENT

Sheet:
A2.1





HECLA WAY MONUMENT SIGNAGE IS IMPORTED FROM THE 2001 PUD DOCUMENTS AS APPROVED BY THE CITY AND ON FILE WITH THE CITY OF LOUISVILLE, CO. NEVER BUILT AT THE SITE.

1 HECLA WAY MONUMENT SIGN

0 1' 2' 4'

SCALE: 1/2" = 1'-0"

2 HECLA WAY MONUMENT SIGN

PROPOSED PRELIMINARY SIGN SHOWED IN APPROXIMATE SIZE/LOCATION IN EXISTING PHOTO.

KEYNOTES:

1. EXISTING SIGN BOX WITH CHANGEABLE ILLUMINATED SIGN FACES.
2. NEW SIGN BOX WITH LED SIGNAGE READOUT SCREEN.
3. EXISTING BASE TO REMAIN.
4. METAL PLATE WITH FULL COVER PRINTED GRAPHICS .
5. METAL SIGN BOX - ILLUMINATED .
6. STEEL I-BEAM SUPPORTS PAINT TO MATCH METAL ON BUILDING.
7. METAL FACE-LIT CHANNEL LETTERS - TYPICAL.
8. METAL FACE-LIT CHANNEL SIGN BOX - ILLUMINATED .
9. METAL CABINET SIGN BOX WITH FULL COVER PRINTED GRAPHICS.
10. METAL BASE PLATE.
11. METAL BASE PLATE COVER.
12. LED GAS PRICE READOUT SCREEN.
13. POURED CONCRETE FOUNDATION.
14. NEW SIGN BOX WITH CHANGEABLE ILLUMINATED SIGN FACES.
15. METAL BASE BOX PLATE.
16. GRADE.
17. APPROXIMATE LOCATION/SIZE OF HECLA WAY MONUMENT SIGN.
18. APPROXIMATE LOCATION/SIZE OF NEW SPEEDY SOUTH BOULDER MONUMENT SIGN.
19. EXISTING SOUTH BOULDER MONUMENT SIGN.

NOTES:

1. SIGN MANUFACTURE WILL BE RESPONSIBLE FOR FINAL SIGN PANEL DESIGN, PERMIT AND CONSTRUCTION.

CWA
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No	Date	Revisions
1	1-15-19	PUD Submittal
2	5-20-19	PUD Modification
3	5-29-19	PUD Modification
4	6-4-19	PUD Amen. #3 Modifications

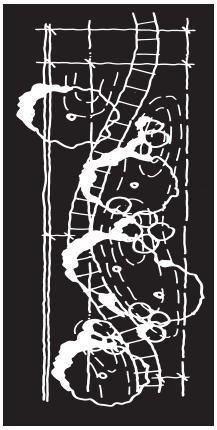
SPEEDY SPARKLE CAR WASH
1414 Hecla Way
Louisville, Colorado 80027

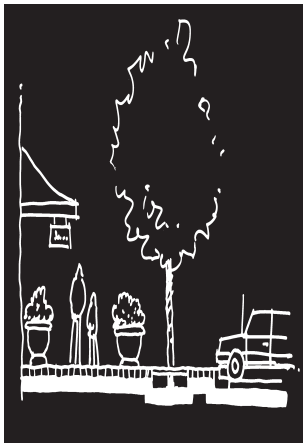
TITLE
SIGNAGE

Date:	1-15-19
CWA #	18021
Drawn:	CWA
Checked:	CW
Phase:	PUD AMENDMENT
Sheet:	A2.2

City of Louisville

COMMERCIAL DEVELOPMENT DESIGN STANDARDS AND GUIDELINES





J U N E • 1 9 9 7

COMMERCIAL DEVELOPMENT DESIGN STANDARDS AND GUIDELINES

Adopted 17 JUNE 1997 by Ordinance 1242, Series 1996
Amended by Ordinance 1287, Series 1998 &
Ordinance 1341, Series 2000

PREPARED FOR:
CITY OF LOUISVILLE, COLORADO

PREPARED BY:

DOWNING, THORPE & JAMES INC.
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Boulder, Colorado 80302

ARCHITECTURE
PLANNING
LANDSCAPE ARCHITECTURE
ENGINEERING

DOWNING
THORPE
JAMES

COMMERCIAL DEVELOPMENT DESIGN STANDARDS AND GUIDELINES

June 17, 1997

Acknowledgments and Credits

Honorable Mayor and Members of the City of Louisville City Council

Chairman and Members of the City of Louisville Planning Commission

Downing, Thorpe & James, Inc. (Assisted by: Blackwood & Company)

City of Louisville Departments of Administration, Public Works and Planning

Griffiths & Tanoue, P.C.

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Jay Keany, City Council
Bill Boulet, Planning Commission Chairman
Betty Solek, Planning Commissioner
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INTRODUCTION

A. Purpose

The Commercial Development Design Standards and Guidelines (**"CDDSG"**) establish design criteria and minimum standards for commercial developments within the City of Louisville. The purpose of the CDDSG is to:

1) Enhance and protect Louisville's quality of life and community image through clearly articulated commercial development design goals and policies, design guidelines and minimum design standards; and
2) Protect and promote Louisville's long-term economic vitality through commercial design standards which encourage and reward high quality development, while discouraging less attractive and less enduring alternatives; and
3) Minimize adverse impacts of vehicular circulation to existing neighborhoods and to the surrounding physical environment; and
4) Enhance and protect the security and health, safety and welfare of all residents of the City of Louisville.

B. Applicability

The provisions of the Guidelines shall apply to all commercial development within the City, except commercial development for which there exists a vested property right to develop under other approved design guidelines and/or development standards.

The CDDSG provide general design guidelines, as well as mandatory minimum development standards. The CDDSG will be utilized by staff, planning commission, and city council to review commercial development applications submitted under the City's PUD Development Plan review process.

The goals and policies set forth in this document are expected to be met through compliance with all mandatory design standards and consideration of design guidelines. Modifications to or waivers of mandatory design standards may be recommended by the Planning Commission and authorized by City Council as part of the PUD Development Plan Review process.

C. Who Uses the CDDSG

The CDDSG are to be used by property owners/ applicants and their design consultants in the planning of commercial development projects within the City of Louisville. The CDDSG will also be utilized by staff, planning commission, and city council as part of the PUD Development Plan process in their reviews of commercial projects to which the CDDSG apply.

D. Desirable Elements of Commercial Project Design

The city considers the following design features to be desirable elements of commercial development, and the standards and guidelines set forth in the following chapters are intended to facilitate the incorporation of these features into a commercial project:

1. Prominent access driveways with clear visibility of entrances and retail signage
2. Multi-modal transportation
3. Landscaped and screened parking
4. Quality of exterior building materials, surfaces, and textures
5. Significant landscape and hardscape elements
6. Building locations which provide pedestrian courtyards and common gathering areas with coordinated site furniture and lighting
7. Visual compatibility with development on adjacent sites
8. Visual connections between entrances and associated pedestrian areas of individual buildings to encourage visual and physical integration into a strengthened “sense of place”
9. Step-down of building scale adjacent to pedestrian routes and building entrances
10. Pedestrian-oriented ornamentation and detail at ground level
11. Multi-planed, pitched roofs with meaningful overhangs and arcades
12. Regular or traditional window rhythm
13. Articulated building forms and massing with significant wall articulation (e.g. insets, canopies, wing-walls, trellises)
14. Preservation of natural site features
15. Enhancement of view corridors to open areas and mountain vistas

E. Undesirable Elements of Commercial Project Design

The city considers the following design features to be undesirable elements of commercial development:

1. Poorly defined site access points
2. Disjointed parking areas, or confusing or unsafe circulation pattern
3. Square, “box-like” structures with large, blank, unarticulated wall surfaces
4. Highly reflective surfaces or heavily-tinted glass storefronts
5. Metal siding on primary facades
6. Mix of unrelated styles (such as rustic wood shingles or siding and polished chrome)
7. Strongly thematic architectural styles including some forms of “franchise” architectural styles associated with some chain commercial developments
8. Visible outdoor storage, loading, and equipment areas
9. Signage which is redundant or out of scale with building architecture

F. Relation of the CDDSG to Other City Regulations, Ordinances and Private Development Covenants

The CDDSG are a supplement to the City of Louisville's Zoning and Subdivision Regulations, PUD Ordinance, City of Louisville Department of Public Works Engineering Division Design and Construction Standards, and City of Louisville Storm Drainage Design and Technical Criteria.

Where a mandatory standard in this document is in conflict with any provision of the City of Louisville municipal code, the most restrictive requirement shall take precedence and shall apply. Building and life safety codes and the City of Louisville Department of Public Works Engineering Division Design and Construction Standards, and the City of Louisville Storm Drainage Design and Technical Criteria take precedence over the standards in this document in cases where the standards in this document require action that is in conflict with those codes.

All commercial development within the City of Louisville shall meet the guidelines of the Americans with Disabilities Act (ADA).

G. How to Use the CDDSG

The CDDSG are generally organized in a descending order of scale, from overall site planning concerns, to circulation issues, to buildings, site details, and then signs. When first developing overall planning concepts for a parcel, the earlier sections will be most relevant. At advanced stages of design, when architectural details and specific landscaping ideas are being developed, sections appearing later in the document will be most relevant.

This document has nine chapters and one appendix. Each chapter has four basic components:

1. A goal statement, which sets forth the city's overall design goal to be achieved in the PUD Commercial Planned Unit Development Plan review process with regard to the subject matter of the chapter.
2. A policy statement, which establishes a more specific design goal with regard to a more specific subject matter.
3. The statements of **standards,** indicated with an (S), and **guidelines,** indicated with a (G), which establish the specific design standards with which compliance is mandatory, and the design guidelines with which compliance is strongly encouraged. A failure to meet a mandatory standard may be used as a basis for denial of an application. A failure to meet a guideline shall not be a basis for denial of an application.
4. Graphic Illustrations showing one or more suggested design solutions that would be appropriate or inappropriate with respect to the standards and guidelines. These may be photographs or sketches. In the event of conflict between a graphic illustration and the text of the CDDSG, the text shall control.

H. Definitions

For purposes of this document, the following terms shall have the following meanings:

"Commercial Development": Any land development activity in the city, including but not limited to retail and office development, but not including development activity intended solely for residential, industrial or light industrial use. Commercial development also includes any addition, remodeling, relocation or construction requiring an amendment to an approved, Final Commercial Planned Unit Development Plan.

"Open Space": Land that is undeveloped or developed that can support plant materials; or has decorative landscape treatment; or that may be used by customers for recreation, circulation, or may be viewed by them. Walkways, plant beds, lawns, and terraces within an open space area may be included as part of such open space area. Paved parking lot areas used for auto circulation or parking do not qualify as Open Space.

"Parcel": A parcel is the minimum amount that a single user may occupy. In many cases, more than one parcel will be combined for development of a single building or cluster of buildings to be used by a single user.

"Pedestrian Scale/Human Scale": The relationship between the dimensions of a building, street, outdoor space, or streetscape element to the average dimensions of the human body.

1. SITE PLANNING

Goal:

Locate buildings to be visible from major roadways and entries, to provide clear orientation and access for both vehicles and pedestrians and to facilitate internal pedestrian circulation. Place structures in consideration of the existing built context, the location of adjoining uses, and the location of major roads. Include an analysis of the site's physical and natural characteristics and other influences. Create pedestrian courtyards and common gathering areas through creative design solutions. Create walkable, well-landscaped environments that encourage pedestrian movement between uses and gathering places.

1.1 Building Siting and Orientation

Policy:

Buildings should be sited so that the character of existing land forms and site features is enhanced; the relationships between buildings are strengthened; and pedestrian and vehicular circulation is facilitated.

Standards and Guidelines:

A. Provide pedestrian connections from buildings to public walkways and between buildings to buffer pedestrians from vehicle circulation areas. (S)

B. Locate retail buildings to create plazas and pedestrian gathering places which are of a sufficient size and scale to buffer the pedestrian areas from traffic and circulation areas. (G)

C. Orient buildings to promote views through and into each commercial development. (G)

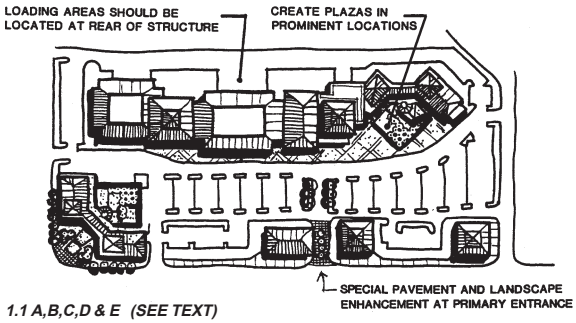
D. Orient single free-standing buildings and their primary facades and primary pedestrian entrances toward streets. (G)

E. Position entries to buildings so they are easily identifiable from the interior drives and parking lots. (G)

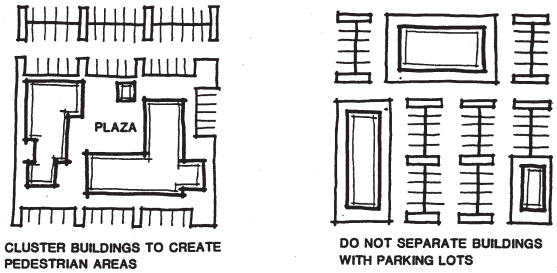
1.2 Building and Parking Setbacks

Policy:

Provide a well-landscaped and pedestrian-friendly character along major streets which promotes a comfortable walkable environment. To attain this objective, all buildings and parking should be set back from perimeter and interior streets a sufficient distance to create a distinct landscape zone between buildings, parking, and adjacent roadways. Varying building setbacks to enhance visual interest along the streetscape is strongly encouraged.



1.1 A,B,C,D & E (SEE TEXT)



1.1 B CLUSTER BUILDINGS TO CREATE PLAZAS AND PEDESTRIAN GATHERING PLACES.

Parking setbacks from all streets should allow for adequate visual buffering or screening.

Surrounding buildings or wrapping the project perimeter with parking lots, especially along the street front is strongly discouraged; orienting some buildings closer to the street to screen parking in the interior of the site and provide strong pedestrian connections to buildings is encouraged.

Standards and Guidelines:

A. Minimum Building Setbacks *EXCEPT WITHIN THE OLD TOWN CC-DISTRICT* **(for building footprints less than or equal to 30,000 gross square feet): (S)**

- Street R.O.W. Line:
  - Arterial Street 30 ft.
  - Collector Street 20 ft
  - Local Street 15 ft.
  - Internal/Common Property Boundary 10 ft.
  - Internal/Private Driveway (to back of curb) 10 ft.

B. Minimum Building Setbacks *EXCEPT IN OLD TOWN CC-ZONE DISTRICT* **(for building footprints greater than 30,000 gross square feet): (S)**

- Street R.O.W. Line:
  - Arterial Street 50 ft.
  - Collector Street 40 ft.
  - Local Street 35 ft.
  - Internal/Common Property Boundary 25 ft.
  - Internal/Private Driveway (to back of curb) 10 ft.

C. Minimum Parking Setbacks *EXCEPT IN OLD TOWN CC-ZONE DISTRICT* **(from all perimeter property lines or rights-of-way): (S)**

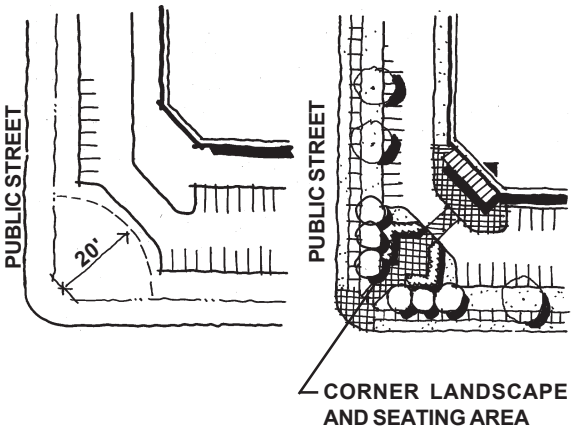
- Property Lines Adjacent to U.S. 36 40 ft.
- Arterial Street R.O.W. 25 ft.
- Collector & Local Street R.O.W. 15 ft.
- Internal/Common Property Boundary 10 ft.

D. No portion of any building, including canopies, overhangs, or other projections shall encroach into the above setbacks. (S)

E. Building and Parking Setbacks at Street Corners - If an intervening parking or a drive aisle is located between a building and the street corner, a corner landscape area must be provided. (S) In addition, no parking may be located within a radius of 15 feet measured from the point of intersection of the required parking setback lines. (S)

F. The clustering of buildings within larger master planned and multiple building projects is strongly encouraged, and the minimum building setbacks may be waived or modified for such purpose. (G) However, all fire and emergency access and building code requirements must be met. (S)

G. Consider orienting buildings, including some of the buildings in multiple building projects, to perimeter streets, rather than orienting all buildings to internal parking lots. (G)



1.2 E TREATMENT OF STREET CORNERS WITH PARKING

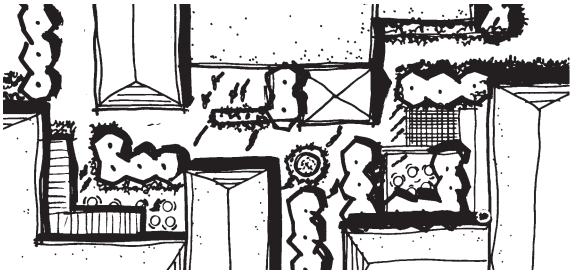
1.3 Pedestrian Amenities

Policy:

Plazas, courtyards or similar pedestrian amenities should be incorporated into both overall and individual site development plans. These areas should be easily accessible and comfortable for a substantial part of the year.

Standards and Guidelines:

A. Furnish spaces with pedestrian amenities such as benches, landscaping, fountains and play areas. These outdoor spaces should be "functional" and should not appear as "left-over" spaces. (S)
B. Aggregate open space areas for pedestrian use. (G) Do not distribute them in low impact areas, such as building peripheries, areas behind structures, or where barely visible. (S)
C. Delineate areas of pedestrian activity with accent paving, landscaping, lighting and furnishings. (S)
D. Provide seating that is useable year-round. Position seating which is buffered from exposed areas and takes advantage of sunny locations. (S)
E. All common amenities within commercial developments shall be owned and maintained by the developer or by an organization established for such purpose . (S)
F. Where feasible, create a sense of enclosure for outdoor seating areas. (G)
G. Orient open spaces to views of activities, architectural landmarks or distinctive natural land forms. (G)



1.3 A FURNISH OUTDOOR SPACES WITH PEDESTRIAN AMENITIES.

1.3 C DELINEATE AREAS OF INTENSE PEDESTRIAN ACTIVITY.

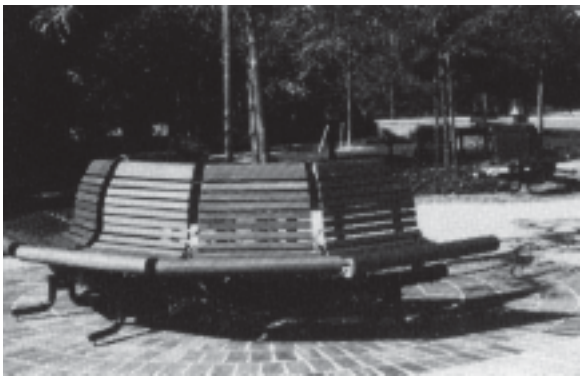
1.4 Site Coverage Requirements

Policy:

Open space is a valued amenity. Building, parking, and driveway site coverage within each parcel should be limited.

Standards and Guidelines:

A. The maximum building, parking, and driveway coverage within each parcel and for the entire development is 70%. (S)
B. The minimum amount of open space provided within a commercial development parcel or cluster of parcels is 30%. (S) Open space can include "pedestrian-oriented" areas such as sidewalks and hardscape plazas within open space areas and pedestrian gathering places. (G) This open space area is in addition to any required public land dedication. (S)



1.3 D PROVIDE SEATING THAT IS USABLE YEAR ROUND.

1.5 Utilities, Mechanical, and Telecommunications Equipment

Policy:

The visual and noise impacts of utilities, mechanical equipment, data transmission dishes, towers, and similar antennas and equipment should be mitigated.

Standards and Guidelines:

A. Install all permanent utility lines underground. (S)
B. Temporary overhead power and telephone facilities are permitted during construction only. (S)
C. Locate transformers away from major pedestrian routes and outdoor seating areas. (S)
D. Buffer all transformers, telecommunications devices, equipment switching boxes and other utility cabinets from street and pedestrian areas with landscaping or architectural screens. (S) Do not leave meters exposed where visible to the public. (S) (See also Section 6. Screen Walls and Fencing). (S)

1.6 Service, Delivery and Storage Areas

Policy:

Service, delivery and storage areas can be visually obtrusive. The visual impact of service and delivery areas should be minimized, especially views of such areas from public ways and along designated view corridors.

Standard and Guidelines:

A. Locate loading docks and service areas a minimum of 20 feet from any public street in areas of low visibility such as the rear of buildings. (S)
B. Combine loading docks and service areas between multiple sites. (G) Screen from public view with fencing, walls and/or landscaping. (S) (See also Section 6. Screen Walls and Fencing).
C. Clearly identify service entrances with signs to discourage the use of main entrances for deliveries. (G)

1.7 Water Quality Control and Drainage

Policy:

Storm water and snow-melt from rooftops, paved areas, and lawns carry plant debris, soil particles, and dissolved chemicals into the City's storm drainage system. Site development plans should employ management and engineering practices to protect stormwater from these undesirable elements, before releasing water into the City's storm drainage system.

Site drainage should be designed to minimize water collection near building foundations, entrances and service ramps. In addition to the City of Louisville's Storm Drainage and Technical Criteria, the following standards and guidelines apply:

Standards and Guidelines*:*

A. Storm water should not drain directly into the public storm drainage system without first going through a detention pond and a grassy swale. (G)
B. Design and maintain all grassed swales and other drainage channels in accordance with City of Louisville Storm Drainage Design and Technical Criteria. (S)

C. Avoid hard concrete-lined channel designs. If a hard channel design is required use a more natural approach that incorporates river rock or natural rock channel lining when possible. (G)
D. Utilize accepted design criteria and recommendations of the Urban Drainage and Flood Control District (UD & FCD) and the City of Louisville for detention pond design to enhance water quality. (S)
E. The use of consolidated detention pond facilities is encouraged. (G)
F. Design on-site drainage and detention facilities with attractive, landscape features and amenities. (S)

1.7 C AVOID HARD CHANNEL DESIGNS...

... USE GRASSY SWALES WHEN POSSIBLE AND DESIGN ALL ON-SITE DRAINAGE AND DETENTION FACILITIES WITH ATTRACTIVE, YEAR-ROUND SITE FEATURES AND AMENITIES.

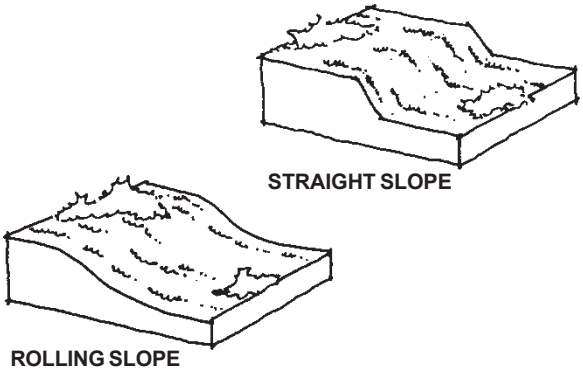
1.8 Site Grading, Excavation and Erosion Control

Policy:

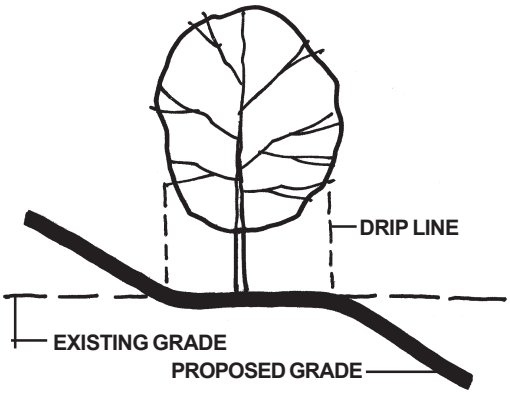
The design of site improvements should minimize cut-and-fill in order to preserve each site's natural terrain to the maximum extent possible. Site grading designs should be executed in such a manner to avoid drainage impacts (such as erosion and road damage), both on-site and downstream.

Standards and Guidelines:

A. Preserve the natural setting with grading designs that are sensitive to existing land forms and topography. (G)
B. In developing sites, limit slopes to 4:1 or less. (G) Slopes in excess of 4:1 may be allowed when engineering or site constraints dictate a steeper slope. (G)
C. In general, transition grades between old and new elevations should be rolling rather than one continuous straight slope. (G)
D. Avoid grade changes within the drip-line of existing trees that are to be maintained. (G)
E. Stockpile and protect topsoil during construction. (S)
F. Preserve existing site vegetation, to the extent possible, during over-lot grading activities. (G) Replant all disturbed soil and slopes with an approved grass mixture or ground cover. (S) Prepare the soil prior to seeding. (S)



1.8 C TRANSITION GRADES SHOULD BE ROLLING RATHER THAN ONE CONTINUOUS STRAIGHT SLOPE.



1.8 D AVOID GRADING WITHIN THE DRIPLINE OF EXISTING TREES.

2. VEHICULAR CIRCULATION AND PARKING

Goal:

The on-site vehicular circulation and parking system is a critical factor in the safety and success of a commercial development. The parking/access/circulation system should provide for the safe, efficient, convenient, and functional movement of multiple modes of transportation both on and off the site where pedestrian/bicycle/vehicle conflicts are minimized. Alternate modes of transportation, including public transit, bicycles and pedestrians should be given priority in the site design.

2.1 Site Access and Vehicular Circulation

2.1.1 Vehicular Access

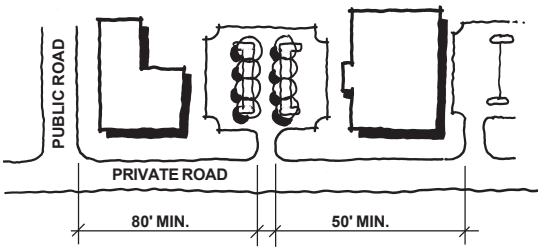
Policy:

Promote the safety and mobility of through traffic by minimizing the number of access points to private property from public streets. Design vehicle entrances as Gateways.

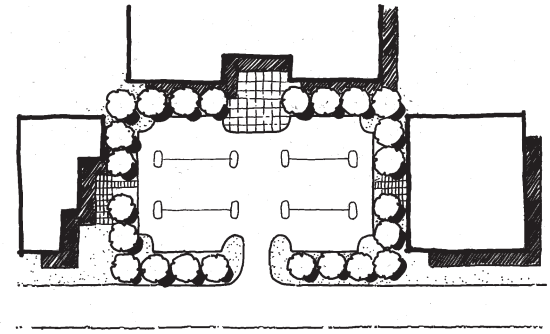
Standards and Guidelines:

A. Enhance the intersections of entrance drives with arterial and collector streets by incorporating signs, accent paving, special landscaping and lighting. (S)
B. Materials used in entry features shall be consistent with other materials used in the development. (S)
C. Utilize street intersections for access into commercial developments. (G)
D. Locate site access points as far as possible from street intersections to provide adequate vehicle stacking room. (G) More than one access to a site may be permitted when it will not be hazardous to the safety and operation of the street or to pedestrians. (G)
E. Maintain a minimum 50.0' separation between adjacent curb cuts along private roadways. (S)
F. Maintain a minimum 80.0' separation between a public or private road intersection and a parcel curb cut. (S)
G. When the opportunity exists, provide common or shared entries. (G) (See Section 5.2.C for landscaping details)
H. Locate site entries to minimize pedestrian/vehicular conflicts. (G)
I. Design entrances to align with focal points within the development such as landmark towers or landscape features. (G)
J. Entrances that lead directly into head-in parking are not allowed. (G)
K. Design internal roadways to incorporate design elements of gateway entries. (G)
L. Accent pavement materials located within the public right-of-way must meet City of Louisville Public Works Department criteria. (S).

2.1.1 DESIGN VEHICLE ENTRANCES AS ENHANCED "GATEWAYS".



2.1.1 D, E & F MINIMUM SEPARATION BETWEEN INTERSECTIONS AND CURB CUTS



2.1.1 G PROVIDE COMMON OR SHARED ENTRIES WHEN POSSIBLE.

2.1.1 I DESIGN ENTRANCES TO ALIGN WITH FOCAL POINTS SUCH AS LANDMARK TOWERS.

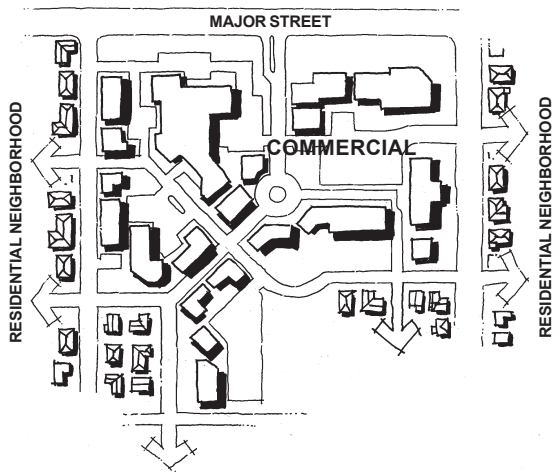
2.1.2 Vehicular Circulation

Policy:

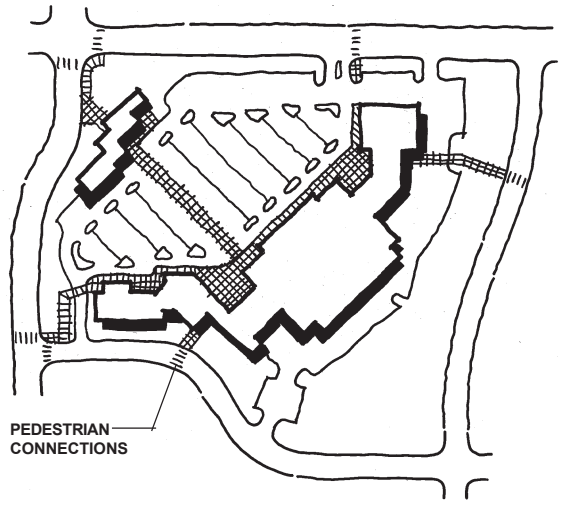
Projects with multiple building sites or parcels should include a hierarchy of internal roadways such as: 1) Internal Collector 2) Internal Drives and Parking Aisles; and 3) Service Drives. This hierarchy should be implemented by engineering and landscape treatments. The street, access and parking network shall provide for the smooth, safe, convenient and functional movement of all modes of transportation, including vehicles, public transit, bikes and pedestrians, with priority to the pedestrians.

Standards and Guidelines:

A. Link developments with surrounding areas and uses by extending streets, drives and sidewalks directly into and across the development, and across property lines, thereby providing convenient, direct pedestrian, bicycle, and vehicular access to adjoining development. (G)
B. Provide separate vehicular and pedestrian circulation systems with a strong emphasis on pedestrian linkages between uses. (S)
C. Separate parking aisles from vehicle circulation routes and entry drives. (G)
D. Avoid conflicts between adjacent parking lots by maintaining similar directions of travel and parking designs. (G)
E. Design drive-thru lanes to allow for a vehicle stacking distance that accommodates anticipated demand without impairing traffic circulation. (S) For drive-thru restaurants, the vehicle staking distance must anticipate and accommodate periods of peak demand. (S)
F. Drive-thru facilities and lanes shall be separated from parcel access points. (G)
G. Drive-thru facilities and stacking lanes shall not be located within the front yard setbacks, and when located adjacent to public right-of-ways, residential zone districts, or pedestrian gathering areas shall be adequately screened from view. (S)
H. One-way access ways require a minimum 12 foot wide (FL to FL) driveways, a minimum 15 foot radius intersection, and a maximum 100 foot length. (S)



2.1.2 A LINK DEVELOPMENTS WITH SURROUNDING AREAS.



2.1.2 B PROVIDE SEPARATE VEHICULAR AND PEDESTRIAN CIRCULATION SYSTEMS WITH A STRONG EMPHASIS ON PEDESTRIAN LINKAGES.

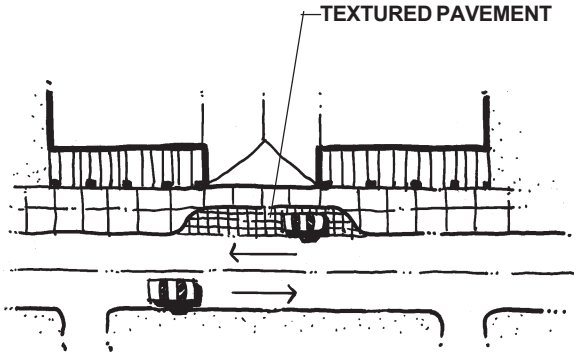
2.1.3 Passenger Drop-Off Areas

Policy:

Passenger drop-off areas should provide for safe and convenient access to building entries.

Standards and Guidelines:

A. Passenger drop-off areas should be incorporated into all projects. (G)
B. All schools and child care facilities having a capacity greater than 25 students shall incorporate drop-off areas. (S)
C. Provide a clear separation of vehicular traffic between drop-off zones and accesses to either parking lots or parking structures. (S)
D. Design drop-off lanes so as not to obstruct traffic flow when motorists are stopped to discharge passengers. (S)
E. Use a textured paving material that is distinguishable from the travel lane at the drop-off. (G)
F. Use signs to indicate "drop-off zone" or "passenger loading only". (S)



2.1.3 D & E DESIGN DROP -OFF LANES SO AS TO NOT OBSTRUCT TRAFFIC FLOW AND USE TEXTURED PAVEMENT TO DELINEATE THIS ZONE.

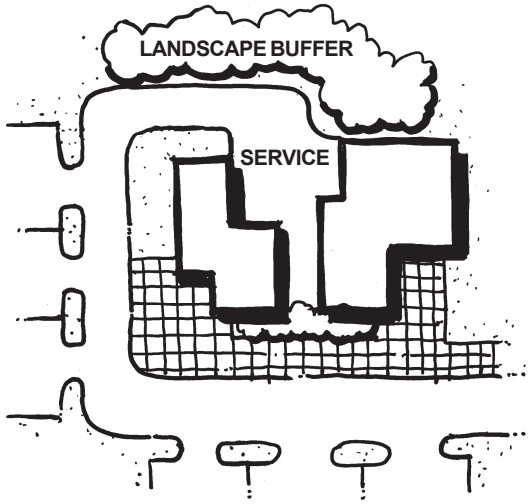
2.1.4 Service/Delivery, Emergency and Utility Access

Policy:

Routes for service, emergency and utility access should be clearly marked. Service circulation within a development shall be designed to provide safe movements for all anticipated vehicles. The design of individual parcels to accommodate truck access shall meet all regulatory requirements for turning radii without sacrificing other important goals and policies of the CDDSG.

Standards and Guidelines:

A. Meet all Louisville Fire Protection District regulations in the design and provision of emergency access to buildings for fire suppression, police, ambulance and other emergency vehicles. (S)
B. Avoid the creation of "blind areas" that cannot be patrolled by police or security staff. (G)
C. Provide shared service and delivery access ways between adjacent parcels and/or buildings. (G)

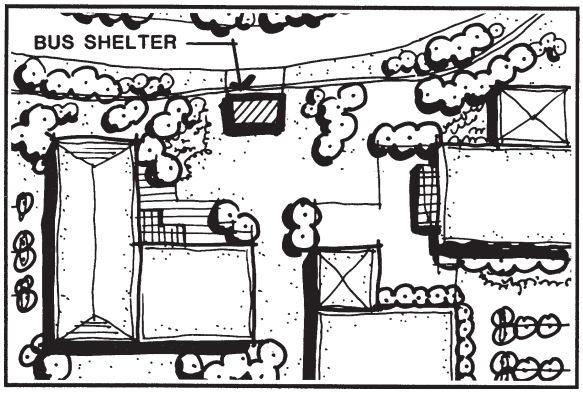


2.1.4 C PROVIDE SHARED SERVICE AREAS BETWEEN BUILDINGS OR PARCELS.

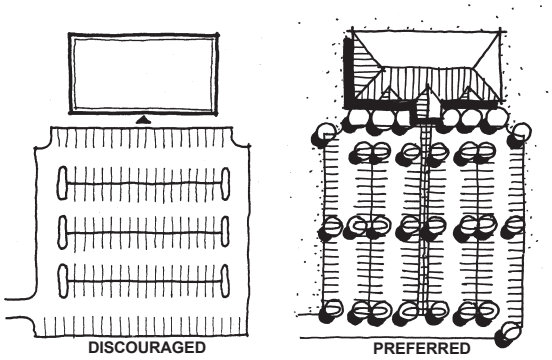
2.1.5 Mass Transit Facilities

Policy:

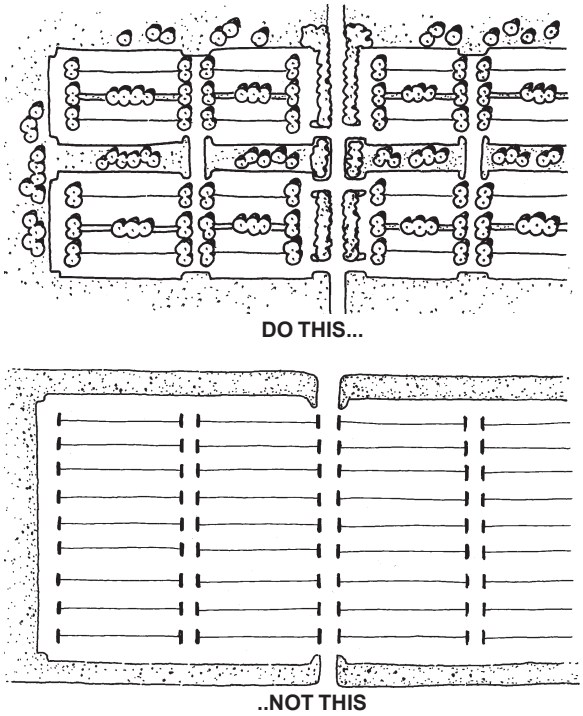
Mass transit facilities should be accommodated within all major commercial developments that could generate high volumes of transit use. Transit routes, access points and shelter locations should be addressed along major roadways within and on the perimeter of such projects. Transit facilities shall be provided in a manner to make transit an attractive mode of travel for both employees and patrons.



2.1.5 A LOCATE BUS SHELTERS CLOSE TO SIGNIFICANT CLUSTERS OF BUILDINGS.



2.2.1 E ORIENT PARKING AISLES PERPENDICULAR TO BUILDING ENTRANCES SO PEDESTRIANS WALK PARALLEL TO MOVING CARS.



2.2.1 G DIVIDE LARGE PARKING AREAS INTO A SERIES OF SMALLER, CONNECTED LOTS.

Standards and Guidelines:

A. Locate bus shelters close to significant clusters of buildings. Provide a concrete pad in front of bus shelters. Provide protection for bus shelters from the prevailing winds. Consider incorporating passive solar heating features. (G)
B. Coordinate any shelter design and locations with RTD. (S)

2.2 Parking Lots and Structures

This section provides standards and guidelines for the siting and layout of parking lots and structures. Specific landscape standards for parking areas are included in Section 5.3, Parking Lot Landscaping.

2.2.1 Surface Parking Lots

Policy:

Vehicle parking should be provided to meet the location and quantity requirements of specific uses without undermining the function of other modes of transportation or detracting from the creation of attractive pedestrian environments.

Standards and Guidelines:

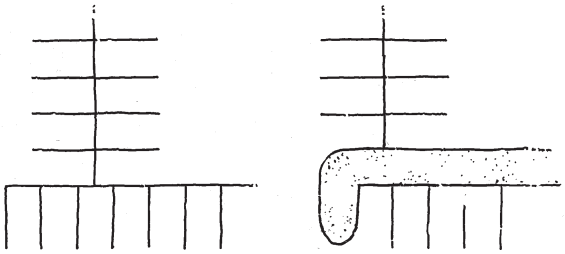
A. Design parking lots to avoid dead-end aisles. (G)
B. Where a dead-end aisle is authorized, adequate space for unimpeded turn-around must be provided. (S)
C. Separate parking areas from buildings by either a raised concrete walkway, pedestrian plaza or landscaped strip. (S)
D. Avoid head in parking, except handicap parking, which causes hazardous backing movements into major drive aisles. (G)
E. Orient parking aisles perpendicular to buildings so pedestrians walk parallel to moving cars. Minimize the need for pedestrians to cross multiple parking aisles and landscape areas. (G)
F. Design parking areas that incorporate pedestrian walkways in a manner that links buildings to the street sidewalk system. (S)
G. Divide parking areas which accommodate more than 125 vehicles into a series of smaller, connected lots. (S)
H. Landscape and offset portions of the lot to reduce the visual impact of large parking areas. (G)
I. Avoid aligning all travel lanes in parking lots in long straight configurations. (G)
J. Provide cross-access easements between adjacent lots to facilitate the flow of traffic between complementary users. (G)

K. Minimum Parking Ratios:
Except for uses in the area designated as *Downtown Louisville,* the minimum number of parking spaces required per parcel/ use is based on the following ratios (# Parking Spaces/Floor Area as defined in Section 17.08.165) (S):

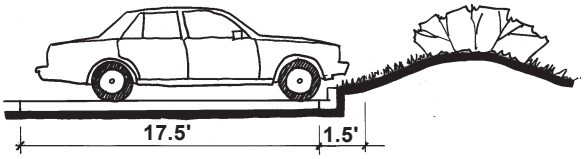
• Retail Uses	4.5 spaces/1000 SF
• Restaurants	15 spaces / 1000 SF
• Theaters	1 spaces / 3 seats
• Professional Offices	4 spaces/1000 SF
• Medical/Dental Offices	6 spaces/1000 SF
• Warehouse	1 / 1000 SF
• Showroom	4.5 / 1000 SF
• Hotel/Motel/Extended Stay Lodging/ Bed & Breakfast	1space/guest room
plus	1 space/2 employees

The minimum number of parking spaces required for any construction, expansion or modification in Downtown Louisville that creates additional floor area is one space per 400 square feet of new floor area, rounded to the nearest 400 square feet. See Section 17.20.025 of the Louisville Municipal Code for additional requirements regarding parking in Downtown Louisville.

L. Locate special parking spaces for van pool and car pool parking close to building entrances. (G)
M. When opportunities exist for shared parking between different uses with staggered peak parking demand, make every effort to take advantage of this opportunity to reduce the total number of parking spaces within the development, especially in multi-tenant and mixed-use commercial centers. (G)
N. Use curbed landscaped islands to designate a change in direction of parking stalls and aisles. (S)
O. Provide landscaped islands at the ends of all rows of parking. (S) (See Section 5 for required sizes.)
P. Parking bumpers in surface lots are prohibited. (S)
Q. Where parking spaces abut landscaped islands, medians, or perimeter curbs or sidewalks, the length of spaces may be shortened by 1.5 feet to account for the car overhang, and the width of the sidewalk or landscape strip increased by that same amount. (G)

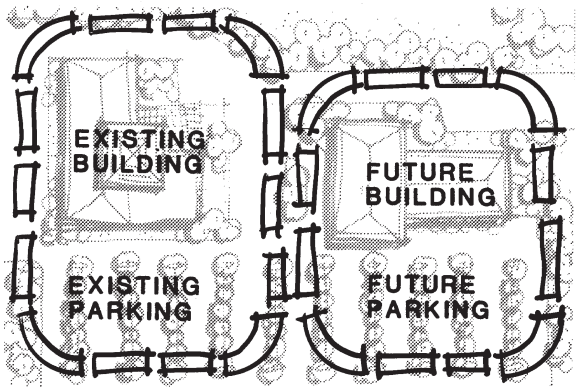


2.2.1 N USE CURBED LANDSCAPED ISLANDS TO DESIGNATE A CHANGE IN DIRECTION OF PARKING STALLS AND AISLES.



2.2.1 Q PARKING SPACES MAY BE SHORTENED BY 1.5' WHERE THEY ABUT LANDSCAPED ISLANDS.

2.2.2 D THE GROUND LEVEL OF PARKING STRUCTURES SHOULD BE INTERESTING TO THE PEDESTRIAN.



2.2.3 WHERE EXPANSION OF A BUILDING IS PLANNED, RESERVE APPROPRIATE AMOUNTS OF LAND FOR THAT PURPOSE.

2.2.2 Parking Structures and Parking Beneath Buildings

Policy:

The appearance of parking structures, whether free-standing or attached, should relate to the buildings they serve, and contribute to the character of the development. The incorporation of parking structures in a commercial development is encouraged in order to minimize site coverage.

Standards and Guidelines:

A. The general architectural criteria shall apply to all parking structures. (S) (See Section 4 Architectural Design Criteria)
B. Provide convenient pedestrian connections between parking structures and main buildings. (S)
C. Separate vehicular access to parking structures from access to general surface parking lots, and clearly identify the access with signs. (G)
D. Where the ground level of the parking structure fronts a public way, provide decorative screens, murals, or plant materials to create interest for pedestrians. (S)

2.2.3 Provisions for Future Parking Lots and Structures

Policy:

Many large projects which are expected to be developed in phases should anticipate and accommodate such phasing in the parking lot design. Provision should be made for increased parking demands related to anticipated expansions, and for possible changes in use of a building or complex of buildings.

Standards and Guidelines:

A. Where expansion of a building is planned, appropriate amounts of unimproved land for additional parking should be reserved at the outset. (G)

2.2.4 Motorcycle Parking

Policy:

Motorcycle parking should be designed and sited in such a way that it is clearly distinguishable from automobile parking. Parking stalls should be identified to encourage orderly positioning of parked motorcycles. Adequate security for parked motorcycles and visibility of motorcyclists by automobile drivers is also a concern.

Standards and Guidelines:

A. Locate motorcycle parking bays separately from automobiles. (G)
B. Use concrete paving in these parking areas to support kickstand pressure. (S)
C. Provide 1 motorcycle space/40 vehicle parking spaces up to a total of 10 spaces. (G)

3. PEDESTRIAN AND BICYCLE CIRCULATION

Goal:

Pedestrian and bicycle systems should be incorporated into all developments and designed to be safe and invite walking and bicycling throughout the project. Individual parcels and sites (within larger projects) should be integrated with adjacent properties design to form a comprehensive system and to provide convenient access to the adjacent neighborhoods as well as the regional systems.

3.1 Overall Pedestrian and Bicycle Circulation

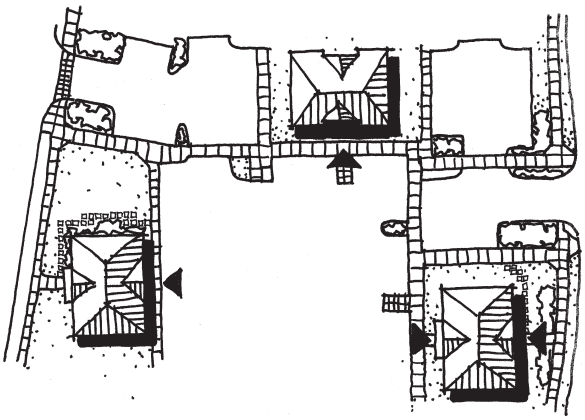
Policy:

Pedestrian spaces and routes should be designed to invite walking throughout and around each commercial development. Routes should be integrated to form a comprehensive circulation system providing convenient, safe and visually attractive access to all destinations on the site. Ease of maintenance should be considered.

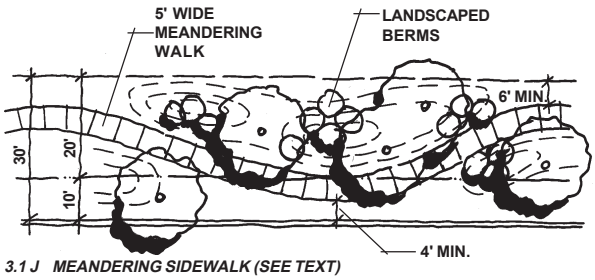
Standards and Guidelines:

A. Locate buildings and design on-site circulation to minimize pedestrian/vehicle conflicts. (S)
B. Separate pedestrian and vehicle movements with the use of landscaping, barriers or other appropriate design solutions. (G) (See also Section 3.4)
C. Differentiate areas of pedestrian and bicycle/vehicle interface with accent pavement and signage to alert drivers to potential conflicts. (S)
D. Where a driveway crosses a walkway, make the walkway continuous in grade without a ramp down to the road bed. (G)
E. Provide well-identified connections from the primary pedestrian and bicycle paths within the development to the perimeter sidewalks and bikepaths. (S)
F. Align walkways directly and continuously to connect pedestrian destinations. (S) Avoid following the outline of parking lots that do not provide direct pedestrian access. (G)
G. Locate pedestrian access and walkways away from the north sides of buildings. (G)
H. Sidewalks shall be at least 5 feet wide and detached from all arterial, collector and local public streets by a minimum 6 foot wide landscaped parkway, except at intersections where acceleration & deceleration lanes are provided. (S)
I. Sidewalks should be aligned parallel to the adjacent street. (G)

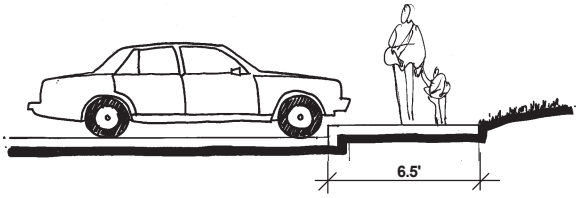
3.1 B SEPARATE PEDESTRIAN AND VEHICULAR MOVEMENTS WITH LANDSCAPING, BARRIERS, OR OTHER APPROPRIATE DESIGN SOLUTIONS.



3.1 F ALIGN WALKWAYS DIRECTLY AND CONTINUOUSLY TO PEDESTRIAN DESTINATIONS.

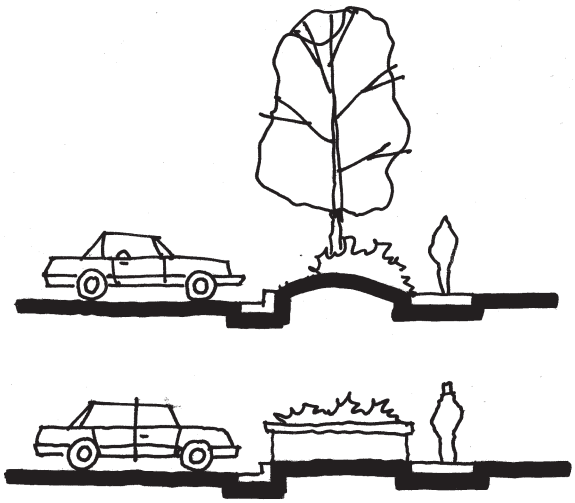


3.1 J MEANDERING SIDEWALK (SEE TEXT)



3.1 L WALKWAYS SHOULD BE 6.5' WIDE WHERE ATTACHED TO END OF HEAD-IN PARKING STALLS.

3.2 PROVIDE CLEARLY DEFINED PEDESTRIAN PATHWAYS THROUGH PARKING LOTS TO BUILDINGS.



3.3 USE ATTRACTIVE BARRIERS TO SEPARATE PEDESTRIAN AND VEHICULAR TRAFFIC.

J. In cases where a meandering sidewalk is desired along an arterial street, provide adequate width within which to accommodate berming and landscaping that enhances the meander and defines the walkways. (G) If the appropriate width is not provided within the public right of way to meet this guideline, a sidewalk easement will be required. (G)

K. Attached sidewalks are permitted only adjacent to acceleration and deceleration lanes, internal drives, the front of parking stalls and designated drop-off areas outside of the traffic flows. (S)

L. Attached sidewalks shall be a minimum of 5 feet wide, except those sidewalks attached to head in parking stalls shall be 6.5 feet in width. (S)

3.2 Pedestrian Connections through Parking Lots

Policy:

Bikeways and pedestrian walkways should be separated and buffered from external and internal automobile circulation within parking lots. Walkways should lead pedestrians from parking areas to building entrances to facilitate convenient movement and to minimize conflicts with cars. Pedestrians should feel comfortable that they are in a clearly defined pathway to the building.

Standards and Guidelines:

A. Internal pedestrian walkways should be designed to avoid the crossing of drive through lanes, and service drives. (S)

3.3 Site Barriers

Policy:

Barriers are intended to separate vehicular and pedestrian traffic for safety purposes, or to restrict access for security reasons. Barriers should be designed as visual assets to the development, and where barriers are used, the following standards and guidelines apply:

Standards and Guidelines:

A. Barriers may include fences, walls, gates, curbs, bollards, low shrubbery, and berms. (G)

B. Barrier materials shall be consistent with site furniture and building materials. (S)

C. Steel post, chain, cable and wire barriers are prohibited. (S)

D. These alternatives to conventional barriers may also be considered (G) :

1) Change the level between a walkway and the surrounding area as an effective means to keep pedestrians on walks.

2) Install benches, seating walls, bike racks, or raised planters along the edge of a designated route to discourage cross-cutting.

E. The use of movable vehicle barriers such as gates, barricades, and mechanical devices that fold down or recess into the pavement is discouraged.

3.4 Bicycle Parking

Policy:

Functional and attractive bike parking shall be provided in convenient locations and in adequate numbers for both customers and employees.

Standards and Guidelines:

A. Locate bicycle parking spaces near both customer and employee building entrances. (S)
B. Provide sufficient lighting levels to facilitate evening bicycle use. (S)
C. Do not position racks where they will obstruct building entrances or the flow of pedestrian traffic. (S)
D. Provide bicycle parking spaces at bus shelter locations. (S)
E. Provide bicycle parking spaces in the following minimum ratio:
One (1) bicycle space for every ten (10) required off-street automobile parking spaces up to a total of 20 bicycle parking spaces. (S)
F. Providing protection from the elements for bicycle parking is encouraged. (G) Consider the use of shelters. (G) Coordinate the design of the bicycle shelter with adjacent buildings or other street furniture designs. (G)
G. Use bicycle racks that accommodate a range of bicycle types and a variety of security devices. (G)

3.4 A LOCATE BICYCLE PARKING CLOSE TO BUILDING ENTRANCES.

3.4 G PROVIDE RACKS THAT ACCOMMODATE A VARIETY OF BICYCLE TYPES.

4. ARCHITECTURAL DESIGN

Goal:

Architectural design should seek to blend in rather than stand out from adjacent structures. All elements including the scale and mass of buildings, materials, colors, roof styles, door and window openings, and details should be responsive to existing architectural design. New buildings should add to community character without rigid uniformity of design.

All buildings should be energy efficient to conserve natural resources.

Building masses should respond to "human scale" with materials and details that are proportionate to human height and provide visual interest at the street and sidewalk level. Buildings should be reduced in apparent mass or articulated to avoid large monolithic, box-like shapes.

Strongly thematic architectural styles associated with some chain restaurants and service stores are strongly discouraged and if utilized must be modified to be compatible with nearby structures and uses.

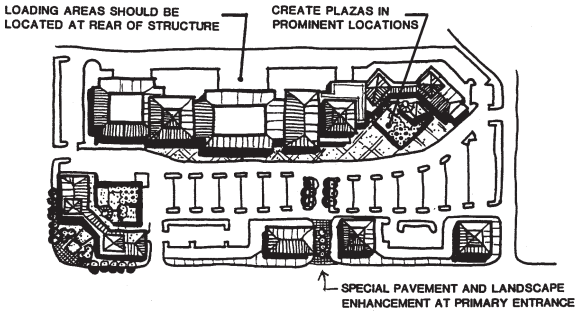
4.1 Building Relationships and Compatibility

Policy:

All buildings within a proposed development should be visually and physically compatible with one another, and with existing buildings on adjacent sites.

Standards and Guidelines:

A. Locate buildings so they will not obscure desired views from existing or proposed buildings nearby. (G)
B. Locate the building(s) to create pedestrian plazas and gathering places. (G) (See Sec 1.1.A)

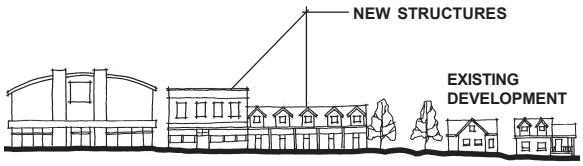


4.1 B LOCATE AND ORIENT BUILDINGS TO CREATE COMFORTABLE PEDESTRIAN PLAZAS AND GATHERING PLACES.

4.2 Building Heights

Policy:

Building heights should be minimized and should not be out of scale with existing or planned development. Buildings should appear "anchored" closely to the ground, although building heights are expected to vary, especially along the perimeter edges, adjacent to the major roadways.



4.2 B TRANSITION THE HEIGHT OF NEW BUILDINGS TO BE COMPATIBLE WITH ADJACENT DEVELOPMENT.

Standards and Guidelines:

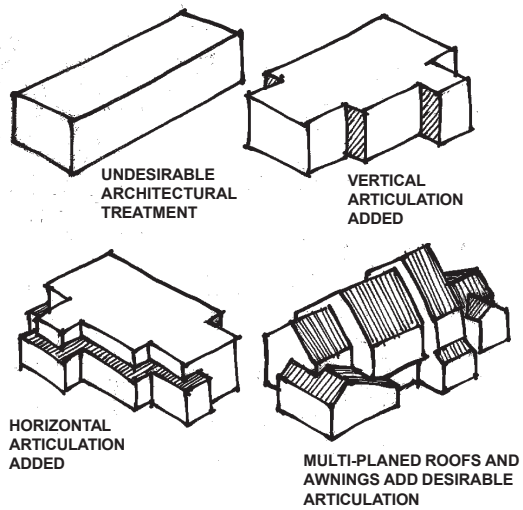
A. Relate building heights to adjacent open spaces to allow maximum sun and ventilation and to provide protection from prevailing winds. (G)
B. The height of new development should be compatible with and transition from the height of adjacent development. (G)
C. The maximum height of all commercial buildings (as measured pursuant to the Louisville Municipal Code) is 35.0', and 42.0' to the top of the rooftop mechanical screen. (S)
D. Architectural elements such as domes, spires, towers, etc. may exceed the 42.0' height limit up to 50.0', when authorized through the PUD process. (S)

4.3 Building Massing, Forms, and Pedestrian Scale

Policy:

Buildings should relate to the terrain and each other in their massing and forms. Square “box-like” structures with large, blank, unarticulated wall surfaces are not an acceptable form.

Facades with a high level of visual interest from auto and pedestrian views are encouraged. The exterior character of buildings should respond to pedestrian scale in the immediate vicinities. Buildings should have features and patterns that provide visual interest at the scale of the pedestrian, that reduce apparent mass, and that relate to local architectural character.



4.3 BREAK LARGE BUILDINGS INTO MODULES OR SUB-PARTS TO REDUCE PERCEIVED SCALE.

Standards and Guidelines:

A. In cases of facades more than 50 feet in length, incorporate significant architectural features and treatments to diminish the building mass. (S)
B. Additional techniques shall be used to reduce scale and apparent massing of buildings. (S) Utilization of the techniques set forth in the following guidelines C thru I, as well as other techniques proposed by the applicant, will be used in determining compliance with this standard.
C. Variations in facade elements can reduce perceived scale and mass. For example:
   1) Variations in color and/or texture should be used. (G)
   2) Step downs and step backs should follow the terrain and be tiered and reinforced by landscape elements. (G)
   3) Variation in roof forms and height of roof elements should be used. (G)
D. Compositions that emphasize floor lines or that express rhythms and patterns of windows, columns, and other architectural features are encouraged. (G)
E. Express the position of each floor in the external skin design:
   1) Consider terracing, articulated structural elements, or a change in materials as methods of defining floors. (G)

4.3 B & C USE A VARIATION IN FACADE ELEMENTS TO REDUCE PERCEIVED SCALE.

2) Consider using belt courses or other horizontal trimbands of contrasting color and materials to define floor lines. (G)

F. Avoid blank walls at ground-floor levels. Use windows, trellises, wall articulation, arcades, material changes, awnings or other features. (G)

G. Use materials manufactured in units and measurable in human proportions such as brick, tile, and modular stone. Other appropriate materials include: stucco, glass, and decorative tiles. (G)

H. Architectural features such as columns, pilasters, canopies, porticos, awnings, brackets or arches should be included. (G)

I. Windows that can reveal indoor amenities and activities and displays are encouraged. (G)

4.3 G USE BUILDING MATERIAL THAT CAN VISUALLY BE MEASURED TO GAIN A SENSE OF HUMAN SCALE.

4.4 Roof Forms and Materials

Policy:

Rooftops should contribute to the unified appearance of each development and should be considered as seen from: higher areas, ground level, other buildings, and roadways.

Standards and Guidelines:

A. Avoid roof lines running in continuous planes of more than fifty (50) feet. (G)

B. Flat roofs are not encouraged. (G)

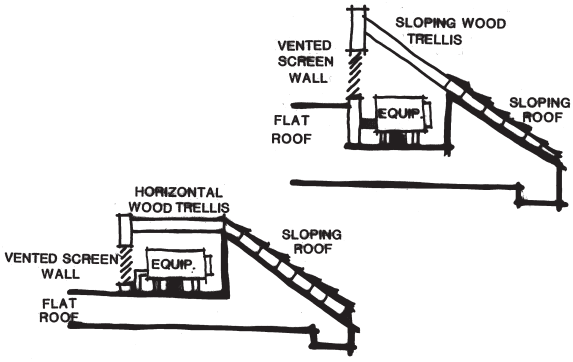
C. Roof materials should be high quality, durable and consistent with local architectural themes. (S) Concrete tile, asphalt shingles, and standing-seam metal are examples of appropriate roof materials. (G)

D. Screen roof top mechanical units from view with architecturally integrated screening units, roof parapets, or sloped roof forms. (S)

E. Design roof forms to correspond to and denote building elements and functions such as entrances, arcades, and porches. (S)

F. Roof forms should relate to adjacent buildings or developments. (G)

4.4 MIX ROOF FORMS TO CREATE VARIETY IN THE "ROOFSCAPE".



4.4 D SCREEN ALL ROOF EQUIPMENT WITH MATERIAL CONSISTENT WITH THE MAIN STRUCTURE.

4.5 Building Materials and Colors

Policy:

Exterior materials and colors should be aesthetically pleasing, of a high quality and compatible with materials and colors of nearby structures. Compatibility of building materials is desired throughout a development project consisting of multiple buildings.

4.5.1 F USE HEAVIER MATERIALS AT LOWER PORTIONS OF BUILDINGS.

4.5.1 Building Materials

Standards and Guidelines:

A. Exterior wall materials must be muted. (S) As such:
   1) Matte textures are encouraged. (G)
   2) Masonry, brick, stone and stucco, are strongly preferred. (G)
   3) Textured concrete may also be considered. (G)
   4) Wood is also appropriate in the context of similar adjacent development. (G)
B. Utilize materials in their natural texture and color. (G)
C. Use the same materials and colors on all elevations of a building. (S)
D. Highly reflective materials such as bright aluminum and glass are not permitted as the primary building material, especially at the pedestrian level. (S)
E. Combine building materials in patterns that create a sense of human scale. (G)
   1) Cast or scored concrete that gives a sense of proportion may be appropriate as well as conventional modular materials such as brick or stone. (G)
   2) Avoid large blank featureless or uniform surfaces. (G)
F. Use heavier materials such as natural stone and masonry materials on the lower 3 to 4 feet of buildings to help visually anchor them to the ground. (G)
G. High quality, low-maintenance materials are encouraged. Select durable building materials that will age well. (G)
H. Painted metal, painted concrete, plain unfinished concrete block or large expanses of unarticulate stucco are not acceptable materials. (S)
I. Do not use plexiglass, glossy metal and backlit vinyl awnings. (S)

4.5.2 Building Colors

A. Do not use paints or other covering materials with unproven durability. (S) Do not use bright colors, (including bright white) that may streak, fade or generate glare. (S) While subdued or muted colors generally work best as a dominant, overall color, a bright or primary color can also be appropriate for accent elements, such as door and window frames, and architectural details. (G)
B. Choose color palettes for new buildings that are compatible with the colors of adjacent structures. (S)
C. Minimize the number of colors appearing on a structure's exterior. (G)
D. Paint architectural detailing to complement the facade and coordinate with adjacent buildings. (S)
E. Roof colors shall be muted and compatible with the dominant building color. (S)

4.6 Building Entrances

Policy:

Primary building entrances should be easily identifiable and relate to human scale.

Standards and Guidelines:

A. Locate main entrances to be clearly identifiable from primary driveways and drop-offs. (S)
   For example:
   1) Design building entrances to contrast with the surrounding wall plane. (G)
   2) Consider tinted glass, painted doors, or recessed features that will create a shaded effect. (G)
   3) Create a frame around doorways, by changing materials from the primary facade material. (G)
   4) Design primary entrances to be accessible to handicapped users without complex ramp systems. (G)
B. All building entrances shall be well-lit. (S) (See Chapter 8)
C. Consider using building entrance ways as a transition from the building to the ground. Incorporate walls, terraces, grading and plant materials to accomplish this transition. (G)
D. Consider using terraces or porticos to define entrances. (G)

4.6 A LOCATE AND DESIGN MAIN ENTRANCES TO BE CLEARLY IDENTIFIABLE.

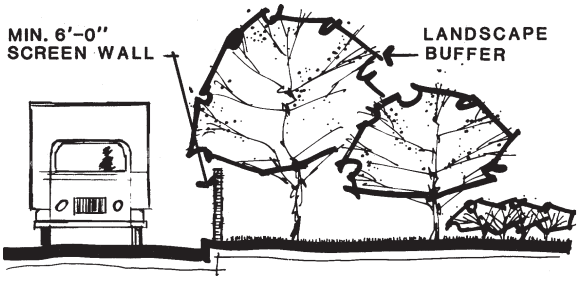
4.7 Service Entrances and Loading Areas

Policy:

Service areas should be visually unobtrusive and integrated with the project site design and architecture.

Standards and Guidelines:

A. Orient service entrances, loading docks, waste disposal areas and other similar uses toward service roads and away from arterial and collector streets and residential areas, unless adequately screened. (S)
B. Screen service entrances and trash dumpsters from public streets, pedestrian gathering areas and primary entrances with fencing, walls and/or landscaping. (S) Use the same materials as employed elsewhere on the building or site. (S)
C. Coordinate the location of service areas with adjacent developments, so that shared service drives may be feasible. (G)
D. Do not place service areas where they will be readily visible from adjacent buildings or where they will negatively impact important/identified view corridors. (S)



4.7 B SCREEN SERVICE ENTRANCES AND TRASH DUMPSTERS WITH FENCING, WALLS, AND/OR LANDSCAPING.

4.8 Energy Conservation Measures

Policy:

Local climate conditions afford the opportunity to take significant advantage of passive and active solar energy applications. Buildings should be designed and sited to maximize the use of solar gain for energy savings, and respect the solar access requirements of adjacent (existing and proposed) buildings.

Standards and Guidelines:

A. Applicants are encouraged to consider energy conserving design concepts, including but are not limited to the following: (G)
   1) Proper orientation and clustering of buildings to take advantage of the prevailing summer winds and to buffer against adverse winter wind conditions.
   2) Types of material and their insulation characteristics.
   3) The arrangement and design of windows and doors.
   4) Direct solar or photovoltaic energy.
   5) Daylighting concepts.
   6) Earth sheltering with creative land forming.
   7) Natural ventilation of outdoor, indoor and attic spaces.

5. LANDSCAPE DESIGN [1]

Goals:

Landscaping for commercial areas is provided within each building site to: 1) enhance the aesthetics of commercial developments, 2) create a pedestrian friendly environment, 3) break up the mass of buildings, 4) soften architectural materials, 5) provide screening of service structures, 6) enhance the streetscape/parkway environment, 7) define building and parking area entrances, 8) provide shade and climate control, 9) control airborne particulates and 10) provide buffers between incompatible land uses or site areas. Drought tolerant plant species that are native to the region or suitable to this climate should be used.

This chapter addresses 4 distinct zones corresponding to the 4 major design influences on each commercial site:

1) Perimeter Landscaping Adjacent to Public and Private Roads
2) Perimeter Landscaping Adjacent to Abutting Property
3) Parking Lot Landscaping
4) Individual Building Landscaping

On smaller sites, there may be overlap between the four (4) planting zones that could result in over planting. Please consult with Planning Division staff to determine whether the requirements of one zone may take precedence over those of another zone.

The City shall strive to:

- Inspect all plant material prior to planting
- Inspect all irrigation designs and implementations
- Inspect installation at one and five year intervals

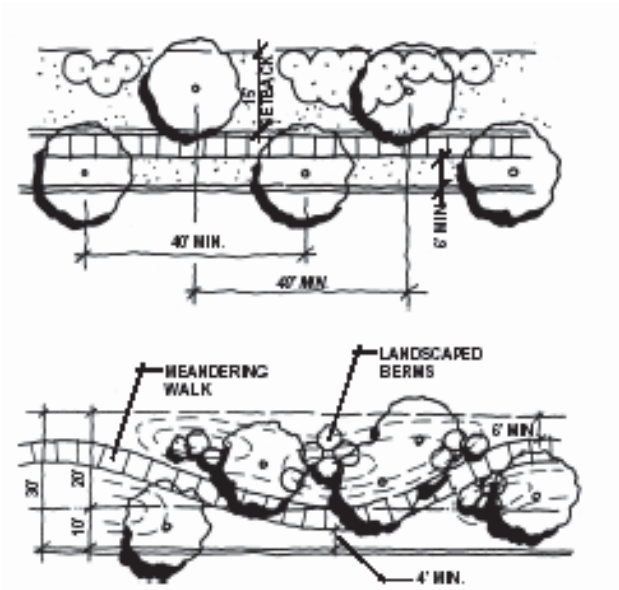
5.1 Perimeter Landscaping Adjacent to Public and Private Roads

Policy:

The corridors along perimeter arterial streets and internal collectors should provide a visually cohesive open space system. Similar landscape treatments should be used at all entrances and intersections. Plant materials, massing, spacing, and height characteristics should reinforce the hierarchy of roadways. Planting and grading should work together to create a variety of experiences along these roadways and to call attention to open space amenities. Perimeter edge treatments should establish identity for the project and convey a high-quality image.

5.1.A INCLUDE A COMBINATION OF MANICURED AND ENHANCED NATURAL LANDSCAPE AREAS.

5.1.D CREATE LANDSCAPE POCKETS IN LONG EXPANSES OF FENCES AND WALLS.



5.1.E2 & E4 LANDSCAPE REQUIREMENT DIAGRAMS

Standards and Guidelines:

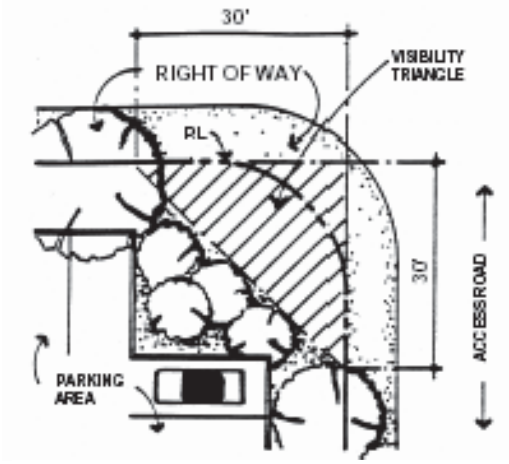
A. Include a combination of manicured and enhanced natural landscape areas. (G)
B. Place annual and perennial gardens at entries. (S)
C. Place project identification markers along the perimeter edge of all commercial developments. (G)
D. Design long expanses of fence and wall surfaces to create landscape pockets. In cases of walls or fences over 50 feet in length, provide structural offsets, insets or landscape pockets to break monotony, provide visual interest and reduce heating effects. (S)
E. Parkway and Median Plantings:
   1) Vary street tree planting species in medians and parkways. (S) However, maintain the desired rhythm of plantings by selecting street trees with similar characteristics (i.e., height and branching patterns). (S)
   2) Where detached walks parallel to the street are proposed:
      a. Provide a minimum of 1 tree per 40 lineal feet of public and private street frontage between the sidewalk and curb in a minimum 8-foot width strip (S) Also in this area, provide durable, low growing shrubs at a minimum ratio of 1 shrub per 5 lineal feet, durable ground covers or a combination of the two. Irrigated turf may also be placed in these areas. However, if the width of the area between sidewalk and curb is less than 10 feet, it would require subsurface irrigation. (S)
      b. Provide an additional 1 tree per 40 lineal feet of street frontage within 10 feet outside the sidewalk, internal to the development. (S)
      c. Provide a minimum of 1 shrub per 5 lineal feet plus ground cover or turf outside the sidewalk, internal to the development. Turf should be limited in this area and when used should be planned in a manner that can be efficiently irrigated. Low water using turf species should be chosen, provided they will typically provide a green appearance. (S)
   3) Where attached sidewalks are proposed:
      a. Provide a minimum of 1 tree per 20 lineal feet of public and private street frontage within 15 feet of the edge of the sidewalk. Tree spacing should be evaluated relative to the mature canopy size, as provided in the Recommended Plant Materials List maintained by the City and on file with the Planning Division. (S)
      b. Provide a minimum of 5 shrubs per 20 lineal feet plus perennial flowerbeds,

ground cover or grass lawn within 20 feet of the edge of curb. Lawn areas that are less than 10 feet wide in any one dimension and bordered by impervious (or paved) surfaces, may not be turf, unless irrigated with a subsurface (no pop up or spray heads) system. (S)

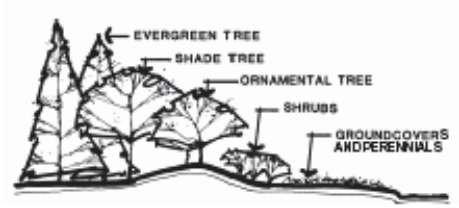
4) Where meandering sidewalks are proposed:
   a. Provide a minimum of 1 tree per 20 lineal feet of public and private street frontage. Tree spacing should be evaluated relative to the mature canopy size, as provided in the Recommended Plant Materials List maintained by the City and on file with the Planning Division. (S)
   b. Accompany the trees with a variety of shrubs and ground covers. Terracing of landscape area may also be appropriate in this area; however, berming should be avoided, as it tends to lead to inefficient irrigation and water waste. (G)
   c. Provide a minimum of 8 shrubs per 20 linear feet plus perennial flowerbeds, ground cover or grass lawn. Lawn areas that are less than 10 feet wide in any one dimension and bordered by impervious (or paved) surfaces, may not be turf, unless irrigated with a subsurface (no pop up or spray heads) system. (S)
5) To prevent interference with motorist visibility, plant parkway trees a minimum of 3 feet from the back of curb and choose shrubs that do not exceed 24" mature height. (S)

F. Visually buffer all parking lots adjacent to perimeter roadways with adequate screening within a planting strip between the public right of way and the edge of the parking lot pavement. (S) Provide adequate shrub plantings to create a dense visual buffer between parking lots and perimeter roadways. (S) When using Juniper shrubs to create said buffer, a variety of species should be used to avoid the appearance of a single mass. (S) A maximum ratio of 1 Juniper per 3 deciduous shrubs is suggested. (G) Raised planters and screen walls are also encouraged to provide parking lot screening. Bermed turf areas should be avoided due to their tendency to waste irrigation water. (G)

G. Sight-lines at Intersections and within Medians
   1) Provide adequate sight lines for an effective 30-foot sight triangle measured from the right of way. (S) Plants and signage are allowed within the sight triangle if:
      a. plants do not exceed 30" in height at full maturity; and
      b. signs do not exceed 30" in height (measured from top of curb height) unless they are more than 80 percent open. (S)



5.1.G TYPICAL SIGHT LINES AT INTERSECTIONS



5.1.H.1 PROVIDE A MINIMUM OF 3 LEVELS OF LANDSCAPE SCALE AT ENTRY DRIVES

H. Provide a diversity of landscaping materials at entry drives to development parcels. (S) Therefore:
   1) Provide a minimum of 3 levels of scale, including shade, evergreen, and/or ornamental trees, shrubs, annual and perennial flowers, and ground covers. (S)
   2) Plant clusters that appear as a cohesive visual element, and that complement the overall landscape theme and palette. (G)
   3) Integrate the plant design with the entry sign. Plantings should frame or provide a visual base for the signs. (S)

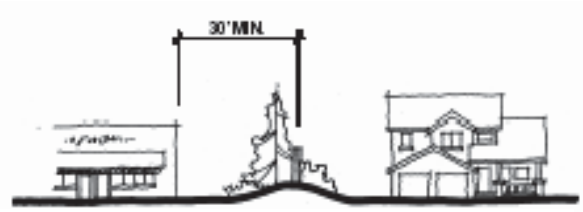
5.2 Perimeter Landscaping Adjacent to Abutting Property

Policy:

Visual buffers should be provided between similar land uses to accomplish transitions and to mitigate potential conflicts between dissimilar uses.

Standards and Guidelines:

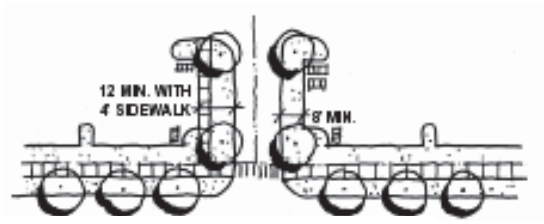
A. Between similar uses (i.e., where the adjoining uses are each permitted in the underlying zone district): Provide a minimum 10 foot wide buffer planting strip next to a perimeter or internal property line containing 1 tree for every 40 lineal feet of property line and appropriate shrubs, ground cover and/or turf areas. (S) This may not apply to internal property boundaries within a multiple-lot development to the extent the lots are developed under a single Planned Unit Development Plan and achieve other site design policies of these guidelines.



5.2.B PROVIDE A 30' WIDE PLANTING STRIP BETWEEN DISSIMILAR USES.

B. Between dissimilar uses (i.e., where the adjoining uses are not both permitted as a use by right in the underlying zone district(s)): Provide a minimum 30-foot wide buffer planting strip containing a minimum of 1 tree for every 20 lineal feet of property line and a screen hedge incorporating both deciduous and evergreen shrubs a minimum of 3 feet in height (at maturity) along a minimum of 50% of this perimeter area. (S)

C. Common/Shared Access Drives:
   1) Provide a minimum 8-foot wide buffer strip along both sides of a shared access drive when no sidewalk is included. (S)
   2) Provide a minimum 12-foot wide buffer strip along both sides of a shared access drive where a sidewalk is included. (S)



5.2.C COMMON/SHARED ACCESS DRIVES.

5.3 Parking Lot Landscaping

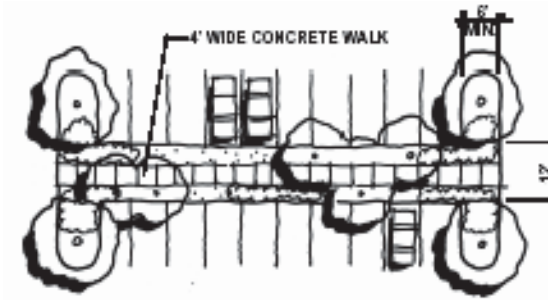
Policy:

Parking lots are necessary features of building sites that can, if not designed properly, visually detract from the overall development character. Parking lots should be designed to blend with each building site's character using landscape plantings and grading.

Standards and Guidelines:

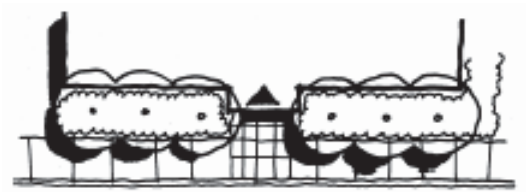
A. Use low, opaque walls and/or flowering plants combined with raised planters to create a dense visual buffer of parking areas from peripheral streets or frontages. (S)
B. Lower the grades of parking lots below existing street elevations to aid in obscuring views of automobiles, while promoting views of architectural elements of the structures beyond. (G)
C. A minimum of 1 canopy shade tree per 8 parking spaces is required in all parking lots, to be planted in islands, medians, and perimeter areas adjacent to lots (excluding streetscape tree plantings). (S)
D. Physical shade structures that incorporate live planting may also be an appropriate means of shading parking lot areas. (G)
E. No Evergreen Tree with a mature width greater than 20 feet, as noted in the Recommended Plant Materials List, should be planted within 15 feet of a hardscaped area. (S)
F. Utilize landscaped islands and medians to improve the definition of circulation patterns, provide shading for paved areas and break up continuous rows of parking. (G)
G. No landscaped area within a parking lot shall be less than 100 square feet. (S)
H. Landscaped Islands
   1) Provide a minimum 6-foot wide landscaped island at the end of every row of parking, equal in length to the length of the parking space(s). (S)
   2) Provide a minimum of 2 canopy shade trees in each island with a minimum mature canopy of 20 feet. (S)
   3) In addition to the trees, plant each island with either a minimum of 8 shrubs, not exceeding 3 feet in height at maturity or a durable and hardy ground cover. (S)
I. Landscaped Medians
   1) Place landscape medians between every other parking bay in lots for more than 100 cars. (S)
   2) Landscape medians should be 12 feet wide, including a 4-foot concrete sidewalk. (S) Where walkways in medians will not be utilized, the medians may be reduced to a width of 8 feet. (G)
   3) Provide a minimum of 1 canopy shade tree for each 30 lineal feet of median. (S) In

5.3.A USE LOW WALLS AND LANDSCAPING TO SCREEN PARKING



5.3.H & I LANDSCAPE MEDIAN AND ISLAND (SEE TEXT)

5.4.B EMPHASIZE AND INTENSIFY LANDSCAPE AT BUILDING ENTRANCES INCLUDING FLOWER BEDS WITH A VARIETY OF PERENNIALS, ANNUALS, GROUND COVERS AND ORNAMENTAL GRASSES.



5.4.C PROVIDE LANDSCAPING AROUND BASES OF BUILDINGS (SEE TEXT)

5.4.D PROTECT LANDSCAPING FROM PEDESTRIAN AND VEHICULAR TRAFFICE WITH ATTRACTIVE BARRIERS.

5.4.E USE CONTAINERS WITH FLOWERING PLANTS TO ENHANCE SIDEWALK SHOPS, PLAZAS AND COURTYARDS.

addition to trees, plant each island with either a minimum of 8 shrubs per 30 lineal feet or a durable and hardy ground cover. (S)

3) The use of landscape medians is encouraged as a transition slope between parking bays on hillside parking lots (maximum slope of 4:1). (G)

J. Where head-in parking occurs, locate all shrubs a minimum of 3 feet from the edge of the parking lot curb. (S)

5.4 Building Site Landscaping

Policy:

The coordination of landscape design for individual building sites and larger, multi-parcel projects is essential for creating a consistent, high-quality character. A coordinated design unifies the various buildings and strengthens the cohesiveness of the development. Individual landscape treatments for building sites should compliment the roadway landscapes, create distinctive settings for buildings, reinforce the design of the open space systems, and provide amenities for pedestrians.

Standards and Guidelines:

A. Use landscaping that is of appropriate scale relative to the proposed adjacent structures.
B. Intensify landscaping at building entrances. (G)
C. Provide a minimum planting width of 6 feet adjacent to the building and plant no less than 25% of the building perimeter with multi-stemmed ornamental trees, shrubs, perennial flowers, and ground cover. (S) Emphasis should be given to landscaping along the front building elevation. (G) Provide additional landscaping around the perimeter of buildings to soften the edge between sidewalks/parking lots and structures. (G) To promote irrigation efficiency, no single landscaped area shall be less than 100 square feet, with the exception of deciduous trees planted in grates. (S)
D. Protect landscaping from vehicular and pedestrian encroachments with raised planting surfaces, depressed walks, and/or curbs. (G)
E. Use high quality, durable planters with flowering annual and perennial plants to enhance sidewalk shops, plazas and courtyards. (G)
F. Minimum Landscape Area required within each building site and within the entire development shall be 30% including hardscaped plazas and walkways within open space areas. (S) Hardscape plazas and walkways can account for a maximum of one-third of the minimum landscape area requirement. (S)
G. Landscaping within Public Easements
   1) Landscaping within public easements is limited to shrubs, ground covers, and small

ornamental trees. (G) No canopy/shade trees may be planted within such easements. (S)

2) Berming is generally acceptable within public easements in conjunction with plant material. (G) Berming is not to be used instead of plant material. (S)

5.5 Landscape Irrigation / Water Conservation

Policy:

A significant percentage of the City's treated water supply is used to irrigate plant materials and grasses. Every effort should be made to conserve water by utilizing alternative means for maintaining a suitable landscape environment.

Standards and Guidelines:

A. Incorporate Xeriscape Concepts into the landscape design of each commercial development without compromising the intent to establish significant visual amenities through landscaping. Utilize a combination of the following principles to achieve this requirement. (S)

   For Example:

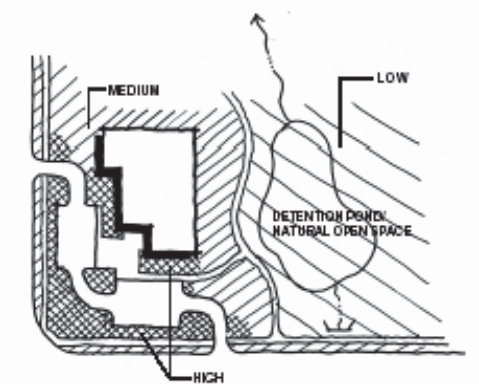
   1) Incorporate a "zoned planting scheme" to reduce water demand by grouping similar varieties of plants that are drought and disease tolerant. (S) The use of water conserving landscapes is encouraged by minimizing manicured grassy areas. (G) The PUD landscape plan should depict what are proposed as low, medium and high water zones. (S) The building permit irrigation plan should calculate GPM/zone. (S)
   2) Use drought tolerant plant species suitable to this climate that have minimum watering and pruning requirements. (G)
   3) For all irrigated areas, potential runoff should be avoided through a combination of locating such areas away from hard surfaces and the proper selection of irrigation devices. (G)
   4) Incorporate heavily mulched planting beds to aid in retaining moisture and to make planting areas easier to maintain. For all grassy areas, soils shall be improved with 3 to 6 yards of organic materials per 1,000 square feet to a depth of 6 to 8 inches. (S)
   5) Incorporate advanced irrigation measures and scheduling. Install an efficient automatic irrigation system that will incorporate water conservation measures. Spray heads are recommended for lawn and ground cover areas, with drip irrigation for shrubs and trees. (G)

B. The developer is encouraged to investigate alternative sources of irrigation water for all

landscaped areas. (G) Alternative sources shall be owned and maintained by the developer or an organization formed for such purpose, unless the City otherwise agrees.

5.6 Landscape Standards and Plant Material Selections

Policy:



5.6.A LANDSCAPE MAINTENANCE ZONES

A. Landscape zones:
Depending on the size and magnitude of an individual parcel, the project's landscape areas should be divided into one or more of the following basic zones (G):
   1) High Maintenance Zone (located at site and building entrances and pedestrian areas.) This zone may include:
      a. Manicured lawns which require weekly mowing and regular watering (including blue grass sod or fescue grasses)
      b. Formal plantings of trees and shrubs
      c. Planters, with annuals and perennials
   2) Medium Maintenance Zone (located along perimeter roadways.) This zone may include:
      a. Drought tolerant grasses, which require less water and maintenance (but still provide a manicured green look during the growing season – including fescue-type grasses)
      b. Large shrubs
      c. Large specimen trees
   3) Low Maintenance Zone (located in environmentally sensitive areas, along waterways and the balance of the site.) These may include:
      a. Natural areas and native grasses (which require very low water and maintenance)
      b. Existing vegetation
      c. Drought resistant plant species
      d. Meadow-like, open fields
      e. Wetlands areas

B. The City Manager shall by written order adopt a Recommended Plant Materials List for development subject to the CDDSG, which List may be updated periodically by subsequent written order of the City Manager. Prior to adopting any such order, the City Manager may obtain the input of HFAB, the Planning Department, and any other persons regarding such List, and may notice and hold any public meetings the Manager deems advisable to assist in formulating any such order or List. The Recommended Plant Materials List shall be maintained on file in the Planning Department. All applicants for development subject to the CDDSG shall be advised as to the existence of the Recommended Plant Materials List and a

copy thereof shall be made available to such applicants. Selection of plant materials is preferred from the Recommended Plant Materials List (G), and in light of the following standards and guidelines:

1) Select plan materials on the basis of suitability to climate, setting, long-season of visual appeal (multi-season plants, good architectural appeal, long bloom time, branching structure or ornamental grasses, for instance), and compatibility with other development plantings, character and functions. (G)
2) Select plant materials that are free of disease and harmful insect problems. (S)
3) To avoid the spread of disease, avoid planting more than 20 percent of a site with any single plant species. On small sites (less than 2 acres), some flexibility may be granted to achieve specific design objectives, subject to review and approval of the City Forester. (G)
4) The quality of plant material selected will follow the guidelines of the "American Standard for Nursing Stock" by the American Association of Nurserymen. (S)
5) Proper drainage is required for all major plantings to ensure the establishment of a good root system and healthy growth. (S)
6) The installation of all landscaping shall be done by an established landscape contractor who follows the procedures set forth by the American Association of Landscape Contractors and its local agencies. (S)
7) All landscaping and landscape material shall be backed by a warranty of the owner and the Contractor for a minimum of one year, as detailed in the development agreement. (S)
8) A performance guarantee is required to ensure completion of landscaping. (S)
9) Artificial plants of any type, size or color are not allowed as exterior landscaping within any development parcel. (S)

C. Grasses should provide an immediate cover and sod is recommended. In less irrigated/non-irrigated areas, plant drought-tolerant plants. A temporary irrigation system should be maintained for a minimum of one year. (G)

D. Choose plant materials that provide variety and year-round color and screening. Select materials, which highlight each season (G).
   1) Spring: Flowering Plants
   2) Summer: Shade
   3) Fall: Leaf color
   4) Winter: Branch form and texture

E. Edging is required to separate grass areas from shrubs, ground cover and mulch. (S)

F. Utilize porous paving materials for paths, plazas, etc., such as patio bricks, inter-locking pavers, concrete stepping stones and/or sandstone. (G)

5.6.E PLANT FLOWER BEDS IN VISIBLE AREAS

G. Plant annual and perennial flower beds in visible areas such as pedestrian plazas, building entries. (S)
H. Mulching:
   1) All planting beds should be mulched with wood or decorative rock to stabilize soils, control erosion, and conserve water use. (S)
   2) Use organic mulch materials that are best suited and adapted for the local area. (S)
   3) Decorative rock may not constitute more than 50% of the total mulched area. (S)
   4) In parking lot landscape islands, rock mulch may be used as an edger to protect the organic mulch, which should be the primary mulch material. (S)
I. Use landscape or weed barrier fabric within all shrub beds and mulched areas to control weeds. (G)
J. All Landscape Plans should be prepared by a qualified Landscape Architect or landscape designer. (G)

5.7 Planting Size Standards

Policy:

An immediate landscape impact is desired within all commercial developments, and to facilitate this, minimum plant size standards are required. Larger sizes are encouraged for shrubs and perennials.

Standards and Guidelines:

A. Provide landscaping according to the following minimum sizes: (S)
   1) Deciduous shade/canopy trees: 2.0” caliper*
   2) Ornamental trees: 2.0” caliper*, however, 1.5” caliper ornamental trees may be sufficient in some cases.
   3) Evergreen trees: 6’-8’ height (with a minimum of 25% 8’ in height)
   4) Multi-stem Ornamentals: 8’-10’ height
   5) Shrubs: 5 gallon container
   6) Ground Cover/Perennials: 2¼” pots*
   7) Vines: 1 gallon container

   *Measured by ANSI standard Z60.1.

5.8 Landscape Maintenance and Replacement

Policy:

The property owner is responsible for providing, protecting and maintaining all landscaping in a healthy and growing condition.

Standards and Guidelines:

A. The property owner will remove and replace dead plant materials immediately with the same type, size and quantity of plant material as originally installed. If material is diseased or insect-infected, replacement with same species is not advisable unless solution has been found for disease or infestation. Replacement may not be identical, yet should provide same form and function, subject to City Staff review and approval. (S)
B. Avoid replacing landscape materials during the dry winter months between December and February and in midsummer. (G)
C. Contact the Planning Division for specific time requirements for landscape material replacement. (G)

5.8.A REMOVE AND REPLACE DEAD OR DISEASED PLANT MATERIALS IMMEDIATELY.

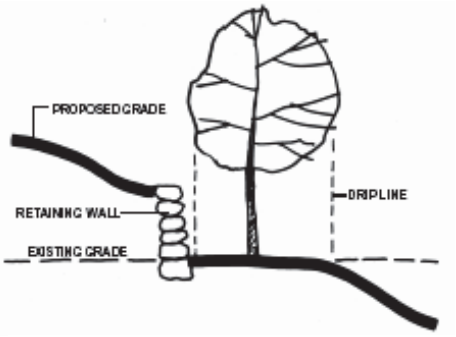
5.9 Existing Vegetation

Policy:

Special attention should be paid to preserving within each commercial development those natural features and vegetation which are significant because of their unique character, history, size, variety, or growth habits. This includes all mature trees greater than 3 inches in diameter and significant understory plants and shrubs.

Standards and Guidelines:

A. Provide an inventory of all existing trees and significant woody vegetation that identifies size, health, and species and trees to be retained and removed. (S) The inventory is to be prepared by a botanist, licensed arborist or landscape architect. (S)
B. Locate site and building improvements to preserve significant natural vegetation. (G)
C. Preserve and incorporate into the landscape plan, any existing health tree 6" caliper or larger, and located more than 20 feet from any proposed building location. (S) Preserve all trees over 24" caliper unless deemed unhealthy or unsuitable for preservation. (S)
D. During construction of site improvements, erect suitable protective barriers (generally located beyond the drip line) around trees to be preserved, making sure trunks, branches and root structures are not damaged by construction equipment. (S)
E. Incorporate tree wells or retaining walls as necessary in the landscape plan to protect existing trees. (G) Maintain historic drip lines. (G)



5.9.E USE TREE WELLS OR RETAINING WALLS TO MAINTAIN GRADE AROUND EXISTING TREES

5.10.A PROVIDE ATTRACTIVE, FUNCTIONAL OUTDOOR SEATNG

5.10.C PROVIDE ATTRACTIVE, HEAVY DUTY TREE GRATES IN PLAZA AREAS.

5.10.D ENCLOSE AND LANDSCAPE AROUND ALL TRASH DUMPSTERS.

5.10 Site Furniture and Features

Policy:

Site furnishings include benches, waste receptacles, planters, railings and bollards. Visual consistency of these elements is desired throughout each development. All components of outdoor site furniture should be low maintenance, highly durable and resistant to vandalism, graffiti, and theft.

Standards and Guidelines:

A. Outdoor Seating
   1) Use outdoor seating that is comfortable, attractive, durable and easy to maintain. (S)
   2) Locate benches at major building entryways, drop-off areas, transit stops, pedestrian courtyards and plazas. (S)
   3) Locate benches in areas that receive direct sunlight in the winter, are sheltered from winds and shaded in the summer. (G)
   4) Where seating is fixed, provide a variety of arrangements (both linear and grouped), which accommodate two (2) to six (6) persons. (G)

B. Planters and Waste Receptacles
   1) Design planters and waste receptacles to coordinate with other furniture. (G)
   2) Use materials and colors similar to those used for benches. (G)

C. Tree Grates
   1) Use of tree grates is discouraged unless used in conjunction with structural soils. If necessary, use tree grates to prevent excessive soil compaction and to give added interest to the pavement. (G)
   2) Choose tree grates that are fabricated of a strong, durable material. (S) In areas which receive heavy use, tree guards may be appropriate to give added protection to young trees. (G)

D. Trash dumpsters
   1) Provide a concrete pad a minimum of 8 feet wide to provide truck access to dumpster locations. (S)
   2) Enclose and landscape around all trash dumpsters. (S) (See also Section 4.7, Service Entrances and Loading Areas and Section 6.0, Screen Walls and Fences.)

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[1] Revised: Ordinance 1422, Series 2003.

6. SCREEN WALLS AND FENCES

Goal:

Fences and walls should be decorative and contribute to the visual quality of the project and the overall development. Walls, fences, and landscape materials shall be used to screen service areas, loading areas, and outdoor storage or sales areas. When not required for security, screening, or grade transitions, the size of walls and fences should be minimized. When required, however, fencing should be as inconspicuous as possible, and walls should be low.

6.1 Wall and Fence Design and Materials

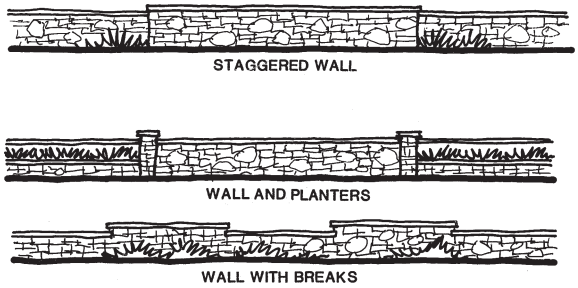
Policy:

Fencing and walls shall be constructed of materials that are compatible with the adjacent building architecture and their appearance softened with landscape materials.

Standards and Guidelines:

A. Avoid using retaining walls in excess of 30 inches in height (G). Where taller retaining walls are required, provide safety protection in the form of railings, fences or hedges, or create a terrace with two (2) shorter walls. (S)
B. Incorporate architectural treatment on both sides of perimeter walls. (S)
C. Provide landscaping in combination with walls and fences to soften their appearances. (G)
D. Chain-link fencing with or without wood slatting is not an acceptable screen material. (S)
E. Break up long expanses of fences or walls, with periodic columns, insets or change in materials. (S)
F. Construct walls and fences from durable materials such as stone, brick, or metal with dark finishes (wrought iron or similar), or a combination of these materials. (G) Wood is not an acceptable fence/screening material. (S)
G. Concrete walls are permitted if faced with masonry or stone, or if the surface is scored or textured. (G)

6.1 A AVOID USING RETAINING WALLS IN EXCESS OF 30 INCHES IN HEIGHT.

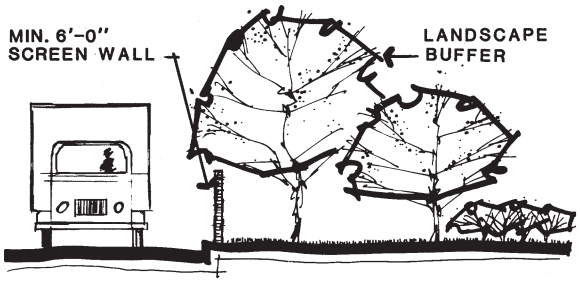


6.1 E BREAK UP LONG EXPANSES OF FENCES OR WALLS WITH COLUMNS, INSETS OR CHANGES IN MATERIAL

6.2 Screening Requirements

Policy:

A project must include adequate screening of meters, transformers, and loading and service areas.



6.2 A MAKE SCREENING FOR LOADING DOCKS AND SERVICE AREAS A MINIMUM OF 6 FEET HIGH.

6.2 B & C ALL AUTHORIZED OUTSIDE STORAGE, UTILITY EQUIPMENT, METERS, AND TRANSFORMERS SHALL BE SCREENED.

Standards and Guidelines:

A. Make screening for loading docks and service areas a minimum of 6 feet high and constructed of the same materials and finishes as the main building. (S)

B. All authorized outside storage shall be screened. (S)
   1) Screen from view all outdoor areas used for the display, storage, or sale of seasonal inventory. (S) Use fencing, walls, and/or landscaping. (S)

C. Screen all utility equipment, meters and transformers from view with fencing, walls, and/or landscaping. (S)

7. Sign Design

Goal:

Signs should be consistent with project and overall development design but should be subordinate to architectural and landscape elements. Signs serve to identify, inform, direct, regulate and interpret. Each commercial building or group of commercial buildings should have a consistent and comprehensive sign program from project identification at the street through individual tenant suite identity. Placement, scale, and readability should be considered in developing a sign package.

7.1 Sign Materials

Policy:

Design and construct signs of durable, high quality architectural materials.

Standards and Guidelines:

A. The sign package must utilize materials, colors, and designs that are compatible with the associated structures. (S)
B. Sign materials must be of proven durability. (S)

7.2 A & B FLUSH MOUNTED SIGNS (SEE TEXT).

7.2 Sign Number and Area

Policy:

The size of signs should be modest and afford businesses sufficient visibility and identification without becoming a dominant part of the landscape or interfering with vehicular movement along the public streets.

Standards and Guidelines:

A. Number of Signs - Commercial / Retail
   1) The maximum number of building-mounted signs allowed for freestanding buildings is one per individual tenant building frontage, not to exceed three signs. (S)
B. Number of Signs - Commercial / Office
   1) One monument sign is permitted for each freestanding building. (S)
   2) Where a freestanding office building contains multiple tenants, or multiple accesses off a public right of way, an increase in the number of monument-

7.2 B FREESTANDING SIGNS (SEE TEXT).

signs may be permitted in the planned unit development plan process. (G)

3) Office building-mounted signs not exceeding 40 square feet of surface area each, and not exceeding 100 square feet total, are permitted. (S)

C. Area of Signs: Character Heights

1) Monument signs shall not exceed 60 square feet per face in retail zones nor 40 square feet in office zones. (S)
2) Maximum area of Commercial / Retail building-mounted signs shall be 1 square foot of sign area per linear foot of building frontage of the individual business. No individual sign shall exceed 200 square feet. (S)
3) Projecting signs may not exceed 4 square feet in area. (S)
4) Character heights for commercial retail and office signs shall be limited to a maximum height of 24 inches and a minimum height on monument signs of 8 inches. (S)
5) Character heights may be further limited through the PUD process based on architectural compatibility and site development context. (S)
6) Maximum area of commercial / office signs is as set forth in subsection B.3 above. (S)

7.3 Location/Placement/Visibility

Policy:

Signs should be located with visability from streets and paths without conflicting with safe vehicular movement.

Standards and Guidelines:

A. Signs shall be sufficiently visible from public streets so that site entrances can be readily identified by both pedestrians and persons in vehicles. (G)
B. Locate monument signs in a planter setting within a landscaped area. (S)
C. Locate signs a minimum of 10 feet from the right of way so as to not obstruct visibility at intersections. (S)
D. The placement of signs on roofs is not allowed. (S)

7.3 B LOCATE MONUMENT SIGNS IN A PLANTER SETTING WITHIN A LANDSCAPED AREA.

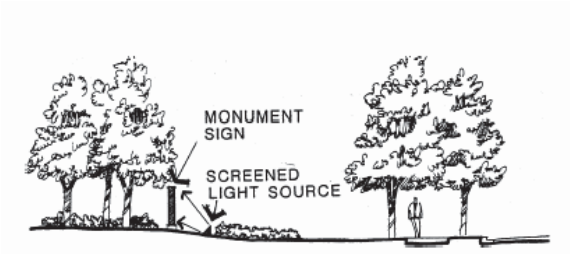
7.4 Sign Illumination

Policy:

Sign illumination should complement, not overpower, the image of the building and its immediate landscaping.

Standards and Guidelines:

A. Neon tubing is an acceptable method of sign illumination. (G)
B. Flashing signs are not permitted under any circumstances. (S)
C. The use of individually-cut, back-lit character signs is strongly encouraged. (G)
D. When external light sources are directed at the sign surface, conceal the light source from pedestrians' and motorists' "lines of sight". (S)
E. When using an internally illuminated sign cabinet, only that portion of the sign face dedicated to the trademark or characters may be translucent. The balance of the sign face shall be opaque. (S)
F. As used in this Chapter 7, "character" means and includes any graphic symbol used for sign text, included but not limited to letters, numbers and logos, provided that any character used for a sign must be a part of the name, service mark or trademark of the company or business.



7.4 D EXTERNAL LIGHT SOURCES DIRECTED AT SIGNS SHOULD BE CONCEALED FROM PEDESTRIANS' AND MOTORISTS' "LINES OF SIGHT".

7.5 Allowable Sign Types

Policy:

The type of sign used should reinforce the urban environment of commercial developments. Signs should be designed as a "family", incorporating similar, compatible materials that reinforce the design and style of the project architecture. The following standards and guidelines apply with regard to the listed sign types.

7.5 A MONUMENT SIGNS (SEE TEXT).

Standards and Guidelines:

A. Monument Signs
   1) For office zones project monument signs, if authorized, may be located at the street or primary entries to commercial developments to provide the overall project identity. (G) Such signs shall contain only the name of the project which it identifies, and shall not contain change, panels, advertising or names of individual tenants. (G)
   2) For retail zones individual monument signs may be located at primary entries to free-standing buildings to provide individual business identifications and building addresses. (G) Such sign shall contain only the name or trademark of the business served, and shall not contain change panels, advertising or names of individual tenants. (S)
   3) Affix monument signs to the ground in a continuous connection. (S)
   4) For multiple user projects such as shopping centers or office buildings, project identity

7.5 A 2 SMALLER SCALE MONUMENT SIGNS MAY BE LOCATED AT PRIMAR ENTRIES TO PROVIDE INDIVIDUAL BUSINESS IDENTIFICATIONS AN ADDRESSES.

signage requires additional variables that must be considered. Conceptual designs for signs serving these types of facilities must be submitted to the planning department.

The total measured area of a sign shall be measured using the smallest single square or rectangle that includes the area of all writing, representation, lines, emblems or figures contained within all modules, together with any air space, material or color forming an integral part or background of the display if used to differentiate such sign from the backdrop or structure (S)

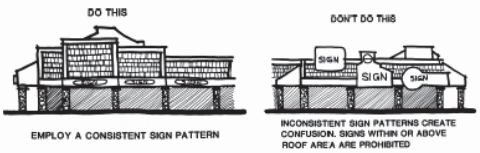
5) All monument signs using a sign cabinet design shall have an architectural boarder that integrates a minimum of two sides of the sign cabinet into the base. The architectural base and boarder shall be consistent with and/or compliment the building materials. (S)
6) All individual tenant panels shall be of a uniform size and a minimum of 5 square feet.
7) All monument signs shall be constructed of an opaque background and use a uniform color.

B. Building-mounted Signs
1) Locate building-mounted signs at the first floor level only for retail uses. (S) Building-mounted signs shall identify the individual business, building or building complex by name or trademark only. (S)
2) Building-mounted signs may not project more than 8 inches from the face of the building. (S)

C. Projecting Signs
1) Signs that project perpendicular from a building are allowed only for multi-tenant retail and office uses within a predominantly retail center. (S)
2) Projecting signs must be mounted above 7 feet from grade and may not project more than 5 feet from the wall. (S)

D. Pole-mounted Signs
1) Pole-mounted signs are allowed only as traffic regulation signs or to provide appropriate directions to loading and receiving areas, visitor parking, and other areas within each development site. (S)
2) Pole-mounted signs may not exceed 4 square feet in area and 6 feet in height measured from grade. (S)

E. Flashing or moving signs are not permitted. (S)



7.5 B LOCATE FLUSH-MOUNTED SIGNS ON BUILDINGS AT THE FIRST FLOOR LEVEL ONLY FOR RETAIL USES.

7.5 B FLUSH-MOUNTED SIGN AT THE FIRST LEVEL

7.5 C PROJECTING SIGNS (SEE TEXT)

8. EXTERIOR SITE LIGHTING

Goal:

Exterior lighting should be used to provide illumination for the security and safety of entry drives, parking, service and loading areas, pathways, courtyards and plazas, without intruding on adjacent properties. Site lighting shall be architecturally compatible and consistent in design between sites.

8.1 LIGHT FIXTURES SHOULD BE COMPATIBLE AND RELATE TO THE ARCHITECTURAL CHARACTER OF THE BUILDINGS.

8.1 Fixture Design and Illumination Level

Policy:

Exterior light fixtures should be compatible and relate to the architectural character of the buildings on a site. Site lighting should be provided at the minimum level to accommodate safe pedestrian and vehicle movements, without causing any off-site glare.

Standards and Guidelines:

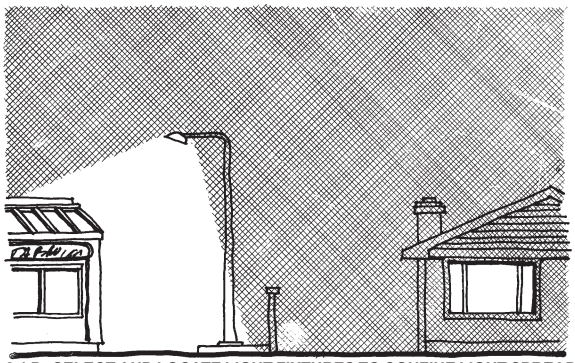
A. Poles and fixtures should be designed to be architecturally compatible with structures and lighting on adjacent properties. (G)
B. Poles and fixtures shall be compatible with all other fixtures on site. (S)
C. Illuminate all intersections with perimeter public roads with similar poles and fixtures used internal to the development. (G)
D. Select and locate all lighting fixtures to shield or confine light spread within a site's boundaries. (S)
E. To facilitate security, specify lighting levels that are adequate for visibility, but not overly bright. All building entrances should be well-lighted. (G)
F. Use metal halide or other white light fixtures. High pressure sodium is not allowed in any application. (S)
G. Maximum height of all poles within landscaped and plaza areas is 20 feet, measured from grade. Poles within these areas may be set on pedestals no more than 8 inches in height. (S)

8.1 A POLES AND FIXTURES SHOULD BE COMPATIBLE WITH ADJACENT STRUCTURES AND LIGHTING.

8.2 Decorative Architectural Lighting

Policy:

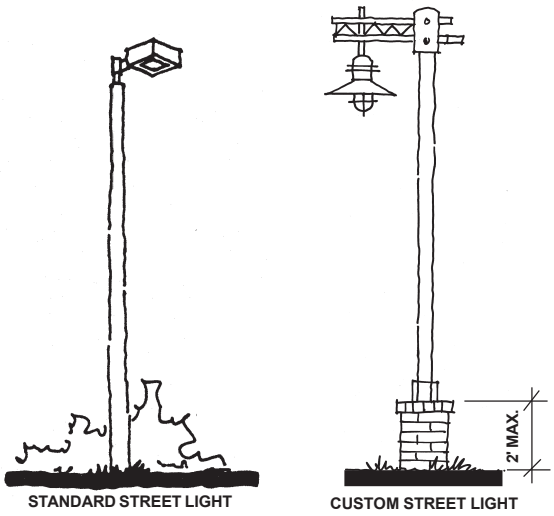
Special lighting that accents building features and creates visual interest is permitted in commercial developments, provided that design continuity is maintained among buildings.



8.1 D SELECT AND LOCATE LIGHT FIXTURES TO CONFINE LIGHT SPREAD.

Standards and Guidelines:

A. Lighting fixtures mounted directly on structures may be allowed when utilized to enhance specific architectural elements or to help establish scale or provide visual interest. (G)
B. "Wall paks" are permitted only in loading and service areas, and should be down-lit and shielded from view. (S)
C. Neon tubing is not acceptable as a building accent or to accentuate the building's form. (S)
D. Integrate illuminators or fixtures used to light building mounted signage, building facades, or pedestrian arcades into a building's architectural design. (G)
E. Consider highlighting entrances, art, terraces, and special landscape features. (G)



8.3 PARKING LOT LIGHT FIXTURES (SEE TEXT).

8.3 Parking Lot Lighting

Policy:

Parking lot lighting should be unobtrusive and provide safe light for orderly functions.

Standards and Guidelines:

A. Make all parking lot light fixtures similar in design for all surface parking areas. (S)
B. Select metal halide lighting with a concealed light source of the "cut-off" variety to prevent glare and "light trespass" onto adjacent buildings and sites. (S)
C. Provide separate, pedestrian scale lighting for all pedestrian ways through parking lots. (G)
D. Maximum height of parking lot poles is 24 feet measured from finished grade. (S)
E. Locate poles in medians wherever possible with a maximum base height of two (2) feet. (G)

8.4 Pedestrian Area Lighting

Policy:

Walkway lighting should be scaled to the pedestrian and should provide for safe use of pathways and pedestrian areas. Walks should be lighted for the safe passage of pedestrians as should areas which are dangerous if unlit, such as stairs, ramps, intersections, and underpasses.

8.4 A USE LIGHTED BOLLARDS TO IDENTIFY PEDESTRIAN AREAS.

Standards and Guidelines:

A. Use of lighted bollards or other low level fixtures is encouraged to identify pedestrian walkways and drop-off areas at entrances to buildings. (G)
B. Emphasize pedestrian-to-vehicle intersections with low level decorative street lights. (G)
C. Illuminate all primary walkways, steps or ramps along pedestrian routes. (G)

D. Incandescent or metal halide lamps are strongly encouraged. (G)
E. Use building mounted fixtures for walkways or plazas near buildings. (G)

8.5 Landscape Lighting

Policy:

Landscape lighting should enhance and complement, not overpower, the landscape materials.

Standards and Guidelines:

A. Design the landscape lighting to work for all seasons of the year and through the life of the landscape. (G)
B. Conceal fixtures where possible (ie. in trees, by landscape, behind rocks), control glare , and avoid extreme bright spots on the surrounding landscape. (G)

8.5 B CONCEAL LIGHT FIXTURES WHERE POSSIBLE.

8.6 Site Security Lighting

Policy:

Security lighting is anticipated in some sites, but it should not negatively impact the site and building architecture as well as adjacent parcels.

Standards and Guidelines:

A. No light source (bulb) shall be directly visible from adjacent parcels. (S)
B. Provide only as much light/illumination as necessary to provide safety and security of the area. (G)

8.7 Light Intensity

Policy:

The light intensity levels within all areas should correspond to use and potential hazards.

Standards and Guidelines:

A. A photometric lighting plan is required for all proposed commercial developments to ensure adequate and appropriate light levels are provided for each site condition. (S)

B. The following levels of illumination should be maintained for each of the specific locations*: (G)

1)	Building Entrances	5.0 footcandles
2)	Sidewalks	2.0 footcandles
3)	Bikeways	1.0 footcandles
4)	Courts/Plazas/Terraces	1.5 footcandles
5)	Ramps	5.0 footcandles
6)	Stairways	5.0 footcandles
7)	Underpasses	5.0 footcandles
8)	Waiting Areas	1.0 footcandles
9)	Parking Lots	1.0 footcandles
10)	Roadways	1.5 footcandles

* Values given area in minimum average maintained horizontal, footcandles which are measured at the average point of illumination between brightest and darkest areas, 4'-5' above the ground surface. (Source: IES Lighting Handbook - 4th Edition).

C. Site lighting should provide consistent levels of illumination, avoiding pockets of very high or low levels of illumination. (G)

9. SPECIAL DESIGN GUIDELINES FOR LARGE RETAIL ESTABLISHMENTS

Goal:

Large retail establishments, such as "superstores" containing more than 30,000 square feet allocated to a single user, depend on high visibility from major public streets. Correspondingly, the design of these buildings will shape much of the character and attractiveness of the major streetscapes in the commercial areas of Louisville. It is important that these large individual developments contribute to and integrate with the city in a positive way. The following policies, standards and guidelines are meant to provide a means to address the community-wide and regional impacts of large retail store developments and are in addition to the preceding standards and guidelines in this document.

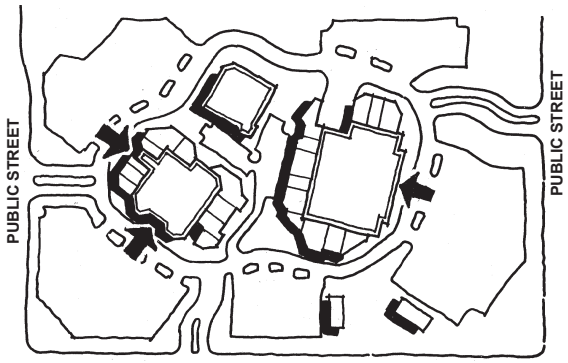
9.1 Parking Lot Orientation

Policy:

Parking should be distributed around large buildings in order to shorten the distance to the buildings and public sidewalks.

Standards and Guidelines:

Locate no more than 75% of the off-street parking area for the entire property between the front facade of the principal building(s) and the primary abutting street. (G)



9.1 DISTRIBUTE PARKING TO MINIMIZE WALKING DISTANCES.

9.2 Rear of Buildings

Policy:

The rear or sides of buildings should be attractive. Architectural and landscape screening techniques should be employed to mitigate the aesthetic impacts of blank walls, loading areas, storage areas, HVAC units and garbage receptacles.

Standards and Guidelines:

A. Provide a minimum 35 foot building setback from the nearest property line along the rear and sides of buildings. (S)
B. Where the parcel is adjacent to a residential use, plant evergreen trees at 15 foot intervals, or in clusters that accommodate mature tree diameter and provides appropriate screening. (S)

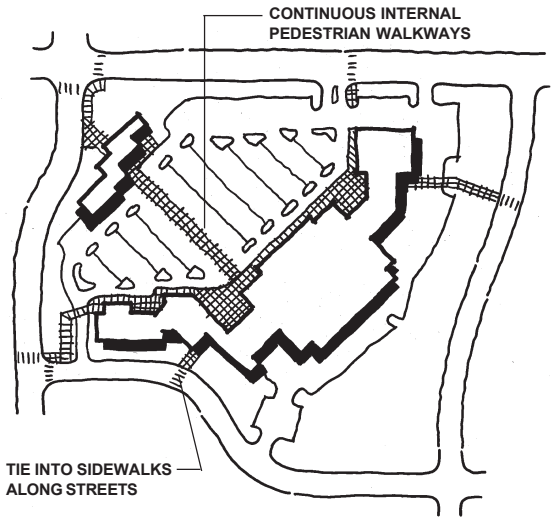
9.3 Pedestrian Accessibility

Policy:

Pedestrian accessibility provides linkages with surrounding areas and uses and opens auto-oriented developments to the neighborhood, thereby reducing traffic impacts and enabling the development to project a friendlier, more inviting image.

Standards and Guidelines:

A. Provide continuous internal pedestrian walkways, a minimum of 8 feet wide, from the public sidewalk or right-of-way to the principal customer entrance of all principal buildings on the site. (S) Such walkway can include crosswalks. (G)
B. Provide sidewalks, not less than 8 feet wide along any facade that contains a customer entrance, is adjacent to a parking area, or which would provide functional pedestrian connections. (S)
C. Except where features such as arcades and entry ways are part of the facade, provide a 6 foot wide planting bed between the facade of the building and the adjacent sidewalk. (S)
D. Distinguish all internal pedestrian walkways from driving surfaces with durable, low maintenance surface materials such as concrete or brick pavers. (S)
E. Provide weather protection features such as awnings or arcades within 30 feet of all customer entrances. (G)



9.3A PROVIDE CONTINUOUS INTERNAL PEDESTRIAN WALKWAYS WHICH CONNECT ALL FOCAL POINTS OF PEDESTRIAN ACTIVITY.

9.4 Central Features and Community Spaces

Policy:

Large retail establishments should offer attractive and inviting pedestrian scale features, spaces, and amenities within the overall development area.

Standards and Guidelines:

A. Configure entrances and parking lots to be functional and inviting with walkways conveniently tied to logical destinations. (G)
B. Incorporate bus stops and drop-off/pick-up points as integral parts of the development. (G)
C. Anchor pedestrian ways with special design features such as arcades, porticos, pedestrian-scale light fixtures, bollards, planter walls, towers and other architectural elements that define circulation ways and outdoor spaces. (G)
D. Each large retail establishment within a larger commercial development must contribute to the establishment or enhancement of community and public spaces by providing at least 2 of the following amenities within its site or elsewhere within the overall development: 1) patio/seating area, 2) pedestrian plaza with benches, 3) transit center, 4) bus shelter, 5) window shopping walkway, 6) outdoor playground area, 7) kiosk area, 8) water feature, 9) clock tower, or 10) other such appropriate amenities. (S)

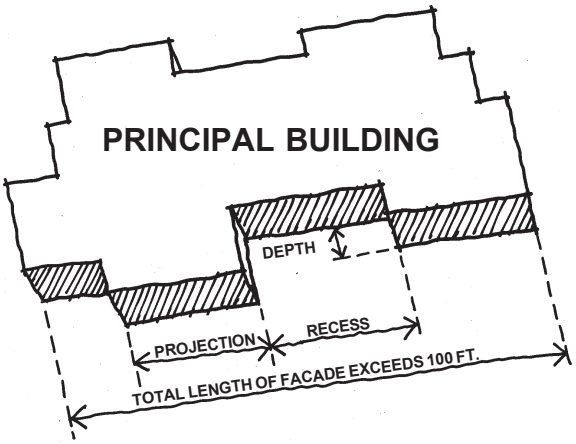
9.5 Facades and Exterior Walls

Policy:

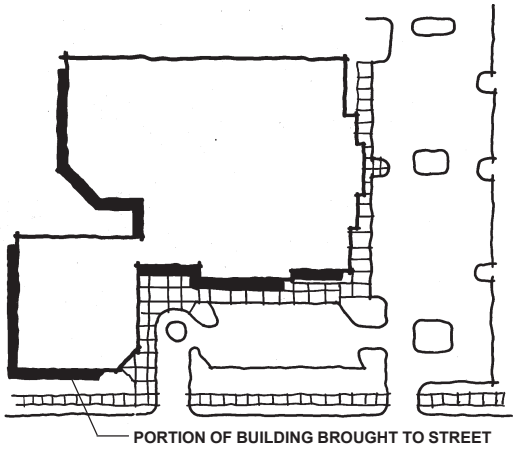
Articulate facades to reduce the massive scale and the uniform impersonal appearances of large retail buildings and provide visual interest that is consistent with Louisville's desired identity, character and scale.

Standards and Guidelines:

A. In cases of facades more than 100 feet in length, incorporate significant architectural features and treatments to diminish the building mass. (S)
B. Incorporate arcades, display windows, entry areas, or other such features along at least 60% of the horizontal length of all the ground floor facade with the primary pedestrian entrance. (S)
C. Incorporate design features that are similar to the front facade in all rear and side facades visible from adjoining properties and/or public streets. (S)
D. In cases of large buildings for employment, storage or auto related uses that have little relationship to pedestrians, or have a need to limit ground floor windows, bring a part of the building to the street. (G) A setback modification may be authorized for such purpose. (G)



9.5A FACADES MORE THAN 100 FEET IN LENGTH SHALL INCORPORATE SIGNIFICANT ARCHITECTURAL FEATURES AND TREATMENTS.



9.5 D IN CASES OF LARGE BUILDINGS BRING A PART OF THE BUILDING TO THE STREET.

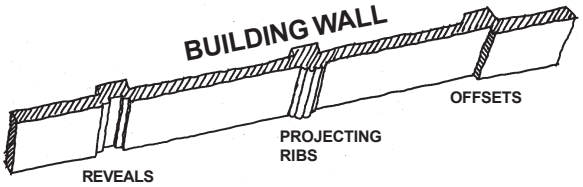
9.6 Detail Features

Policy:

All buildings should incorporate architectural features and patterns that create visual interest, are of a pedestrian scale, and recognize Louisville's desired identity character, and scale.

Standards and Guidelines:

A. Incorporate a repeating pattern in all building facades, to include the following elements: 1) color change, 2) texture change and 3) material module change. (G) Repeat these elements at intervals of no more than 30 horizontal feet. (G)
B. Express architectural or structural bays through a change in plane of at least 12 inches in width, such as an offset, reveal, or projecting rib. (G)



9.6B EXPRESS ARCHITECTURAL OR STRUCTURAL BAYS THROUGH A CHANGE IN PLANE.

9.7 Roofs

Policy:

Variations in roof lines should be used to add interest to, and reduce the massive scale of large retail buildings. Roof features should complement the character of adjoining neighborhoods.

9.7A INCORPORATE A VARIETY OF ROOF FEATURES IN LARGE RETAIL BUILDINGS.

Standards and Guidelines:

A. Incorporate the following features into the roofs of large retail buildings:
   For flat roofs:
   1) Parapets on all building elevations that conceal flat roofs and rooftop equipment. (S)
      If sloping roofs are used, the standards in 2 and 3 below must be applied on all building elevations. (S)
   For sloping roofs:
   2) Overhanging eaves that extend no less than 3 feet past the supporting walls. (S)
   3) Three or more roof slope planes. (S)
B. Design roof slopes within the maximum to minimum range of 1:1 to 3:1. (S)

9.8 Materials and Colors

Policy:

Exterior building materials and colors comprise a significant part of the visual impact of a building. Therefore, they should be aesthetically pleasing and compatible with materials and colors used in adjoining neighborhoods and commercial parcels.

Standards and Guidelines:

A. Incorporate high quality exterior building materials in the design and construction of large retail buildings such as brick, wood, sandstone or other native stone and tinted, textured, concrete masonry units. (G)
B. Avoid using the following exterior building materials: smooth-faced concrete block, tilt-up concrete panels and pre-fabricated steel panels. (G)

9.9 Building Entryways

Policy:

Entryway design elements should give orientation and aesthetically pleasing character to a building.

Standards and Guidelines:

A. Incorporate clearly defined, highly visible customer entrances for each principal building on a site. (S)
B. Enhance each entrance with at least 3 of the following features: 1) canopies or porticos, 2) overhangs, 3) recesses/projections, 4) arcades, 5) raised corniced parapets over the door, 6) peaked roof forms, 7) arches, 8) outdoor patios, 9) display windows, 10) architectural details such as tile work and moldings which are integrated into the building structure and design and 11) integral planters or wing walls that incorporate landscaped areas and/or places for sitting. (S)
C. Provide at least 1 exterior customer entrance for each additional store located within a principal building (such as a pharmacy or bank located within a supermarket). (G)

9.9 A INCORPORATE CLEARLY DEFINED, HIGHLY VISIBLE CUSTOMER ENTRANCES FOR EACH PRINCIPAL BUILDING.

APPENDIX A

RECOMMENDED PLANT MATERIALS LIST

DECIDUOUS TREES

Common Name	Botanical Name	Height[3]	Width[3]	Water Requirement	Maintenance Requirement	Street Tree	Remarks
Western Hackberry	Celtis occidentalis	60’	40’	M-L	L	Yes	Great bird attractant; CO native
Kentucky Coffeetree	Gymnocladus dioica	60’	50’	L	L	Yes	Males have flowers but no seeds; slow growth but superior drought tolerance
Norway Maple	Acer platanoides (2)	50-60’	40-45’	M	L	Yes	Good fall color yellow
Black Walnut	Juglans nigra	50-60’	50-60’	M-L	L	No	Stains sidewalks, streets and cars
American Linden	Tilia americana	50-60’	30-35’	M	L	Yes	
Redmond Linden	Tilia euchlora 'Redmond'	50-60’	30-35’	M	L	Yes	
Horsechestnut	Aesculus hippocastanum	50’	40’	M-L	L		
Western Catalpa	Catalpa speciosa	50’	30’	M-L	M		Fruits can be messy
Swamp White Oak	Quercus bicolor	50’	40’	M-L	L	Yes	
Bur Oak	Quercus macrocarpa	50’	40’	L	L	Yes	Tolerates tough conditions
Northern Red Oak	Quercus rubra borealis	50’	30’	M	L	Yes	
Shumard Oak	Quercus shumardii	50’	40’	M	L	Yes	Red fall color; not fussy; tolerant of high pH
English Oak	Quercus robur	45’	35’	M-L	L	Yes	Good fall color; needs shelter
Red Maple very few	Acer rubrum	40-50’	30-40’	M	L	Yes	Good yellow to red fall color
Texas Shumard Oak	Quercus buckleyi	40’	30’	M-L	L	Yes	More drought tolerant
Honeylocust	Gleditsia triacanthos inermis (2)	36’	25’	L	L	Yes	Shademaster, Imperial & Skyline
Little Leaf Linden	Tilia cordata	35-40’	25-30’	M	L	Yes	
Chinese Catalpa	Catalpa ovata	35’	30’	M-L	M	No	
Turkish Hazel	Corylus colurna	30-40’	20-25’	M-L	L	Yes	Tolerates pollution
Amur Corktree	Phellodendron amurense	30-40’	35-45’	M-L	L	Yes	
Japanese Pagoda Tree	Sophora japonica	30-40’	15-20’	M-L	L	Yes	
Ohio Buckeye	Aesculus glabra	30-35’	26’	M-L	L	Yes	Poisonous seeds, good fall color
Yellow	Aesculus flava	30’	25’	M	L	Yes	Yellow flowers,

Buckeye							smooth fruit
Bigtooth Maple	Acer grandidentatum	20-25’	12-15’	L	L	No	Small tree or large shrub; tolerant of dry & alkaline soils; Ft. Collins selection is cherry-red in fall
Western Soapberry	Sapindus drummondii	20-25’	20-25’	L	M		Native to Baca County, poor soil; watch for co-dominant limbs; small tree
American Hornbeam	Carpinus caroliniana	20’	20-25’	M	L	No	Needs some shade; sensitive to salts; gorgeous winter look
Gambel Oak small tree	Quercus gambelli	15-20’	15-20’	L	L	No	Yellow to orange or red in fall

ORNAMENTAL TREES

Common Name	Botanical Name	Height	Width	Water Requirement	Maintenance Requirement	Street Tree	Remarks
Globe and Purple Robe Locust	Robinia pseudoacacia ‘Globe’ & ‘Purple Robe’	50’	30’	L	L	NA	
Colorado Paper Birch	Betula x andrewsii	40’	20’	M	L	NA	Native of Boulder Cnty., hybrid; white peeling bark
Glen’s Form Callery Pear Aristocrat Pear Chanticleer Pear Stone Hill Pear	Pyrus calleryana (2)	35’ 35’ 30’	25’ 15’ 12-15’	M-L	M	NA	Narrower & more cold hardy than Bradford; fruit unimportant; clay ok
Downy Hawthorn	Crataegus mollis	30’	30’	L	L	NA	
White Shield Osage Orange	Maclura pomifera	30’	30’	M	L	NA	No thorns; leathery leaves; fruitless
Mayday Tree	Prunus padus	30’	20’	M-L	L	NA	
Shantung Maple	Acer truncatum	25-30’	20-25’	M-L	L	NA	Replacement candidate for Amur Maple; orange-yellow in fall
Cockspur Hawthorn	Crataegus crus-galli	25’	20’	L	L	NA	Thorns, good fall color orange to red
Des Fontanes Cherry	Prunus x fontanesiana	25’	20’	M	M	NA	Cheyenne USDA Research Station intro. – Ft. Collins Nursery
Thornless Cockspur Hawthorn	Crataegus crus-galli inermis	20-30’	25-35’	L	L	NA	Thornless, good fall color orange to red
Washington Hawthorn	Crataegus phaenopyrum	20-30’	15-20’	M-L	L	NA	Good fall color, red
Amur Maackia	Maackia amurensis	20-30’	25-30’	M	L	NA	Wider than tall; nitrogen fixing; tolerate dry,

							alkaline soils
Peking Lilac	Syringa pekinesis	20-30’	15-25’	M-L	L	NA	Showy flowers
Tatarian Maple ‘Hot Wings’	Acer tataricum ‘Hot Wings’	20-25’	15-20’	M-L	L	NA	June-pink/brilliant red seeds, fall yellow to orange-red; Fort Collins Nursery introduction 2003
Shadblow Serviceberry	Amelanchier canadensis	20-25’	10-15’	M-L	L	NA	Nice fall color yellow to red
Shubert Chokecherry or Canada Red Cherry	Prunus virginiana ‘Shubert’	20-25’	15-20’	M-L	L	NA	Red-purple foliage
Eastern Redbud	Cercis canadensis	20’	15’	M - H	L	NA	Showy flowers
Russian Hawthorn	Crataegus ambigua	20’	20’	M-L	M-L	NA	Some thorns, some suckering, fruit persists through winter; flowers in June
English Hawthorn	Crataegus laevigata	15-25’	15-25’	M-L	L		Tough, good for islands, buffers
Flowering Crab	Malus varieties (2)	15-25’	15-25’	L - M	M	NA	
Amur Maple	Acer ginnala	15-20’	15-20’	M-L	L	NA	Good fall color orange to red
Cornelian Dogwood	Cornus mas	15’	12-15’	M	L	NA	Showy flowers
Gray Dogwood	Cornus racemosa	15’	15’	M-L	L	NA	Very attractive
American Smoketree	Cotinus obovatus	15’	12’	M	L	NA	Plume-like flowers
Wafer Ash or Hoptree	Ptelea trifoliata	15’	15’	M-L	L	NA	Elm-like wafers in late summer; fall-yellow; drought tolerant
Japanese Tree Lilac	Syringa reticulata	15’	12’	M-L	L	NA	Showy flowers, good fall color yellow
American Plum	Prunus americana	10-12’	8-12’	L	M	NA	Suckers

DECIDUOUS SHRUBS

Common Name	Botanical Name	Height	Width	Water Requirement	Maintenance Requirement	Street Tree	Remarks
Thin Leaf Alder	Alnus tenuifolia	15-30’	15-20’	M	L	NA	Nice fall color yellow
Seneca Viburnum	Viburnum sieboldii ‘Seneca’	15-20’	10-15’	M-L	L	NA	Hedge, buffer strips, specimen
Yellow-fruited Chokecherry	Prunus virginiana xanthocarpa	12-18’	12’	L	M	NA	Nice flower panicles
Staghorn Sumac	Rhus typhina	10-25’	10-15’	L	M	NA	
Curlleaf Mountain Mahogany	Cercocarpus ledifolius	10-20’	8-12’	L	M	NA	
Wavy Leaf Oak	Quercus undulata	10-20’	8-16’	L	L	NA	
Siberian Peashrub	Caragana arborescens	10-15’	8-12’	L	L	NA	Good windbreak; soil tolerant; many varieties
Beautybush	Kolkwitzia amabilis	10-15’	12-15’	L		NA	
Burning Bush	Euonymus alata (2)	10-12’	8-12’	M	M	NA	Nice fall color red
American Plum	Prunus americana	10-12’	10-12’	L	L	NA	Very fragrant flowers; suckering; good for wildlife
Native	Prunus virginiana	8-20’	8-12’	L - M	M	NA	

Chokecherry	melanocarpa						
Scrub Oak	Quercus gambelii	8-20’	6-12’	L	L	NA	
New Mexico Privet	Forestiera neomexicana	8-15’	8-12’	L	M	NA	Fall: yellow; makes excellent hedge
Smooth Sumac	Rhus glabra	8-15’	8-10’	L	M	NA	Nice fall color orange to red; cismontana is native form
Buffaloberry	Shepherdia sp.	8-15’	6-12’	L	M	NA	Silver, Russet and Round-leaf are best
Hairy Mountain Mahogany	Cercocarpus breviflorus	8-12’	8-12’	L	L	NA	Stays evergreen in protected sites
Tallhedge Buckthorn	Rhamnus frangula columnaris	8-12’	3-4’	M	M	NA	
Siberian Weeping Peashrub	Caragana arborescens ‘Pendula’	8-10’	8-10’	L	L	NA	Yellow flowers; poor soil and wind tolerant
Thimbleberry or Boulder Raspberry	Rubus deliciousus	8’	6’	L	M	NA	Native, prune out older canes every few years
Silver Fountain Butterflybush	Buddleia alternifolia ‘Argentea’	6-8’	6-8’	L	M	NA	Plant Select Winner
Szechwan Fire Cotoneaster	Cotoneaster ignavus	6-8’	4-6’	L	L	NA	Cheyenne USDA Experimental Station intro.; very tough
Forsythia	Forsythia intermedia	6-8’	6-8’	M	M	NA	Showy flowers
Cistena Plum	Prunus cistena	6-8’	4-6’	M	M	NA	
Manchurian Viburnum	Viburnum burejacticum	6-8’	5-7’	M-L	L	NA	Similar to V. lantana in appearance; Cheyenne USDA Station introduction
Singleleaf Ash	Fraxinus anomala	6-20’	6-20’	L	L	NA	Tolerates dry conditions
Saskatoon Serviceberry	Amelanchier alnifolia	6-12’	6-12’	L	L	NA	Nice fall color
Utah Serviceberry	Amelanchier utahensis	6-12’	6-12’	L	L	NA	Native to Western Slope
Butterfly Bush	Buddleia sp. (2)	6-12’	4-8’	M-L	M	NA	

DECIDUOUS SHRUBS

Common Name	Botanical Name	Height	Width	Water Requirement	Maintenance Requirement	Street Tree	Remarks
Hedge Cotoneaster	Cotoneaster lucidus	6-12’	4-6’	M-L	L	NA	
Silverberry	Eleagnus commutata	6-12’	6-12’	M	M	NA	
Smith’s Buckthorn	Rhamnus smithii	6-12’	6-8’	L	L	NA	Tolerates dry; Plant Select Winner
Peking Cotoneaster	Cotoneaster acutifolia	6-10’	6-10’	M-L	L	NA	
Nanking Cherry	Prunus tormentosa	6-10’	6-12’	M-L	L	NA	
Mentor Barberry	Berberis mentorensis	5-7’	5-7’	M-L	M	NA	Thorns, good fall color yellow to red
Western Sandcherry	Prunus besseyi	5-6’	5-6’	L	M	NA	‘Pawnee Buttes’ is very low, wide spreading
Mountain Mahogany	Cercocarpus montanus	4-9’	4-6’	L	M	NA	
Cliffrose	Cowania mexicana	4-8’	4-8’	L	L	NA	
Honeysuckle	Lonicera (2)	4-8’	3-12’	M	M	NA	Honeyrose, Blue

							Velvet, Arnold Red, Clavey's Dwarf & Miniglobe
Yucca sp., Soaptree,	Yucca elata,	4-8'	3-7'	M-L	M	NA	native
Redleaf Japanese Barberry	Berberis thunbergii (2)	4-6'	4-6'	M-L	M	NA	Thorns
Quince	Chaenomeles spp.	4-6'	4-6'	M-L	M	NA	Showy flowers
Spreading Cotoneaster	Cotoneaster divaricata	4-6'	6-8'	M-L	M	NA	
Cliff Fendler Bush	Fendlera rupicola	4-6'	4-6'	L	L	NA	Native, heat & drought tolerant
Privet	Ligustrum (2)	4-6'	3-4'	L	M	NA	Regal, Cheyenne, 'Densiflorum' & 'Lodense'
Mockorange	Philadelphus (2)	4-6'	4-6'	M-L	M	NA	
Golden Currant	Ribes aureum	4-6'	4-6'	L	M	NA	
Crandall Clove Currant	Ribes ordoratum 'Crandall'	4-6'	4-6'	M-L	L	NA	Native; can smell cloves 10-15' away; orange fall color
Emerald Carousel Barberry	Berberis x 'Tara'	4-5'	4-5'	M-L	M	NA	Yellow flowers; very adaptable, cold hardy; persistent red fruit
Privet	Ligustrum vulgare (2)	4-15'	4-15'	M	M	NA	
Viburnum	Viburnum (2)	4-12'	4-15'	M-L	M	NA	Nice fall color varies
Antelope Brush	Purshia tridentata	4'	5'	L		NA	
Gooseberry	Ribes sp. (2)	4'	4'	M-L	M	NA	
Four Wing Saltbush	Atriplex canescens	3-6'	2-4'	L	M	NA	
Apache Plume	Fallugia paradoxa	3-6'	3-6/\'	L	L	NA	Native, silver-pink seed heads all summer
Rock Spirea	Holodiscus dumosus	3-6'	3-6'	M-L	L	NA	Good ornamental winter look
Waxflower	Jamesia americana	3-6'	3-6'	L	L	NA	Prefers good drainage
Threeleaf Sumac	Rhus trilobata	3-6'	3-6'	L	M	NA	Nice fall color orange to red

DECIDUOUS SHRUBS

Common Name	Botanical Name	Height	Width	Water Requirement	Maintenance Requirement	Street Tree	Remarks
Alpine Currant	Ribes alpinum	3-6'	3-6'	L – M	M	NA	
Wood's Rose	Rosa woodsii	3-6'	3-6'	L		NA	
Siberian Spirea	Sibiraea laevigata	3-6'	5-10'	M-L	M	NA	
Littleleaf Mountain Mahogany	Cercocarpus intricatus	3-5'	3-5'	L	L	NA	Very drought tolerant, slow growing, evergreen
Fernbush	Chamaebatiaria millefolium	3-5'	3-6'	L	M	NA	Blooms throughout summer into late fall
Carol Mackie Daphne	Daphne x burkwoodii 'Carol Mackie'	3-5'	3-5'	M-L	L	NA	Part shade; needs good drainage
Fremont's Desert Holly	Mahonia fremontii	3-5'	3-6'	L	L	NA	Very xeric broadleaf evergreen, blue holly foliage
Russian Sage	Perovskia atriplicifolia	3-5'	3-5'	L	M	NA	Must be cut nearly to ground

							in late winter
Blue Mist Spirea	Caryopteris x clandonensis	3-4'	2-3'	L	L	NA	
Blue Stem Joint Fir	Ephedra equisetina	3-4'	5-6'		L	NA	3-4'; red berries against blue foliage
Mountain Ninebark	Physocarpus monogynus	3-4'	3-4'	M-L	M	NA	Orange to red fall color
Aromatic Sumac	Rhus aromatica	3-4'	6-8'	L	L	NA	Non-suckering form; good year-round architecture; 'Gro-low' is low, wide-spreading
Red Lake Currant	Ribes 'Red Lake'	3-4'	3-4'	M-L	M	NA	
Snowberry	Symphoricarpos albus	3-4'	3-5'	M	M	NA	
Lilac	Syringa patula, hyacinthiflora, prestoniae & vulgaris (2)	3-12'	3-12'	M-L	M	NA	All cultivars are drought tolerant
Snowfall Common Ninebark	Physocarpus opulifolius 'Snowfall'	3'	4'	L	L	NA	More compact; larger white-pinkish flowers; fall: yellowish-bronze
Rabbit Brush	Chrysothamnus nauseosus	2-6'	2-6'	L	M	NA	Blue and green varieties
Corallberry	Symphoricarpos sp. (2)	2-6'	3-6'	M-L	L	NA	
Potentilla	Potentilla fruticosa (2)	2-5'	2-5'	M-L	M	NA	Showy flowers
Dwarf Russian Almond	Prunus tenella	2-5'	2-4'	L	L	NA	
Leadplant	Amorpha canescens	2-4'	2-4'	L	M	NA	One of most showy western plants
Broom, Moonlight or Spanish Gold	Cytisus 'Moonlight' & Cytisus purgans 'Spanish Gold'	2-4'	4-6'	L	L	NA	
Wax Currant	Ribes cereum	2-4'	2-4'	L	M	NA	
Rose	Rosa 3	2-4'	2-4'	L – M	M	NA	
Spiraea	Spiraea 3	2-4'	2-4'	M-L	M	NA	
Ponchita Manzanita	Arctostaphylos nevadensis 'Ponchito'	2-3'	3-5'	M-L	L	NA	2-3';Native, drought tolerant; pink-white flowers Apr-May

DECIDUOUS SHRUBS

Common Name	Botanical Name	Height	Width	Water Requirement	Maintenance Requirement	Street Tree	Remarks
Rock Cotoneaster	Cotoneaster horizontalis	2-3'	3-6'	M-L	M	NA	
Royal Gold Woadwaxen	Genista tinctoria 'Royal Gold'	2-3'	2-3'	L	L	NA	Great planted in swaths, blooms twice; bright yellow; holds green leaves into winter
St. Johnswort, Sunburst and Hidcote	Hypericum sp.	2-3'	2-3'	L	L	NA	
Soapweed	Yucca glauca	2.5-3'	3-4'	M-L	M	NA	native
Sagebrush	Artemisia (2)	1-6'	2-3'	L	L	NA	
Winterfat	Ceratoides lanata	1-4'	2-4'	L	L	NA	Needs good drainage
Cascade Manzanita	Arctostaphylos nevadensis 'Cascade'	1-2'	3-5'	M-L	L	NA	1-2' high, Ft. Collins introduction; cascading habit;

							FS-PS
Mock-Bearberry Manzanita	Arctostaphylos x coloradoensis	1-2’	3-5’	M-L	L	NA	1-2’ high; Ft. Collins introduction; red berries; FS-PS
Coral Beauty Cotoneaster	Cotoneaster dammeri ‘Coral Beauty’	1-2’	4-6’	M-L	M	NA	
Creeping Oregon Grape Holly	Mahonia haematocarpa	1-1.5’	3-4’	M-L	L	NA	Red fall color
Cranberry Cotoneaster	Cotoneaster apiculata	1.5-2’	4-6’	M-L	M	NA	
Harriman’s	Yucca harrimaniae	.75-1’	1-1.5’	M-L	M	NA	native

EVERGREEN TREES (1)

Common Name	Botanical Name	Height	Width	Water Requirement	Maintenance Requirement	Street Tree	Remarks
Southwestern White Pine	Pinus strobiformus	80’	40’	M-L	L	No	
Douglas Fir	Pseudotsuga menziesii 'Taxifolia'	75-100’	40’	M	L	No	
Swiss Mountain Pine	Pinus mugo	6-8’	12-15’	L - M	L	No	
Colorado Green Spruce	Picea pungens	60’	30’	M-L	L	No	
Colorado Blue Spruce	Picea pungens 'Glauca'	60’	30’	M-L	L	No	
Serbian Spruce	Picea omorika	50-60’	20-25’	M	L	No	Narrow pyramidal growth; uniform; blue
Austrian Pine	Pinus nigra	50’	20’	M-L	L	No	
Scotch Pine	Pinus sylvestris	50’	30’	M-L	L	No	
Red Cedar	Juniperus virginiana 'Varieties'	40-50’	8-20’	M	L	No	
Ponderosa Pine	Pinus ponderosa	40’	25’	L	L	No	
Rocky Mountain Juniper	Juniperus scopulorum 'Varieties'	30-60’	15’	L - M	L	No	
Bristlecone Pine	Pinus aristata	30’	15’	L	L	No	
Limber Pine	Pinus flexilis	30’	15’	L	L	No	
Pinon Pine	Pinus edulis	25-30’	10-15’	L	L	No	
Smooth Arizona Cypress	Cupressus arizonica var. glabra	20-40’	8-15’	L	L		Blue color
Oneseed Juniper	Juniperus monosperma	10-30’	6-12’	L	L	No	

EVERGREEN SHRUBS

Common Name	Botanical Name	Height	Width	Water Requirement	Maintenance Requirement	Street Tree	Remarks
Yew	Taxus x media 'Hicksii'	8-12’	3-4’	M-L	M	NA	High drought tolerance
Firethorn	Pyracantha coccinea (2)	8’	8’	M	M	NA	
Oregongrape	Mahonia aquifolium	6’	3’	M	M	NA	Nice fall colors red to purple
Euonymus Manhattan	Euonymus kiautschovicus 'Manhattan'	5’	4’	M	M	NA	
Euonymus Sarcoxie	Euonymus fortunei 'Sarcoxie'	4-6’	4-6’	M	M	NA	
Bigleaf Wintercreeper	Euonymus fortunei vegeta	4-5’	4-5’	M	M	NA	
Gnome Firethorn	Pyracantha angustifolia 'Gnome'	4’	4’	M	M	NA	
Juniper	Juniperus sp. (2)	1-30’	4-15’	L	L	NA	Many species; something for any size
Creeping Hollygrape	Mahonia repens	1’	1’	M	M	NA	Nice fall/winter colors red to purple

PERENNIALS, GROUND COVERS, AND ORNAMENTAL GRASSES

Due to the large quantity, variety, and changing availability of these plants, please consult your local nursery preferably a C.N.A. Member.

Height, color, texture, moisture, light requirement, and heartiness need to be considered when specifying these plants.

Most local nurseries provide a yearly catalog of available plants and their descriptions.

Notes:

1. Mature size of all evergreen trees must be considered when determining location for planting. They are not recommended within 8' of any roadway, walkway, entrance, or window as they will eventually obstruct passage or view. Evergreen trees shall not be placed within roadway site triangles. During winter, icy conditions often occur on the north side of evergreen trees. This must be considered for their placement.

2. These plants have numerous different species, varieties and/or cultivars. Consult a local nursery for current availability and proper selection.

3. Heights and widths are anticipated sizes, but will vary due to environmental issues.

PUD PLAN AMENDMENT
LOT 1 OF LOUISVILLE PLAZA, FILING NO. 3
KING SOOPERS FUELING CENTER #13
HECLA WAY & PLAZA DRIVE
LOUISVILLE, COLORADO

PROPERTY OWNER

DILLON COMPANIES INC. A KANSAS CORPORATION
KING SOOPERS (DIVISION OF KROGER)
65 TEJON STREET
DENVER, COLORADO 80223
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APPLICANT

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ATTN: DREW WAROT
EMAIL: drewwarot@kingsoopers.com

ENGINEERING\ARCHITECT\PLANNING CONSULTANT

GALLOWAY & CO, INC.
5300 DTC PARKWAY, SUITE 100
GREENWOOD VILLAGE, COLORADO 80111
TEL. (303) 770-8884
FAX. (303) 770-3636

ATTN: MATTHEW DUHAIME P.E., P.L.S.
EMAIL: mattduhaime@GALLOWAYUS.COM

LEGAL DESCRIPTION:

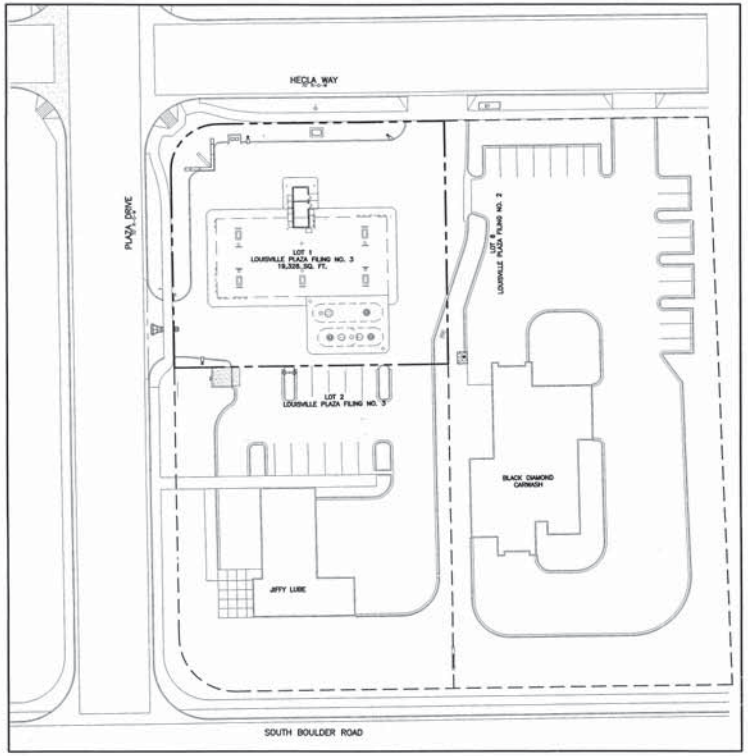
LOT 1, LOUISVILLE PLAZA FILING NO. 3 LOCATED IN THE SW1/4 OF SECTION 4, T1S, R69W OF THE 6TH P.M., CITY OF LOUISVILLE, COUNTY OF BOULDER, STATE OF COLORADO

ADDRESS:

1712 PLAZA DRIVE LOUISVILLE COLORADO 80027

DATE OF PREPARATION

INITIAL: AUGUST 12, 2010
REVISED: SEPTEMBER 29, 2010
REVISED: FEBRUARY 28, 2011



SITE MAP
SCALE 1" = 30'

AREA MAP
SCALE 1" = 500'

SHEET INDEX

SHEET	SHEET TITLE
1 OF 7	COVER SHEET
1 OF 1	ALTA SURVEY
2 OF 7	OVERALL SITE PLAN
3 OF 7	SITE AND UTILITY PLAN
4 OF 7	GRADING AND EROSION CONTROL PLAN
5 OF 7	LANDSCAPE PLAN
6 OF 7	CANOPY AND KIOSK ELEVATIONS
7 OF 7	PHOTOMETRIC PLAN

SITE DATA:	PROPOSED WITHIN DISTURBED AREA:	
USE:	AUTOMOTIVE REFUELING STATION	
EXISTING ZONING:	P-C	
LOT FRONTAGE:	PLAZA DRIVE 107.1' HECLA WAY 122.4'	
BUILDING AREA:	4,136 SQ. FT. (CANOPY & KIOSK)	21.4%
	KIOSK 180 SQ. FT.	
	CANOPY 3,956 SQ. FT.	
PAVED AREA:	12,936 SQ. FT.	66.9%
LANDSCAPING:	2,254 SQ. FT.	11.7%
LOT AREA:	19,326 SQ. FT.	100.0%
BUILDING HEIGHT:	KIOSK 11'-0"	
	CANOPY 19'-0"	
CANOPY STREET ROW SETBACK:	23.75 PLAZA DRIVE	34.4' HECLA WAY
CANOPY REAR LOT SETBACKS:	SOUTH 37.8"	EAST 31.6'
PUMP ISLANDS:	5	
CURB CUT ACCESS:	1 EXISTING ACCESS POINT, 1 NEW ACCESS POINT	

OWNERSHIP SIGNATURE BLOCK

By signing this PUD Plan Amendment the owner acknowledges and accepts all the requirements & intent set forth herein.

Witness our hands and seals this 8th day of March, 2011

For and on the behalf of the Dillon Company a Kansas Corporation

Susan R. McKnight
NOTARY SEAL

NOTARY PUBLIC

MY COMMISSION EXPIRES 4-6-2014

PLANNING COMMISSION CERTIFICATE

RECOMMENDED APPROVAL THIS 14 DAY OF OCTOBER 20 10 BY THE PLANNING COMMISSION OF THE CITY OF LOUISVILLE, COLORADO.

RESOLUTION NO. 26 SERIES 2010

CHAIRMAN

CITY COUNCIL CERTIFICATE

APPROVED THIS 19 DAY OF OCTOBER, 2010 CITY COUNCIL OF THE CITY OF LOUISVILLE, COLORADO.

RESOLUTION NO. 62 SERIES 2010

MAYOR

Nancy Varra
CITY CLERK

CITY OF LOUISVILLE SEAL COLORADO

CLERK AND RECORDER CERTIFICATE

(COUNTY OF BOULDER
STATE OF COLORADO)

I HEREBY CERTIFY THAT THIS INSTRUMENT WAS FILED IN MY OFFICE AT 3:13 O'CLOCK, P.M., THIS 29th DAY OF July, 2011, AND IS RECORDED IN PLAN FILE _____, FEE $71.00 PAID $71.00

FILM NO. _____, RECEPTION 3162405

Hillary Hall
CLERK & RECORDER

DEPUTY

No.	REVISION	DES. BY	DRAWN BY	DATE
1	PER CITY COMMENTS	MFD	EVR	9/29/10
2	UPDATED PER CONSTRUCTION DOCUMENTS	MFD	EVR	2/28/11

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5300 DTC Parkway, Suite 100
Greenwood Village, CO 80111
303.770.8884 P
www.gallowayUS.com

King Soopers
Supplies Fuel Petroleum
Contact: Jim Pettit
Phone: 303-910-2000
Fax: (303) 671-5822

KING SOOPERS
FUEL FACILITY
CANOPY AND KIOSK
STORE # 13
HECLA WAY & PLAZA DRIVE
LOUISVILLE, COLORADO

Project No:	KSF000013
Sheet Scale:	AS NOTED
Designed By:	MFD
Drawn By:	RDG
Date:	AUGUST 2010
Disk File:	KSF13_P_01-Cover

COVER SHEET

1 OF 7

Louisville Plaza, Filing No. 3, Lot 1 PUD Amendment

DRAWING NUMBER

DRAWING NUMBER

King Soopers 1712 Plaza Dr.

Louisville Plaza, Filing No. 3, Lot 1 PUD Amendment

DRAWING NUMBER

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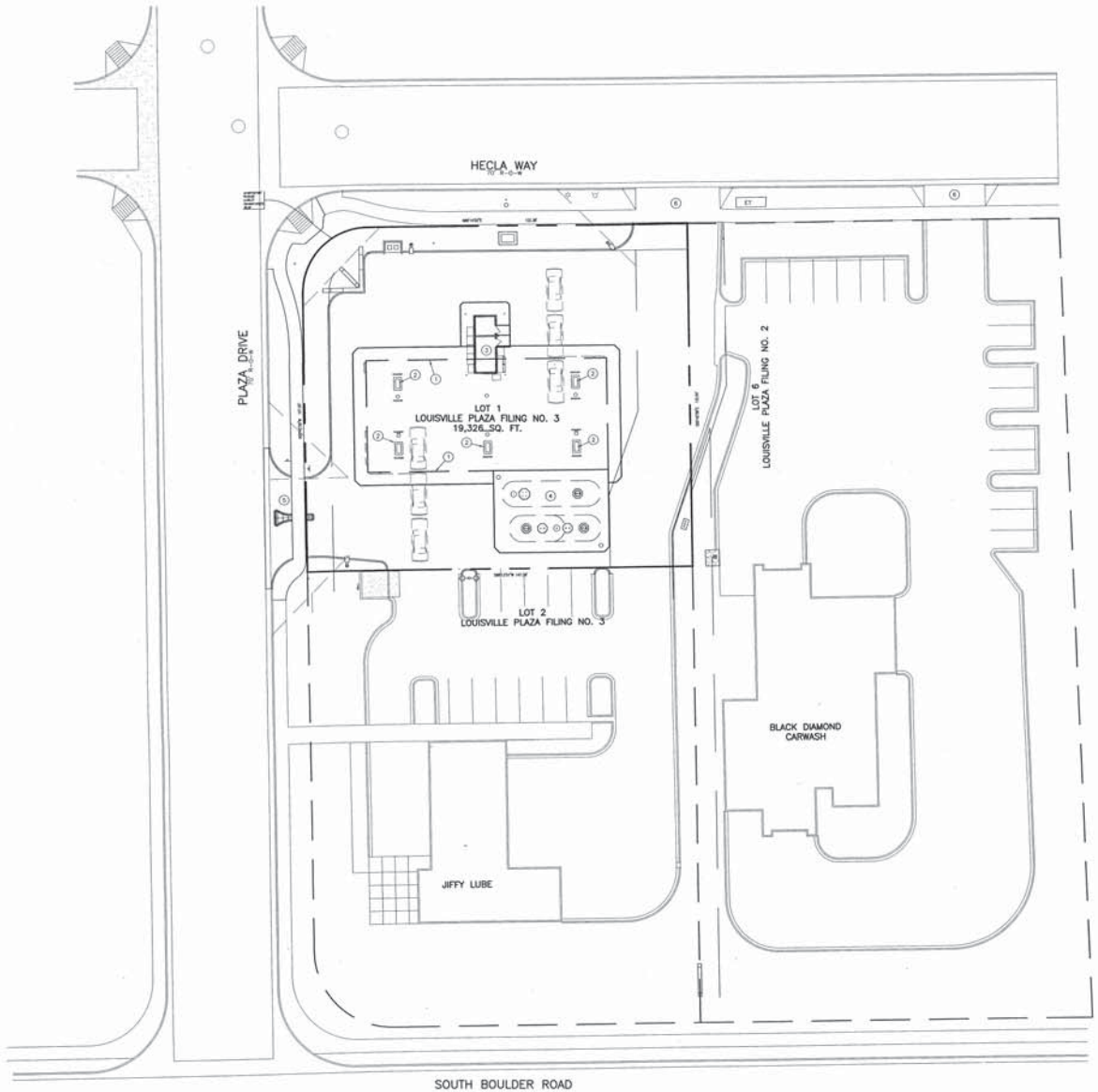

SITE LEGEND

- PROPERTY BOUNDARY LINE
- ADJACENT PROPERTY BOUNDARY LINE
- SECTION LINE
- CENTER LINE
- EASEMENT BOUNDARY LINE
- TRAFFIC DIRECTION
- PARKING COUNT
- SITE LIGHTING
- WALL PACK LIGHT
- STREET LIGHT
- EXISTING TRAFFIC POLE
- EXISTING FIRE HYDRANT
- PROPOSED FIRE HYDRANT
- EXISTING MANHOLE COVER
- PROPOSED MANHOLE COVER
- UTILITY PEDESTAL
- EXISTING INLET
- PROPOSED INLET
- EXISTING FENCE TO REMAIN
- EXISTING TO REMAIN
- EXISTING RETAINING WALL
- EXISTING TO BE REMOVED
- PROPOSED NEW
- PROPOSED RETAINING WALL

N

0 10 20

SCALE: 1"=20'

SCHEDULE:

1. PROPOSED 43'-0" WIDE, 92'-0" LONG CANOPY (3,956 SF)
2. PROPOSED 3'-0" x 5'-0" ISLAND W/MULTIPLE PRODUCT DISPENSER (TYP.5)
3. PROPOSED 8'-2" x 21'-6" KIOSK (WITH BATHROOM 180 SF)
4. PROPOSED ONE 20,000 GALLON SINGLE COMPARTMENT UNDERGROUND DOUBLE WALL STORAGE TANK (UNLEADED) AND ONE 18,000 GALLON TWO COMPARTMENT UNDERGROUND DOUBLE WALL STORAGE TANK (8,000 GALLON PREMIUM AND 10,000 GALLON DIESEL)
5. PROPOSED RIGHT IN/RIGHT OUT 30' CURB CUT
6. EXISTING CURB CUT

CONTRACTOR TO REFER TO GEOTECHNICAL REPORT FOR PAVING, SUBGRADE AND COMPACTION RECOMMENDATIONS. SEE GRADING PLAN FOR DETAILED INFORMATION ON FINAL GRADES AND PAVING.

CONTRACTOR TO REFER TO THE LANDSCAPE PLANS AND TREE PROTECTION NOTES FOR LOCATION OF EXISTING TREES, TREE PRESERVATION DETAILS, STORAGE OF EQUIPMENT UNDER TREES, AND PRUNING.

No.	REVISION:	DES. BY	DRAWN BY	DATE
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Fax: 303.968.4444
Fax (Law): 513-762-1262

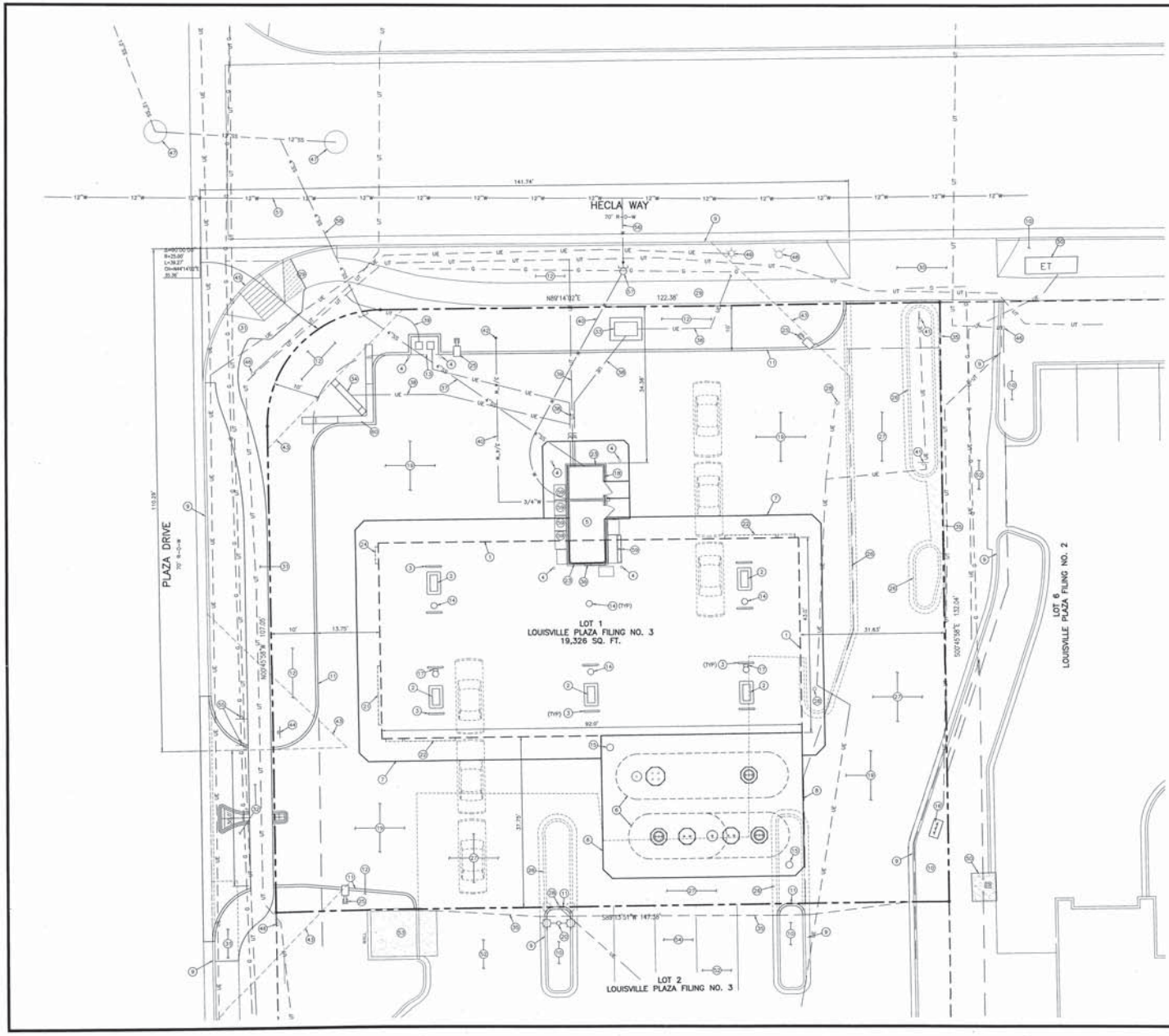
KING SOOPERS FUEL FACILITY CANOPY AND KIOSK STORE # 13

HECLA WAY & PLAZA DRIVE
LOUISVILLE, COLORADO

Project No:	KSF13
Sheet Scale:	FULL
Designed By:	MFD
Drawn By:	CWB
Date:	AUGUST 16, 2010
Disk File:	KSF13_P_02-Ovsite

OVERALL SITE PLAN

2 OF 7



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2. PROPOSED 3'-0" x 9'-0" ISLAND W/MULTIPLE PRODUCT DISPENSER (TYP.5)
3. PROPOSED INVERTED U-SHAPED BOLLARD (TYP.10)
4. PROPOSED 6" PIPE BOLLARD (TYP.6)
5. PROPOSED 8'-2" x 21'-4" KIOSK (WITH BATHROOM 180 SF)
6. PROPOSED ONE 20,000 GALLON SINGLE COMPARTMENT UNDERGROUND DOUBLE WALL STORAGE TANK (UNLEADED) AND ONE 18,000 GALLON TWO COMPARTMENT UNDERGROUND DOUBLE WALL STORAGE TANK (8,000 GALLON PREMIUM AND 10,000 GALLON DIESEL)
7. PROPOSED 6" THICK REINFORCED CONCRETE SLAB UNDER CANOPY WITH 2' CHAMFER CORNERS
8. PROPOSED 8" THICK REINFORCED CONCRETE SLAB OVER FUEL STORAGE TANKS
9. EXISTING CURB AND GUTTER TO REMAIN
10. EXISTING LANDSCAPE ISLANDS/AREA TO REMAIN
11. PROPOSED 6" CURB AND 1' GUTTER
12. PROPOSED LANDSCAPE ISLANDS/AREA
13. PROPOSED PUBLIC AIR STAND AND PUBLIC PAY PHONE ON 6' X 4' CONCRETE PAD BOTTOM OF PAD WILL BE FLUSH WITH DRIVE
14. PROPOSED CANOPY COLUMN (TYP. 6)
15. PROPOSED TANK OBSERVATION WELLS.
16. PROPOSED 2" BLACK STEEL VENT RISERS.
17. PROPOSED OVERFILL ALARM STROBE AND ACKNOWLEDGMENT SWITCH ON CANOPY COLUMN
18. PROPOSED EMERGENCY SHUT-OFF SWITCH MOUNTED ON KIOSK, WITH DISTINCTLY LABELED SIGN READING "EMERGENCY FUEL SHUTDOWN DEVICE"
19. PROPOSED 6" CONCRETE PAVEMENT
20. PROPOSED RELOCATED SITE LIGHT (EXISTING UNDERGROUND ELECTRICAL SHALL BE RE-ROUTED TO NEW LOCATION)
21. ILLUMINATED 3-FUEL PRODUCT PRICE SIGNAGE (45.5 SQ.FT.)
22. ILLUMINATED LOGO AND KING SOOPERS SIGNAGE (18.1 SQ. FT.)
23. NON-ILLUMINATED KIOSK LOGO SIGNAGE (5.0 SQ. FT.)
24. ILLUMINATED CANOPY LOGO SIGNAGE
25. PROPOSED SITE LIGHT
26. EXISTING CONCRETE CURB AND GUTTER TO BE REMOVED
27. EXISTING PAVING TO BE REMOVED
28. EXISTING SITE LIGHT TO BE REMOVED
29. EXISTING CONCRETE SIDEWALK TO REMAIN
30. EXISTING CURB CUT TO REMAIN
31. PROPOSED CONCRETE SIDEWALK
32. PROPOSED CURB CUT (CONSTRUCT PER CITY OF LOUISVILLE STANDARDS)
33. PROPOSED PAD MOUNTED TRANSFORMER
34. PROPOSED MONUMENT SIGN, SIGN FACE MINIMUM 10'-0" FROM RIGHT-OF-WAY LINE, REFER TO MONUMENT SIGN DETAIL ON ARCHITECTURAL DRAWINGS
35. PROPOSED ASPHALT SAWCUT LINE
36. PROPOSED PAY WINDOW
37. PROPOSED 4" SDR 35 SANITARY SEWER SERVICE TO KIOSK
38. PROPOSED UNDERGROUND ELECTRICAL, CONTRACTOR TO VERIFY POINT OF SERVICE WITH UTILITY COMPANY PRIOR TO CONSTRUCTION
39. PROPOSED UNDERGROUND TELEPHONE
40. PROPOSED 3/4" WATER LINE
41. EXISTING SIGN TO BE REMOVED
42. PROPOSED FROST FREE YARD HYDRANT
43. 30' SITE TRIANGLE
44. PROPOSED R1-1 STOP SIGN AND "NO LEFT TURN" SIGN MOUNTED ON SAME POST
45. EXISTING HANDICAP RAMP
46. EXISTING TELEPHONE PEDESTAL
47. EXISTING SANITARY SEWER MANHOLE
48. EXISTING FIRE HYDRANT
49. EXISTING STREET LIGHT
50. EXISTING ELECTRICAL TRANSFORMER
51. EXISTING WATER LINE
52. EXISTING ASPHALT PAVEMENT TO REMAIN
53. EXISTING TRASH ENCLOSURE
54. EXISTING PARKING STALLS TO REMAIN
55. EXISTING R3-76 (LEFT LANE MUST TURN LEFT) TO BE RELOCATED
56. EXISTING 1.5" SERVICE TAP TO REMAIN
57. PROPOSED 3/4" WATER METER AND PIT PER CITY OF LOUISVILLE CRITERIA
58. EXISTING SANITARY SEWER STUB INTO PROPERTY
59. OUTSIDE SODA POP, ICE, AND OIL VENDOR CASES, ETC.
60. PROPOSED MSE GRAVITY WALL

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King Soopers Supermarket Petroleum
Project Manager: J. Fritz
Phone: 303-968-8000
Fax: (303) 968-8282

KING SOOPERS FUEL FACILITY CANOPY AND KIOSK STORE # 13

HECLA WAY & PLAZA DRIVE
LOUISVILLE, COLORADO

Project No:	KSF13
Sheet Scale:	FULL
Designed By:	MFD
Drawn By:	CWB
Date:	AUGUST 10, 2010
Disk File:	KSF13_P_03-Site

SITE AND UTILITY PLAN

3 OF 7

Louisville Plaza, Filing No. 3, Lot 1 PUD Amendment 3 of 7

DRAWING NUMBER

DRAWING NUMBER

King Soopers 1712 Plaza Dr.

Louisville Plaza, Filing No. 3, Lot 1 PUD Amendment

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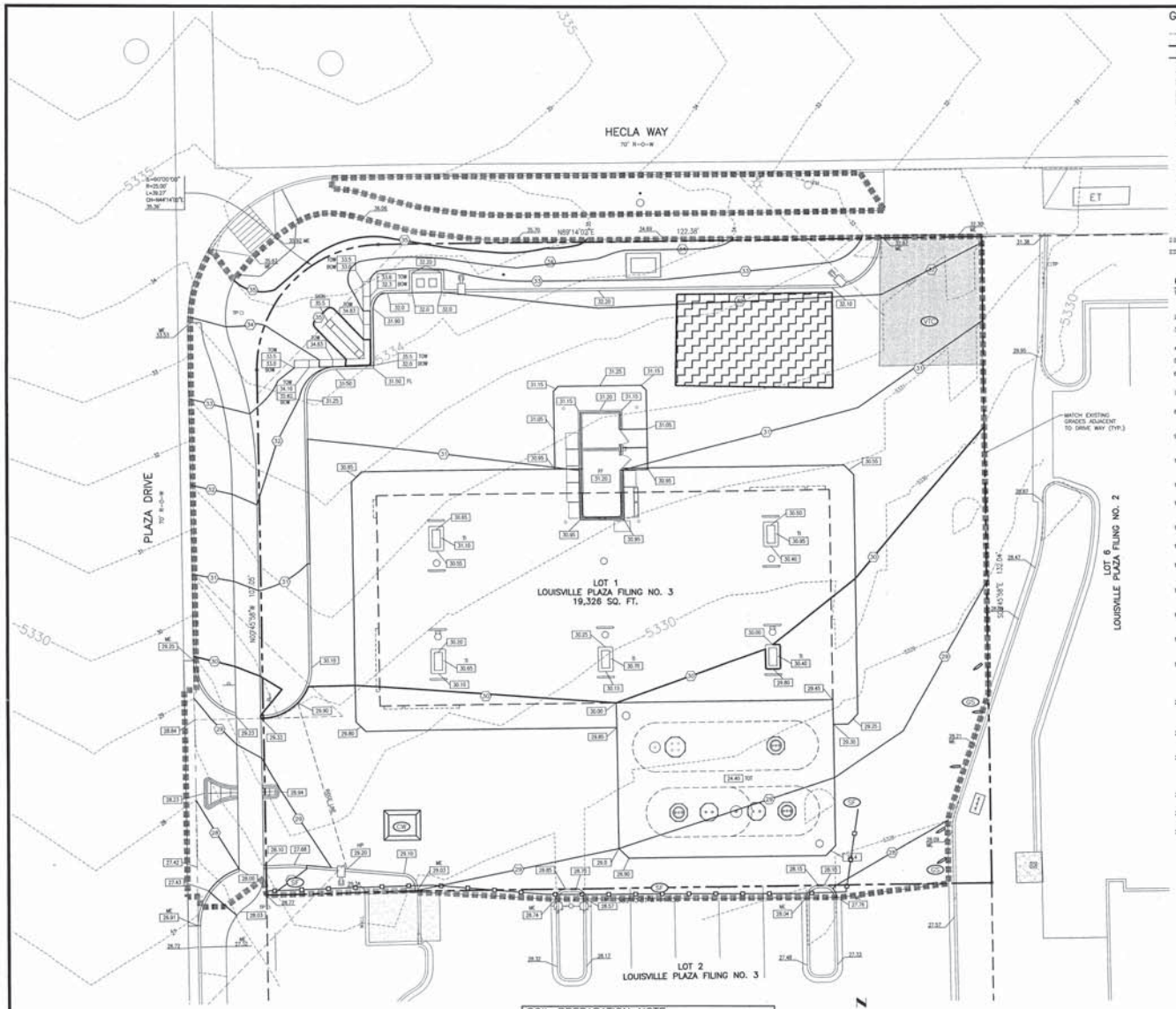

GRADING LEGEND

- EXISTING CONTOUR
- PROPOSED CONTOUR
- PROPOSED CONTOUR (BY OTHERS)
- 24.00 EXISTING SPOT ELEVATION
- 24.0 PROPOSED SPOT ELEVATION
- 24.0 / 24.0 PROPOSED TOP OF CURB ELEVATION / PROPOSED FLOWLINE ELEVATION
- FF FINISHED FLOOR
- TOT TOP OF TANKS
- TI TOP OF ISLAND
- TOG TOP OF GRATE
- TC TOP OF CURB
- TOS TOP OF SIDEWALK
- FL FLOWLINE
- HP HIGH POINT
- LP LOW POINT
- ME MATCH EXISTING
- INV INVERT ELEVATION
- EXISTING STORM SEWER
- PROPOSED STORM SEWER

EROSION CONTROL LEGEND

- LIMITS OF CONSTRUCTION
- EXISTING CONTOUR
- PROPOSED CONTOUR
- SOIL SWALE
- FLOW ARROW
- VEHICLE TRACKING CONTROL CONSTRUCTION ENTRANCE
- SILT FENCE
- GRAVEL SOCK IN GUTTER
- CONCRETE WASHOUT AREA
- CONTRACTOR STAGING AREA (APPROXIMATE)

GENERAL NOTES

1. REQUIREMENTS SHOWN ON SITE PLAN SHALL GOVERN. DRAWINGS AND SPECIFICATIONS SHOWING OTHERWISE NOTWITHSTANDING. CONTRACTOR TO POINT OUT ANY DISCREPANCIES TO THE OWNERS REP. PRIOR TO BID.
2. NO WORK IS TO BEGIN UNTIL ALL PERMITS HAVE BEEN OBTAINED.
3. CONTRACTOR TO PROVIDE ALL EQUIPMENT AND PERSONNEL REQUIRED FOR FINAL CHECKOUT OF ALL FACILITIES BY OWNER'S REPRESENTATIVE.
4. ENTIRE INSTALLATION SHALL MEET ALL APPLICABLE CODES.
5. VERIFY ALL DIMENSIONS AND CONDITIONS ON SITE.
6. ALL LANDSCAPING AREAS SHALL BE GRADED TO WITHIN 0.10' WITH COMPANY APPROVED TOP SOIL TO A MINIMUM 6" DEPTH.
7. FINAL GRADES ARE SUBJECT TO MINOR CHANGE BY COMPANY REPRESENTATIVE. NO GRADE CHANGES IN EXCESS OF 0.05' WITHOUT COMPANY APPROVAL.
8. ANY FILL MATERIAL REQUIRED TO BRING THE SITE TO GRADE SHALL BE CLEAN FILL DIRT APPROVED BY GEOTECHNICAL ENGINEER AND SHALL BE PLACED PER GEOTECHNICAL RECOMMENDATIONS.
9. SET PROPERTY CORNER PINS IN CONCRETE. IF PROPERTY CORNERS ARE DESTROYED BY CONTRACTOR, THE CONTRACTOR SHALL BEAR THE EXPENSE OF RELOCATING CORNERS BY A REGISTERED SURVEYOR.
10. THIS DESIGN IS BASED ON A SOIL AND FOUNDATION INVESTIGATION. CONTRACTOR SHALL FOLLOW ALL GEOTECHNICAL RECOMMENDATIONS. A COPY OF THIS REPORT IS AVAILABLE FOR INSPECTION BY THE CONTRACTORS.
11. ALL UTILITY CONNECTIONS, FOOTINGS, FOUNDATIONS SHALL BE INSTALLED BY GENERAL CONTRACTOR UNLESS OTHERWISE SPECIFICALLY EXCLUDED IN NOTES.
12. GENERAL CONTRACTOR SHALL RECEIVE, UNLOAD, STORE AND UNCRATE ALL EQUIPMENT FURNISHED BY THE OWNER AND SHIPPED TO THE SITE. SEE SPECIFICATIONS FOR EQUIPMENT FURNISHED BY OWNER.
13. LANDSCAPING AND IRRIGATION SYSTEM SHALL BE INSTALLED BY GENERAL CONTRACTOR. SEE LANDSCAPE AND IRRIGATION PLANS FOR DETAILS.
14. GENERAL CONTRACTOR TO PERFORM GENERAL YARD AND BUILDING CLEAN-UP AT COMPLETION OF WORK.
15. SEE THE SITE SURVEY FOR SURVEY INFORMATION. CONTRACTOR'S CONSTRUCTION SURVEYOR TO OBTAIN AUTOCAD FILE PRIOR TO CONSTRUCTION STAKING. CONSTRUCTION SURVEYOR SHALL ADHERE TO ALL ACSM GUIDELINES FOR CONSTRUCTION STAKING.
16. ALL TOP OF CURB GRADES ARE 6" HIGHER THAN FINISH GRADES SHOWN ON DRIVE UNLESS OTHERWISE NOTED. ALL SPOT ELEVATIONS SHOWN ADJACENT TO CURBS AND SIDEWALKS REFER TO FLOWLINE UNLESS NOTED OTHERWISE.
17. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR MINIMIZING DEPOSITION OF ONSITE SEDIMENTS ONTO SURROUNDING PUBLIC STREETS DURING CONSTRUCTION. SEE SWMP EROSION CONTROL PLANS FOR ADDITIONAL DETAILS.
18. GENERAL CONTRACTOR SHALL PROVIDE COMPREHENSIVE TRAFFIC CONTROL PLAN WHICH SHALL BE SUBMITTED TO AND APPROVED BY THE CITY AND/OR STATE PRIOR TO ANY WORK IN THE PUBLIC R.O.W.
19. ALL UTILITY LOCATIONS SHOWN ARE BASED ON MAPS PROVIDED BY THE APPROPRIATE UTILITY COMPANY AND FIELD SURFACE EVIDENCE AT THE TIME OF SURVEY AND IS TO BE CONSIDERED AN APPROXIMATE LOCATION ONLY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY THE LOCATION OF ALL UTILITIES, PUBLIC OR PRIVATE, WHETHER SHOWN ON THE PLANS OR NOT, PRIOR TO CONSTRUCTION. REPORT ANY DISCREPANCIES TO THE ENGINEER PRIOR TO CONSTRUCTION.
20. WHERE A PROPOSED UTILITY CROSSES AN EXISTING UTILITY, IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY THE HORIZONTAL AND VERTICAL LOCATION OF SUCH EXISTING UTILITY, EITHER THROUGH POTHOLING OR ALTERNATIVE METHOD. REPORT INFORMATION TO THE ENGINEER PRIOR TO CONSTRUCTION.
21. IF DEWATERING IS REQUIRED TO INSTALL UTILITIES, A STATE CONSTRUCTION DEWATERING WASTEWATER DISCHARGE PERMIT IS REQUIRED IF WATER IS DISCHARGED INTO A STORM SEWER, CHANNEL, IRRIGATION DITCH OR ANY WATERS OF THE UNITED STATES.
22. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RECORDING AS-BUILT INFORMATION ON A SET OF RECORD DRAWINGS KEPT ON THE CONSTRUCTION SITE, AND AVAILABLE TO THE CITY, ITS AGENTS, OWNER OR GALLOWAY AT ALL TIMES. DIMENSIONS SHALL BE ANNOTATED ON AS-BUILT RECORD DRAWINGS. AS-BUILT DRAWINGS ARE REQUIRED PRIOR TO ISSUANCE OF FINAL PAYMENT. AS BUILT DRAWINGS WILL BE SUPPLIED TO OWNER AND CITY PRIOR TO FINAL PAYMENT.
23. ALL TRENCH EXCAVATION SHALL BE PROPERLY SLOPED OR SUPPORTED IN A MANNER REQUIRED BY OSHA OR AS REQUIRED BY STATE OR LOCAL LAWS.
24. ALL RAMPS SLOPES SHALL BE 12:1 OR LESS. SIDEWALKS AND DRIVES WHERE RAMPS CROSS SHALL HAVE LONGITUDINAL SLOPES 5% OR LESS AND CROSS SLOPES 2% OR LESS.
25. PUBLIC IMPROVEMENTS CONSTRUCTION FOR UTILITY AND CONCRETE WORK WITHIN RIGHT OF WAY SHALL MEET THE REQUIREMENTS OF THE CITY OF LOUISVILLE DESIGN AND CONSTRUCTION STANDARDS. CONTRACTORS WORKING WITHIN PUBLIC PROPERTY ARE REQUIRED TO OBTAIN A RIGHT OF WAY PERMIT AVAILABLE FROM THE CITY OF LOUISVILLE PUBLIC WORKS DEPARTMENT

EROSION CONTROL NOTES:

1. OS: GRAVEL SOCKS CAN BE PLACED AT CURB INLETS (COMBINATION INLET) IN LIEU OF THE GRAVEL FILTER. INSTALL GRAVEL SOCKS SIMILAR TO "GRAVEL SOCKS AT AREA INLET" DETAIL. THE GRAVEL SOCKS MUST BE PLACED PERPENDICULAR TO FLOW AND COMPLETELY AROUND GRATE WITH NO SPACES BETWEEN SOCKS.
2. VTC: VEHICLE TRACKING PAD SHOULD BE EXTENDED ACROSS THE ENTIRE ENTRANCE IF TRUCK TRAFFIC TRAVELS OFF DESIGNATED PAD.
3. SF: STRAW ROLLS MAY BE STAKED DOWN SIMILAR TO THE HAY BALE DETAIL IN LIEU OF SILT FENCE WHEN FINE GRADING OR FINAL STABILIZATION IS OCCURRING.
4. CW: SEVERAL CONCRETE WASHOUT LOCATIONS ARE SHOWN HERE AS OPTIONS FOR THE CONTRACTOR'S USE DURING VARIOUS CONSTRUCTION PHASING. **ONLY ONE LOCATION MAY BE USED AT A TIME.**
5. CONTRACTOR TO REPLACE STRAW BALE INLET PROTECTION AROUND INLETS WITH CURB INLET GRAVEL FILTERS ONCE PAVING OF SITE HAS STARTED.
6. VTC – VEHICLE TRACKING CONTROL SHALL BE RELOCATED, AS REQUIRED, AS CONSTRUCTION PROGRESSES, FOR ADEQUATE SEDIMENT CONTROL.

BENCHMARK

THE BENCHMARK UTILIZED FOR THIS SURVEY IS A NGS MONUMENT Q 413, PID – KK1556, WITH A PUBLISHED ELEVATION OF 5296.02 FEET, NAVD 88 DATUM

CALL UTILITY NOTIFICATION CENTER OF COLORADO
1-800-922-1987
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

SOIL PREPARATION NOTE

SOIL PREPARATION FOR NON-LANDSCAPE AREAS SHALL BE PER RECOMMENDATIONS FROM A GEOTECHNICAL REPORT PREPARED FOR THIS SITE AS FOLLOWS:

GEOTECHNICAL ENGINEER:
REPORT No:

THE CONTRACTOR MUST FULLY REVIEW THIS REPORT PRIOR TO CONSTRUCTION. INFORMATION IN THE GEOTECHNICAL REPORT SUPERSEDES ANY CONFLICTING INFORMATION CONTAINED IN THE CONSTRUCTION PLANS AND SPECIFICATIONS. REFER TO GENERAL, STRUCTURAL NOTES FOR SPECIFIC SOIL PREPARATION AT SITE STRUCTURES. REFER TO THE LANDSCAPE PLANS FOR SPECIFIC PLANTING AREA SOIL AMENDMENT PROCEDURES.

No.	REVISION	DES. BY	Drawn BY	DATE
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Greenwood Village, CO 80111
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www.galloway-co.com

King Soopers Supermarket Petroleum
Project Manager: J. Smith
Phone: 303-779-5710
Fax: 303-779-5614
For SUBD #11-1002

KING SOOPERS FUEL FACILITY CANOPY AND KIOSK STORE # 13

HECLA WAY & PLAZA DRIVE
LOUISVILLE, COLORADO

Project No:	KSF00013
Sheet Scale:	1" = 10'
Designed By:	MFD
Drawn By:	CWB
Date:	AUGUST 10, 2010
Disk File:	KSF13_P_05-Grad

GRADING AND EROSION CONTROL PLAN

4 OF 7

Louisville Plaza, Filing No. 3, Lot 1 PUD Amendment

5 of 7

DRAWING NUMBER

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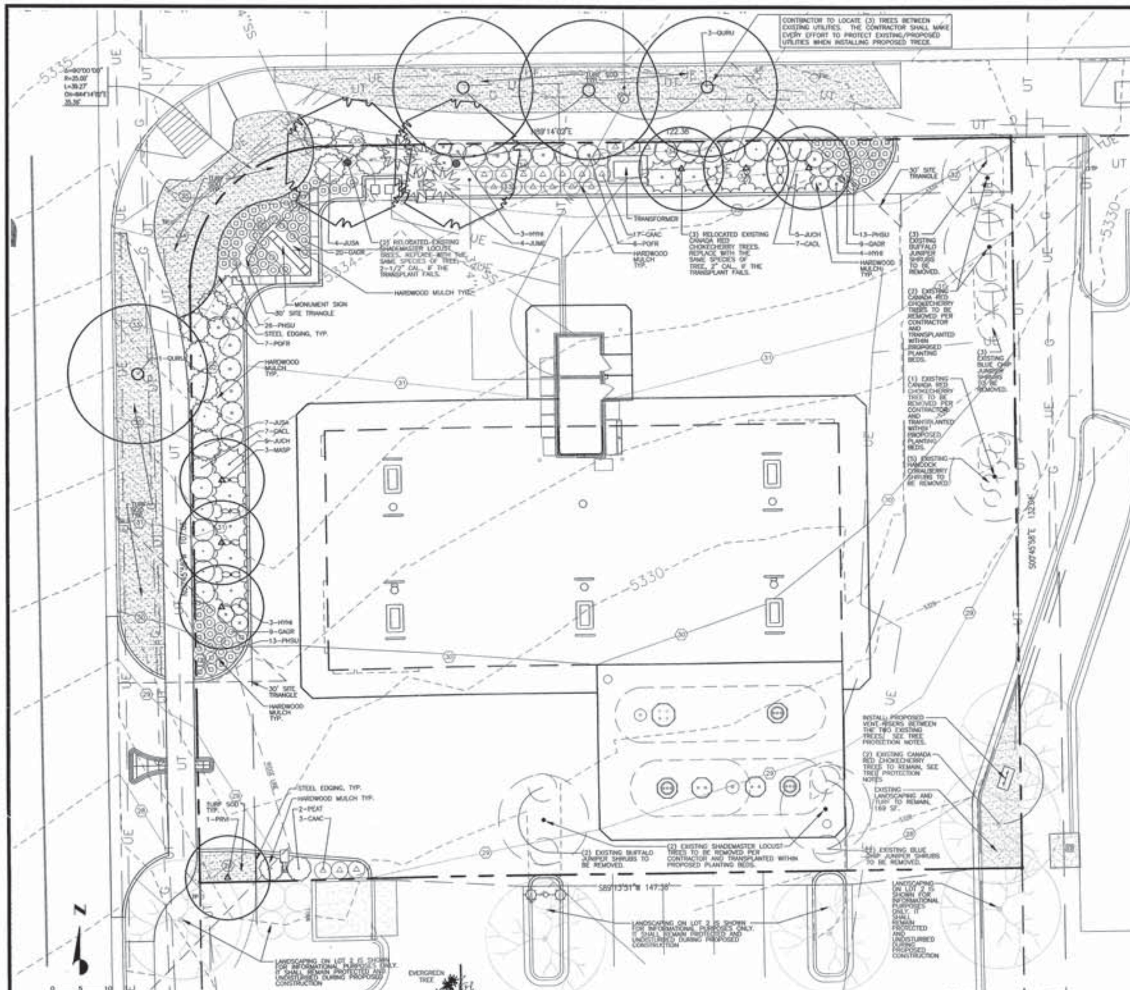
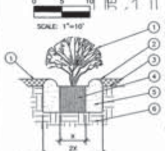
King Soopers 1712 Plaza Dr.

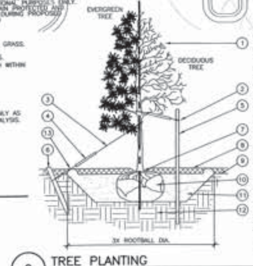




1. SHRUB, PERENNIAL, OR ORNAMENTAL GRASS.
2. MULCH, TYPE AND DEPTH PER PLANS. PLACE NO MORE THAN 1" OF MULCH WITHIN 6" OF PLANT CENTER.
3. FINISH GRADE.
4. ROOT BALL.
5. BACKFILL. AMEND AND FERTILIZE ONLY AS RECOMMENDED IN SOIL FERTILITY ANALYSIS.
6. UNDISTURBED NATIVE SOIL.
7. 3" HIGH EARTHEN WATERING BASIN.

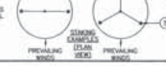
1 SHRUB AND PERENNIAL PLANTING
SCALE: NTS

CALL UTILITY NOTIFICATION CENTER OF COLORADO
1-800-922-1987
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES



1. TREE CANOPY.
2. NYLON TREE STRAPS AT ENDS OF WIRES - SECURE TO STAKE OR DEADMAN WITH NAILS.
3. 12 GAUGE GALVANIZED WIRE. SECURE TO TRUNK JUST ABOVE LOWEST MAJOR BRANCHES.
4. 24" X 3/4" P.V.C. MARKERS OVER WIRES.
5. PRESSURE-TREATED WOOD STAKE, 2" DIA. EXTEND STAKES 12" MIN. INTO UNDISTURBED SOIL.
6. PRESSURE-TREATED WOOD DEADMAN, TWO PER TREE (MIN.). BURY OUTSIDE OF PLANTING PIT AND 18" MIN. INTO UNDISTURBED SOIL.
7. TRUNK FLARE.
8. MULCH, TYPE AND DEPTH PER PLANS. DO NOT PLACE MULCH WITHIN 6" OF TRUNK.
9. FINISH GRADE.
10. ROOT BALL.
11. BACKFILL. AMEND AND FERTILIZE ONLY AS RECOMMENDED IN SOIL FERTILITY ANALYSIS.
12. UNDISTURBED NATIVE SOIL.
13. 4" HIGH EARTHEN WATERING BASIN.

NOTES:
1. SCARIFY SIDES OF PLANTING PIT PRIOR TO SETTING TREE.
2. REMOVE EXCESS SOIL APPLIED ON TOP OF THE ROOTBALL THAT COVERS THE ROOT FLARE. THE PLANTING HOLE DEPTH SHALL BE SUCH THAT THE ROOTBALL RESTS ON UNDISTURBED SOIL, AND THE ROOT FLARE IS 3"-5" ABOVE FINISH GRADE.
3. CUT OFF BOTTOM 1/3 OF WIRE BASKET BEFORE PLACING TREE IN HOLE. CUT OFF AND REMOVE REMAINDER OF BASKET AFTER TREE IS SET IN HOLE. REMOVE ALL NYLON TIES, TWINE, ROPE AND OTHER PACKING MATERIAL. REMOVE AS MUCH BURLAP FROM AROUND ROOTBALL AS IS PRACTICAL.
4. TREE WRAP TO BE USED ON ANY NEW PLANTINGS, EXCEPT IN LATE FALL PLANTING SITUATIONS AND ONLY THEN AFTER CONSULTATION WITH THE LANDSCAPE ARCHITECT. WHEN WRAPPING TREE, WRAP FROM TRUNK FLARE TO LOWEST MAJOR BRANCH.
5. REMOVE ALL NURSERY STAKES AFTER PLANTING.
6. FOR TREES OVER 3" CALIPER, USE THREE STAKES OR DEADMEN (AS APPROPRIATE), SPACED EVENLY AROUND TREE.



2 TREE PLANTING
SCALE: NTS

IRRIGATION CONCEPT

1. THE AUTOMATIC IRRIGATION SYSTEM SHALL BE INSTALLED AND OPERATIONAL BY THE TIME OF FINAL INSPECTION. THE ENTIRE IRRIGATION SYSTEM SHALL BE INSTALLED BY A QUALIFIED IRRIGATION CONTRACTOR.
2. THE IRRIGATION SYSTEM WILL OPERATE ON POTABLE WATER, AND THE SYSTEM WILL HAVE APPROPRIATE BACKFLOW PREVENTION DEVICES INSTALLED TO PREVENT CONTAMINATION OF THE POTABLE SOURCE.
3. ALL TURF (SOD) AREAS SHALL BE IRRIGATED WITH AN AUTOMATIC POP-UP IRRIGATION SYSTEM. ALL SHRUB BEDS AND PERENNIAL BEDS TO BE IRRIGATED WITH AN AUTOMATIC DRIP IRRIGATION SYSTEM.
4. ALL PLANTS SHARING SIMILAR HYDROZONE CHARACTERISTICS SHALL BE PLACED ON A VALVE DEDICATED TO PROVIDE THE NECESSARY WATER REQUIREMENTS SPECIFIC TO THAT HYDROZONE.
5. THE IRRIGATION SYSTEM SHALL BE DESIGNED AND INSTALLED, TO THE MAXIMUM EXTENT POSSIBLE, TO CONSERVE WATER BY USING THE FOLLOWING DEVICES AND SYSTEMS: MATCHED PRECIPITATION RATE TECHNOLOGY ON ROTOR AND SPRAY HEADS (WHEREVER POSSIBLE), RAIN SENSORS, AND MULTI-PROGRAM COMPUTERIZED IRRIGATION CONTROLLERS FEATURING SENSORY INPUT CAPABILITIES.
6. ALL EXISTING IRRIGATION, WHERE EXISTING TURF AREAS HAVE BEEN MODIFIED, WILL GET A REVISED IRRIGATION SYSTEM.

LANDSCAPE TABLE

-TOTAL LOT LANDSCAPE SIZE (IN SF):	2,280 SF
-TOTAL R.O.W. LANDSCAPE SIZE (IN SF):	1,855 SF
-TOTAL LANDSCAPE SIZE (IN SF):	4,135 SF

PLANTING LEGEND (APPROVED BY THE LOUISVILLE COMMERCIAL DESIGN GUIDELINES RECOMMENDED PLANT LIST) 1

SYMBOL	BOTANIC NAME	COMMON NAME	SIZE	HYDROZONE	MAINT. REQ.	HT. X SPD	QUANT.
DECIDUOUS SHADE TREES							
QURU	QUERCUS RUBRA	NORTHERN RED OAK	2.5" CALIPER	LOW	LOW	50' X 45'	4
~~EXRS~~	~~EXISTING SHADE TREES TO BE REMOVED AND TRANSPLANTED PER PLAN LOCATIONS. GROUP SIMILAR TREE SPECIES TOGETHER.~~						2
							6
DECIDUOUS ORNAMENTAL TREES							
MASP	MALUS X 'SPRING SNOW'	SPRING SNOW CRAB	2.0" CALIPER	MODERATE/LOW	LOW	25' X 20'	3
PRVI	PRUNUS VIRGINIANA 'CANADA RED'	CANADA RED CHOKECHERRY	2.0" CALIPER	MODERATE/LOW	MODERATE	20' X 15'	1
EXRO	EXISTING ORNAMENTAL TREES TO BE REMOVED AND TRANSPLANTED PER PLAN LOCATIONS. GROUP SIMILAR TREE SPECIES TOGETHER.						3
							7
DECIDUOUS SHRUBS							
CACL	CARYOPTERIS X CLANDONENSIS	BLUE MIST SPIREA	5 GALLON	LOW	LOW	5' X 5'	14
HYHI	HYPERICUM HIDCOTE	ST. JOHNS WORT	5 GALLON	LOW	LOW	2' X 3'	10
PEAT	PEROVSKIA ATRIPLICIFOLIA	RUSSIAN SAGE	5 GALLON	LOW	MODERATE	4' X 4'	2
POFR	POTENTILLA FRUTICOSA 'GOLD STAR'	GOLD STAR POTENTILLA	5 GALLON	MODERATE/LOW	MODERATE	2' X 3'	13
							39
EVERGREEN SHRUBS							
JUCH	JUNIPERUS CHINENSIS 'ARMSTRONGII'	ARMSTRONG JUNIPER	5 GALLON	LOW	LOW	4' X 4'	10
JUME	JUNIPERUS X MEDIA 'PFITZERIANA COMPACTA'	COMPACT PFITZER	5 GALLON	LOW	LOW	4' X 5'	4
JUSA	JUNIPERUS SABINA 'BUFFALO'	BUFFALO JUNIPER	5 GALLON	LOW	LOW	1' X 6'	12
							25
PERENNIALS AND ORNAMENTAL GRASSES							
CAAC	CALAMAGROSTIS ACUTIFLORA 'KARL FOERSTER'	FEATHER REED GRASS	1 GALLON	LOW	MODERATE	4.5' X 2'	20
GAGR	GAILLARDIA X GRANDIFLORA	BLANKET FLOWER	1 GALLON	LOW	MODERATE	1.5' X 2'	55
PHSU	PHLOX SUBULATA	CREEPING PHLOX	1 GALLON	LOW	MODERATE	6" X 2'	36
							111
SOD AND MULCH							
	100% REVEILLE SOD, OR APPROVED EQUAL	TURF SOD	SOD	MODERATE	- - -	- - -	1,307 SF
	DOUBLE SHREDDED CEDAR BARK MULCH	BARK MULCH	MULCH	LOW	- - -	- - -	2,029 SF

MULCH NOTES

HARDWOOD MULCH

AFTER ALL PLANTING IS COMPLETE, CONTRACTOR SHALL INSTALL LANDSCAPE FABRIC AND A MINIMUM 4" THICK LAYER OF DOUBLE SHREDDED CEDAR BARK MULCH OR APPROVED EQUAL IN ALL PLANTING AREAS AS INDICATED ON PLANS. CONTRACTOR SHALL SUBMIT SAMPLE OF ALL MULCHES TO THE OWNER AND LANDSCAPE ARCHITECT FOR APPROVAL PRIOR TO CONSTRUCTION. ABSOLUTELY NO EXPOSED GROUND SHALL BE LEFT SHOWING ANYWHERE ON THE PROJECT AFTER MULCH HAS BEEN INSTALLED.

SOD NOTES:

1) ALL SOD IS AVAILABLE THROUGH: GRAFF'S TURF FARMS 8909 N. FRONTAGE ROAD (I-76) FT. MORGAN, CO 80701 970-867-8873
2) INSTALL AND MAINTAIN IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
3) REVEILLE SOD IS A MODERATE HYDROZONE PLANT MATERIAL. 1

PERIMETER PLANTING CALCULATIONS

	LENGTH L.F.	REQUIRED PLANTINGS	PROVIDED PLANTINGS
STREET EDGE NORTH DETACHED SIDEWALK	160 L.F.	8 TREES & 32 SHRUBS	8 TREES, 33 SHRUBS & 51 PERN/ORN GRASSES
STREET EDGE WEST DETACHED SIDEWALK	145 L.F.	8 TREES & 29 SHRUBS	5 TREES, 31 SHRUBS & 56 PERN/ORN GRASSES
TOTAL		16 TREES & 61 SHRUBS	13 TREES, 64 SHRUBS & 107 PERN/ORN GRASSES

PLANTING NOTES

GENERAL

1. CALL UNCC AT (303) 232-1991 PRIOR TO ANY EXCAVATION.
2. ALL WORK SHALL CONFORM TO APPLICABLE LOCAL CODES
3. PLANT QUANTITIES SHOWN ON LEGENDS ARE FOR GENERAL INFORMATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR HIS OWN TAKEOFFS AND QUANTITY CALCULATIONS. MINOR ADJUSTMENTS TO THE LANDSCAPE MATERIAL AND LOCATIONS MAY BE PROPOSED FOR THE CITY CONSIDERATION AT THE CONSTRUCTION DOCUMENT STAGE TO RESPOND TO MARKET AND FIELD CONDITIONS. HOWEVER, THERE SHALL BE NO REDUCTION IN THE NUMBER AND SIZE OF MATERIALS.
4. THE CONTRACTOR SHALL MAKE HIMSELF AWARE OF THE LOCATIONS OF EXISTING AND PROPOSED UTILITIES, AND SHALL BE RESPONSIBLE FOR ANY DAMAGE TO THE UTILITIES AND/OR ANY INJURY TO ANY PERSON. FIELD LOCATE ALL UTILITIES PRIOR TO PLANTING.
5. THE CONTRACTOR SHALL TAKE EXTREME CARE NOT TO DAMAGE ANY EXISTING PLANTS INDICATED AS "TO REMAIN". ANY SUCH PLANTS DAMAGED BY THE CONTRACTOR SHALL BE REPLACED WITH THE SAME SPECIES, SIZE, AND QUANTITY AT THE CONTRACTOR'S OWN EXPENSE, AND AS ACCEPTABLE TO THE OWNER. REFER TO THE TREE PROTECTION NOTES ON THE PLANS (AS APPLICABLE).
6. IF SITE CONDITIONS OR PLANT AVAILABILITY REQUIRE CHANGES TO THE PLAN, THEN AN APPROVAL WILL BE OBTAINED FROM THE CITY OF LOUISVILLE.
7. ALL UTILITY EASEMENTS SHALL REMAIN UNOBSTRUCTED AND FULLY ACCESSIBLE ALONG THEIR ENTIRE LENGTH FOR MAINTENANCE EQUIPMENT.

FINISH GRADING AND SOIL PREPARATION

8. CONTRACTOR SHALL CONSTRUCT AND MAINTAIN FINISH GRADES AS RECOMMENDED BY THE GEOTECHNICAL REPORT. ALL LANDSCAPE AREAS SHALL HAVE POSITIVE DRAINAGE AWAY FROM STRUCTURES AT THE MINIMUM SLOPE SPECIFIED IN THE REPORT, AND AREAS OF POTENTIAL PONDING SHALL BE REGRADED TO BLEND IN WITH THE SURROUNDING GRADES AND ELIMINATE PONDING POTENTIAL. SHOULD ANY CONFLICTS AND/OR DISCREPANCIES ARISE BETWEEN THE GEOTECHNICAL REPORT, THE GRADING PLANS, THESE NOTES, AND ACTUAL CONDITIONS, THE CONTRACTOR SHALL IMMEDIATELY BRING SUCH ITEMS TO THE ATTENTION OF THE LANDSCAPE ARCHITECT AND OWNER.
9. AFTER FINISH GRADES HAVE BEEN ESTABLISHED, CONTRACTOR SHALL HAVE SOIL SAMPLES TESTED BY AN ESTABLISHED SOIL TESTING LABORATORY FOR THE FOLLOWING: GENERAL SOIL FERTILITY, pH, ORGANIC MATTER CONTENT, SALT (CEC), LIME, SODIUM ADSORPTION RATIO (SAR) AND BORON CONTENT. EACH SAMPLE SUBMITTED SHALL CONTAIN NO LESS THAN ONE QUART OF SOIL. CONTRACTOR SHALL ALSO SUBMIT THE PROJECT'S PLANT LIST TO THE LABORATORY ALONG WITH THE SOIL SAMPLES. THE SOIL REPORT PRODUCED BY THE LABORATORY SHALL CONTAIN RECOMMENDATIONS FOR THE FOLLOWING (AS APPROPRIATE): GENERAL SOIL PREPARATION AND BACKFILL MIXES, PRE-PLANT FERTILIZER APPLICATIONS, AND ANY OTHER SOIL RELATED ISSUES. THE REPORT SHALL ALSO PROVIDE A FERTILIZER PROGRAM FOR THE ESTABLISHMENT PERIOD AND FOR LONG-TERM MAINTENANCE.
10. THE CONTRACTOR SHALL INSTALL SOIL AMENDMENTS AND FERTILIZERS PER THE SOILS REPORT RECOMMENDATIONS, AND AFTER RECEIVING A CHANGE ORDER FROM THE OWNER. ANY CHANGE IN COST DUE TO THE SOIL REPORT RECOMMENDATIONS SHALL BE SUBMITTED TO THE OWNER WITH THE REPORT. REFER TO SPECIFICATIONS FOR SOIL PREPARATION METHODS.
11. FOR BIDDING PURPOSES ONLY, THE SOIL PREPARATION SHALL CONSIST OF THE FOLLOWING:

    TURF:
    (INCORPORATED INTO THE TOP 6" OF SOIL BY MEANS OF ROTOTILLING AFTER CROSS-RIPPING, AND NOT INCLUDING SLOPES OR SHRUB-PLANTED BEDS):
    NITROGEN STABILIZED ORGANIC AMENDMENT - 3 CU. YDS. PER 1,000 S.F.
    AMMONIUM PHOSPHATE 16-20-0 - 15 LBS PER 1,000 S.F.

    TREES, SHRUBS, AND PERENNIALS - BEDS:
    ~~6 PARTS BY VOLUME ON-SITE SOIL~~
    2 PARTS BY VOLUME NITROGEN STABILIZED ORGANIC AMENDMENT
    10 LBS. 12-12-12 FERTILIZER PER CU. YD.

    NO MANURE OR ANIMAL-BASED PRODUCTS SHALL BE USED FOR ORGANIC AMENDMENTS.

PLANTING

12. PLANT QUANTITIES SHOWN ON LEGENDS ARE FOR GENERAL INFORMATION. IN THE EVENT OF A DISCREPANCY BETWEEN THE PLAN AND THE LANDSCAPE LEGEND, THE PLANT QUANTITY AS SHOWN ON THE PLAN SHALL TAKE PRECEDENCE.
13. ALL PLANT LOCATIONS ARE DIAGRAMMATIC. ACTUAL LOCATIONS SHALL BE VERIFIED WITH THE LANDSCAPE ARCHITECT PRIOR TO PLANTING.
14. ALL PLANTS WITHIN A SPECIES SHALL HAVE SIMILAR SIZE, AND SHALL BE OF A FORM TYPICAL FOR THE SPECIES. ANY PLANT DEEMED UNACCEPTABLE BY THE LANDSCAPE ARCHITECT SHALL BE IMMEDIATELY REMOVED FROM THE SITE AND SHALL BE REPLACED WITH AN ACCEPTABLE PLANT OF LIKE TYPE AND SIZE AT THE CONTRACTOR'S OWN EXPENSE. ANY PLANTS APPEARING TO BE UNHEALTHY, EVEN IF DETERMINED TO STILL BE ALIVE, SHALL NOT BE ACCEPTED. THE LANDSCAPE ARCHITECT SHALL BE THE SOLE JUDGE AS TO THE ACCEPTABILITY OF PLANT MATERIAL.
15. ALL PLANT MATERIAL SHALL FOLLOW THE GUIDELINES OF THE "AMERICAN STANDARD FOR NURSING STOCK" BY THE AMERICAN ASSOCIATION OF NURSERYMEN.
16. ALL TREES SHALL BE STANDARD IN FORM, UNLESS OTHERWISE SPECIFIED. TREES WITH CENTRAL LEADERS WILL NOT BE ACCEPTED IF LEADER IS DAMAGED OR REMOVED. PRUNE ALL DAMAGED TWIGS AFTER PLANTING.
17. THE CONTRACTOR SHALL INSTALL ROOT BARRIERS NEAR ALL NEWLY-PLANTED TREES THAT ARE LOCATED WITHIN FIVE (5) FEET OF PAVING OR CURBS. ROOT BARRIERS SHALL BE EQUIVALENT TO "CENTURY" OR "DEEP-ROOT" 24" DEEP PANELS. BARRIERS SHALL BE LOCATED IMMEDIATELY ADJACENT TO HARDSCAPE AND AS PER THE ROOT BARRIER DETAIL ON THESE PLANS. INSTALL PANELS PER MANUFACTURER'S RECOMMENDATIONS. UNDER NO CIRCUMSTANCES SHALL THE CONTRACTOR USE ROOT BARRIERS OF A TYPE THAT COMPLETELY ENCIRCLE THE ROOTBALL.
18. ALL TREES SHALL BE GUYED AND STAKED ACCORDING TO THE TYPICAL AMERICAN NURSERY STANDARDS FOR THE STATE OF COLORADO. ALL TREES AND SHRUBS SHALL BE INSTALLED PER AMERICAN NURSERY STANDARDS FOR THE STATE OF COLORADO.
19. ALL SHRUB BEDS SHALL BE CONTAINED WITH STEEL EDGER. STEEL EDGER IS NOT REQUIRED ALONG CURBS, WALKS OR BUILDING FOUNDATIONS. STEEL EDGER SHALL BE AN APPROVED 4"X 1/16" SIZED ROLLED TOP, GREEN PAINTED STEEL EDGER.
20. THE INSTALLATION OF ALL LANDSCAPING SHALL BE DONE BY AN ESTABLISHED LANDSCAPE CONTRACTOR WHO FOLLOWS THE PROCEDURES SET FORTH BY THE AMERICAN ASSOCIATION OF LANDSCAPE CONTRACTORS AND ITS LOCAL AGENCIES.
21. LANDSCAPE AND IRRIGATION WORK SHALL BE COMPLETED PRIOR TO THE ISSUANCE OF THE FINAL CERTIFICATE OF OCCUPANCY.
22. THE DEVELOPER, HIS SUCCESSOR, OR ASSIGNEE SHALL BE RESPONSIBLE FOR ESTABLISHING AND CONTINUING A REGULAR PROGRAM OF MAINTENANCE FOR ALL LANDSCAPED AREAS.
23. FLUSH AND ADJUST ALL SPRINKLER HEADS FOR OPTIMUM PERFORMANCE AND TO PREVENT OVERSPRAY ONTO WALKS, ROADWAYS, AND/OR BUILDINGS AS MUCH AS POSSIBLE. THIS SHALL INCLUDE SELECTING THE BEST NOZZLE ARC AND RADIUS TO FIT THE EXISTING SITE CONDITIONS.

MULCHING

24. ALL PLANTING AREAS WITH LESS THAN A 4:1 GRADIENT SHALL RECEIVE A LAYER OF MULCH, TYPE AND DEPTH PER PLANS. SUBMIT 1 CUBIC FOOT SAMPLE OF MULCH (ONE SAMPLE PER TYPE) TO LANDSCAPE ARCHITECT FOR APPROVAL PRIOR TO INSTALLATION. THE MULCH SHALL BE SPREAD EVENLY THROUGHOUT ALL PLANTING AREAS EXCEPT SLOPES 4:1 OR STEEPER, OR AS OTHERWISE DENOTED ON THE PLAN. ABSOLUTELY NO EXPOSED GROUND SHALL REMAIN IN AREAS TO RECEIVE MULCH AFTER MULCH HAS BEEN INSTALLED.
25. ALL PLANTING AREAS ON SLOPES OVER 4:1 SHALL RECEIVE COCONUT FIBER EROSION CONTROL NETTING FROM ROLLS. NETTING SHALL BE RCT-125, AS MANUFACTURED BY NORTH AMERICAN GREEN (OR EQUAL). INSTALL AND STAKE PER MANUFACTURER'S SPECIFICATIONS. SEE ALSO THE CIVIL ENGINEER'S EROSION CONTROL PLAN.

TREE PROTECTION NOTES

1. "PROTECTED ZONE" FOR EXISTING TREES: BEFORE BEGINNING ANY DEMOLITION OR CONSTRUCTION OPERATIONS, THE CONTRACTOR SHALL INSTALL TEMPORARY FENCING AROUND ALL EXISTING TREES WITHIN THE CONSTRUCTION ZONE THAT ARE TO BE SAVED. THE FENCE SHALL BE INSTALLED NO CLOSER TO THE TREE THAN THE EDGE OF THE TREE'S PROTECTED ZONE, GENERALLY DEFINED AS THE AREA BEGINNING FIVE FEET OUTSIDE OF THE TREE'S DRIPLINE AND EXTENDING TOWARDS THE TREE (OR AS FAR AWAY FROM THE TRUNK AS PRACTICABLE). THE FENCING SHALL BE A MINIMUM OF 4' IN HEIGHT AND A MATERIAL ACCEPTABLE TO THE LANDSCAPE ARCHITECT. ALL CONTRACTORS AND THEIR CREWS SHALL NOT BE ALLOWED INSIDE THIS "PROTECTED ZONE" NOR SHALL THEY BE ALLOWED TO STORE OR DUMP FOREIGN MATERIALS WITHIN THIS AREA UNLESS FOR INSTALLATION OF LANDSCAPE MATERIAL AND DRIP SYSTEMS. NO WORK OF ANY KIND, INCLUDING TRENCHING, SHALL BE ALLOWED WITHIN THE PROTECTED ZONE EXCEPT AS DESCRIBED BELOW. THE FENCING SHALL REMAIN AROUND EACH TREE TO BE SAVED UNTIL THE COMPLETION OF CONSTRUCTION OPERATIONS.
2. TEMPORARY MULCH: TO ALLEVIATE SOIL COMPACTION IN ANTICIPATED AREAS OF HIGH CONSTRUCTION TRAFFIC, AND ONLY WHERE FENCING CANNOT BE SET FIVE FEET OUTSIDE OF THE DRIPLINE, THE CONTRACTOR SHALL INSTALL A LAYER OF DOUBLE SHREDDED CEDAR BARK MULCH, 9"-12" THICK, OVER ALL EXPOSED EARTH FROM THE TREE TRUNK TO 5' OUTSIDE OF THE DRIPLINE. THIS LAYER SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION. WHEN PLANTING OPERATIONS ARE COMPLETED, THE MULCH SHALL BE REDISTRIBUTED THROUGHOUT ALL PLANTING AREAS DESIGNATED FOR BARK MULCH IN A 3" THICK "PERMANENT" MULCH LAYER.
3. NECESSARY WORK: WHEN IT BECOMES NECESSARY TO ENTER THE "PROTECTED ZONE", SUCH AS FOR FINE GRADING, IRRIGATION INSTALLATION, AND PLANTING OPERATIONS, THE CONTRACTOR SHALL STRICTLY ADHERE TO THE FOLLOWING RULES:
    A. EVERY EFFORT SHALL BE MADE TO PRESERVE THE EXISTING GRADE AROUND PROTECTED TREES IN AS WIDE AN AREA AS POSSIBLE.
    B. TRENCHING WITHIN THE PROTECTED ZONE OF EXISTING TREES SHALL BE PERFORMED BY HAND, AND WITH EXTREME CARE NOT TO SEVER ROOTS 1-1/2" IN DIAMETER AND LARGER. WHERE ROOTS 1-1/2" IN DIAMETER AND LARGER ARE ENCOUNTERED, THE CONTRACTOR SHALL TUNNEL UNDER SAID ROOTS. EXPOSED ROOTS THAT HAVE BEEN TUNNELED UNDER SHALL BE WRAPPED IN WET BURLAP AND KEPT MOIST WHILE THE TRENCH IS OPEN.
    C. WHERE ROOTS 1-1/2" IN DIAMETER OR LARGER MUST BE CUT DUE TO EXTENSIVE GRADE CHANGES, THOSE ROOTS MUST BE EXPOSED BY HAND DIGGING AND CUT CLEANLY. RAGGED CUTS GENERALLY DO NOT HEAL PROPERLY, AND MAY LEAVE THE TREE OPEN TO PESTS AND PATHOGENS.
    D. WHERE TRENCHING NEAR TREES HAS ALREADY OCCURRED FROM PREVIOUS CONSTRUCTION OPERATIONS, THE CONTRACTOR SHALL MAKE EVERY EFFORT TO CONFINE HIS TRENCHING OPERATIONS TO THE PREVIOUSLY-CREATED TRENCHES, WHILE ADHERING TO THE CONDITIONS SET FORTH IN 3B.
4. POTENTIAL CONFLICTS: THE CONTRACTOR SHALL NOTIFY THE OWNER, LANDSCAPE ARCHITECT, AND CITY'S ARBORIST SHOULD ANY POTENTIAL CONFLICTS ARISE BETWEEN THESE SPECIFICATIONS AND/OR LARGE ROOTS ENCOUNTERED IN THE FIELD, AND CONSTRUCTION OPERATIONS. THE CONTRACTOR SHALL NOT TAKE ANY ACTION IN SUCH CONFLICTS WITHOUT THE ARBORIST'S WRITTEN APPROVAL. THE CITY'S ARBORIST SHALL HAVE FINAL AUTHORITY OVER ALL METHODS NECESSARY TO HELP ENSURE THE PROTECTION AND SURVIVAL OF THE CITY'S EXISTING TREES.
5. PRUNING: PRUNE ONLY THE TREES THAT ARE INDICATED ON THE PLANS AS REQUIRING PRUNING. PRUNE TREES ACCORDING TO INTERNATIONAL SOCIETY OF ARBORICULTURE / ANSI A300 STANDARDS:
    A. REMOVE ALL DEAD WOOD.
    B. PRUNE LIVE WOOD FOR HEALTH OR STRUCTURAL REASONS ONLY, INCLUDING THE NEED TO ELIMINATE DISEASED OR DAMAGED GROWTH, ELIMINATE STRUCTURALLY UNSOUND GROWTH, REDUCE THE POTENTIAL FOR WIND TOPPLING OR WIND DAMAGE, OR TO MAINTAIN GROWTH WITHIN LIMITED SPACE. DO NOT REMOVE MORE THAN 25% OF ANY TREE'S LIVE FOLIAGE IN ANY ONE GROWING SEASON. PRUNE ONLY TO INTERNATIONAL SOCIETY OF ARBORICULTURE/ANSI A300 STANDARDS, AND ONLY UNDER THE DIRECT SUPERVISION OF A CERTIFIED ARBORIST.
    C. FINAL CUTS SHALL BE MADE JUST OUTSIDE THE SHOULDER RING AREA. EXTREMELY FLUSHED CUTS WHICH PRODUCE LARGE WOUNDS SHALL NOT BE MADE.
    D. ALL TRIMMING CUTS SHALL BE PERFORMED IN SUCH A MANNER AS TO PROMOTE THE NATURAL GROWTH AND SHAPE OF EACH TREE SPECIES.
    E. IMPROPER PRUNING METHODS INCLUDING, BUT NOT LIMITED TO, "TOPPING", "TIPPING", "HEADING BACK", "DEHORNING", AND "LIONTAILING" WILL NOT BE ALLOWED. THE CONTRACTOR SHALL PAY FOR ALL WORK NECESSARY TO CORRECT SUCH PRUNING WHEN PERFORMED BY HIS CREWS OR SUBCONTRACTORS.
    F. SHOULD THE CONTRACTOR REQUIRE MORE INFORMATION, THE CONTRACTOR SHALL CONTACT THE ISA AT (217) 355-9411 FOR A COPY OF THE ANSI A300 PRUNING STANDARDS. CONTRACTOR SHALL ADHERE TO THE METHODS AND PRACTICES SET FORTH IN THIS DOCUMENT.
6. GENERAL NOTES:
    A. PROVIDE A SIGNIFICANT WATER SUPPLY TO EXISTING TREES FROM THE FIRST DAY OF CONSTRUCTION TO THE COMPLETION AND INSTALLATION OF A SITE IRRIGATION SYSTEM.
    B. SPRAY TREES WITH PESTICIDES BEFORE CONSTRUCTION AND BEFORE EACH GROWING SEASON DURING CONSTRUCTION.
    C. ROOT PRUNE DAMAGED ROOTS WITHIN ONE HOUR AFTER THE DAMAGE OCCURS.
    D. EXAMINE THE PRESERVED PLANT MATERIAL A MINIMUM OF ONCE A MONTH DURING THE GROWING SEASON TO VERIFY THE CONDITION. ADJUST WATERING FREQUENCY AND QUANTITY AS NECESSARY TO INSURE PLANT SURVIVAL.

LANDSCAPE GUARANTEE AND MAINTENANCE

1. THE LANDSCAPE CONTRACTOR SHALL GUARANTEE ALL TREES, SHRUBS, PERENNIALS, SOD, SEEDED AREAS, AND IRRIGATION SYSTEMS FOR A PERIOD OF ONE YEAR FROM THE DATE OF THE OWNER'S ACCEPTANCE. THE CONTRACTOR SHALL REPLACE, AT HIS OWN EXPENSE, ANY PLANTS WHICH DIE IN THAT TIME, OR REPAIR ANY PORTIONS OF THE IRRIGATION SYSTEM WHICH OPERATE IMPROPERLY. A PERFORMANCE GUARANTEE IS REQUIRED TO ENSURE COMPLETION OF LANDSCAPING.
2. THE LANDSCAPE CONTRACTOR SHALL MAINTAIN THE LANDSCAPE IN A NEAT, CLEAN, AND HEALTHY CONDITION FOR A PERIOD OF 90 DAYS. THIS SHALL INCLUDE PROPER PRUNING, MOWING AND AERATION OF LAWNS, WEEDING, RESEEDING AREAS WHICH HAVE NOT GERMINATED WELL, REPLACEMENT OF MULCH, REMOVAL OF LITTER, AND THE APPROPRIATE WATERING OF ALL PLANTINGS. IRRIGATION SHALL BE MAINTAINED IN PROPER WORKING ORDER, WITH SCHEDULING ADJUSTMENTS BY SEASON AND TO MAXIMIZE WATER CONSERVATION.
3. AFTER THE INITIAL MAINTENANCE PERIOD AND DURING THE GUARANTEE PERIOD, THE LANDSCAPE CONTRACTOR SHALL ONLY BE RESPONSIBLE FOR REPLACEMENT OF PLANTS WHEN PLANT DEATH CANNOT BE ATTRIBUTED DIRECTLY TO OVERWATERING OR OTHER DAMAGE BY HUMAN ACTIONS.
4. DURING THE LANDSCAPE MAINTENANCE PERIOD, THE LANDSCAPE CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE AWAY FROM STRUCTURES IN ALL LANDSCAPE AREAS AT THE MINIMUM SLOPE SPECIFIED IN THE GEOTECHNICAL REPORT. LANDSCAPE AREAS WHICH SETTLE AND CREATE THE POTENTIAL FOR PONDING SHALL BE REPAIRED TO ELIMINATE PONDING POTENTIAL AND BLEND IN WITH THE SURROUNDING GRADES. SHOULD ANY CONFLICTS AND/OR DISCREPANCIES ARISE BETWEEN THE GEOTECHNICAL REPORT, THE GRADING PLANS, THESE NOTES, AND ACTUAL CONDITIONS, THE CONTRACTOR SHALL IMMEDIATELY BRING SUCH ITEMS TO THE ATTENTION OF THE LANDSCAPE ARCHITECT AND OWNER.

NO.	REVISION	DES. BY	DRAWN BY	DATE
1	PER CITY COMMENTS	MFD	EVR	9/29/10

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KING Soopers
King Soopers Supermarket Petroleum

KING SOOPERS FUEL FACILITY CANOPY AND KIOSK STORE # 13
HECLA WAY & PLAZA DRIVE
LOUISVILLE, COLORADO

Project No:	KSF13
Sheet Scale:	1" = 10'
Designed By:	JLW
Drawn By:	JLW
Date:	AUGUST 10, 2010
Disk File:	KSF13_P_05-Land

LANDSCAPE PLAN

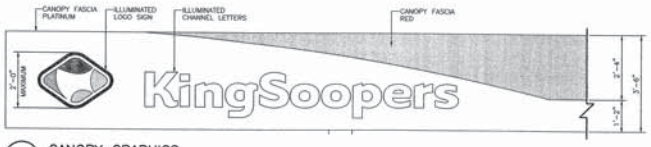
5 OF 7

Louisville Plaza, Filing No. 3, Lot 1 PUD Amendment

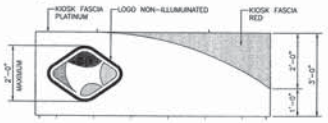
DRAWING NUMBER

DRAWING NUMBER

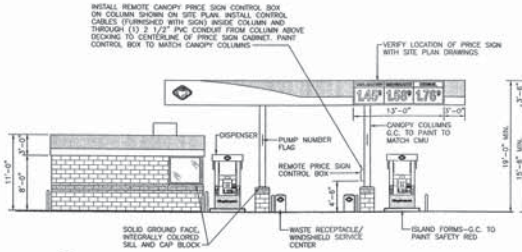
King Soopers 1712 Plaza Dr.



1 CANOPY GRAPHICS
SCALE: 1/2"=1'-0"

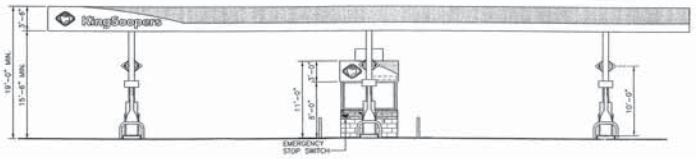


2 KIOSK GRAPHICS
SCALE: 1/2"=1'-0"

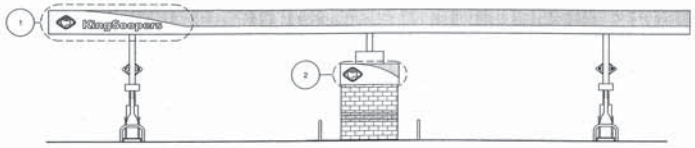


3 WEST ELEVATION
SCALE: 1/8"=1'-0"

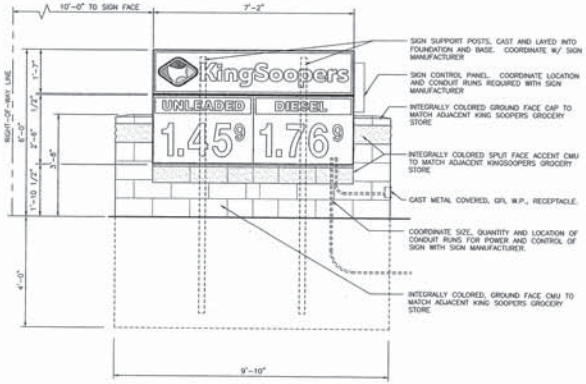
4 EAST ELEVATION
SCALE: 1/8"=1'-0"



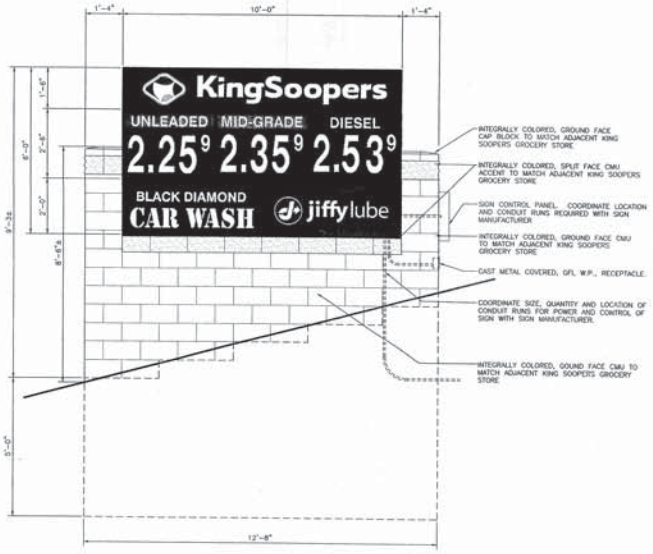
5 SOUTH ELEVATION
SCALE: 1/8"=1'-0"



6 NORTH ELEVATION
SCALE: 1/8"=1'-0"



7 FUEL MONUMENT SIGN ELEVATION
SCALE: 1/2"=1'-0"



8 GROCERY MONUMENT SIGN ELEVATION
SCALE: 1/2"=1'-0"

No.	REVISION	DES. BY	DRAWN BY	DATE
1	PCR CITY COMMENTS	MFD	EVR	9/29/10

Galloway
Three Park Central, Suite 1000
5500 DTC Parkway, Suite 285
Greenwood Village, CO 80111
303.770.5673 P
303.770.3636 F
www.galloway.us.com

King Soopers Supermarket Petroleum
1712 Plaza Dr.
Louisville, CO 80027
Tel. (303) 861-5874
Fax (303) 861-5882

KING SOOPERS FUEL FACILITY CANOPY AND KIOSK STORE # 13
HECLA WAY & PLAZA DRIVE
LOUISVILLE, COLORADO

Project No:	KSF000013
Sheet Scale:	FULL
Designed By:	MDC
Drawn By:	ELS
Date:	AUGUST 10, 2010
Disk File:	KSF13_P_06-Elev

CANOPY AND KIOSK ELEVATIONS

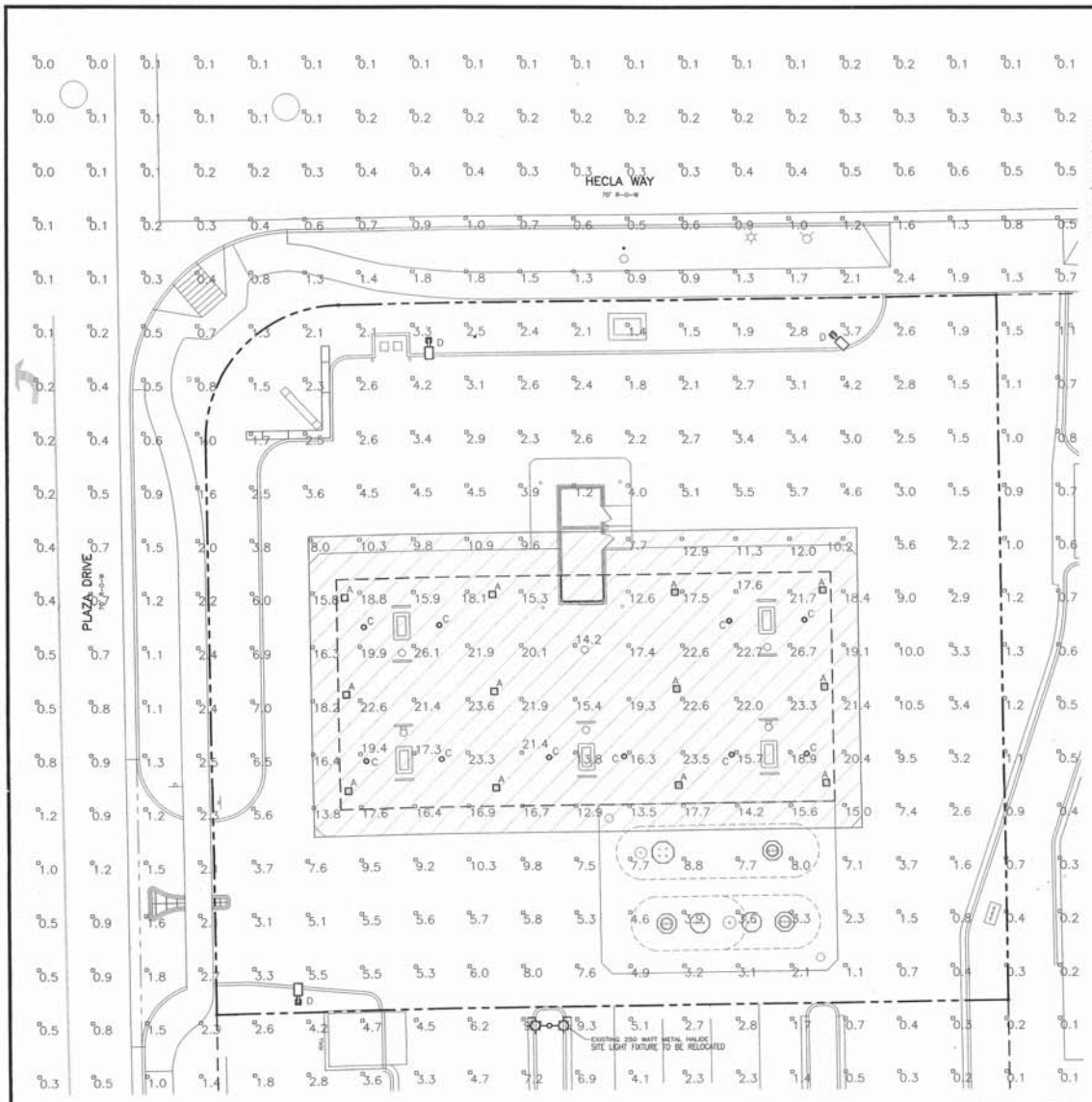
6 OF 7

Louisville Plaza
Filing No. 3, Lot 1
PUD Amendment

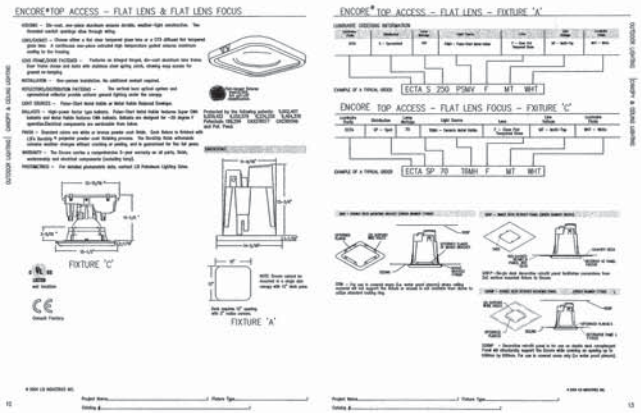
DRAWING NUMBER

DRAWING NUMBER

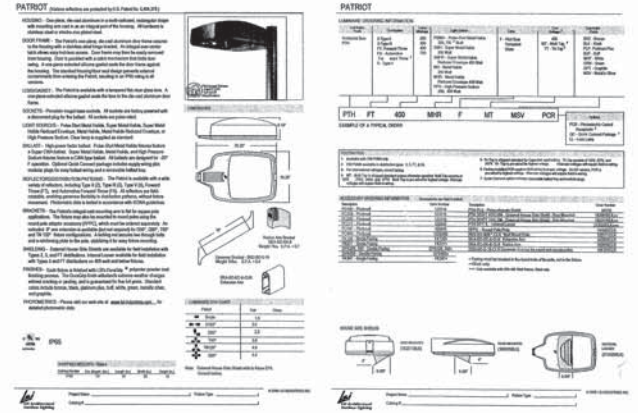
King Soopers
1712 Plaza Dr.



1 PHOTOMETRIC SITE PLAN
SCALE: 1"=10'-0"



FIXTURE 'A' & 'C' SPECIFICATION SHEET



FIXTURE 'D' SPECIFICATION SHEET

SCALE: 1"=10'

STATISTICAL AREA SUMMARY

LABEL	AVG	MAX	MIN	UNIFORMITY RATIOS AVG/MIN	MAX/MIN
CANOPY INFLUENCE	17.07	26.7	7.7	2.22	3.47

LUMINAIRE SCHEDULE

FIXTURE	SYMBOL	QTY	POLE HEIGHT/ MOUNTING HEIGHT	MOUNTING	INITIAL LUMENS	MAINTAINED AVERAGE	MANUFACTURER/CATALOG # (SEE NOTE 2 BELOW)	LAMP TYPE	WATTS
A		12	15'-6"	SURFACE	23500	0.72	LSI LIGHTING, ENCORE SERIES #ECTA-S-250-PSMV-F-MT-WHT	PULSE START METAL HALIDE	250
C		10	15'-6"	SURFACE	6600	0.72	LSI LIGHTING, ENCORE FOCUS #ECTA-SF-70-TBMH-F-MT-WHT	CERAMIC METAL HALIDE	70
D		3	24'-0"	POLE	22000	0.72	LSI LIGHTING, PATRIOT SERIES #PTH-FT-250-PSMH-F-MT-PLP	PULSE START METAL HALIDE	250

No.	REVISION	DES. BY	DRAWN BY	EVR	MFD	DATE
1	PER CITY COMMENTS					9/29/10

Galloway
Planning Architecture Engineering
6300 DTC Parkway, Suite 100
Greenwood Village, CO 80111
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303.770.3636 F
www.gallaway-US.com

King Soopers
Supermarket
Petroleum
Fuel Facility
Fax: (303) 779-4272
Tel: (303) 779-4272

KING SOOPERS
FUEL FACILITY
CANOPY AND KIOSK
STORE # 13
HECLA WAY & PLAZA DRIVE
LOUISVILLE, COLORADO

Project No:	KSF13
Sheet Scale:	1" = 10'
Designed By:	MFD
Drawn By:	JMG
Date:	AUGUST 10, 2010
Dsk File:	KSF13_P_07-Lts

PHOTOMETRIC PLAN

7 OF 7

King Soopers
1712 Plaza Dr.

BLACK DIAMOND CAR WASH

FINAL PLANNED UNIT DEVELOPMENT PLAN – ADMINISTRATIVE AMENDMENT
LOT 6, LOUISVILLE PLAZA SUBDIVISION, FILING NO. 2
CITY OF LOUISVILLE, COUNTY OF BOULDER, STATE OF COLORADO

LEGAL DESCRIPTION

LOT 6, LOUISVILLE PLAZA SUBDIVISION, FILING NO. 2, LOUISVILLE, COLORADO.

P.U.D. AMENDMENT DESCRIPTION: MINOR REVISIONS TO ELEVATIONS TO REMOVE ORNAMENTAL ELEMENTS AND REVISE EXTERIOR MATERIAL OF WEST-MOST PORTION OF BUILDING FROM CMU TO WOOD SIDING.

In witness whereof, Rachel S. Gerrity, President, Black Diamond Car Wash, L.L.C. has her name to be here unto subscribed this 6 day of June A.D. 2001.

For The Black Diamond LLC

Rachel S. Gerrity, President, Black Diamond Car Wash, L.L.C.

STATE OF COLORADO)
COUNTY OF BOULDER) SS

The foregoing instrument was acknowledge before me this 6th day of June 2001 A.D., 2001 by Rachel S. Gerrity, President, Black Diamond Car Wash, L.L.C.
Witness my hand and official seal.

My Commission Expires: 9/11/2004

Notary Public

STATE OF COLORADO
COUNTY OF BOULDER
SUBSCRIBED AND SWORN TO BEFORE ME THIS 6 DAY OF JUNE 2001
MY COMMISSION EXPIRES 9/11/2004
NOTARY PUBLIC
BANK ONE - LOUISVILLE

CLERK AND RECORDER'S CERTIFICATE:

STATE OF COLORADO)
COUNTY OF BOULDER) SS

I hereby certify that this instrument was filed in my office at 2:31 o'clock P.M. this 12th day of June, 2001, and is recorded in Plan File 4452 2030
FEES $20.00 PAID $20.00
FILM NO. N/A
RECEPTION NO. 2160401

Charlotte Houston
CLERK AND RECORDER

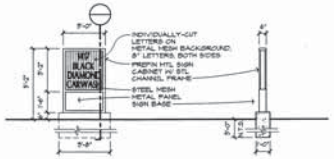
Sally M. Ly
DEPUTY

ADMINISTRATIVE AMENDMENT

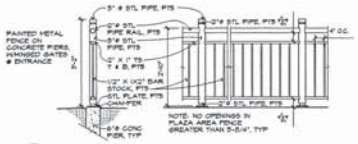
Approved this 30 day of May, 2001, by the Director of Planning, City of Louisville, Colorado.

Paul S. Wood
Planning Director

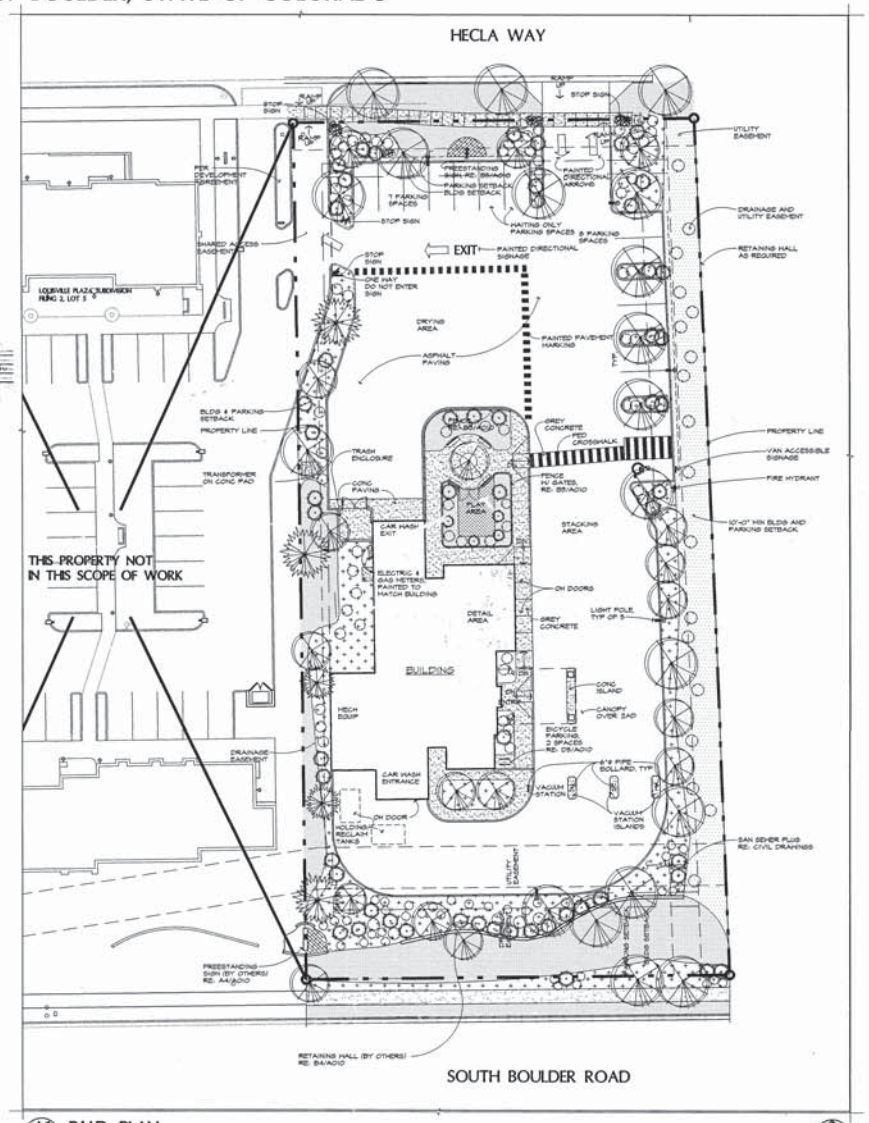
VICINITY MAP
N.T.S.



A3 HECLA WAY MONUMENT SIGN ELEVATION
1/4" = 1'-0"



A2 PLAZA AREA FENCE
1/2" = 1'-0"



A1 P.U.D. PLAN
1" = 20'

HARTRONFT FAURI ARCHITECTS
Planning • Architecture • Interiors
801 MAIN STREET
SUITE 300
LOUISVILLE, CO 80027
VOICE: 303.673.9304
FAX: 303.673.9319

BLACK DIAMOND CAR WASH
LOT 6, LOUISVILLE PLAZA, FILING 2
ADMINISTRATIVE AMENDMENT TO P.U.D.
LOUISVILLE, COLORADO

ADMINISTRATIVE AMENDMENT TO FINAL P.U.D.

PROJECT # 9963
DATE: 4/26/01
DRAWN BY: SLA/BSF
CHECKED BY: JEH
REVISIONS:

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All drawn and written information appearing herein shall not be used without written consent of Hartronft Fauri Architects, p.c.

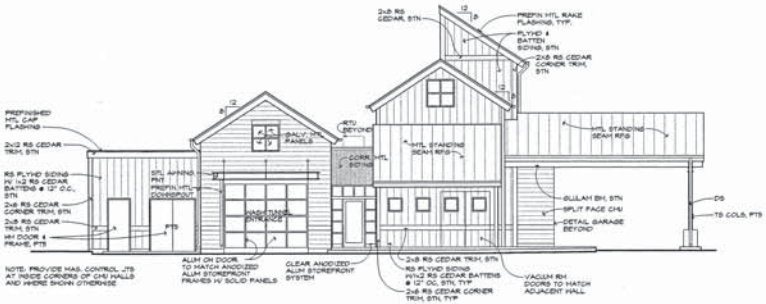
PUD PLAN

SIGNAGE

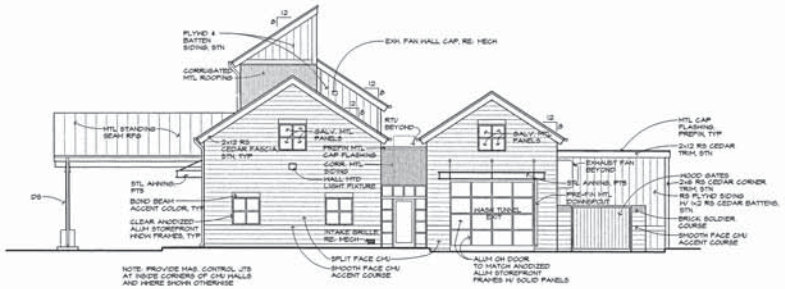
Sheet
1
1 of 2 Sheets

DRAWING NUMBER

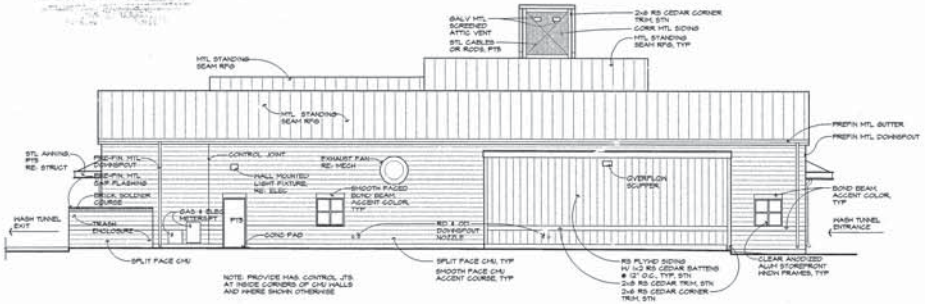
BLACK DIAMOND CAR WASH
LOT 6 LOUISVILLE PLAZA, FILING 2
APRIL 2001



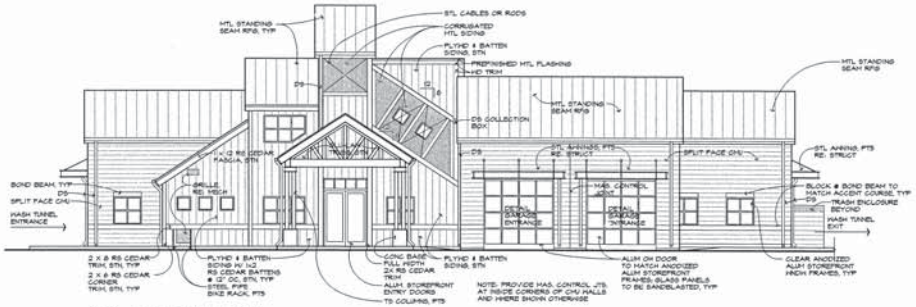
C3 2 SOUTH ELEVATION
1/8" = 1'-0"



C1 2 NORTH ELEVATION
1/8" = 1'-0"



B1 2 WEST ELEVATION
1/8" = 1'-0"



A1 2 EAST ELEVATION
1/8" = 1'-0"

HARTRONFT FAURI ARCHITECTS
Planning • Architecture • Interiors

801 MAIN STREET
SUITE 300
LOUISVILLE, CO 80027
VOICE: 303.673.9304
FAX: 303.673.9319

BLACK DIAMOND CAR WASH
LOT 6, LOUISVILLE PLAZA, FILING 2
P.U.D. ADMINISTRATIVE AMENDMENT
LOUISVILLE, COLORADO

ADMINISTRATIVE AMENDMENT TO FINAL P.U.D.

PROJECT # 9963
DATE: 04/26/01
DRAWN BY: BJS/DHA
CHECKED BY: HJF/HBH
REVISIONS:

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REVISED ELEVATIONS

Sheet
2
2 of 2 Sheets

DRAWING NUMBER

BLACK DIAMOND CAR WASH
LOT 6 LOUISVILLE PLAZA, FILING 2

Felicity Selvoski

From: Chip Weincek <chip@cwa-architect.com>
Sent: Thursday, June 13, 2019 2:58 PM
To: Rob Zuccaro; Felicity Selvoski; Dawn Burgess
Cc: 'Robert Kearney'
Subject: RE: Speedy Sparkle PUD Amendment #3 Modification

Hello Rob,

Thank you for the first written design response and notification that the City Staff does not support the applicants 6-4-19 PUD #3 Amendment resubmittal. As both myself and the applicant have mentioned to you we would prefer to work with staff to come to a common ground sign design solutions prior to submittal to PC. But if staff remains silent on their written design response to the applicant and submits their written design response late in the City planning track, this does not allow the applicant time to respond. This first written design response received from you does not even seem to apply to the applicants 6-4-19 PUD #3 Amendment resubmittal, which was submitted to you in an attempt to incorporate what we heard from your in our meetings and phone discussions. You seem to enjoy running the applicant around in circles with any verbal responses we receive from you. How do you except the applicant to respond to this seemly uninformed first design response e-mail.

Thus our attempt below in *green Italic* to provide you with our correction responses to your below first written design response.

Yes, we want to continue to PC as scheduled and request all the information we have provided to you and City staff be included in the staff packet to PC, including this e-mail.

Regards,

Chip Weincek, AIA, LEED AP
Principal Architect/Planner
CWA
C W ASSOCIATES, PLLC
ARCHITECTURE • PLANNING • DEVELOPMENT SERVICES
P.O. Box 271033 • Louisville, Colorado • 80027
303-666-8941
chip@cwa-architect.com
www.cwa-architect.com

"Crafting Spaces, Achieving Sustainability and Creating Value"

From: Rob Zuccaro [mailto:rzuccaro@louisvilleco.gov]
Sent: Wednesday, June 12, 2019 12:50 PM
To: Chip Weincek; Felicity Selvoski; Dawn Burgess
Cc: 'Robert Kearney'
Subject: RE: Speedy Sparkle PUD Amendment #3 Modification

Chip,

As submitted, we do not support your request for the reasons I explained in our phone call and have detailed in our past meetings. Please note you may move forward with your current application if you would like, but I will reiterate the planning staff's main recommendations and comments that have not been addressed.

- Having one combined monument sign is preferred for all three lots as approved under the current PUD. This helps reduce sign clutter, which is a goal of our sign regulations. *Please provide your old code (CDDSG) item that addresses this combined sign criteria?* The proposed updated sign code (scheduled for adoption this summer) would allow 60 sq. ft., which matches the current sign area. *You have mentioned to the applicant while meeting with you this application is not being reviewed under the updated sign code. You keep bringing the updated sign code up in your discussions and correspondence – please clarify this PUD Amendment #3 is being reviewed under the old sign code (CDDSG) and that the PC and CC will be informed of this by staff, as you have mentioned to us prior?* Your original request was for 120 sq. ft., which is not necessary for adequate visibility and out of character with any similarly situated property in the City. *This does not apply to our 6-4-19 PUD Amendment #3 as resubmitted, why do you bring this up?* Staff believes 60 square feet is adequate for the scale of development. However, staff would be willing to consider supporting a sign area of 70 sq. ft. if it otherwise meets the City's design requirements. This would allow an additional foot of height on each lower panel and add significant additional visibility and copy height. *Again this does not apply to our 6-4-19 PUD Amendment #3 as resubmitted, again why do you bring this up?*
- For the secondary sign on Hecla, the current PUD allows 9.5 sq. ft. and 5', 2" in height. We would support a sign up to 32 sq. ft. and 6 ft. in height. Your proposal is 36 sq. ft. and 12 ft. tall. This is out of character and greatly exceeds in height what would be appropriate for the context of its location. *The applicants 6-4-19 PUD Amendment #3 resubmittal addresses this, reference sheet A2.2, detail #1 which lowered the sign height from the original 2-19-19 PUD Amendment #3 submittal from 12' to 9' and reduced the sign to 22.5 sf to reflect your request from the last time we met with you. Does your prior verbal request to lower this sign to 9' as reflected in our 6-4-19 PUD Amendment #3 resubmittal no longer apply? Please reference sheet A2.2, detail #2 that shows why a higher height of sign is needed due to the site conditions and for visibility as we have discussed with you.*
- The architectural border for the Hecla sign should match a building material or be upgraded to a higher quality material. *Both our submittals to you and as stated in the current applicants 6-4-19 PUD Amendment #3 resubmittal reflect steel I-beams which reflect the style of the project architecture – are the steel I-beams not acceptable to you as a high quality material?*
- Sign illumination must meet code. We currently do not have information on illumination and panel opacity. *Please reference the applicants 6-4-19 PUD Amendment #3 resubmittal which provides information on illumination and panel opacity.*
- We do not support an electronic message sign. This has not been supported in our public outreach with the sign code update and not allowed under our current or proposed codes. *The applicants 6-4-19 PUD Amendment #3 resubmittal includes two LED electronic signs. Both indicated as submitted with the applicants 6-4-19 PUD Amendment #3 resubmittal. First – King Soopers LED gas price readout screen. From our meetings with you indicated this would be supported by you, have you changed you thought on this? Second - is the new Speedy SB monument sign box with LED signage readout screen for messages. We provided you sign studies to support these electric signs with the applicants 6-4-19 PUD Amendment #3 resubmittal as you requested in our last meeting. The applicant would like this speedy sparkle LED sign presented to the PC.*
- We do not prefer the splitting of the signs, as this adds to sign clutter. *Please provide your old code (CDDSG) section item that addresses what you mean by sign clutter?* However, if all property owners want to maintain their own signs, each sign must be located on each individual lot and meet the sign code. *This is new to us, thus you want the applicant to resolve multiple old PUD approvals we have nothing to do with?* Therefore, the current sign that splits property boundaries would need to be relocated and each individual sign on each lot would need to be part of the sign update for staff to support splitting the signs. *Please reference the applicants 6-4-19 PUD Amendment #3 resubmittal which indicates the existing SB monument sign will remain and will be for King Soopers and Jiffy Lube only. A new 48sf (this includes the $4 portion of the sign) SB monument sign is proposed for Speedy Sparkle. The old code allows the property owner to have their own monument sign, such as proposed for Speedy Sparkle. The existing KS fueling station currently has two monument signs.*

We see no reason to remove an existing sign as you request. The applicant could work with the adjoining property owners for a use of right to this sign that has a portion on Speedy Sparkle's property. This could be a condition of approval, since the two days you have allowed us to address this new issue is not possible to achieve.

As we know the old code remains silent on menu signs, in which you choose not to address with your first written deign response e-mail. The applicants 6-4-19 PUD Amendment #3 resubmittal indicates what the applicant would like approved and falls in the middle of what the City has allowed in the past built environment with in the City of Louisville. We presented to you, at your requested, a City of Louisville built environment slide deck sign study and written sign studies to support this. At this time we have no written design response direction from the City on the menu signs, except you don't support this menu sign.

Please let me know how you would like to proceed. We need revisions by the end of this week so we can review for completeness before we submit public notice on June 19th for the July 11th Planning Commission hearing.

Thanks,

Rob

Robert Zuccaro, AICP
Planning & Building Safety Director
rzuccaro@louisvilleco.gov
303-335-4590 (direct)
303-335-4592 (office)

City of Louisville
COLORADO • SINCE 1878

From: Chip Weincek [mailto:chip@cwa-architect.com]
Sent: Wednesday, June 12, 2019 10:13 AM
To: Felicity Selvoski <fselvoski@louisvilleco.gov>; Rob Zuccaro <rzuccaro@louisvilleco.gov>; Dawn Burgess <dburgess@louisvilleco.gov>
Cc: 'Robert Kearney' <robert@speedysparklecarwash.com>
Subject: RE: Speedy Sparkle PUD Amendment #3 Modification

Hello Rob,

Thanks for the call today. As I understand you will send us detailed design direction for what the City wants for this proposal.

I look forward to your detailed design direction, seen you do not support our 6-4-19 resubmittal.

Let us know.
Thank you,

Chip Weincek, AIA, LEED AP

Principal Architect/Planner
CWA
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www.cwa-architect.com

"Crafting Spaces, Achieving Sustainability and Creating Value"

From: Chip Weincek [mailto:chip@cwa-architect.com]
Sent: Monday, June 10, 2019 5:17 PM
To: 'Felicity Selvoski'; 'Rob Zuccaro'
Cc: 'Robert Kearney'; 'Aaron DeJong'
Subject: RE: Speedy Sparkle PUD Amendment #3 Modification

Hello Felicity and Rob,

Just a general question - Does the City staff support the new reduced size sign proposal and we just need to work out the details as mentioned below?

As we understand from our prior meeting the applicant will have the right to continue the PC to the next available date if the week before PC staff report is unacceptable to the applicant, please confirm?

Also please send the City of Louisville wavier requirement for what you mentioned below.

Thank you,

Chip Weincek, AIA, LEED AP
Principal Architect/Planner
CWA
C W ASSOCIATES, PLLC
ARCHITECTURE • PLANNING • DEVELOPMENT SERVICES
P.O. Box 271033 • Louisville, Colorado • 80027
303-666-8941
chip@cwa-architect.com
www.cwa-architect.com

"Crafting Spaces, Achieving Sustainability and Creating Value"

From: Felicity Selvoski [mailto:fselvoski@louisvilleco.gov]
Sent: Monday, June 10, 2019 2:23 PM
To: 'Chip Weincek'; Rob Zuccaro
Cc: 'Robert Kearney'
Subject: RE: Speedy Sparkle PUD Amendment #3 Modification, e-mail 2 of 2

Hi Chip,

As we discussed in our prior meeting, our detailed response will be included in the staff report published the week prior to the Planning Commission meeting on July 11. We did an initial review of the changes you submitted and have some initial comments and questions.

- Confirm which areas on the sign will illuminate and which are entirely opaque.
- Clarify what is meant by "New sign box with LED signage readout screen". Is this an electronic message center?
- The portion of the sign with "$4" on it needs to be included in the square footage of the sign.
- Based on our initial review, it appears waivers are required for the items below. A waiver request, along with written rationale for these requests is necessary.
    - Number of signs – the existing sign is on the shared property line, and the proposed sign will result in two signs on the property. A waiver is required to allow two signs on the Speedy Sparkle property, or the existing sign will need moved to be located entirely off Speedy Sparkle's property.
    - Sign illumination – If the proposal includes areas of the sign that will illuminate that aren't consistent with the language in the CDDSG, a waiver is required. Essentially, only the characters on the sign may illuminate in a cabinet sign, not the entire sign.
    - Sign design - CDDSG 7.5.A.5 requires design elements that are not included on this proposal. A waiver is required for the architectural border on two sides, and a material for the base that complements the building. Staff will likely find that the metal sign cabinet design does not meet this section.
- Because of the proposed changes regarding the monument sign, we will need confirmation that King Soopers and Jiffy Lube support the changes to the sign on your submitted plans.

Let me know if you have any questions. We'd like these answered by Friday of this week so we are able to clarify this information for Planning Commission.

Best,

Felicity Selvoski
Planner / Historic Preservation
City of Louisville
fselvoski@louisvilleco.gov
P: 303-335-4594

We encourage you to visit our online maps webpage with planning and land use information.

From: Chip Weincek [mailto:chip@cwa-architect.com]
Sent: Tuesday, June 4, 2019 3:30 PM
To: Rob Zuccaro <rzuccaro@louisvilleco.gov>; Felicity Selvoski <fselvoski@louisvilleco.gov>; Aaron DeJong <aarond@louisvilleco.gov>
Cc: 'Robert Kearney' <robert@speedysparklecarwash.com>
Subject: RE: Speedy Sparkle PUD Amendment #3 Modification, e-mail 2 of 2

Chip Weincek, AIA, LEED AP
Principal Architect/Planner
CWA
CW ASSOCIATES, PLLC
ARCHITECTURE • PLANNING • DEVELOPMENT SERVICES
P.O. Box 271033 • Louisville, Colorado • 80027
303-666-8941
chip@cwa-architect.com
www.cwa-architect.com

Felicity Selvoski

From:	David Chernikoff <davidchernikoff@icloud.com>
Sent:	Saturday, June 29, 2019 4:02 PM
To:	Planning
Subject:	residential comment: Speedy Sparkle PUD proposed sign
Follow Up Flag:	Follow up
Flag Status:	Flagged

To Whom it May Concern:

As one of the owners of a townhome at 1459 Hecla Way, which is located close to the Speedy Sparkle Car Wash at 1414 Hecla Way, I want to express my opposition to the proposed new sign in their PUD Amendment Application. The proposed sign will have a significant negative impact on the views from our building as well as those from other buildings in our neighborhood. In addition, when future structures are built on the vacant lot in accordance with current plans, these buildings will partially block the new sign that is being proposed and decrease its usefulness.

If the intention of the business owner(s) of the car wash is to attract interest from traffic on South Boulder Road, the proposed location will be of little value. The people living in the North End neighborhood will regularly drive by the car wash and will not need a sign to alert them to the existence of the car wash. While I recognize that we chose to buy a property that is located close to a business area and I accept the associated impacts on the neighborhood, this proposed sign is unnecessary and unlikely to serve its intended function. It makes much more sense for the car wash to attract business with additional signage that is closer to and clearly visible from South Boulder Road.

I'm further concerned about light pollution, which is an increasing problem throughout the Front Range. If Speedy Sparkle Car Wash is permitted to put up a new sign or to change their existing signs, I strongly oppose signage that is illuminated.

Thank you for considering this request and for doing what you can to preserve the quality of life in the North End neighborhood of Louisville.

Respectfully submitted, David Chernikoff

Felicity Selvoski

From:	Rob Zuccaro
Sent:	Monday, July 1, 2019 8:41 AM
To:	trudyturveypt@gmail.com
Cc:	Felicity Selvoski; Lisa Ritchie
Subject:	RE: Objection to Signage proposal

From: Trudy Turvey <trudyturveypt@gmail.com>
Date: June 29, 2019 at 12:41:21 PM EDT
To: CityCouncil@LouisvilleCo.gov
Subject: Objection to Signage proposal

I live on Hecla Way. Inasmuch as this is a residential area and signage that is proposed would further destroy the ambiance (not to mention the noise levels and congestion) I oppose further signage-the car wash gets plenty of business and it is VERY visible to motorists without further making this area look like a trashy shopping center. It is not clear from the drawings (hard to discern) if this would be a neon sign-I absolutely oppose this.

Trudy Turvey

Felicity Selvoski

From: Laura Chernikoff <lauraachernikoff@icloud.com>
Sent: Monday, July 1, 2019 12:14 PM
To: Felicity Selvoski
Cc: Planning
Subject: Re: Speedy Sparkle PUD Amendment - Resident Comment

Hi Felicity and the Planning Department,

Here are my revised comments based on the updated plan document:

I am a resident at 1459 Hecla Way, which is diagonally across from the Speedy Sparkle Car Wash at 1414 Hecla Way. I oppose the new 9' sign proposed in their PUD Amendment Application and I hope you will consider the perspective of the residents in my building and the North End neighborhood. The proposed Hecla Way sign is out of character and proportion for the location, given the proximity to the current and proposed residential properties. In particular, having an illuminated sign creates a light pollution nuisance for our neighborhood.

The proposed location of the new sign would be a visual nuisance every time we enter our neighborhood–not only for our 6 units, but also for the 12-unit condominium buildings nearby, and the future residences that are planned for the vacant lot. This is a residential area that is in close proximity to commercial properties. We already deal with the lit car wash menu signs, overhead lights, sound of their vacuums, traffic from their customers during work hours and employees before 7am and after 7pm every day. This proposed sign goes too far, particularly in scale and the proposed design.

The Hecla Way location does not seem effective at increasing traffic to the car wash business. There is not significant traffic heading east on Hecla Way, except the residents of the North End going to their homes. It's one thing to have signs centered around the commercial intersection at Plaza and Hecla Way, but it's another for these signs to be directly at the entrance of our neighborhood. Anyone on Hecla Way, at the King Soopers Gas Station, or Napa Tires businesses can already directly see that there is a car wash. It seems sufficient for the car wash to have the requested changes made to the signage on South Boulder Road. However, if a sign on Hecla Way is allowed, it should be much more in style with the other low-profile signs of the other businesses.

If the sign is allowed to be built, then I specifically strongly request that it not be lit or illuminated in any way as planned. Light pollution is a serious problem. In the winter hours, the car wash stays open for several hours after dark. We already have their illuminated menu signs and overhead lights shining directly at our homes in my building.

I hope you will consider the negative impact this proposal would have on the residents of this neighborhood. I worry that this unnecessary commercial encroachment would hurt our property values. This also could decrease the chances of attracting residential and commercial customers to the planned development on the vacant lot. This new development, when it happens, will be good for the neighborhood and will drive new traffic to the businesses.

Please confirm that you received this. I will also plan to attend the hearing on July 11.

Sincerely,

Laura Chernikoff

Felicity Selvoski

From: Marsha McClanahan <marshamccl@icloud.com>
Sent: Monday, July 1, 2019 12:16 PM
To: Felicity Selvoski
Cc: Planning
Subject: Re: Speedy Sparkle PUD Amendment, residential owner input

Re: Proposed additional sign for Speedy Sparkle Car Wash on Hecla Way.

I have just received notice of the amended proposal for a 9 foot high sign on Hecla Way adjacent to the entrance to my neighborhood. Both the location and the size of the sign are different than I previously understood so my previous comments can be disregarded. I am a property owner at 1459 Hecla Way.

I am against the addition of this proposed sign because it is proposed to be a lighted sign which will add additional light to the residential neighborhood, is out of proportion and very large for its parkway location and is out of character with the other signs for businesses nearby on Hecla Way. Additionally, it seems an unnecessary sign in that people going along Hecla either are already going to the carwash or are entering the neighborhood. The resident's in North End who drive regularly along Hecla Way certainly know from all the other Speedy Sparkle signs that the car wash is there and no additional signs are needed for them. If people are entering on Plaza to go to and leave the shopping center, they have already seen signs for the car wash.

Marsha McClanahan

Felicity Selvoski

From: Brady <bradymtb@gmail.com>
Sent: Monday, July 1, 2019 1:31 PM
To: Planning
Subject: Speedy Sparkle car wash-Hecla way sign

Good afternoon,

I would like to object to a new sign on Hecla way. We already have enough light pollution coming from the car wash and gas station. This sign would directly be visible from my living room, bedroom and balcony. There are new houses planned to be built next to the car wash, any further signage for the car wash on Hecla way would reduce the value of our homes and future homes. A sign on S. Boulder rd seems reasonable.

Brady Henderson
(970)222-9474

Felicity Selvoski

From: Tim Merkel <tim@bigcompass.com>
Sent: Monday, July 1, 2019 4:21 PM
To: Planning
Subject: Speedy Sparkle Signage

Dear Louisville Planning,

Thank you for the opportunity to comment on the proposed signage associated with the Speedy Sparkle PUD Amendment. Unfortunately I won't be able to attend the July 11th meeting. I hope my comments here will be taken into consideration.

The proposed 6' tall monument sign on Hecla way is completely out of character for this location. A sign of this size and this much color right next to a neighborhood disrupts the transition from commercial/retail on Plaza Drive. The previously approved sign that is smaller and constructed out of metal is a nice balance between the big Napa and King Soopers gas signs adjacent to Plaza.

I urge the planning commission to reject this plan and ask the developer to use the previously approved plans.

Many thanks,

Tim Merkel
Partner, Big Compass

BIG COMPASS
destination solution

tim@bigcompass.com | bigcompass.com
M:303-591-4371 O:720 -328-1669

Lisa Ritchie

From: Tzvetanka Gintchin <tagintchin@yahoo.com>
Sent: Thursday, July 4, 2019 9:17 AM
To: Planning
Subject: Re: Speedy Sparkle PUD Amendment

To Who It May Concern:

I am one of the residents of the 6 town homes across from Speedy Sparkle ad I am writing in opposition of the proposed new signage.

I ask that City of Louisville does not approve the Speedy Sparkle Signage application for the following reasons:

- It is a visual nuisance directly in the line of sight of our property and the additional homes that will be built. Such a sign will definitely decrease the aesthetic appeal of the area and negatively affect the property values of adjacent properties.
- This is an already a mixed commercial/residential space, which actually attracted me to the area, but this goes too far by placing it where proposed. An illuminated sign, especially will add unnecessary light pollution, considering the fact that we already have to deal with their current lit menu signs, overhead lights and noise.
- It is out of character and proportion for the location, given the proximity to the current and proposed residential properties.
- This may discourage future residential prospects. The new development, when it happens, will be good for everyone as it will increase property values and drive new traffic to the businesses, while a conspicuous and intrusive commercial sign will negatively affect the overall feel and look of the neighborhood and drive away potential future residents while triggering discontent in current residents.
-Finally, it will not be very effective because when the field is developed, the new buildings will block the sign. It will be much more effective if placed closer to S Boulder Road.

Thank you very much for your time and consideration.

Sincerely,

Tzvetanka Gintchin
1491 Hecla Way

Lisa Ritchie

From: Lazar Gintchin <lazar.gintchin@gmail.com>
Sent: Thursday, July 4, 2019 10:01 PM
To: Planning
Subject: Fw: Speedy Sparkle PUD Amendment

To Whom It May Concern:

I live on 1491 Hecla Way, Louisville CO and the purpose of this letter is to express my disagreement with the proposed new signage by Speedy Sparkle Car Wash.

My request is that City of Louisville declines the application made by Speedy Sparkle based on the following:

- Those of us who invested in a home in this neighborhood were attracted by the modern, high-class appearance which the home builder has created. Having a 12 foot tall sign would definitely change the look and feel, especially for those of us, who live directly across the street.
- I am not sure what value a sign adds, when placed in the middle between our street and S. Boulder Rd. Would it not attract more customers if placed on S. Boulder Rd?
- A brightly lit sign of this size will be very noticeable and unpleasant to look at, given that our homes, porches, and half of the balconies are facing in that direction. The carwash is noisy when operating, and it feels like too much to add a big visual on top of it.
- More residential buildings are still planned to be built, right on the East side of the carwash. I am concerned that potential buyers may be detracted from buying, resulting lowering of the property values in our neighborhood.

Thank you in advance for your consideration.

Sincerely,

Lazar Gintchin

--
Lazar Gintchin
lazar.gintchin@gmail.com

ITEM:	Case #PUD-0204-2019 and SRU-0205-2019
PLANNER:	Robert Zuccaro, AICP, Planning and Building Safety Director Lisa Ritchie, AICP, Senior Planner
APPLICANT:	Erik Hartronft Hartronft Associates, p.c.
OWNERS:	824 South St, Inc. Barbara Iglesias
EXISTING ZONING:	Commercial Community (CC)
LOCATION:	Lot 1, Block 5, Town of Louisville; 824 South Street
TOTAL SITE AREA:	7,481 square feet
REQUEST:	Approval of Resolution No. 15, Series 2019, a resolution recommending approval of a request for a one-year extension to the 824 South St/957 Main St PUD and a request for an amendment to the SRU for outdoor sales of retail goods and eating and drinking establishments

VICINITY MAP:

SUMMARY:
The applicant requests approval of a one-year extension to the Planned Unit Development, and an amendment to the SRU to allow additional area for outdoor sales of retail goods and eating and drinking establishments The City approved the original PUD and an SRU on August 16, 2016. In addition to these requests, the applicant is also requesting approval of a PUD Amendment to make minor changes to architecture and the site configuration. This PUD Amendment is under administrative review and is not part of the application before the Planning Commission.

BACKGROUND:
The subject property is located on the southwest corner of Main Street and South Street. There is an existing residential structure at the rear of the property, close to the alley. The remainder of the lot is substantially undeveloped and functions as the yard to the existing residence. The original PUD and SRU approved in 2016 allowed construction of a new two-story commercial structure in the front portion of the lot and kept the original residential structure. The SRU included exterior areas for outdoor sales and dining along both the Main Street and South Street frontages.

To date, no construction has occurred under the existing approvals. The previous owners of the property sold the property in 2018 to the current owner, who desires to make minor modifications to the site plan and architecture prior to construction. The previous owners intended to keep the existing home for use as a residence, while the current owner intends for the structure to be used for commercial purposes. Single-family homes are not permitted in the CC zone district, and the current home is considered legally nonconforming up until it is converted to a commercial use. The original PUD, SRU and City Council staff report are included as attachments.

PROPOSAL:
<u>PUD Extension</u>
The applicants request approval of a one-year extension to the 824 South St PUD. Louisville Municipal Code (LMC) Section 17.28.200 states that no building permits for work covered by a PUD may be issued more than 36 months following City Council approval unless an extension of time is granted. The applicants are requesting a one-year extension to August 20, 2020 to allow the new property owner additional time to prepare for construction.

<u>SRU Amendment</u>
In addition to the PUD extension, the application includes a request to amend the SRU to allow for additional area for outdoor sales of retail goods and eating and drinking establishments. The PUD Amendment under administrative review requests minor changes to the area connecting the existing residential structure and the new building. Additionally, because the applicant proposes commercial use of the property in entirety, the SRU area now includes the area in front of the existing residential structure. The approval of this SRU is contingent upon the approval of the PUD Amendment, and a condition noting such is included on the Resolution.

Figure 1: Existing SRU site plan, areas in red allow outdoor sales and dining

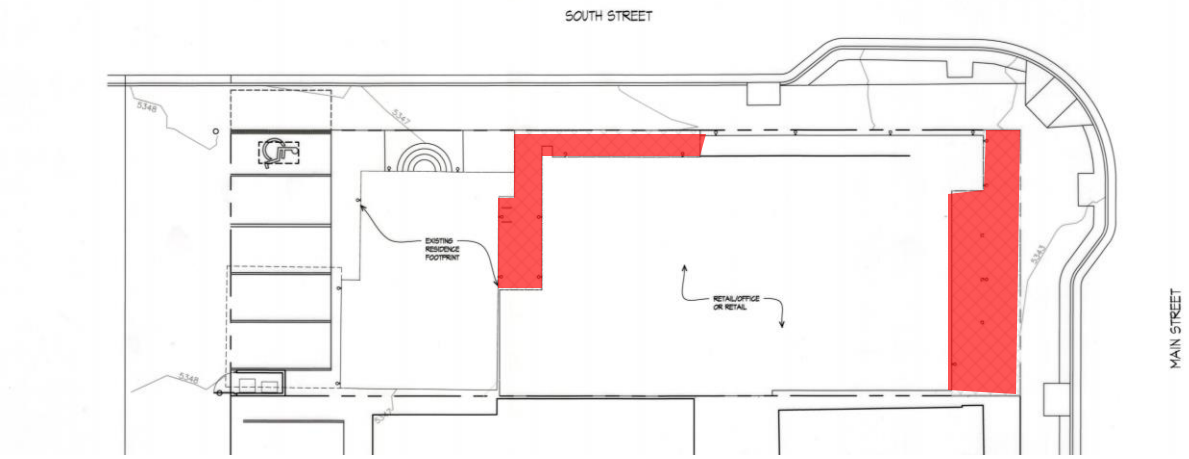
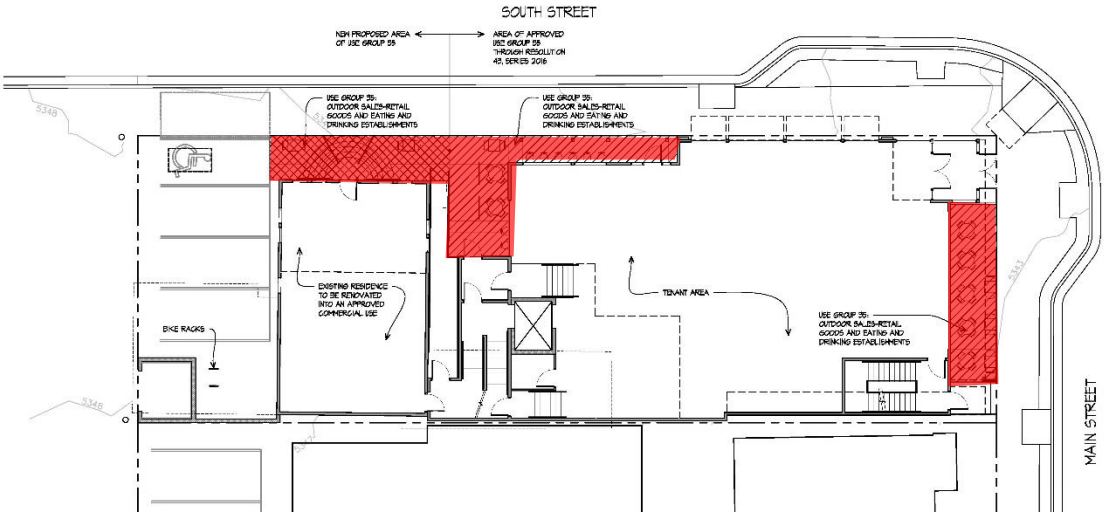


Figure 2: Proposed SRU site plan, areas in red allow outdoor sales and dining



The currently approved SRU does not include notes regulating outdoor music or hours of operation for the outdoor spaces. The SRU Amendment includes the following new notes regarding the operation of the outdoor uses of the property:

- Outdoor amplified music shall be prohibited
- Nightime hours of operation for the outdoor dining areas shall not extend past 12 AM

ANALYSIS:

<u>PUD Extension</u>

LMC Sec. 17.28.200 limits the timeframe for when a building permit may be issued following the approval of a PUD to 36 months. Extension requests must follow the same public hearing procedures for a PUD Amendment application, including a public hearing before the Planning Commission and review by the City Council. There are no specific criteria outlined in the LMC for an extension request, other than the criteria and policies under which the original PUD was approved.

The development was reviewed against current City policy and regulations to understand if conditions have changed since the original approval three years ago. In this case, all relevant municipal codes, comprehensive planning documents and the Design Handbook for Downtown Louisville have not changed since the original approval of the PUD and SRU and staff finds the proposal meets the policies and regulations set forth in these documents.

The original approval of the PUD and SRU through Resolution 43, Series 2016 included the following condition:

1. *The access area for the handicap parking space shall be moved on to the property if the City, at its sole discretion, determines in the future that the access area unduly restricts the public sidewalk after the project is completed and in use or determines an alternative use of the right of way is desired. The property owner shall be responsible for all costs associated with relocation of the parking space, including restoration of the public right-of-way and payment of the parking fee -in -lieu that is in place at the time the determination to relocate the parking space is made.*

This condition is still recommended by staff and is included on the Resolution.

<u>SRU Amendment</u>
The same process and criteria apply to an Amendment to an SRU as the original approval. Section 17.40.100 (A) of the LMC lists the five criteria to be considered:

1. *That the proposed use/development is consistent in all respects with the spirit and intent of the comprehensive plan and of this chapter, and that it would not be contrary to the general welfare and economic prosperity of the city or the immediate neighborhood;*

The proposal to allow outdoor sales of retail goods and eating and drinking establishments helps any future restaurant or other commercial uses be more successful, contributing to the economic prosperity of Downtown. The Comprehensive Plan calls for pedestrian friendly uses in Downtown. Outdoor activity is consistent with a pedestrian friendly environment. **Staff finds the proposal meets this criterion.**

2. *That such use/development will lend economic stability, compatible with the character of any surrounding established areas;*

Outdoor dining areas can contribute to the success of the business, lending economic stability to the area. Outdoor uses are compatible in Downtown, and contribute to the character of the surrounding area. **Staff finds the proposal meets this criterion.**

3. *That the use/development is adequate for the internal efficiency of the proposal, considering the functions of residents, recreation, public access, safety and such factors including storm drainage facilities, sewage and water facilities, grades,*

dust control and such other factors directly related to public health and convenience;

Staff finds that the use is adequate for the efficiency of the proposal. Staff reviewed the amendment for additional impacts to utilities and access and finds that proposal does not negatively impact surrounding facilities. **Staff finds the proposal meets this criterion.**

4. *That external effects of the proposal are controlled, considering compatibility of land use; movement or congestion of traffic; services, including arrangement of signs and lighting devices as to prevent the occurrence of nuisances; landscaping and other similar features to prevent the littering or accumulation of trash, together with other factors deemed to affect public health, welfare, safety and convenience;*

The development plans provide adequate controls on the external effects through site layout, appropriately designed lighting and limitations on hours of operation and amplified music. The site plan provides appropriate vehicular / pedestrian circulation. **Staff finds the proposal meets this criterion.**

5. *That an adequate amount and proper location of pedestrian walks, malls and landscaped spaces to prevent pedestrian use of vehicular ways and parking spaces and to separate pedestrian walks, malls and public transportation loading places from general vehicular circulation facilities.*

This development provides adequate and proper location of walks and landscaped spaces to provide for safe circulation. As noted above, a condition of approval is included related to the use of the adjacent sidewalk and any negative impacts. **Staff finds the proposal meets this criterion.**

STAFF RECOMMENDATION:
Staff finds that the proposal complies with the SRU criteria and the considerations for approving an extension for the PUD, with the following conditions:

1. The access area for the handicap parking space shall be moved on to the property if the City, at its sole discretion, determines in the future that the access area unduly restricts the public sidewalk after the project is completed and in use or determines an alternative use of the right of way is desired. The property owner shall be responsible for all costs associated with relocation of the parking space, including restoration of the public right-of-way and payment of the parking fee -in -lieu that is in place at the time the determination to relocate the parking space is made.

2. The SRU amendment shall not be effective nor recorded with the Boulder County Clerk and Recorder prior to approval of the PUD Amendment authorizing changes to the site plan.

The Planning Commission may recommend approval (with or without conditions) or denial of the request or move for a continuance if the Commission needs additional information related to the proposal.

ATTACHMENTS:

1. Resolution 15, Series 2019
2. Application Materials
3. SRU Amendment
4. PUD Amendment
5. Resolution 43, Series 2016
6. Original PUD, 2016
7. Original SRU, 2016
8. City Council staff report, August 16, 2016

RESOLUTION NO. 15
SERIES 2019

A RESOLUTION RECOMMENDING APPROVAL OF A REQUEST FOR A ONE-YEAR EXTENSION TO THE 824 SOUTH STREET PLANNED UNIT DEVELOPMENT AND AN AMENDMENT TO THE SPECIAL REVIEW USE FOR OUTDOOR SALES FOR RETAIL GOODS AND EATING AND DRINKING ESTABLISHMENTS

WHEREAS, there has been submitted to the Louisville Planning Commission a request for approval of a one-year extension to the 824 South Street PUD and an amendment to the SRU for outdoor sales for retail goods and eating and drinking establishments at 824 South Street/957 Main Street, and,

WHEREAS, the City Staff has reviewed the information submitted and found that the application complies with the Louisville zoning and subdivision regulations and other applicable sections of the Louisville Municipal Code; and,

WHEREAS, the Planning Commission has considered the application at a duly noticed public hearing on July 11, 2019, where evidence and testimony were entered into the record, including the findings in the Louisville Planning Commission Staff Report dated July 11, 2019.

NOW THEREFORE, BE IT RESOLVED that the Planning Commission of the City of Louisville, Colorado does hereby recommend approval of a request for approval of a one-year extension to the 824 South Street PUD and an amendment to the SRU for outdoor sales for retail goods and eating and drinking establishments at 824 South Street/957 Main Street, with the following conditions:

1. The access area for the handicap parking space shall be moved on to the property if the City, at its sole discretion, determines in the future that the access area unduly restricts the public sidewalk after the project is completed and in use or determines an alternative use of the right of way is desired. The property owner shall be responsible for all costs associated with relocation of the parking space, including restoration of the public right-of-way and payment of the parking fee-in-lieu that is in place at the time the determination to relocate the parking space is made.

2. The SRU amendment shall not be effective nor recorded with the Boulder County Clerk and Recorder prior to approval of the PUD Amendment authorizing changes to the site plan.

PASSED AND ADOPTED this 11th day of July 11, 2019.

By: _____
Steve Brauneis, Chairperson
Planning Commission

Attest: _____
Debra Williams, Secretary
Planning Commission

City of Louisville
COLORADO · SINCE 1878

Department of Planning and Building Safety

749 Main Street • Louisville CO 80027 • 303.335.4592 • www.louisvilleco.gov

LAND USE APPLICATION

PUD Exten: PUD-000204-2019
SRU: CASE NO. SRU-000205-2019
Admin Amend: PUD-000203-2019

APPLICANT INFORMATION

Firm: Hartronft Associates p.c.
Contact: J. Erik Hartronft
Address: 950 Spruce St. Suite 2A
Louisville, CO 80027
Mailing Address:
Telephone: 303-673-9304
Fax:
Email: erik@hapcdesign.com

OWNER INFORMATION

Firm: 824 South St Inc.
Contact: Barbara Iglasias
Address: 5718 Westheimer Suite 1806
Houston, TX 77057
Mailing Address: 5718 Westheimer Suite 1806
Houston, TX 77057
Telephone: 720-891-1580
Fax:
Email: bli.824southstreet@gmail.com

REPRESENTATIVE INFORMATION

Firm: Hartronft Associates p.c.
Contact: Erik Hartronft
Address: 950 Spruce St, Suite 2A
Louisville, CO 80027
Mailing Address:
Telephone: 303-673-9304
Fax:
Email: erik@hapcdesign.com

PROPERTY INFORMATION

Common Address: 824 South St
Legal Description: Lot 1 Blk 5
Subdivision Louisville
Area: 7,481 Sq. Ft.

TYPE (S) OF APPLICATION

- ☐ Annexation
- ☐ Zoning
- ☐ Preliminary Subdivision Plat
- ☐ Final Subdivision Plat
- ☐ Minor Subdivision Plat
- ☐ Preliminary Planned Unit Development (PUD)
- ☐ Final PUD
- ☐ Amended PUD
- ☒ Administrative PUD Amendment
- ☐ Special Review Use (SRU)
- ☒ SRU Amendment
- ☐ SRU Administrative Review
- ☐ Temporary Use Permit:
- ☐ CMRS Facility:
- ☒ Other: (easement / right-of-way; floodplain; variance; vested right; 1041 permit; oil / gas production permit) PUD Extension

PROJECT INFORMATION

Summary:
THE PROJECT SCOPE IS TO REDEVELOP THE EXISTING RESIDENCE AT 824 SOUTH STREET INTO A NEW COMMERCIAL SPACE AND DEVELOP A NEW 2-STORY COMMERCIAL BUILDING WITH A FULL BASEMENT AT THE ADJACENT LOT AT 957 MAIN STREET WHICH WILL BE CONNECTED TO THE EXISTING STRUCTURE.

Current zoning: CC Proposed zoning: CC

SIGNATURES & DATE

Applicant:
Print: 824 South St. Inc.
Owner:
Print: Barbara Iglesias, 824 South St. Inc.
Representative:
Print: J. Erik Hartronft

CITY STAFF USE ONLY

- ☐ Fee paid:
- ☐ Check number:
- ☐ Date Received:

HARTRONFT
ASSOCIATES
A Professional Corporation

Planning
Architecture
Interior Design

950 Spruce Street, #2A
Louisville, CO 80027
TEL: 303.673.9304
FAX: 303.673.9319

Mr. Rob Zuccaro, Planning Director
City of Louisville, Colorado
749 Main Street
Louisville, CO 80027

1 April, 2019

Re: 824 South Street
PUD Amendment Extension

Rob,

Due to the anticipated construction schedule, we would like to request a one year extension of the PUD at 824 South Street.

Sincerely,

J. Erik Hartronft, AIA, President
Hartronft Associates, pc.

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Louisville, CO 80027
TEL: 303.673.9304
FAX: 303.673.9319

Mr. Rob Zuccaro, Planning Director
City of Louisville, Colorado
749 Main Street
Louisville, CO 80027

1 April, 2019

Re: 824 South Street
Special Review Use Amendment

Rob,

Attached please find the SRU Plan indicating the proposed amendment to the approved Special Review Use for 824 South St. This SRU Amendment (subject to other applicable regulations) is intended to provide a small additional outdoor sales area to the former residence which will now be used for commercial use.

1) The proposed uses / development is consistent in all respects with the spirit and intent of the comprehensive plan, downtown framework plan, and of chapter 17, and it is not contrary to the general welfare and economic prosperity of the city or the immediate neighborhood;
2) The proposed uses / development will lend economic stability, compatible with the character of any surrounding established areas;
3) The proposed uses / development are adequate for internal efficiency of the proposal, considering the functions of residents, recreation, public access, safety and such factors including storm drainage facilities, sewage and water facilities, grades, dust control and such other factors directly related to public health and convenience;
4) The external effects of the proposal are controlled, considering compatibility of land use; movement or congestion of traffic; services, including arrangement of signs and lighting devices as to prevent the occurrence of nuisances; landscaping and other similar features to prevent the littering or accumulation of trash, together with other factors deemed to effect public health, welfare, safety and convenience;
5) An adequate amount and proper location of pedestrian walks, malls and landscaped spaces are provided to prevent pedestrian use of vehicular ways and parking spaces and to separate pedestrian walks, malls and public transportation loading places from general vehicular circulation facilities.

Please consider this request for approval of the Special Review Use attached herein. Let us know if you have any questions regarding this proposal.

Sincerely,

J. Erik Hartronft, AIA, President
Hartronft Associates, pc.

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HARTRONFT
ASSOCIATES
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Planning
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Interior Design

950 Spruce Street, #2A
Louisville, CO 80027
TEL: 303.673.9304
FAX: 303.673.9319

Mr. Rob Zuccaro, Planning Director
City of Louisville, Colorado
749 Main Street
Louisville, CO 80027

1 April, 2019

Re: 824 South Street
PUD Amendment

Rob,

We are pleased to be submitting this amendment to the approved Planned Unit Development Plan for the 824 South Street development. There are only a few revisions from the currently approved Planned Unit Development. First, the existing residence is to be renovated into an approved commercial use. Second, the new two story structure has been moved to the east by approximately 6 feet and the deck facing Main Street has been reduced in width. This adjustment allows for additional area between the new structure and the existing residence for new a new accessible entrance into both the existing and new structure. Also, the new structure will have a full basement instead of a partial basement.

Finally, we are proposing a very limited number of revisions to the buildings elevations. The southeast building entry has been adjusted to better accommodate the exit stairs. Although there are no significant changes to the building massing or height, adjustments have been made to some materials and building color throughout. The new pitched roof elements have changed material from asphalt to standing seam metal roofing. The parking along the alley has also been moved to the east to allow for a more adequate vehicle back up area. We believe these revisions to the existing PUD are minimal and are items that can be approved through an Administrative PUD Amendment.

We are excited by the potential for the redevelopment of this property and its positive affect on Downtown Louisville. Please consider this request for approval of the Planned Unit Development Plan Amendment attached. We look forward to your comments as we move forward with this important in-fill development project.

Sincerely,

J. Erik Hartronft, AIA, President
Hartronft Associates, pc.

M:_MAIN_065_Proj\1857-957 Main-824 South\Proj Admin\City Submittals\PUD&SRU\PUD Amendment\PUD Amendment\MEMO-PUD-824 S-040119.doc

SHERWIN-WILLIAMS.

Homeowners Color Historic

Historic Paint Colors

Evoke nostalgia with a simple accent wall in one of Sherwin-William's historic paint colors. Sometimes the best way to set the latest trends is to reach back into the past.

Explore all Paint Colors +

FIND A COLOR

Search by Color Name or Number

VICINITY MAP

SIGNATURES

Ownership Signature Block

By signing this PUD, the owner acknowledges and accepts all the requirements and intent set forth in this PUD. Witness my/our hand(s) seal(s) this ___ day of _____, 20___.

_____
Owner Name and Signature

_____
Owner Name and Signature

_____ (Notary Seal)
Notary Name (print)

_____
Notary Signature

My Commission Expires _____

Planning Commission Certificate

Approved this ___ day of _____, 20___ by the Planning Commission of the City of Louisville, Colorado.
Resolution No. _____, Series _____

Clerk and Recorder Certificate (County of Boulder, State of Colorado)

I hereby certify that this instrument was filed in my office at _____ o'clock, ____ M., this _____ day of _____, 20___, and is recorded in Plat File _____, Fee _____ paid. _____ Film No. _____ Reception.

_____
Clerk & Recorder

_____
Deputy

City Council Certificate

Approved this ___ day of _____, 20___ by the City Council of the City of Louisville, Colorado.
Resolution No. _____, Series _____

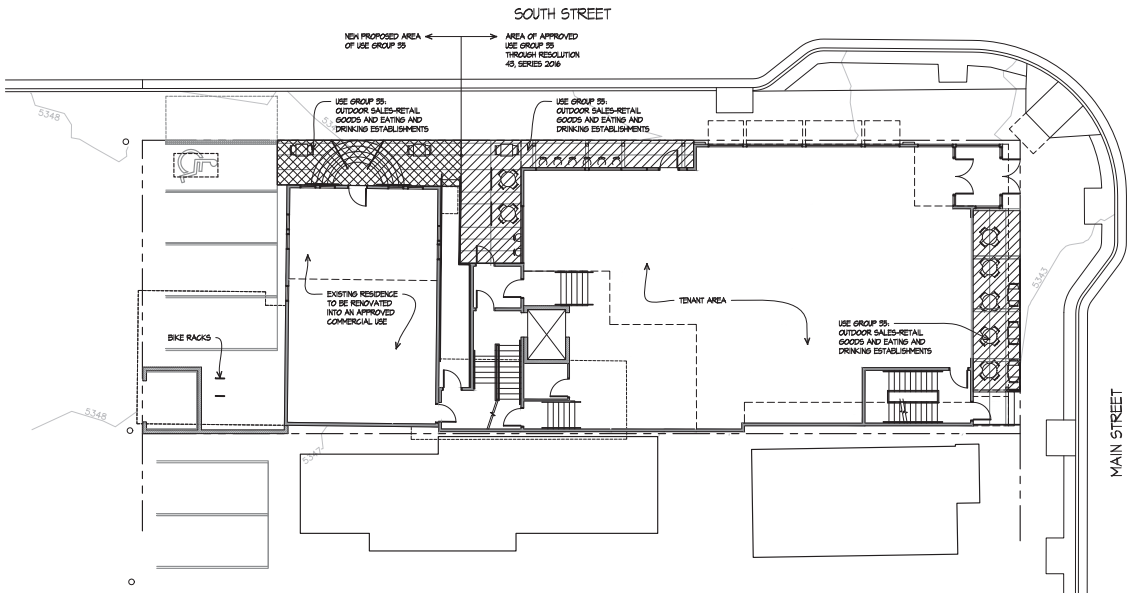
_____ (City Seal)

_____
Mayor Signature

_____
City Clerk Signature

SPECIAL REVIEW USE
824 SOUTH STREET / 957 MAIN STREET
COMMERCIAL DEVELOPMENT

LOCATED IN THE SOUTHEAST QUARTER OF SECTION 8 TOWNSHIP 1 SOUTH, RANGE 69 WEST OF THE THE 6TH P.M., CITY OF LOUISVILLE, COUNTY OF BOULDER, STATE OF COLORADO



824 SOUTH STREET/957 MAIN ST – SPECIAL REVIEW USE

NOTES:

1– EXISTING ZONING CC ALLOWS OUTDOOR SALES AND EATING AND DRINKING ESTABLISHMENTS USES WHEN AUTHORIZED THROUGH A SPECIAL REVIEW USE.

2– OUTDOOR ACTIVITY USES SHALL INCLUDE: OUTDOOR SALES AND EATING AND DRINKING ESTABLISHMENTS.

3– OUTDOOR AMPLIFIED MUSIC SHALL BE PROHIBITED.

4– NIGHTTIME HOURS OF OPERATION FOR THE OUTDOOR DINING AREAS SHALL NOT EXTEND PAST 12AM.

5–THE EXISTING DWELLING UNIT WILL BE RENOVATED INTO NEW COMMERCIAL SPACE.

A1 / 1 SPECIAL REVIEW USE PLAN
1" = 10'-0"

HARTRONFT ASSOCIATES
A Professional Corporation
Planning
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Interior Design
950 Spruce Street, #2A
Louisville, CO 80027
TEL: 303.673.9304
FAX: 303.673.9319

824 SOUTH ST / 957 MAIN ST
824 South St/ 957 Main St, Louisville CO 80027
Louisville, Block 5, Lot 1

PUD AMENDMENT

PROJECT # 1857
DATE 08/06/2015
DRAWN BY: HAPC
CHECKED BY: JEH
REVISIONS:
FINAL PC 10/18/15
FINAL PC 04/05/16
CC 05/16/16
SRU AMENDMENT 06/21/19

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SPECIAL REVIEW USE PLAN

Sheet 1 of Sheets

P.U.D. AMENDMENT
824 SOUTH STREET / 957 MAIN STREET

LOCATED IN THE SOUTHEAST QUARTER OF SECTION 8 TOWNSHIP 1 SOUTH, RANGE 69 WEST OF THE THE 6TH P.M., CITY OF LOUISVILLE, COUNTY OF BOULDER, STATE OF COLORADO

STREET VIEW FROM THE NORTHEAST

STREET VIEW FROM THE NORTH

PROJECT DIRECTORY

OWNER
824 South St Inc.
5718 Westheimer Suite 1806
Houston, TX 77057
Contact: Barbara Iglesias
email: bil.824southstreet@gmail.com
phone: 720-891-1580

ARCHITECT/PLANNER
Hartronft Associates, p.c.
950 Spruce Street, Suite 2A
Louisville, Colorado 80027
Contact: Erik Hartronft, AIA
email: erik@hapcdesign.com
phone: 303-673-9304

CIVIL ENGINEER
Scott, Cox & Assoc., Inc.
1530 55th Street
Boulder, Colorado 80303
Contact: Don Ash
email: ash@scottcox.com
phone: 303-444-3051

VACINITY MAP

SIGNATURES

OWNERSHIP SIGNATURE BLOCK
By signing this PUD, the owner acknowledges and accepts all the requirements and intent set forth in this PUD. Witness my/our hand(s) seal(s) this ___ day of _____, 20___.

_____
Owner Name and Signature

_____
Owner Name and Signature

Notary Name (print) _____ (Notary Seal)

Notary Signature

My Commission Expires _____

PLANNING COMMISSION CERTIFICATE
Approved this ___ day of _____, 20___ by the Planning Commission of the City of Louisville, Colorado.
Resolution No. _____, Series _____

CLERK AND RECORDER CERTIFICATE (COUNTY OF BOULDER, STATE OF COLORADO)
I hereby certify that this instrument was filed in my office at _____ o'clock, ____ M., this _____ day of _____, 20___ and is recorded in Plat File _____, Fee _____ paid. _____ Film No. _____ Reception.

_____
Clerk & Recorder

_____
Deputy

CITY COUNCIL CERTIFICATE
Approved this ___ day of _____, 20___ by the City Council of the City of Louisville, Colorado.
Resolution No. _____, Series _____

(City Seal)

_____
Mayor Signature

_____
City Clerk Signature

SHEET INDEX

SHEET	DESCRIPTION
ARCHITECTURAL	
A1	Cover Sheet, Project Data & Renderings
A2	Site, Landscape & Parking Plan/Floor Plans
A3	Building Elevations
A4	Site Photometric
SURVEY	
Improvement Survey Plat	
CIVIL	
C1.01	Utility Plan
EX-1	ROW Encroachments Exhibit

PROJECT DATA

PROJECT LOCATION:	824 SOUTH ST. / 957 MAIN ST. LOUISVILLE, COLORADO
LOT AREA:	7,481 SF
ZONING:	CC - COMMERCIAL COMMUNITY
OVERLAYS:	DOWNTOWN CORE AREA; CENTRAL BUSINESS DISTRICT; TRANSITIONAL AREA
APPLICABLE STANDARDS:	LOUISVILLE MUNICIPAL CODE DESIGN HANDBOOK FOR DOWNTOWN LOUISVILLE DOWNTOWN LOUISVILLE FRAMEWORK PLAN DOWNTOWN LOUISVILLE SIGN MANUAL
PROPOSED USES:	ANY APPROVED USES INCLUDING RETAIL, RESTAURANT, AND PROFESSIONAL OFFICES
LEGAL DESCRIPTION:	LOT 1 OF BLOCK 5 TOWN OF LOUISVILLE, COUNTY OF BOULDER, STATE OF COLORADO
PROJECT DESCRIPTION:	THE PROJECT SCOPE IS TO REDEVELOP THE EXISTING RESIDENCE AT 824 SOUTH STREET INTO A NEW COMMERCIAL SPACE AND DEVELOP A NEW 13,123sf 2-STORY COMMERCIAL BUILDING WITH A FULL BASEMENT AT THE ADJACENT LOT AT 957 MAIN STREET WHICH WILL BE CONNECTED TO THE EXISTING STRUCTURE.

YARD & BULK REQUIREMENTS

	Required	Provided
Maximum Lot Coverage	N/A [1]	N/A
Minimum Front Yard	0 [1]	0
Minimum Side Yard	0 [1]	0
Minimum Rear Yard	20'	24'
Maximum Building Height	35' [2]	35'

FOOTNOTES PER LMC 17.12.040
1. These requirements for the C-C district shall not be applicable in the Central Business District
2. In the Commercial Core Transitional Area of Downtown, maximum building height for principal uses shall be 35' or as applicable in the Design Handbook for Downtown Louisville

FLOOR AREAS

BASEMENT	
Food Prep	697 SF
Storage Area	3,180 SF
Common Area	976 SF
Total Basement Floor Area	*4,853 SF*
MAIN LEVEL	
Tenant Areas	3,034 SF
Food Prep	618 SF
Common Area	1,188 SF
Total Main Level Floor Area	*4,840 SF*
SECOND LEVEL	
Tenant Areas	2,434 SF
Common Area	1,083 SF
Total Second Level Floor Area	*3,517 SF*
Total Food Prep Areas:	1,315 SF
Total Tenant Areas:	5,468 SF
Total Storage Areas:	3,180 SF
Total Common Areas:	3,247 SF
BUILDING FLOOR AREA:	13,210 SF
TENANT FLOOR AREA (For Parking)	*5,468 SF*
STORAGE/KITCHEN AREA (Not incl. in parking calc.)	*4,495 SF*
ABOVE GRADE BUILDING FLOOR AREA (For FAR calc -Not including basement)	8,357 SF

REQUIREMENTS FOR DOWNTOWN CORE AREA

FAR	
Allowed: 2.0	
Actual: 1.12	
(Building Floor Area not including Basement divided by Lot Area)	
PARKING	
Required: 9	
Provided: 5	
Parking thru fee-in-lieu: 4	
(Based on Tenant Floor Area not including kitchen or storage)	
BIKE PARKING	
Required: 1	
Provided: 1	
(Bicycle parking is required at the rate of 1 bicycle parking space per every 10 required parking spaces)	

NOTE:
Additional secure bicycle parking is provided in the basement for tenants.

PARKING NOTES:
1. LMC 17.020.025 DESIGNATES PARKING STANDARDS FOR DOWNTOWN LOUISVILLE
   1.1. REQUIRED: AFTER FIRST 999SF, PARKING SHALL BE PROVIDED AT A RATE OF 1 SPACE PER 500SF
2. COMMON AREAS LISTED ON THE FLOOR AREA TABULATION CHART ARE THE AREAS EXCLUDED FROM REQUIRED PARKING CALCULATIONS UNDER LOUISVILLE MUNICIPAL CODE SECTION 17.20.025, WHICH ALLOWS EXCLUSION OF VENT SHAFTS, COURTS, UNINHABITABLE AREAS BELOW GROUND LEVEL OR IN ATTICS, OR AREAS WITHIN HALLWAYS, STAIRWAYS, ELEVATOR SHAFTS AND BATHROOMS." FURTHER, STORAGE & COMMON AREAS IN THE BASEMENT ARE INTENDED SOLELY FOR STORAGE, MECHANICAL EQUIPMENT, A FIRE ROOM & THE ELEVATOR SHAFT AND SHALL NOT COUNT TOWARDS REQUIRED PARKING. ANY MODIFICATIONS TO USE OF THE BASEMENT IS SUBJECT TO CITY REVIEW & APPROVAL AS AN AMENDMENT TO THE PLANNED UNIT DEVELOPMENT AND REEVALUATION OF REQUIRED PARKING UNDER SECTION 17.20.025 OF THE LMC - PARKING STANDARDS DESIGNATED FOR DOWNTOWN LOUISVILLE OR AS HEREINAFTER AMENDED.
3. THE CITY MAY VERIFY AND ADJUST THE TOTAL REQUIRED PARKING AT THE TIME OF BUILDING PERMIT FOR TENANT FINISH BASED ON THE REQUIREMENTS OF SECTION 17.20.025 OF THE LMC - PARKING STANDARDS DESIGNATED FOR DOWNTOWN LOUISVILLE OR AS HEREINAFTER AMENDED.

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FAX: 303.673.9319

824 SOUTH ST / 957 MAIN ST
824 South St/ 957 Main St, Louisville CO 80027
Louisville, Block 5, Lot 1

PUD AMENDMENT

PROJECT # 1857
DATE: 08/06/2015
DRAWN BY: HAPC
CHECKED BY: EH
REVISIONS:
FINAL PC 10/18/15
FINAL PC 04/05/16
CC 09/06/16
PUD AMENDMENT 04/01/19

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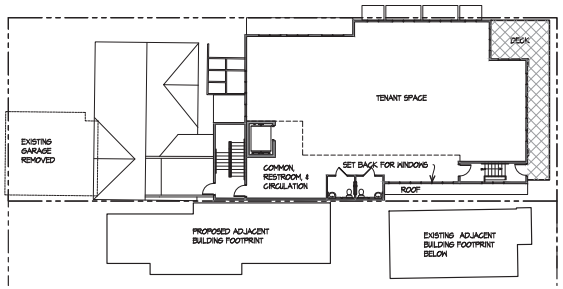
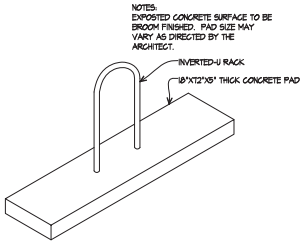
COVER SHEET
PROJECT DATA
RENDERINGS
SIGNATURES

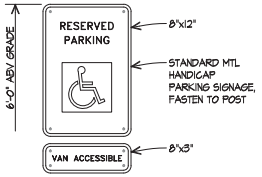
Sheet
A1
1 of 7 Sheets



D4 / A2 2ND FLOOR PLAN
1/16" = 1'-0"



D3 / A2 U-RACK DETAIL @ BIKE PK'G
1" = 20'-0"

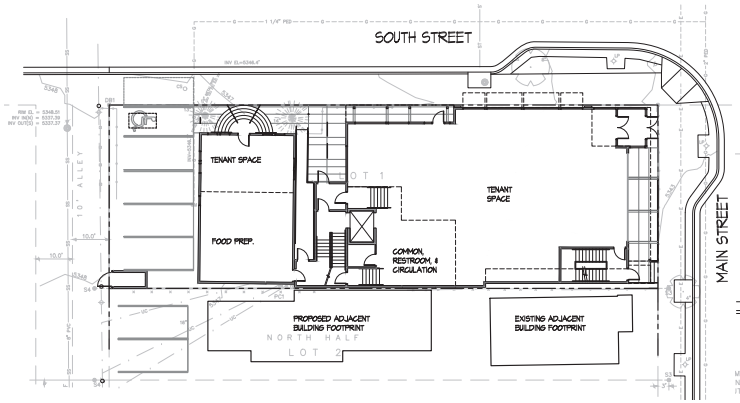


VERIFY SIGNAGE COMPLIES WITH REQUIREMENTS OF 2009 ANSI A117.1 SPECIFICATIONS

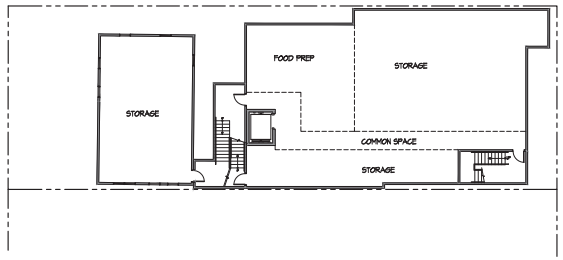
D2 / A2 H.C. PK'G SIGN DETAIL
1" = 10'-0"

LANDSCAPE LEGEND

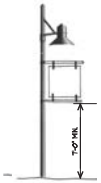
- Ornamental Grasses
- Potted Perennials
- Proposed Deciduous Tree Ornamental
- Existing Coniferous Tree over 12" Caliper
- Existing Deciduous Tree 8" Caliper
- Existing Deciduous Tree 4" Caliper



B4 / A2 1ST FLOOR PLAN
1/16" = 1'-0"

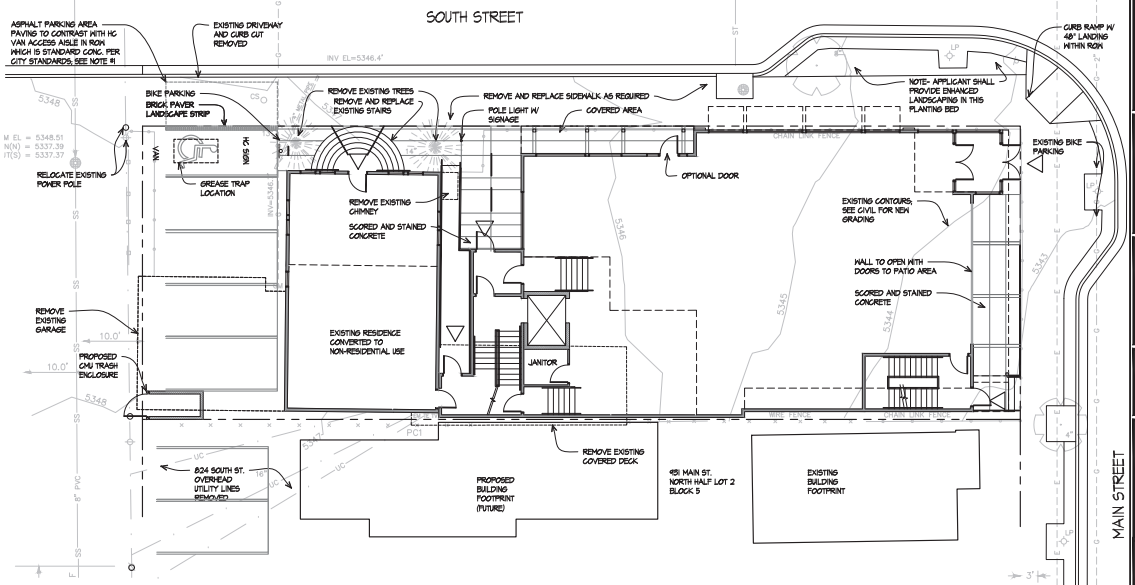


A4 / A2 BASEMENT FLOOR PLAN
1/16" = 1'-0"



C1 / A2 POLE LIGHT AND SIGNAGE
NTS

NOTE:
1. THE ACCESS AREA OF THE HANDICAP PARKING SPACE SHALL BE MOVED ON TO THE PROPERTY IF THE CITY, AT ITS SOLE DISCRETION, DETERMINES IN THE FUTURE THAT THE ACCESS AREA UNDULY RESTRICTS THE PUBLIC SIDEWALK. AFTER THE PROJECT IS COMPLETED AND IN USE OR DETERMINES AN ALTERNATIVE USE OF THE RIGHT OF WAY IS DESIRED. THE PROPERTY OWNER SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH RELOCATION OF THE PARKING SPACE, INCLUDING RESTORATION OF THE PUBLIC RIGHT-OF-WAY AND PAYMENT OF THE PARKING FEE-IN-LIEU THAT IS IN PLACE AT THE TIME THE DETERMINATION TO RELOCATE THE PARKING SPACE IS MADE.



A1 / A2 ARCHITECTURAL SITE PLAN, LANDSCAPE & PARKING PLAN
1" = 10'-0"

HARTRONFT ASSOCIATES
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FAX: 303.673.9319

824 SOUTH ST / 957 MAIN ST

824 South St/ 957 Main St, Louisville CO 80027
Louisville, Block 5, Lot 1

PUD AMENDMENT

PROJECT # 1857
DATE 08/06/2015
DRAWN BY: HAPC
CHECKED BY: JEH
REVISIONS:
FINAL PC 10/18/15
FINAL PC 04/05/16
CC 09/06/16
PUD AMENDMENT 04/01/19

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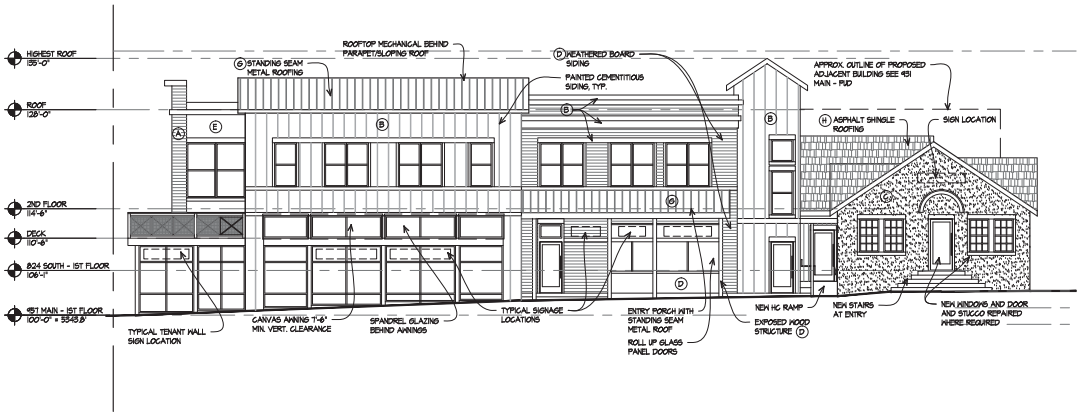
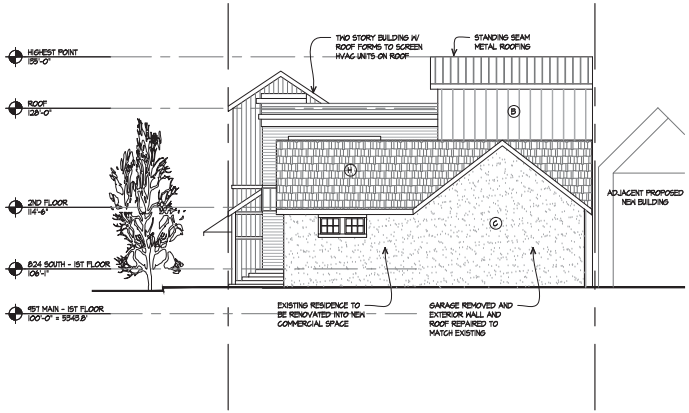
SITE, LANDSCAPE PLAN & PARKING PLAN
FLOOR PLANS
DETAILS

Sheet
A2
2 of 6 Sheets



B2 / A3.00 NORTH ELEVATION
SCALE: 1/8" = 1'-0"



A2 / A3.00 WEST ELEVATION
SCALE: 1/8" = 1'-0"

MATERIAL LEGEND

ALL NEW METAL WINDOW/DOOR FRAMES SHALL BE BLACK ANODIZED ALUMINUM

A- HORIZONTAL OR PANEL PAINTED SIDING
COLOR - SW 0051 -CLASSIC IVORY

B- VERTICAL BOARD/BATTEN SIDING AND TRIM
COLOR - SW 0050 - CLASSIC LIGHT BUFF

C- EXISTING STUCCO
COLOR - WHITE TO MATCH EXISTING

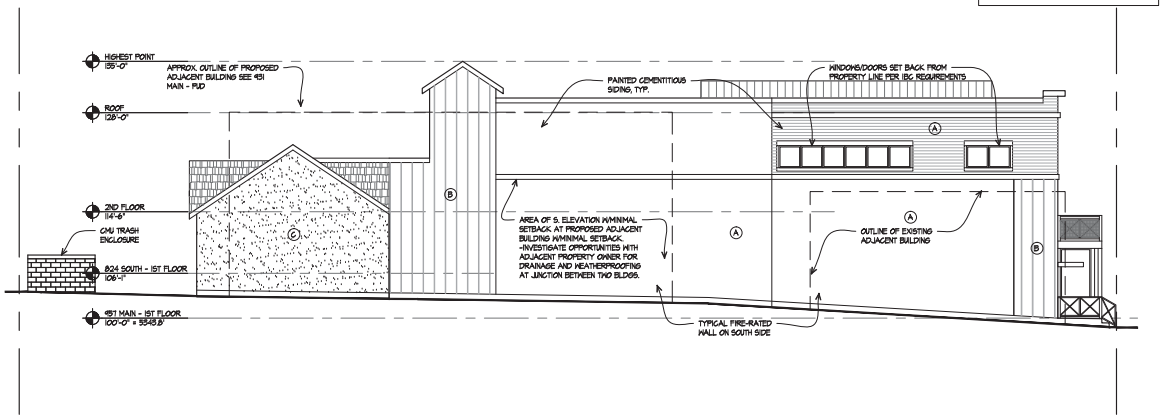
D- NATURAL STAIN WOOD SIDING

E- PAINTED SIDING - ACCENT
COLOR - SW 2848 ROYCROFT PEWTER

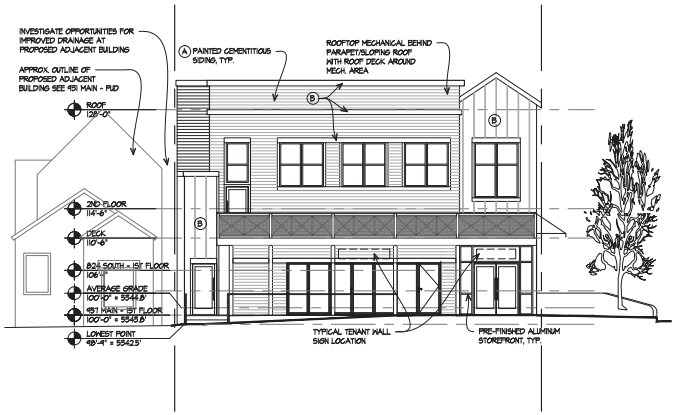
F- PAINTED TRIM
COLOR SW 6992 INKWELL

G- METAL ROOM
MATCH BERRIDGE "MATT BLACK"

H- ASPHALT SHINGLES
MATCH CERTAINTEED "MOIRE BLACK"



B1 / A3.00 SOUTH ELEVATION
SCALE: 1/8" = 1'-0"



A1 / A3.00 WEST ELEVATION
SCALE: 1/8" = 1'-0"

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BUILDING ELEVATIONS

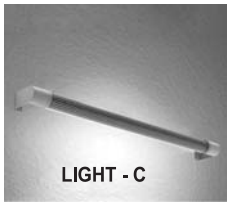
Sheet
A3
3 of 6 Sheets

Schedule

Symbol	Label	Quantity	Manufacturer	Catalog Number	Description	Lamp	Number Lamps	Filename	Lumens Per Lamp	Light Loss Factor	Wattage
	A	1	Lithonia Lighting	WST LED P2 30K VF MVOLT	WST LED, Performance package 2, 3000 K, visual comfort forward throw, MVOLT	LED	1	WST_LED_P2_30K_VF_MVOLT.ies	3236	0.92	25
	B	4	WAC Lighting	WS-W15710	LED Outdoor Light-201801		1	WS-W15710_20180530.ies	561	0.9	11.7672
	C	8	SPI Lighting Inc. Mequon, WI 53092	SPI Optical #6901	SPI Lighting - Linear suspended luminaire. Product ID: SPI Optical #6901 Operating at 120 VAC and 60 Hz.		168	4FT STYK FT MID.ies	13	0.85	29
	D	7	Focal Point LLC	FLC33D-SO-1100L-120-LD1-1-LC33-SO-1100L-35K-DNS-WFL-CD	Formed steel housing, black formed aluminum heatsink, semi -specular reflector, frosted plastic lens enclosure	One white LED	1	FLC33DSO110 0L35KDNSWF LCD_EX.ies	1118	0.85	15.15
	E	5	B-K Lighting Inc	BWM-LED-L11-SD15	Decorative white metal housing with baffles, reflector and diffuse lens.	White LED array	1	LED-L12-SD12-11609588.18.ies	504	0.77	9.88179
	F	1	Lumenpulse	ALG-120/277-SSL-L30-30K-CRI 80-S	Allegra		1	ALG-120_277-SSL-L30-30K-CRI 80-S.ies	2647	0.95	46
	G	3	Baselite Corp	W814/ 25W LED/ 3K	Black aluminum hood, white reflector, and frosted lens	One (1) white LED	1	11329494-1260984.ies	1820	0.85	22.2374

LIGHT - A

LIGHT - B



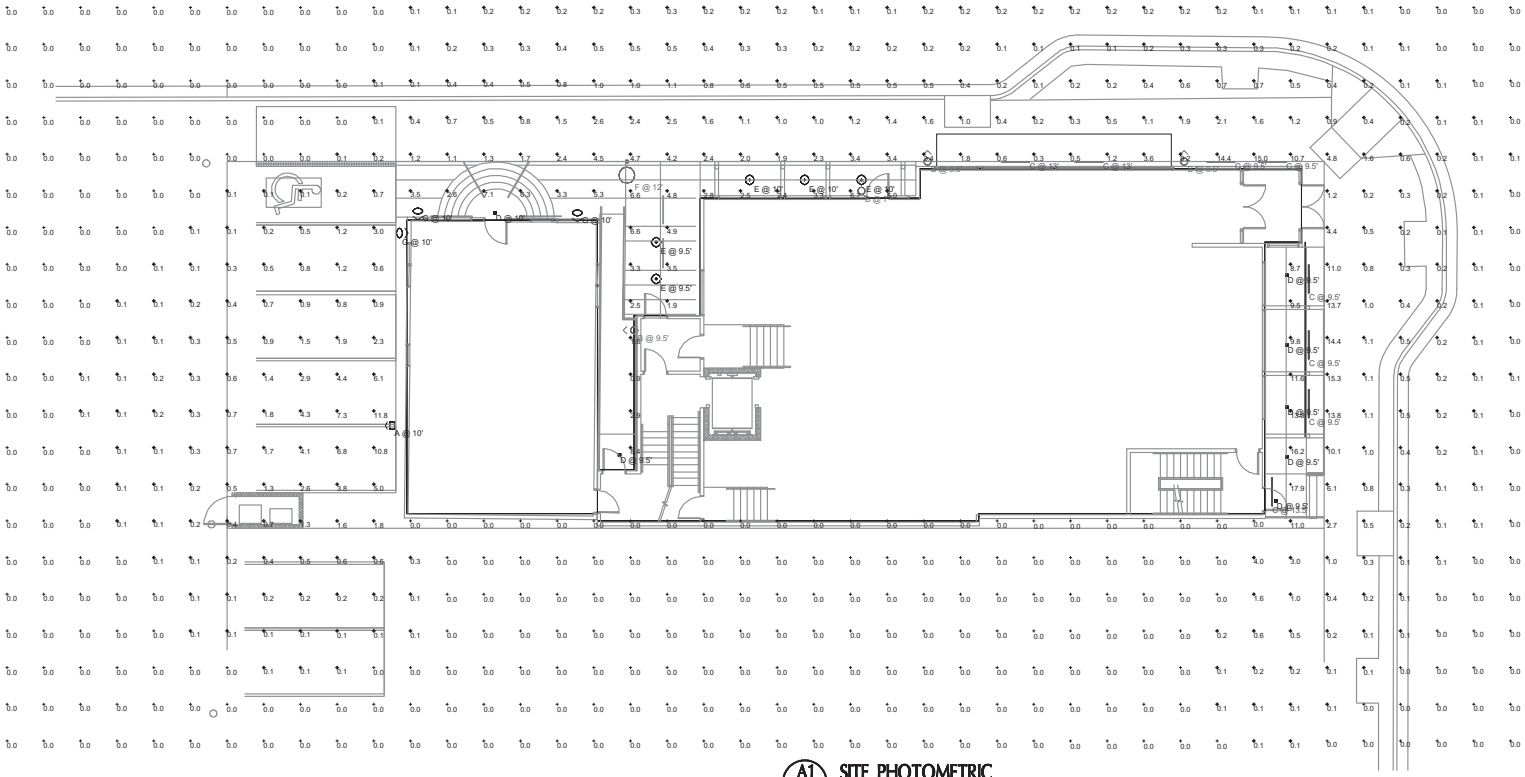
LIGHT - C

LIGHT - D

LIGHT - E

LIGHT - F

LIGHT - G



A1 A4 SITE PHOTOMETRIC
1/16" = 1'-0"

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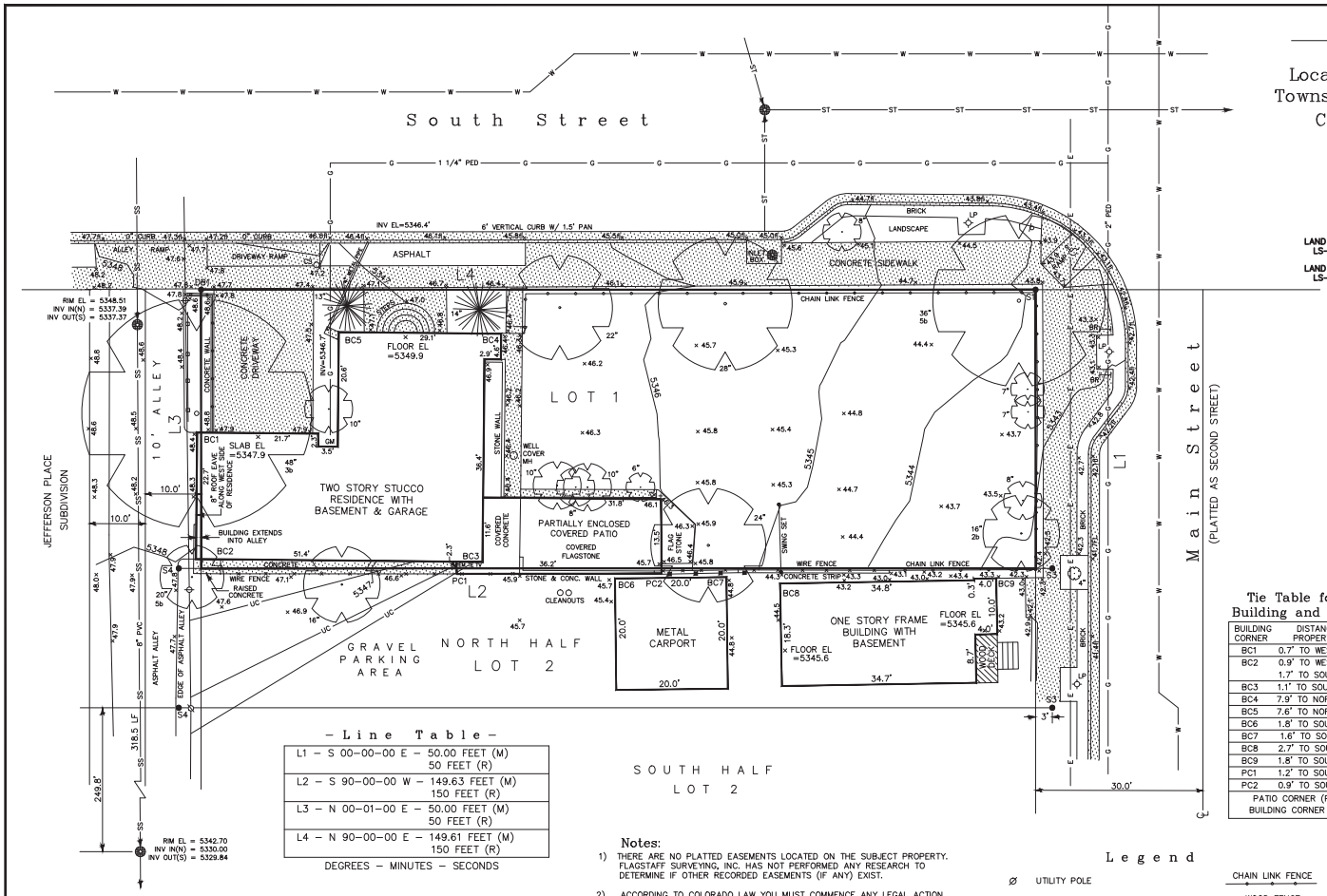
SITE PHOTOMETRICS

Sheet
A4
4 of 6 Sheets

Improvement Survey Plat

824 South Street, Louisville
Located in the Southeast Quarter of Section 8,
Township 1 South, Range 69 West of the 6th P.M.,
County of Boulder, State of Colorado



Tie Table for Building and Patio

BUILDING CORNER	DISTANCE TO PROPERTY LINE
BC1	0.7' TO WEST LINE
BC2	0.9' TO WEST LINE 1.7' TO SOUTH LINE
BC3	1.1' TO SOUTH LINE
BC4	7.9' TO NORTH LINE
BC5	7.6' TO NORTH LINE
BC6	1.8' TO SOUTH LINE
BC7	1.6' TO SOUTH LINE
BC8	2.7' TO SOUTH LINE
BC9	1.8' TO SOUTH LINE
PC1	1.2' TO SOUTH LINE
PC2	0.9' TO SOUTH LINE
PATIO CORNER (PC) BUILDING CORNER (BC)	

– Line Table –

L1 – S 00-00-00 E –	50.00 FEET (M) 50 FEET (R)
L2 – S 90-00-00 W –	149.63 FEET (M) 150 FEET (R)
L3 – N 00-01-00 E –	50.00 FEET (M) 50 FEET (R)
L4 – N 90-00-00 E –	149.61 FEET (M) 150 FEET (R)

DEGREES – MINUTES – SECONDS

Notes:

1) THERE ARE NO PLATTED EASEMENTS LOCATED ON THE SUBJECT PROPERTY. FLAGSTAFF SURVEYING, INC. HAS NOT PERFORMED ANY RESEARCH TO DETERMINE IF OTHER RECORDED EASEMENTS (IF ANY) EXIST.

2) ACCORDING TO COLORADO LAW YOU MUST COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT ON THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVER SUCH DEFECT. IN NO EVENT MAY ANY ACTION BASED UPON ANY DEFECT ON THIS SURVEY BE COMMENCED MORE THAN TEN YEARS FROM THE DATE OF THE CERTIFICATION SHOWN HEREON.

3) THIS IMPROVEMENT SURVEY PLAT HAS BEEN PREPARED FOR THE EXCLUSIVE USE OF RONDA GRASSI AND NANCY WELCH.

4) THIS IMPROVEMENT SURVEY PLAT AND THE INFORMATION HEREON SHOULD NOT BE USED FOR ANY ADDITIONAL OR EXTENDED PURPOSE BEYOND THAT FOR WHICH IT WAS INTENDED AND MAY NOT BE USED BY ANY PARTIES OTHER THAN THOSE TO WHICH IT IS CERTIFIED.

5) BASIS OF BEARINGS: ASSUMED NORTH 00°01'00" EAST ALONG THE WEST LINE OF BLOCK 5, BETWEEN THE SURVEY MARKERS DESCRIBED HEREON.

6) THE SUBJECT PROPERTY CONTAINS 7481 SQUARE FEET.

7) VISIBLE UTILITIES HAVE BEEN SHOWN HEREON. UNDERGROUND UTILITIES HAVE BEEN SHOWN HEREON BASED UPON VISIBLE SURFACE EVIDENCE AND MAPS PROVIDED BY THE CITY OF LOUISVILLE AND XCEL ENERGY. THE EXACT LOCATION OF UNDERGROUND FEATURES CANNOT BE ACCURATELY, COMPLETELY AND RELIABLY DEPICTED. WHERE ADDITIONAL OR MORE DETAILED INFORMATION IS REQUIRED, THE CLIENT IS ADVISED THAT EXCAVATION MAY BE NECESSARY.

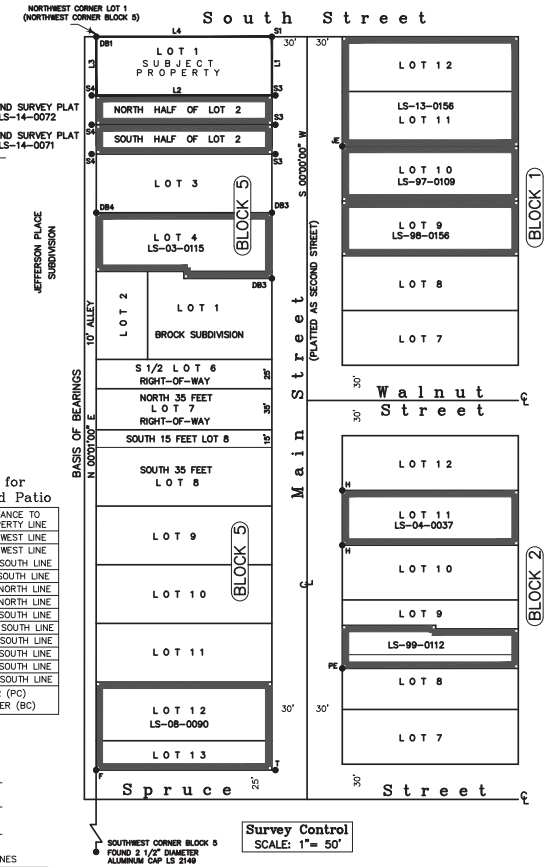
8) ALL UNDERGROUND UTILITIES SHOULD BE FIELD LOCATED BY THE APPROPRIATE AGENCY PRIOR TO ANY CONSTRUCTION OR DIGGING ON OR ADJACENT TO THE SUBJECT PROPERTY.

9) BENCHMARK: NORTHWEST BONNET BOLT OF FIRE HYDRANT LOCATED AT THE NORTHEAST CORNER OF MAIN STREET AND SOUTH STREET, ELEVATION = 5344.98 FEET, CITY OF LOUISVILLE DATUM.

Legend

Ø	UTILITY POLE
TE	TELEPHONE BOX
EM	ELECTRIC METER
GM	GAS METER
UC	UTILITY CONNECTION
LF	LINEAR FEET
℄	CENTERLINE
LP	LIGHT POLE
BR	BIKE RACK
Þ	SIGN
CS	WATER CURB STOP
CO	CLEANOUT
⊕	MANHOLE
45.4×	SPOT ELEVATION
41.2fl ×	SPOT ELEVATION AT FLOWLINE
LS–08–0090	REFERS TO A LAND SURVEY PLAT FILED WITH THE COUNTY OF BOULDER LAND USE DEPARTMENT

CHAIN LINK FENCE
WOOD FENCE
METAL FENCE
OVERHEAD UTILITY LINES
GAS LINE — G — G —
WATER LINE — W — W —
SANITARY SEWER LINE — SS — SS —
STORM LINE — ST — ST —
UNDERGROUND ELECTRIC LINES — E — E —
12" DECIDUOUS TREE WITH TRUNK DIAMETER
12" JUNIPER TREE WITH TRUNK DIAMETER
5b FIVE BOLE TREE
HANDICAP RAMP



Survey Control
SCALE: 1"= 50'

Legend

S1	SET #5 REBAR WITH 1 1/2" DIAMETER ALUMINUM CAP MARKED "SELLARS LS 27615
S4	FOUND #5 REBAR WITH 1 1/2" DIAMETER ALUMINUM CAP MARKED "SELLARS LS 27615 4' W.C."
S3	FOUND 1 1/2" ALUMINUM CAP IN CONCRETE MARKED "SELLARS LS 27615 3' W.C."
DB1	FOUND 2 1/2" DIAMETER ALUMINUM CAP LS 2149 SET BY FRANK DREXEL
DB3	FOUND 1 1/2" DIAMETER ALUMINUM CAP IN CONCRETE LS 28285 SET BY LOREN SHANKS
DB4	FOUND #5 REBAR WITH 1 1/2" DIAMETER ALUMINUM CAP LS 28285 SET BY LOREN SHANKS
JE	FOUND TAG IN CONCRETE LS 29414 SET BY JOHN EHRHART
PE	SET #5 REBAR WITH 2" DIAMETER ALUMINUM CAP LS 14063 SET BY PHILLIP ENGLE
H	FOUND NAIL AND WASHER LS 24310 SET BY JOHN HILL
T	FOUND TAG IN CONCRETE (NOT LEGIBLE) 3' WITNESS CORNER
F	FOUND PK NAIL AND WASHER LS 16406 SET BY FLATIRONS
W.C.	WITNESS CORNER
(R)	RECORD OR PLATTED MEASUREMENT
(M)	MEASURED OR CALCULATED BY THIS SURVEY

N
W E
S

Scale: 1" = 10'
0 5 10 20
U.S. SURVEY FEET
CONTOUR INTERVAL = 1 FOOT

Property Description

(PROVIDED BY THE CLIENT)

LOT 1,
BLOCK 5,
TOWN OF LOUISVILLE,
COUNTY OF BOULDER,
STATE OF COLORADO.

Surveyor's Statement

I, STEVEN J. SELLARS, A DULY REGISTERED LAND SURVEYOR, LICENSED IN THE STATE OF COLORADO, HEREBY STATE FOR AND ON BEHALF OF FLAGSTAFF SURVEYING, INC., THAT A SURVEY OF THE HEREON DESCRIBED PREMISES WAS CONDUCTED BY ME AND UNDER MY DIRECT SUPERVISION, RESPONSIBILITY AND CHECKING DURING NOVEMBER 2014; THAT SAID SURVEY AND THE ATTACHED PRINT HEREON WERE MADE IN SUBSTANTIAL ACCORDANCE WITH C.R.S. 38-51-102 (9) "IMPROVEMENT SURVEY PLAT".

STEVEN J. SELLARS DATE
COLORADO L.S. #27615
FLAGSTAFF SURVEYING JOB NO. 14-17122

Flagstaff Surveying, Inc.
637 SOUTH BROADWAY, SUITE C
TABLE MESA SHOPPING CENTER
BOULDER, COLORADO 80305
303-499-9737
StevenSellars@FlagstaffSurveying.com

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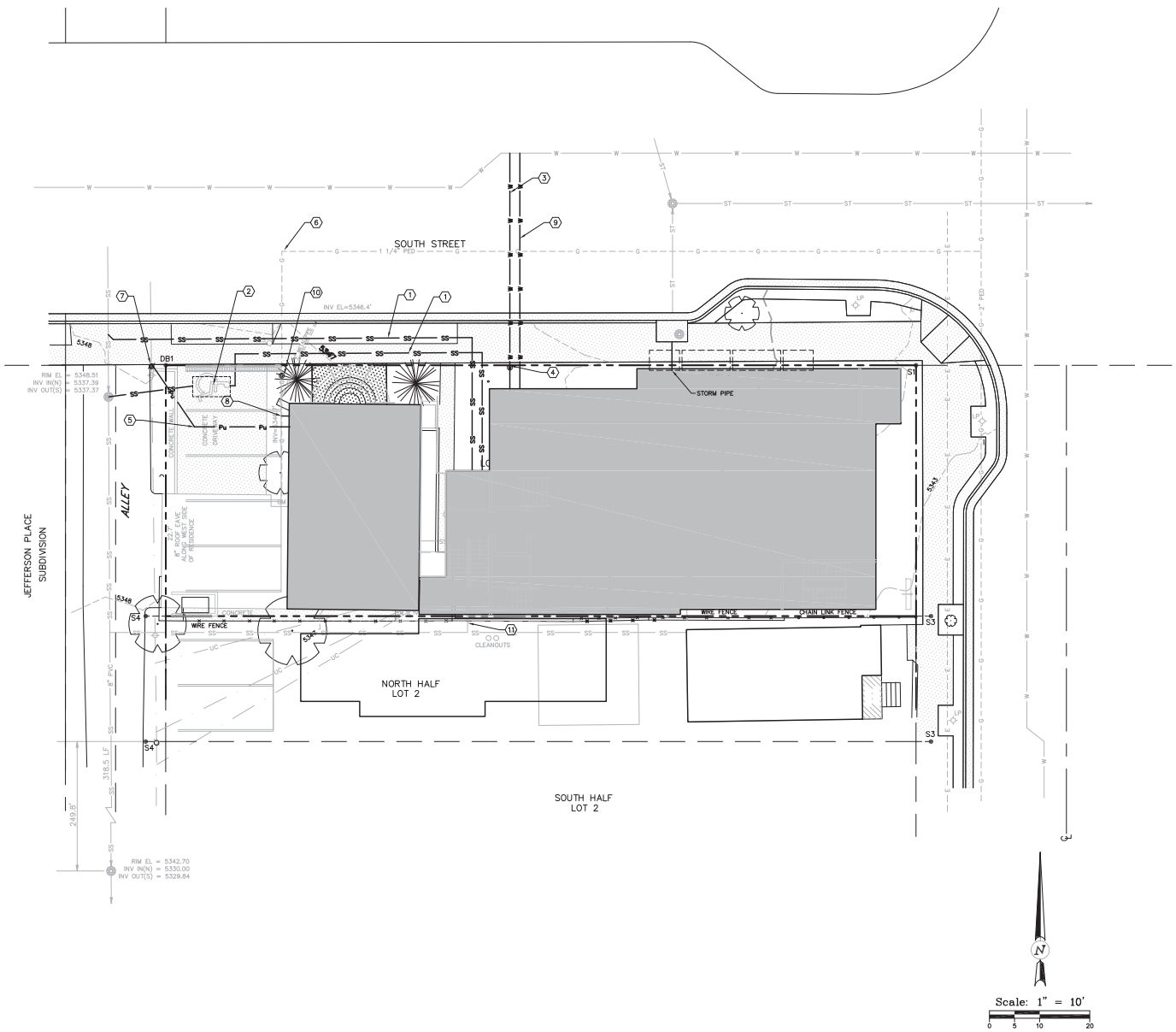
17122A-1.DWG NOVEMBER 26, 2014



LEGEND

Ø	UTILITY POLE
TE	TELEPHONE BOX
EM	ELECTRIC METER
GM	GAS METER
UC	UTILITY CONNECTION
LF	LINEAR FEET
℄	CENTERLINE
LP	LIGHT POLE
BR	BIKE RACK
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CS	WATER CURB STOP
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12"	DECIDUOUS TREE WITH TRUNK DIAMETER
12"	JUNIPER TREE WITH TRUNK DIAMETER
5b	FIVE BOLE TREE
	HANDICAP RAMP

KEYED NOTES (1)

1. PROPOSED SANITARY SEWER SERVICE.
2. PROPOSED GREASE TRAP.
3. PROPOSED WATER SERVICE.
4. PROPOSED WATER METER AND CURB STOP VALVE.
5. PROPOSED UNDERGROUND POWER.
6. EXISTING GAS LINE TO REMAIN.
7. RELOCATE POWER POLE.
8. EXISTING GAS LINE TO REMAIN. IF POSSIBLE, STUB OFF OF EXISTING LINE FOR NEW BUILDING SERVICE.
9. PROPOSED 4" FIRE SERVICE.
10. RELOCATED GAS METER.
11. APPROXIMATE LOCATION OF EXISTING SANITARY SEWER SERVICE TO BE REMOVED AND CAPPED.

UTILITY NOTES

1. ALL CITY UTILITIES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CITY OF LOUISVILLE STANDARD SPECIFICATIONS.
2. WATER, FIRELINE, SEWER TAPS, AND SERVICE LINE SIZES SHALL BE DETERMINED AT THE TIME OF BUILDING PERMIT APPLICATION.
3. ALL CONNECTIONS TO EXISTING UTILITIES SHALL BE DONE IN A WAY SO AS TO MINIMIZE DISRUPTION IN SERVICE TO EXISTING USERS.
4. THE LOCATION OF THE ABOVE GROUND UTILITIES SHOWN HEREON ARE BASED ON THE FIELD SURVEY BY FLAGSTAFF SURVEYING, INC. THE LOCATIONS OF THE UNDERGROUND UTILITIES SHOWN HEREON ARE BASED ON SAID SURVEY AND INFORMATION PROVIDED BY OTHERS (WHICH MAY INCLUDE THE UTILITY OWNER OR UTILITY LOCATING SERVICES). SCOTT, COX & ASSOCIATES, INC. IS NOT RESPONSIBLE FOR UTILITY INFORMATION PROVIDED BY OTHERS. SCOTT, COX & ASSOCIATES, INC. RECOMMENDS THAT THE LOCATION OF THE UTILITIES BE FIELD VERIFIED PRIOR TO ANY DIGGING ON, OR ADJACENT TO THE SUBJECT PROPERTY.
5. BENCHMARK: NORTHWEST BONNET BOLT OF FIRE HYDRANT LOCATED AT THE NORTHEAST CORNER OF MAIN STREET AND SOUTH STREET, ELEVATION = 5344.98 FEET, CITY OF LOUISVILLE DATUM PER FLAGSTAFF SURVEYING, INC. DRAWING 17122A-1, DATED NOVEMBER 26, 2014.

SCOTT, COX & ASSOCIATES, INC.
consulting engineers • surveyors
1500 Kansas Avenue, Longmont, Colorado 80501
(303) 684 - 2000
SAC NO. 19-0400-3

824 SOUTH STREET MIXED USE DEVELOPMENT

824 South St, Louisville CO 80027

SPECIAL REVIEW USE
FINAL PUD

PROJECT #1551
DATE: 5/25/16
DRAWN BY: JAS
CHECKED BY: DMS
REVISIONS:
04/01/19

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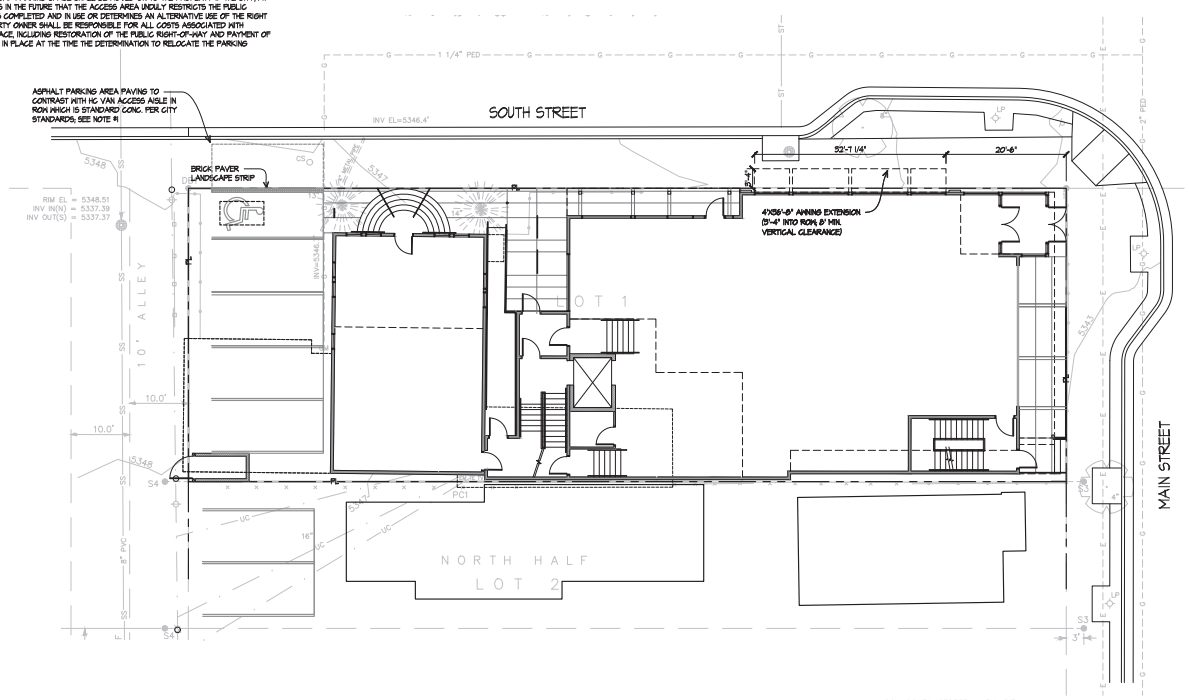
PRELIMINARY UTILITY PLAN

Sheet
C1.01
of Sheets

NOTE:
1- THE ACCESS AREA OF THE HANDICAP PARKING SPACE SHALL BE MOVED ON TO THE PROPERTY IF THE CITY, AT ITS SOLE DISCRETION, DETERMINES IN THE FUTURE THAT THE ACCESS AREA UNDULY RESTRICTS THE PUBLIC SIDEWALK AFTER THE PROJECT IS COMPLETED AND IN USE OR DETERMINES AN ALTERNATIVE USE OF THE RIGHT OF WAY IS DESIRED. THE PROPERTY OWNER SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH RELOCATION OF THE PARKING SPACE, INCLUDING RESTORATION OF THE PUBLIC RIGHT-OF-WAY AND PAYMENT OF THE PARKING FEE-IN-LIEU THAT IS IN PLACE AT THE TIME THE DETERMINATION TO RELOCATE THE PARKING SPACE IS MADE.



824 SOUTH STREET – EXHIBIT 1

LICENSE AGREEMENT FOR THE FOLLOWING PURPOSES:

A.) PROPOSED REMOVABLE AWNINGS ALONG NORTH OF PROPERTY ENCROACH INTO ROW.

B.) PROPOSED HANDICAP ACCESSIBLE PARKING STALL HAS ADJACENT ACCESS AISLE IN THE ROW.

NOTE: ALL LICENSE AGREEMENTS ARE REVOCABLE BY THE CITY OF LOUISVILLE.

A1 EX1 RIGHT OF WAY ENCROACHMENTS SITE PLAN

1" = 10'-0" FOR R.O.W LICENSE AGREEMENT

HARTRONFT ASSOCIATES
A Professional Corporation
Planning
Architecture
Interior Design
950 Spruce Street, #2A
Louisville, CO 80027
TEL: 303.673.9304
FAX: 303.673.9319

824 SOUTH ST / 957 MAIN ST
824 South St/ 957 Main St, Louisville CO 80027
Louisville, Block 5, Lot 1

PUD AMENDMENT

PROJECT # 1857
DATE: 08/06/2015
DRAWN BY: HAPC
CHECKED BY: JEH
REVISIONS:
FINAL PC 10/18/15
FINAL PC 04/05/16
CC 05/16/16
PUD AMENDMENT 04/01/19

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RIGHT OF WAY ENCROACHMENTS SITE PLAN

Sheet
EX-1
of Sheets

RESOLUTION NO. 43
SERIES 2016

A RESOLUTION APPROVING A FINAL PLANNED UNIT DEVELOPMENT (PUD) AND SPECIAL REVIEW USE (SRU) TO ALLOW FOR THE CONSTRUCTION OF A NEW BUILDING WITH 5,700 SF OF COMMERCIAL SPACE, THE REMODEL OF THE EXISTING HOUSE, AND OUTDOOR SALES AT 824 SOUTH STREET, LOT 1, BLOCK 5, LOUISVILLE OLD TOWN

WHEREAS, there has been submitted to the Louisville Planning Commission an application for approval of a final Planned Unit Development (PUD) plan and special review use (SRU) to allow for the construction of a new building with 5,700 SF of commercial space, the remodel of the existing house, and outdoor sales at 824 South Street, Lot 1, Block 5, Louisville Old Town; and

WHEREAS, the City Staff has reviewed the information submitted and found that, subject to conditions, the application complies with the Louisville zoning and subdivision regulations and other applicable sections of the Louisville Municipal Code; and;

WHEREAS, after a duly noticed public hearing on July 14, 2016, where evidence and testimony were entered into the record, including the findings in the Louisville Planning Commission Staff Report dated July 14, 2016, the Planning Commission recommended approval of the PUD and SRU for 824 South Street, with the following conditions:

1. The access area for the handicap parking space shall be moved on to the property if the City determines in the future that the access area unduly restricts the public sidewalk after the project is completed and in use.
2. The items outlined in the Public Works memo dated June 23, 2016 shall be satisfied before recordation of the PUD.

NOW THEREFORE, BE IT RESOLVED that the City Council of the City of Louisville, Colorado does hereby approve a final Planned Unit Development (PUD) plan and special review use (SRU) to allow for the construction of a new building with 5,700 SF of commercial space, the remodel of the existing house, and outdoor sales at 824 South Street, Lot 1, Block 5, Louisville Old Town, with the following condition:

1. The access area for the handicap parking space shall be moved on to the property if the City, at its sole discretion, determines in the future that the access area unduly restricts the public sidewalk after the project is completed and in use or determines an alternative use of the right of way is desired. The property owner shall be responsible for all costs associated with relocation of the parking space, including restoration of the public right-of-way and payment of the parking fee-in-lieu that is in place at the time the determination to relocate the parking space is made.

PASSED AND ADOPTED this 16th day of August, 2016.

By: _____
Robert P. Muckle, Mayor
City of Louisville, Colorado

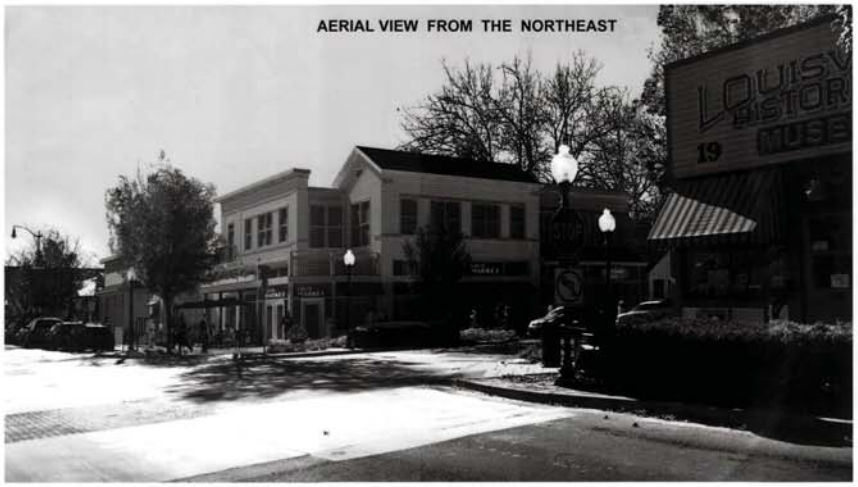
Attest: _____
Meredyth Muth, City Clerk
City of Louisville, Colorado

03690766
12/19/2016 01:30 PM Page: 1 of 5
Boulder County Clerk, CO RF: $53.00 DF: $0.00

FINAL P.U.D.
824 SOUTH STREET
MIXED USE DEVELOPMENT

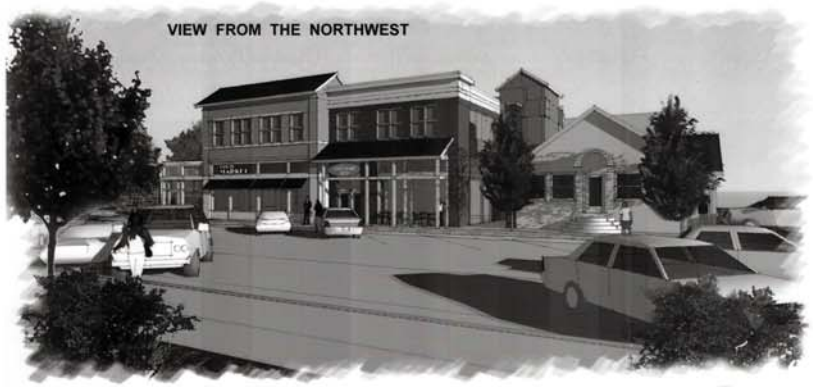
LOCATED IN THE SOUTHEAST QUARTER OF SECTION 8 TOWNSHIP 1 SOUTH, RANGE 69 WEST OF THE THE 6TH P.M., CITY OF LOUISVILLE, COUNTY OF BOULDER, STATE OF COLORADO

AERIAL VIEW FROM THE NORTHEAST



VIEW FROM THE SOUTHEAST

VIEW FROM THE NORTHWEST



VACINITY MAP

SHEET INDEX

SHEET	DESCRIPTION
ARCHITECTURAL	
A1	Cover Sheet, Project Data & Renderings
A2	Site, Landscape & Parking Plan/Floor Plans
A3	Building Elevations
A4	Site Photometric
SURVEY	
~~Improvement Survey Plat~~	
CIVIL	
C1.01	Utility Plan
~~EX-1~~	~~ROW Encroachments Exhibit~~

PROJECT DIRECTORY

OWNER	Ronda Grassi & Nancy Welch 908 Main Street, Suite 220 Louisville, Colorado 80027 Contact: Ronda Grassi 303-665-7892
ARCHITECT/PLANNER	Hartronft Associates, p.c. 950 Spruce Street, Suite 1A Louisville, Colorado 80027 Contact: Erik Hartronft, AIA 303-673-9304
CIVIL ENGINEER	Scott, Cox & Assoc., Inc. 1530 55th Street Boulder, Colorado 80303 Contact: Don Ash 303-444-3051

SIGNATURES

Ownership Signature Block

By signing this PUD, the owner acknowledges and accepts all the requirements and intent set forth in this PUD. Witness my/our hand(s) seal(s) this 5 day of November, 2018

Owner Name and Signature

Owner Name and Signature

Notary Name (print) (Notary Seal)

Notary Signature

My Commission Expires 9/25/2022

Planning Commission Certificate

Approved this 11th day of July 2016 by the Planning Commission of the City of Louisville, Colorado.

Resolution No. 18 Series 2016

Clerk and Recorder Certificate (County of Boulder, State of Colorado)

I hereby certify that this instrument was filed in my office at _____ o'clock, _____ M., this _____ day of _____, 20__, and is recorded in Plan File _____, Fee _____ paid, _____ Film No. _____ Reception.

Clerk & Recorder

Deputy

City Council Certificate

Approved this 16 day of August 2016 by the City Council of the City of Louisville, Colorado.

Resolution No. 43 Series 2016

Mayor Signature

City Clerk Signature

SEAL

PROJECT DATA

PROJECT LOCATION:	824 South St. Louisville, CO 80027		
PROJECT DESCRIPTION:	New construction on open portion of lot at the corner of South St. and Main St. in downtown Louisville, CO. The existing house is to remain with the existing garage removed. The proposed new building is to be two levels. Potential uses of the site include office space, retail, restaurant, and one existing dwelling unit.		
ZONE DISTRICT:	CC- Commercial Community Transitional Area of Downtown Louisville		
PROPERTY AREA:	7481 sf		
RESIDENTIAL UNITS:	1 Existing 2 Bedroom		
BUILDING AREAS:	NEW BUILDING	EXISTING DWELLING UNIT (Garage Removed)	TOTAL
Basement:	2180 gsf	1100 gsf	3280 gsf
Main Level:	3880 gsf	1126 gsf (Res.)	5006 gsf
2nd Level:	3630 gsf	--	3630 gsf
TOTAL BUILDING AREA:	9690 gsf	2226 gsf	11916 gsf
TOTAL BUILDING AREA: (ABOVE GRADE)	7510 gsf	1126 gsf	8636 gsf
TOTAL BUILDING AREA: (FOR PARKING)	[1]5700 net (Commercial)	--	[1]5700 net (Commercial)
FLOOR AREA RATIO:	1.15		
PARKING REQUIRED:	13 spaces (5500/500= 11 sp. + 2 sp.)		
PARKING PROVIDED:	5 spaces		
BICYCLE PARKING:	4 spaces		
DESIGN ELEMENTS:	Building Height Allowed: 35' Building Height Requested: 35' at stair tower		

[1]Only commercial space is included in the calculation per Sec. 17.20.025. Section 17.20.025 Note B allows hallways, stairways, bathrooms, kitchens, and uninhabitable areas to be removed from the building area calculated for parking. This area removed from the parking calculations equal 600 sf on the main level, 880 sf on the second level, and 1510 sf in the basement. In addition, Section 17.20.025 Note F exempts the first 999 sf of floor area from the parking calculation. The 1 dwelling unit is not included in net sf but requires 2 spaces.

Note: Existing public improvements indicated within South St. and Main St. rights of way may be revised or modified by the City at the discretion of the City to address health, welfare or safety concerns.

HARTRONFT ASSOCIATES
A Professional Corporation
Planning
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Interior Design
950 Spruce Street, #1A
Louisville, CO 80027
TEL: 303.673.9304
FAX: 303.673.9319

824 SOUTH STREET
MIXED USE DEVELOPMENT
824 South St, Louisville CO 80027
Louisville, Block 5, Lot 1

FINAL PUD

PROJECT # 1551
DATE: 08/08/2016
DRAWN BY: HAPC
CHECKED BY: JEH
REVISIONS:
FINAL PC 10/16/15
FINAL PC 08/05/16

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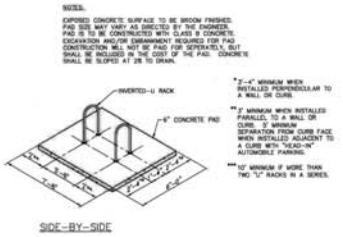
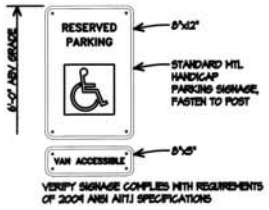
COVER SHEET
PROJECT DATA
RENDERINGS
SIGNATURES

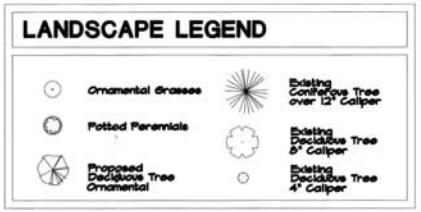
Sheet
A1
1 of 7 Sheets

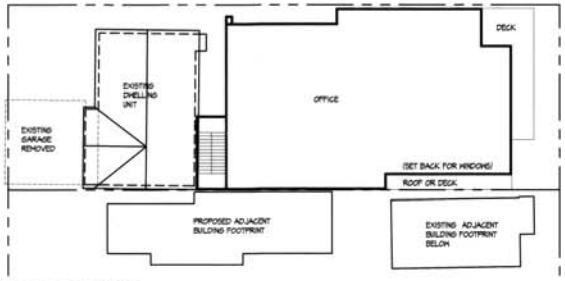


D3 / A2 U-RACK DETAIL @ BIKE PK'G
1" = 10'-0"

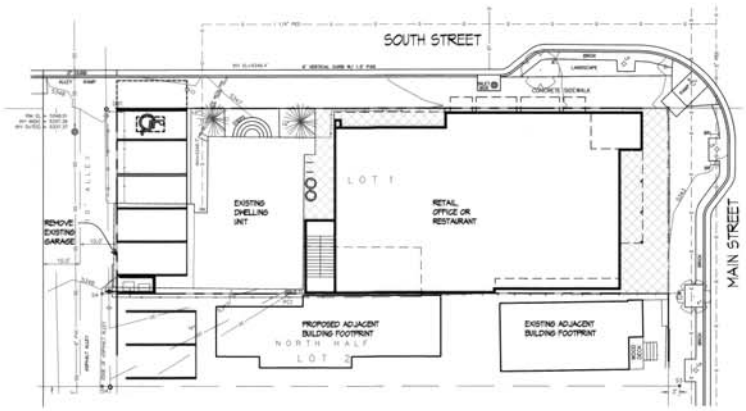


D2 / A2 H.C. PK'G SIGN DETAIL
1" = 10'-0"

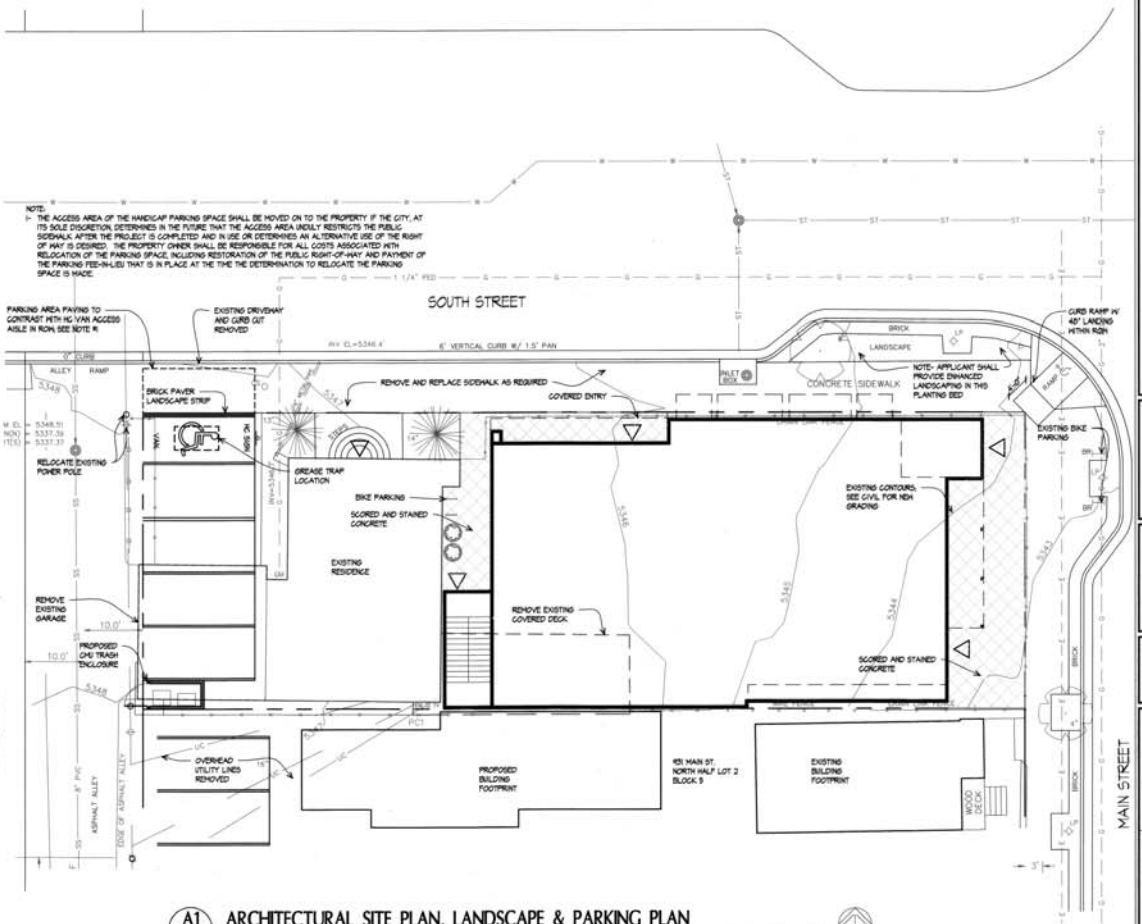




B4 / A2 2ND FLOOR PLAN
1/16" = 1'-0"



A4 / A2 1ST FLOOR PLAN
1/16" = 1'-0"



A1 / A2 ARCHITECTURAL SITE PLAN, LANDSCAPE & PARKING PLAN
1" = 10'-0"

HARTRONFT ASSOCIATES
A Professional Corporation
Planning
Architecture
Interior Design
950 Spruce Street, #2A
Louisville, CO 80027
TEL: 303.673.9304
FAX: 303.673.9319

824 SOUTH STREET MIXED USE DEVELOPMENT

824 South St, Louisville CO 80027
Louisville, Block 5, Lot 1

SPECIAL REVIEW USE
FINAL PUD

PROJECT # 1551
DATE: 08/06/2015
DRAWN BY: HAPC
CHECKED BY: JEH
REVISIONS:
FINAL PC 10/16/15
FINAL PC 08/05/16

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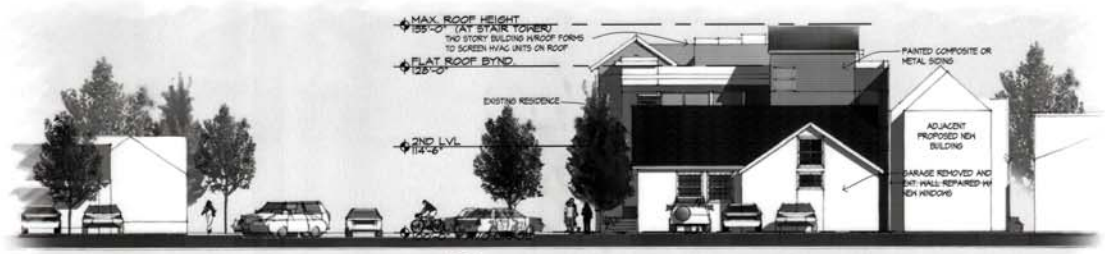
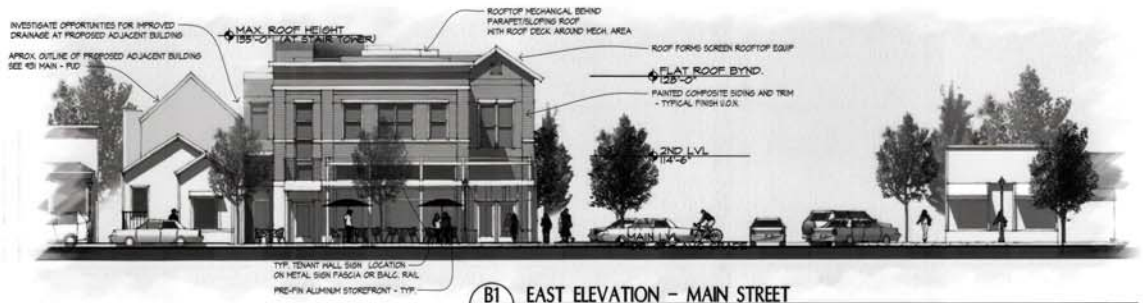
SITE, LANDSCAPE PLAN & PARKING PLAN
FLOOR PLANS
DETAILS

Sheet
A2
2 of 7 Sheets

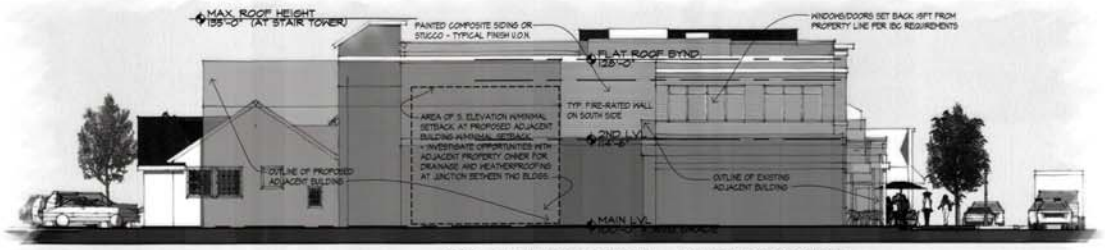


D1 / A3 WEST ELEVATION - ALLEY
SCALE: 1" = 10'-0"

C1 / A3 NORTH ELEVATION - SOUTH STREET
SCALE: 1" = 10'-0"



B1 / A3 EAST ELEVATION - MAIN STREET
SCALE: 1" = 10'-0"



A1 / A3 SOUTH ELEVATION - ADJACENT PROPERTY
SCALE: 1" = 10'-0"

HARTRONFT ASSOCIATES
A Professional Corporation
Planning
Architecture
Interior Design
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Louisville, CO 80027
TEL: 303.673.9304
FAX: 303.673.9319

824 SOUTH STREET MIXED USE DEVELOPMENT

824 South St, Louisville CO 80027
Louisville, Block 5, Lot 1

FINAL PUD

PROJECT # 1551
DATE: 08/06/2015
DRAWN BY: HAPC
CHECKED BY: JEH
REVISIONS:
FINAL PC 10/16/15
FINAL PC 06/05/16

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BUILDING ELEVATIONS

Sheet
A3
3 of 7 Sheets

FIXTURE SCHEDULE

KEY	PHOTO	DESCRIPTION	MANUFACTURER	CATALOG NUMBER	LAMP	VOLTS	MOUNTING INFORMATION	NOTE	MAX WATT
A		RECESSED DOWNLIGHT, WET LOCATION LISTED 1500 LUMEN LED LAMP 3000K	LITHONIA	REALICA ESL 1500L 30K 995C 120 LPBLN 1500	LED INCLUDED	120	RECESSED		18
B		WALL MOUNTED 1/2 CYLINDER WALL SCONCE WITH BLACK FINISH	SCOTT ARCHITECTURAL	99000-BL-C13E	13CFL	120	SURFACE		18
C		WALL MOUNTED LED SIGN LIGHTER WITH 45° CAP AND INTEGRAL POWER CANOPY	BK LIGHTING	SN 24 A LED 1522 WFL XXX 12 A PC	3000K	120	SURFACE		8

LIGHT - C

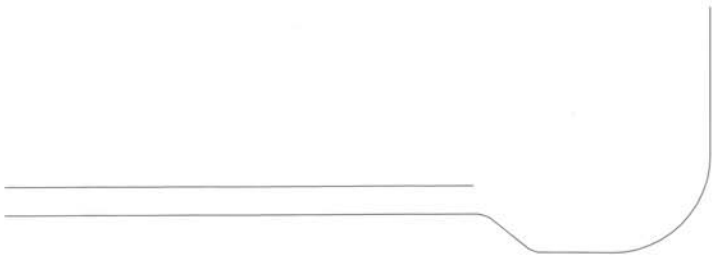
LIGHT - B

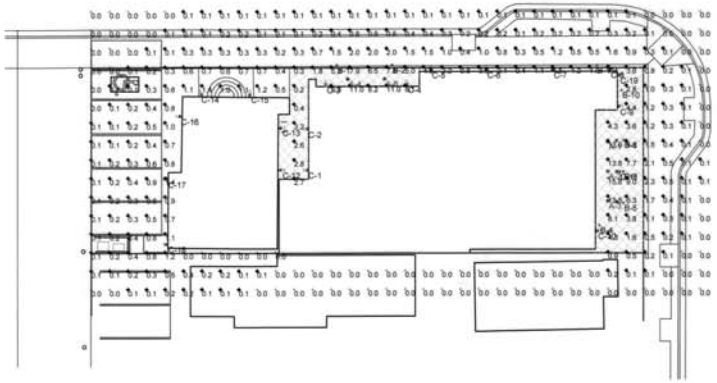
LIGHT - A

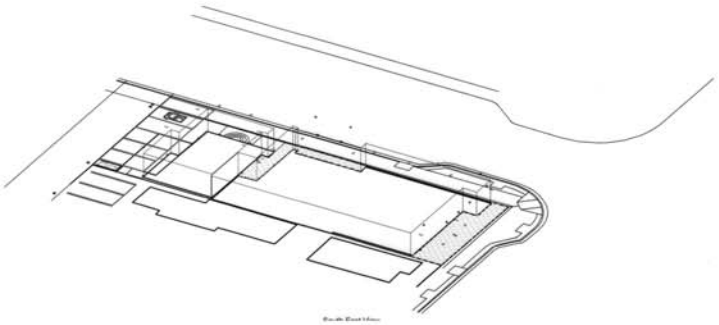
Statistics						
Symbol	Description	Avg	Max/Min	Min	Avg/Min	Max
+	Calc Zone #1	1.0 fc	N/A	0.0 fc	N/A	15.8 fc

Luminaire Locations

		Location						Aim		
No.	Label	X	Y	Z	MH	Orientation	Tilt	X	Y	Z
1	A	90.00	-870.00	9.00	9.00	0.00	0.00	90.00	-870.00	0.00
2	A	90.00	-878.00	9.00	9.00	0.00	0.00	90.00	-878.00	0.00
3	A	90.00	-886.00	9.00	9.00	0.00	0.00	90.00	-886.00	0.00
4	A	19.50	-853.00	9.00	9.00	0.00	0.00	19.50	-853.00	0.00
6	A	29.50	-853.00	9.00	9.00	0.00	0.00	29.50	-853.00	0.00
1	B	16.50	-849.50	14.00	14.00	180.00	81.62	16.50	-866.48	11.50
2	B	31.50	-849.50	14.00	14.00	180.00	85.50	31.50	-881.25	11.50
4	B	87.50	-892.50	10.00	10.00	270.00	70.28	77.74	-892.50	6.50
5	B	94.00	-886.50	10.00	10.00	270.00	60.95	89.50	-886.50	7.50
8	B	94.00	-869.50	10.00	10.00	270.00	60.95	89.50	-869.50	7.50
9	B	94.00	-878.00	10.00	10.00	270.00	60.95	89.50	-878.00	7.50
10	B	93.50	-856.00	10.00	10.00	270.00	60.95	89.00	-856.00	7.50
11	B	87.00	-849.50	10.00	10.00	180.00	60.95	87.00	-854.00	7.50
1	C	8.50	-877.50	6.50	6.50	270.00	0.00	8.50	-877.50	0.00
2	C	8.50	-866.50	6.50	6.50	270.00	0.00	8.50	-866.50	0.00
3	C	13.50	-854.50	6.50	6.50	0.00	0.00	13.50	-854.50	0.00
4	C	35.50	-854.50	6.50	6.50	0.00	0.00	35.50	-854.50	0.00
5	C	42.00	-850.50	6.50	6.50	0.00	0.00	42.00	-850.50	0.00
6	C	57.00	-850.50	6.50	6.50	0.00	0.00	57.00	-850.50	0.00
7	C	75.00	-850.50	6.50	6.50	0.00	0.00	75.00	-850.50	0.00
8	C	90.50	-850.50	6.50	6.50	0.00	0.00	90.50	-850.50	0.00
9	C	93.00	-860.50	6.50	6.50	90.00	0.00	93.00	-860.50	0.00
10	C	87.00	-894.00	6.50	6.50	90.00	0.00	87.00	-894.00	0.00
11	C	93.00	-878.00	6.50	6.50	90.00	0.00	93.00	-878.00	0.00
12	C	1.50	-877.50	12.00	12.00	90.00	0.00	1.50	-877.50	0.00
13	C	1.50	-866.00	12.00	12.00	90.00	0.00	1.50	-866.00	0.00
14	C	-20.50	-857.00	12.00	12.00	0.00	0.00	-20.50	-857.00	0.00
15	C	-7.00	-857.00	12.00	12.00	0.00	0.00	-7.00	-857.00	0.00
16	C	-26.00	-863.00	12.00	12.00	270.00	0.00	-26.00	-863.00	0.00
17	C	-29.50	-880.00	12.00	12.00	270.00	0.00	-29.50	-880.00	0.00
18	C	-29.50	-897.50	12.00	12.00	270.00	0.00	-29.50	-897.50	0.00
19	C	93.00	-852.00	6.50	6.50	90.00	0.00	93.00	-852.00	0.00







A1/A4 SITE PHOTOMETRIC
1/16" = 1'-0"

HARTRONFT ASSOCIATES
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950 Spruce Street, #1A
Louisville, CO 80027
TEL: 303.673.9304
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824 SOUTH STREET
MIXED USE DEVELOPMENT
824 South St, Louisville CO 80027
Louisville, Block 5, Lot 1

FINAL PUD

PROJECT # 1551
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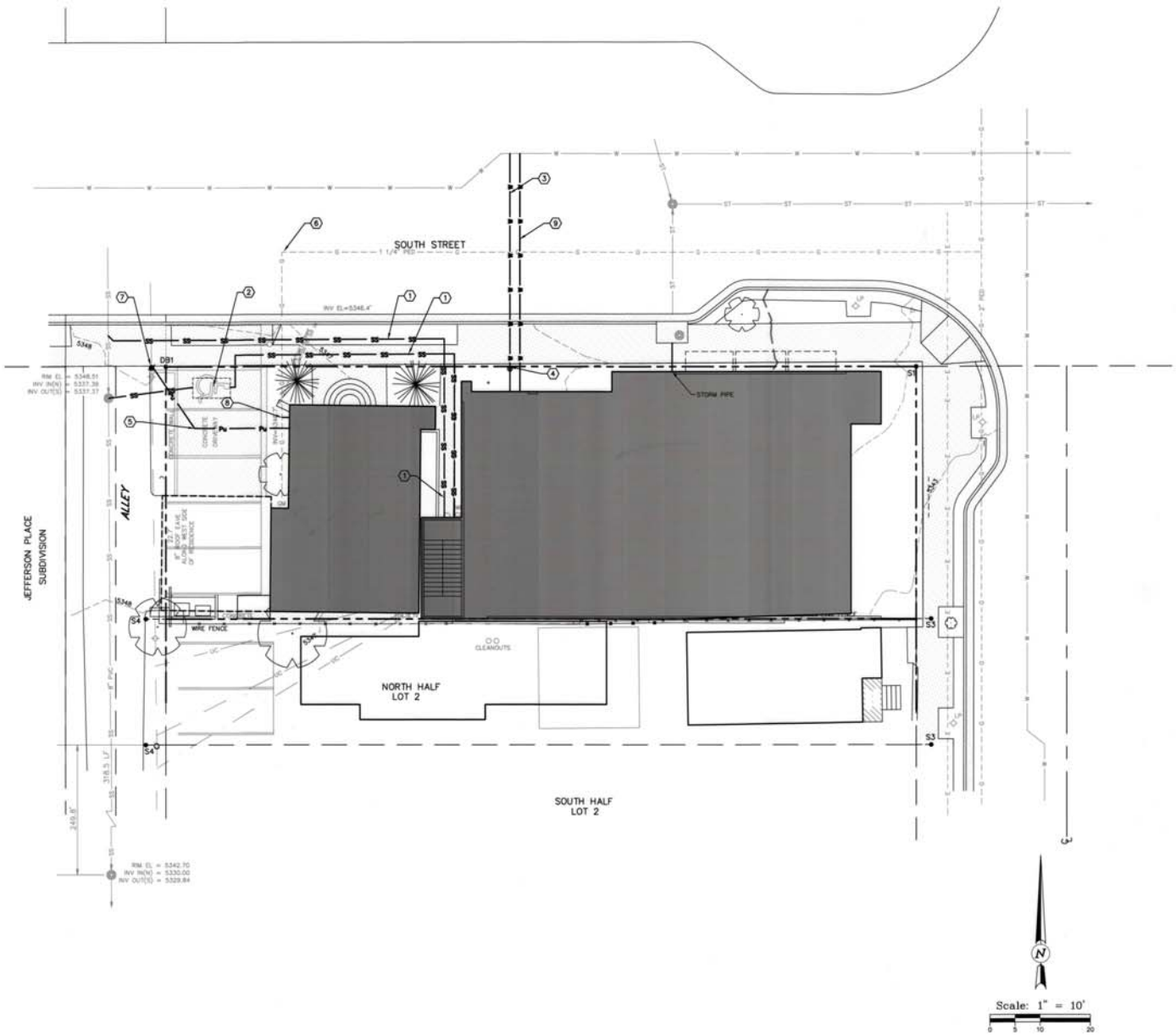
SITE PHOTOMETRICS

Sheet
A4
4 of 7 Sheets



LEGEND

- Ø UTILITY POLE
- TE TELEPHONE BOX
- EM ELECTRIC METER
- GM GAS METER
- UC UTILITY CONNECTION
- LF LINEAR FEET
- ℄ CENTERLINE
- LP LIGHT POLE
- BR BIKE RACK
- SIGN
- CS WATER CURB STOP
- CO CLEANOUT
- MANHOLE
- 45.4+ SPOT ELEVATION
- 41.2ft + SPOT ELEVATION AT FLOWLINE
- CHAIN LINK FENCE
- WOOD FENCE
- METAL FENCE
- OVERHEAD UTILITY LINES
- GAS LINE
- WATER LINE
- SANITARY SEWER LINE
- STORM LINE
- UNDERGROUND ELECTRIC LINES
- 12" DECIDUOUS TREE WITH TRUNK DIAMETER
- 12" JUNIPER TREE WITH TRUNK DIAMETER
- 5b FIVE BOLE TREE
- HANDICAP RAMP

KEYED NOTES ①

1. PROPOSED SANITARY SEWER SERVICE.
2. PROPOSED GREASE TRAP.
3. PROPOSED WATER SERVICE.
4. PROPOSED WATER METER AND CURB STOP VALVE.
5. PROPOSED UNDERGROUND POWER.
6. EXISTING GAS LINE TO REMAIN.
7. RELOCATE POWER POLE.
8. EXISTING GAS LINE TO REMAIN. IF POSSIBLE, STUB OFF OF EXISTING LINE FOR NEW BUILDING SERVICE.
9. PROPOSED 4" FIRE SERVICE.

UTILITY NOTES

1. ALL CITY UTILITIES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CITY OF LOUISVILLE STANDARD SPECIFICATIONS.
2. WATER, FIRELINE, SEWER TAPS, AND SERVICE LINE SIZES SHALL BE DETERMINED AT THE TIME OF BUILDING PERMIT APPLICATION.
3. ALL CONNECTIONS TO EXISTING UTILITIES SHALL BE DONE IN A WAY SO AS TO MINIMIZE DISRUPTION IN SERVICE TO EXISTING USERS.
4. THE LOCATION OF THE ABOVE GROUND UTILITIES SHOWN HEREON ARE BASED ON THE FIELD SURVEY BY FLAGSTAFF SURVEYING, INC. THE LOCATIONS OF THE UNDERGROUND UTILITIES SHOWN HEREON ARE BASED ON SAID SURVEY AND INFORMATION PROVIDED BY OTHERS (WHICH MAY INCLUDE THE UTILITY OWNER OR UTILITY LOCATING SERVICES). SCOTT, COX & ASSOCIATES, INC. IS NOT RESPONSIBLE FOR UTILITY INFORMATION PROVIDED BY OTHERS. SCOTT, COX & ASSOCIATES, INC. RECOMMENDS THAT THE LOCATION OF THE UTILITIES BE FIELD VERIFIED PRIOR TO ANY DIGGING ON, OR ADJACENT TO THE SUBJECT PROPERTY.
5. BENCHMARK: NORTHWEST BONNET BOLT OF FIRE HYDRANT LOCATED AT THE NORTHEAST CORNER OF MAIN STREET AND SOUTH STREET, ELEVATION = 5344.98 FEET, CITY OF LOUISVILLE DATUM PER FLAGSTAFF SURVEYING, INC. DRAWING 17122A-1, DATED NOVEMBER 26, 2014.

SCOTT, COX & ASSOCIATES, INC.

824 SOUTH STREET MIXED USE DEVELOPMENT

824 South St, Louisville CO 80027

SPECIAL REVIEW USE FINAL PUD

PROJECT # 1551
DATE: 5/25/16
DRAWN BY: JAS
CHECKED BY: DMS
REVISIONS:

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PRELIMINARY UTILITY PLAN

Sheet
C1.01
of Sheets

03690765
Page 1 of 1
12/19/2016 01:30 PM RF: $13.00 DF: $0.00
Boulder County Clerk, CO

VICINITY MAP

SIGNATURES

Ownership Signature Block

By signing this PUD, the owner acknowledges and accepts all the requirements and intent set forth in this PUD. Witness my/our hand(s) and seal(s) this 5th day of November, 2018.

Owner Name and Signature

Owner Name and Signature

Notary Name (print) Dawn M. Burgess (Notary Seal)

Notary Signature

My Commission Expires 9/23/2022

DAWN M. BURGESS
NOTARY PUBLIC - STATE OF COLORADO
NOTARY ID 20074016811
MY COMMISSION EXPIRES SEP 23, 2022

Planning Commission Certificate

Approved this 14th day of July 2016 by the Planning Commission of the City of Louisville, Colorado.

Resolution No. 18 Series 2016

Clerk and Recorder Certificate
(County of Boulder, State of Colorado)

I hereby certify that this instrument was filed in my office at _____ o'clock, ____ M., this ____ day of _____, 20____ and is recorded in Plan File _____. Fee _____ paid _____ Film No. _____ Reception. _____

Clerk & Recorder

Deputy

City Council Certificate

Approved this 16 day of August 2016 by the City Council of the City of Louisville, Colorado.

Resolution No. 43 Series 2016

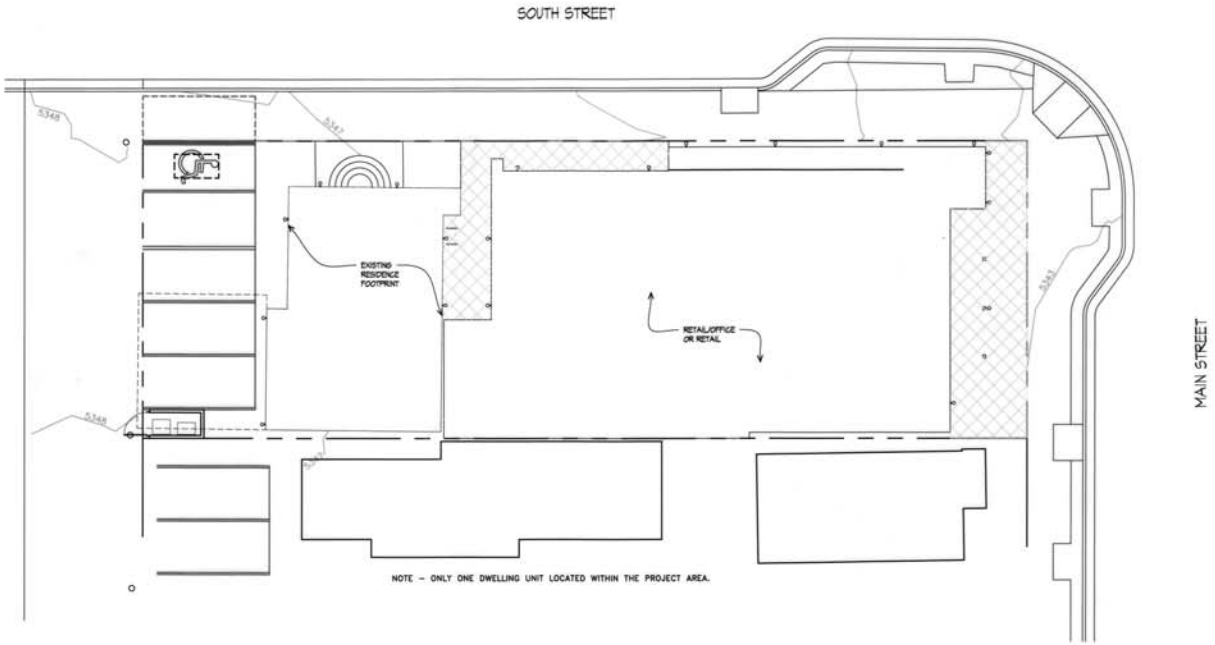
Mayor Signature

City Clerk Signature

CITY OF LOUISVILLE SEAL COLORADO

SPECIAL REVIEW USE
824 SOUTH STREET
MIXED USE DEVELOPMENT

LOCATED IN THE SOUTHEAST QUARTER OF SECTION 8 TOWNSHIP 1 SOUTH, RANGE 69 WEST OF THE THE 6TH P.M., CITY OF LOUISVILLE, COUNTY OF BOULDER, STATE OF COLORADO



NOTE – ONLY ONE DWELLING UNIT LOCATED WITHIN THE PROJECT AREA.

824 SOUTH STREET – SPECIAL REVIEW USE

With one dwelling unit combined with commercial space, this property will be a Mixed Use Residential–Commercial land use designation. Existing zoning CC allows dwellings and mixed use configuration when authorized through a Special Review Use.

–Indicates location of proposed lighting. Bottom of lights to be 6'–8" above walking surface.

A1 / 1 SPECIAL REVIEW USE PLAN
1" = 10'–0"

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SPECIAL REVIEW USE PLAN

Sheet 1 of Sheets

CITY COUNCIL COMMUNICATION
AGENDA ITEM 8B

SUBJECT: **RESOLUTION NO. 43, SERIES 2016 – A RESOLUTION APPROVING A FINAL PLANNED UNIT DEVELOPMENT (PUD) PLAN AND SPECIAL REVIEW USE (SRU) TO ALLOW FOR THE CONSTRUCTION OF A NEW BUILDING WITH 5,700 SF OF COMMERCIAL SPACE, THE REMODEL OF THE EXISTING HOUSE, AND OUTDOOR SALES AT 824 SOUTH STREET, LOT 1, BLOCK 5, LOUISVILLE OLD TOWN**

DATE: **AUGUST 16, 2016**

PRESENTED BY: **SCOTT ROBINSON, PLANNER II**
PLANNING AND BUILDING SAFETY DEPARTMENT

SUMMARY:
The applicant, Erik Hartronft, has submitted a plan to construct a new 7,510 SF office/retail building, containing 5,700 square feet of commercial space at 824 South Street. The proposal includes retaining the existing 1,100 SF one-unit residential structure on the property, with some modifications... The 560 SF attached garage would be removed. The property is 7,481 SF and was platted as part of the Town of Louisville subdivision in 1890. The existing house was built around 1929. Vehicle access to the property is off of South Street to the north.

The property is located in the Community Commercial (CC) zone district and within the area of town formally referred to as Downtown Louisville. All development in the CC zone district requires the establishment of a Planned Unit Development (PUD), and all PUD's in Downtown Louisville must comply with the development regulations established in the Louisville Municipal Code (LMC) and the design standards outlined in

the Downtown Design Handbook. Guidelines for allowed floor area of structures in Downtown are provided by the Downtown Framework Plan. The applicant is requesting outdoor dining at several locations on the site, which requires special review use approval. The Historic Preservation Commission (HPC) must approve the demolition of the existing attached garage. The HPC granted demolition approval on October 19, 2015.

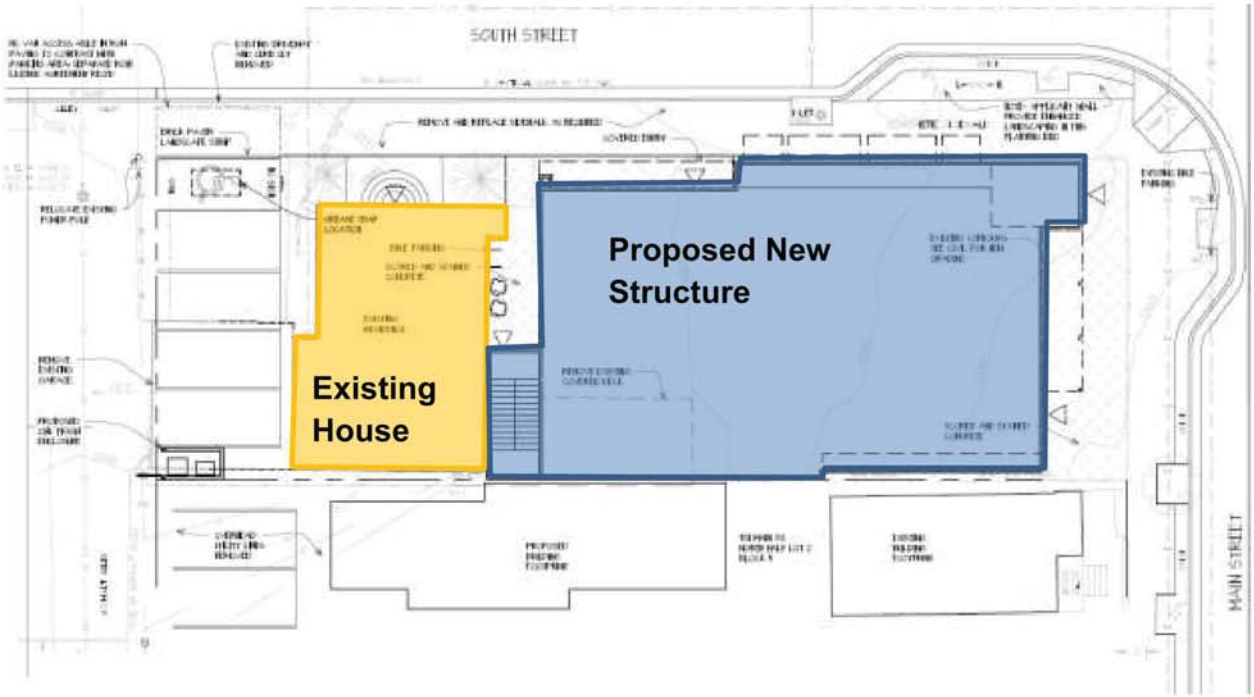
The existing parcel is a standard City double lot, measuring 50' in width by 150' in length, with a total area of 7,481 SF. The property has development on all sides:

North – South St, across which is the Louisville Historical Museum, zoned Residential Medium Density (RM)
South – zoned CC; contains a 1,000 SF retail building and was recently approved for a new 2-story building on the back half of the property
West – alley; adjacent to RM zoned properties fronting Lafarge Avenue
East – Main Street, across which is more commercial property zoned CC

PLANNED UNIT DEVELOPMENT

Site Plan

The proposed plan includes a new two story structure on the east, currently vacant portion of the lot, separated by a courtyard from the existing house. The existing house would be maintained for the most part, except the garage on the west side of the house would be removed.



Bulk and Dimension Standards

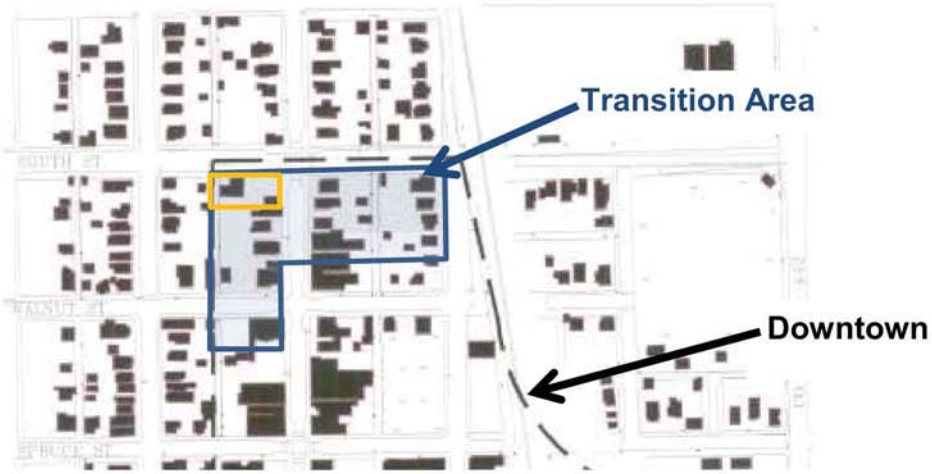
The following table shows the applicable yard, bulk and parking standards. The proposal is consistent with these standards except for parking. The applicant proposes to satisfy the parking standard by paying the City's current Parking Improvement Fee in lieu of providing the actual parking spaces.

Zoning Data	City Standards	Proposed
Commercial Floor Area	N/A	7,510 SF
Residential Floor Area	N/A	1,126 SF
Total		8,636 SF
Floor Area Ratio	1.3	1.15
Building Coverage	N/A	5,006 SF
Bldg. Cover %	N/A	67%
Residential Parking (2/unit)	2 Spaces	2 spaces
Office Parking (1/500SF, first 999 sf exempt)	9 Spaces	3 Spaces
Building Height	35'	35'
No. of Stories	2	2
Setbacks		
- Front Yard	0'	7'
- Side Yard – North	0'	1'
- Side Yard - South	0'	0'
- Rear Yard	20'	21'

As illustrated above, the proposal meets the requirements of the Louisville Municipal Code except for parking.

Floor Area and Height

The LMC establishes height requirements for Downtown Louisville. This property is located in the Transition Area of Downtown, as shown in the illustration below:



The Transition Area is designed to provide a buffer between commercial development and the existing residential area in the adjacent Old Town Neighborhood. The buffer zone requires a lower building height (two stories and 35' maximum in the Transition Area as opposed to three stories and 45'). The proposed building would be two stories, with a maximum height of 35 feet at the stair tower. The majority of the building would be less than 35 feet tall.

35' max height

The Downtown Framework Plan provides guidelines for floor area in Downtown. In the Transition area, the Plan recommends a maximum floor area ratio of 1.3. The proposed plan has a floor area of 8,636 SF and complies with this requirement.

Parking

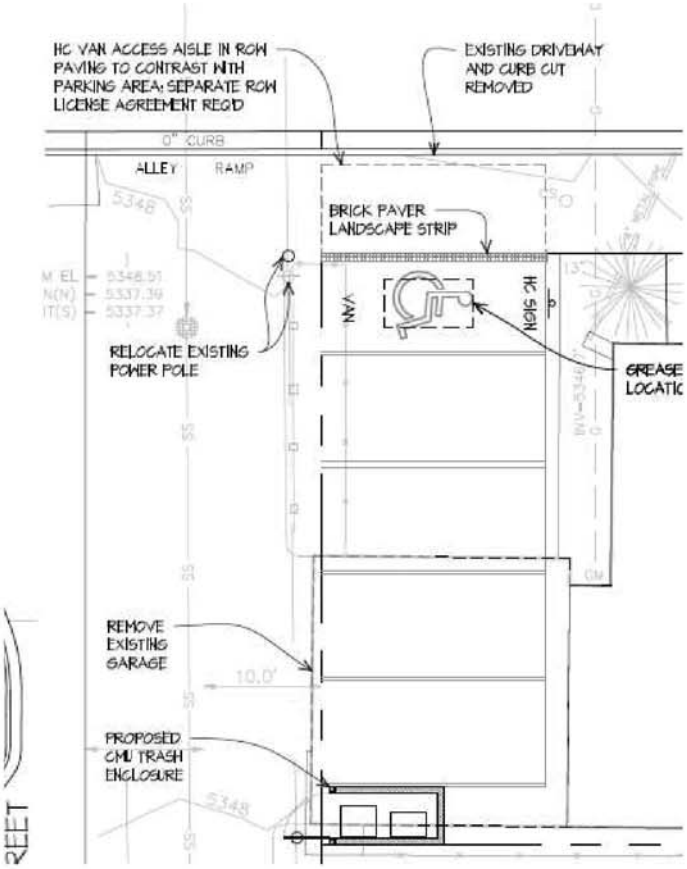
Section 17.20.025 of the LMC requires one parking space for every 500 square feet of leasable commercial area in Downtown, regardless of use. However, the first 999 square feet added to a property after 2002 are exempt. The proposal includes 5,700 square feet of leasable commercial space, resulting in a commercial parking requirement of nine spaces.

Section 17.20.025 also requires two parking spaces for every residential unit. The existing house has two off-street parking spaces, meaning it currently meets the requirements and the existing spaces need to be maintained.

Together, the parking requirement for the proposed development is 11 spaces. The applicant is proposing providing five spaces at the rear of the lot, accessed from the alley. By moving the access from South Street to the alley, the City would be able to add at least one on-street space to South Street, however this space does not count towards the development's parking requirements.

Under the International Building Code, the proposal is required to provide one handicap accessible parking space. The accessible space is proposed for the north end of the parking area, and the applicant is requesting to use a portion of the adjacent sidewalk for access. Vehicles using the space would park on the 824 South St property, but would, if necessary, utilize part of the sidewalk for getting in and out of the vehicle. The access area would be demarcated by different painting or paving on the sidewalk, and the use of the area would be secured through a license agreement with the City. A similar arrangement was allowed for the recently approved addition at 945 Front Street.

Staff is concerned about the use of the public right-of-way for access to the handicap space and, at Planning Commission, recommended one regular parking space be removed to accommodate the access on the property. This would eliminate the possibility of conflicts between pedestrians and vehicles using the space, and not require the use of public space to accommodate private development. This situation is different from 945 Front Street because there the access, while extending into the right-of-way, did not impact the sidewalk. The request for 824 South is to designate nearly the entire width of the sidewalk for access. At the Planning Commission hearing, the applicant proposed, and the Commission accepted, a compromise whereby the access would be moved onto the property and one parking space removed if the City determined the access interfered with the use of the sidewalk.



Section 17.20.025 of the LMC allows an applicant to satisfy the parking requirement in whole or in part by paying a parking improvement fee in lieu of providing the required parking spaces, which the applicant is proposing to do for the six spaces that are not provided. The current fee, set by Council Resolution each year along with other fees, is $3,600 per space, which would result in a total payment of $21,600 to the Downtown Parking Improvement Fund. If a space is removed at any time to provide the handicap access on the property, the proposal would then be deficient, and an additional $3,600, or whatever the fee is at that time, would be paid by the property owner.

Architecture

The Downtown Design Handbook provides guidance for all new construction proposed in Downtown Louisville and indicates buildings should use similar materials, scale and design as established in Downtown. Guideline G24 states, "A new design that draws upon the fundamental similarities among traditional buildings in the community without copying them is preferred. This will allow them to be seen as products of their own time yet compatible with their older neighbors." (Page 25, Downtown Design Handbook).

Sheet A3 of the PUD provides elevations of the proposed new commercial building and modified existing house. The new building is designed in a neo-traditional style, with a mix of gable and flat roof forms. The proposed building would be set back about seven feet from the Main Street right-of-way, and about one foot from the South Street right-of-way, with awnings extending over the property lines into the rights-of-way. If approved, the awning extensions will require a license agreement.

Section T1 of the Design Handbook states buildings in the Transition Area should maintain the general alignment of building fronts. The Handbook recommends front setbacks of 5-25 feet, except where the neighboring buildings have different front setbacks. In this case, the Museum, across the street to the north, and 927 Main, two properties to the south, both have no front setback, while 931 Main, immediately to the south, has a front setback of around five feet. Considering the context of the surrounding properties and the proposal for outdoor seating in front of the building, staff finds the proposed front setback is appropriate.

Section T3 states, "Maintain the pattern created by the even spacing of building side yards" and suggests a standard of five foot setbacks. Both 931 and 927 Main are less than two feet from their north property lines, but have three to five-foot setbacks on their south side. The proposed building at 824 South would be one foot or less from the south property line. Considering the setbacks at 931 and 927 Main, staff believes a setback of less than five feet is acceptable.

Section T4 states new construction should be similar in mass and scale to surrounding buildings. All of the other buildings along the east side of Main Street on this block are one story, as is the Museum across South Street. Both 931 and 927 Main have been approved for new, two-story structures constructed behind the existing one-story structures on Main Street.

Section T6 states the primary width of buildings along the street should be maintained, suggesting no primary façade should exceed 20-30 feet. The front façade is broken up into three segments: the main entrance at the northeast corner is about 10 feet wide, there is an overhang in the middle of the façade which is about 25 feet wide, and the south portion is set back further and is about 12 feet wide.

Section T8 states buildings should be primarily rectangular in form. The proposed building is mostly rectangular.

Section T9 states simple, traditional roof forms should be used, including "roofs composed of a combination of roof planes, but simple in form, are also encouraged." The proposed roof is predominately flat, with a false front along Main Street and a gabled portion along South Street. The adjacent buildings have either simple front gables or false fronts.

The proposed new building would include mostly windows on the first story, with painted composite siding and stucco on the second story and portions of the first. The building would include significant glazing, with aluminum-frame storefront windows on the first

floor and smaller windows on the second floor. The gabled portion of the roof would have asphalt shingles. There would be canvas awnings above the storefront windows with a metal mesh grid above the awnings for mounting signage.

Section G26 states awnings are encouraged. The proposed awnings fit the dimensions of the openings they are above.

Section G29 of the Design Handbook states buildings should use materials traditionally found in Downtown, including vertical and horizontal siding, shingles, and brick. The proposed composite siding would look like horizontal wood siding.

East Elevation

Section G32 states traditional roof materials should be used, including asphalt shingles in muted colors. The asphalt shingle roofs on surrounding buildings are either gray or brown.

Section G33 states windows should be of traditional size and relate to the pedestrian scale. Large storefront windows with knee walls are found in Downtown – although more often in the Core Area than the Transition Area – and are pedestrian friendly.

Section G35 states , "Upper stories, on a street facade, should appear less transparent than the first floor." The proposed second story complies.

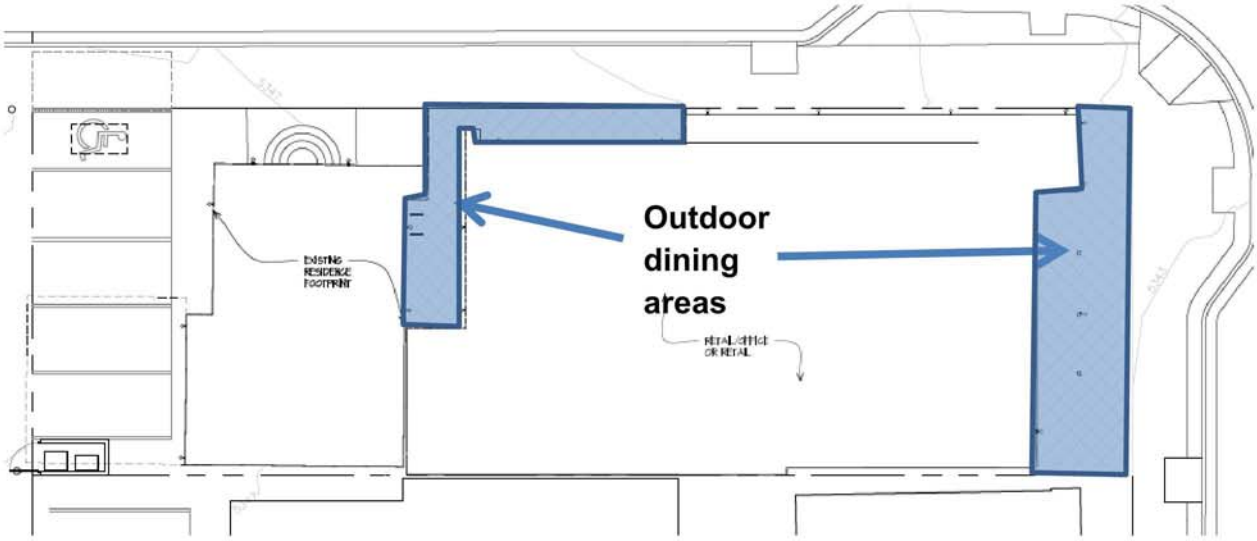
The existing one-story house would maintain its overall form and materials, except the garage on the west side of the house would be removed to comply with the rear setback requirement. The area in front of the house, and the adjacent interior courtyard, both include landscape amenities including trees, planting beds, and potted plants.

In summary, staff finds the proposal is compatible with the standards for the transition area of Downtown and the surrounding properties.

Utility Plan
The proposed utility plan complies with City requirements. All mechanical units would either be housed internally or screened from public view. A trash enclosure would be provided at the rear alley. There were a few remaining utility items that needed to be addressed at the time of the Planning Commission hearing that have since been resolved.

PUD Criteria
Section 17.28.120 of the Louisville Municipal Code lists criteria for Planned Unit Developments (PUDs) that must be satisfied or found not applicable for the PUD to be approved. Staff finds that all applicable criteria are met. The proposal meets all the requirements of the design guidelines and is designed to transition between the Downtown and Old Town areas.

SPECIAL REVIEW USE
Under the use table in Section 17.12.030 of the LMC, outdoor dining is allowed as a special review use in the CC zone district. The outdoor dining is proposed for the courtyard between the two buildings, and in front of the new building along Main Street. The portion of the outdoor dining area extending into the right-of-way would require a license agreement from the City.



Section 17.40.100 (A) of the LMC lists five criteria to be considered by City Council in reviewing a special review use application. The City Council is authorized to place conditions on their recommendation of approval, if they believe conditions are necessary to comply with the criteria listed below.

1. *That the proposed use/development is consistent in all respects with the spirit and intent of the comprehensive plan and of this chapter, and that it would not be contrary to the general welfare and economic prosperity of the city or the immediate neighborhood;*

The proposed outdoor dining would help any future restaurant use be more successful, contributing to the economic prosperity of Downtown. The Comprehensive Plan calls for pedestrian friendly uses in Downtown. Outdoor dining is consistent with a pedestrian friendly environment. **Staff finds this criterion is met.**

2. *That such use/development will lend economic stability, compatible with the character of any surrounding established areas;*

Most restaurants in Downtown have outdoor dining, and the outdoor dining would make a restaurant at the location more likely to be successful. **Staff finds this criterion is met.**

3. *That the use/development is adequate for the internal efficiency of the proposal, considering the functions of residents, recreation, public access, safety and such factors including storm drainage facilities, sewage and water facilities, grades, dust control and such other factors directly related to public health and convenience;*

As described above, the applicant is not meeting parking requirements by providing the required number of spaces, but instead proposes to pay the Parking Improvement Fee

in lieu, as permitted under the LMC. In addition, the parking that is provided requires the use of a portion of the sidewalk for handicap accessibility. Moving the vehicle access from South Street to the alley, however, improves safety and the pedestrian environment. Otherwise, the proposed development's site plan is designed consistent with the standards established in the Louisville Municipal Code and the Design Handbook for Downtown Louisville. **Staff finds this criterion is met.**

4. *That external effects of the proposal are controlled, considering compatibility of land use; movement or congestion of traffic; services, including arrangement of signs and lighting devices as to prevent the occurrence of nuisances; landscaping and other similar features to prevent the littering or accumulation of trash, together with other factors deemed to affect public health, welfare, safety and convenience;*

The proposed development, if approved, should not generate external impacts beyond what is allowed in the applicable regulations. The external effects of the proposal are controlled and the site plan as proposed provides appropriate vehicular / pedestrian circulation, adequate lighting, and appropriate drainage control. **Staff finds this criterion is met.**

5. *That an adequate amount and proper location of pedestrian walks, malls and landscaped spaces to prevent pedestrian use of vehicular ways and parking spaces and to separate pedestrian walks, malls and public transportation loading places from general vehicular circulation facilities.*

This development requested provides appropriate pedestrian walks and landscaped spaces and engages the City's public realm and limits the use of the parking area for pedestrian circulation. **Staff finds this criterion is met.**

FISCAL IMPACT:

The proposed development for 931 Main Street includes approximately 5,700 SF of office/retail space. The office/retail space is a use by right. This new office space, if approved, would introduce new jobs and employees into the local economy. The new retail space would generate additional sales tax revenue. Staff believes the overall fiscal impact would be positive.

HISTORIC PRESERVATION COMMISSION COMMENTS:

The Historic Preservation Commission reviewed the initial application at their October 19, 2015 meeting. The Historic Preservation Commission appreciated the retention of the historic structure and the courtyard separation between the existing structure and proposed building. The Commission had concerns about the scale and compatibility of the original proposal, which have been addressed with the revised plan.

PLANNING COMMISSION ACTION:

The Planning Commission reviewed this submittal at its July 14, 2016 public hearing. Following a discussion regarding the request, the Planning Commission voted to forward the request to City Council with a recommendation of approval by a 6 to 0 vote. Discussion focused on the parking and how best to accommodate the handicap space. At the hearing, the applicant proposed a modified condition regarding the space: "The access area for the handicap parking space shall be moved on to the property *if the City determines in the future that the access area unduly restricts the public sidewalk after the project is completed and in use.*" Planning Commission recommended approval with the modified condition. There was one public comment in favor of the proposal. The Commission determined the request complied with the applicable regulations and the proposal would be a benefit to Downtown and the City.

RECOMMENDATION:

Staff recommends City Council approve Resolution No. 43, Series 2016, approving a final Planned Unit Development (PUD) plan and special review use (SRU) to allow for the construction of a new building with 5,700 SF of commercial space, the remodel of the existing house, and outdoor sales at 824 South Street, Lot 1, Block 5, Louisville Old Town. The resolution recommending approval includes the following condition of approval:

1. The access area for the handicap parking space shall be moved on to the property if the City, at its sole discretion, determines in the future that the access area unduly restricts the public sidewalk after the project is completed and in use or determines an alternative use of the right of way is desired. The property owner shall be responsible for all costs associated with relocation of the parking space, include restoration of the public right-of-way and payment of the parking fee-in-lieu that is in place at the time the determination to relocate the parking space is made.

ATTACHMENT(S):

1. Resolution No. 43, Series 2016
2. Application documents
3. Final PUD
4. July 14, 2016 Planning Commission Minutes
5. Presentation