City Council

Study Session Agenda

March 29, 2016
Library Conference Room
951 Spruce Street
7:00 PM

Note: The time frames assigned to agenda items are estimates for guidance only. Agenda items may be heard earlier or later than the listed time slot.

7:00 p.m.	**I.**	Call to Order
7:00 p.m. - 8:30 p.m.	**II.**	Discussion – South Boulder Road Small Area Plan
8:30 p.m. – 8:35 p.m.	**III.**	City Manager's Report & Advanced Agenda
8:35 – 8:40 p.m.	**IV.**	Identification of Future Agenda Items
8:40 p.m.	**V.**	Adjourn

SUBJECT: **DISCUSSION OF DRAFT SOUTH BOULDER ROAD SMALL AREA PLAN**

DATE: **MARCH 29, 2016**

PRESENTED BY: **SCOTT ROBINSON, PLANNER II**

SUMMARY:
Attached is the draft South Boulder Road small area plan. The South Boulder Road small area plan is intended to define desired community character, land uses, and public infrastructure priorities to provide a reliable roadmap for public and private investments in the corridor. Staff is requesting City Council discuss the document before it is brought for public hearing at the April 5 regular meeting.

The creation of the plan followed a robust public process, as described in the plan. Also attached are results of that process, including the community survey report, results from the last public workshop in November, 2015, and the detailed traffic impact analysis.

FISCAL IMPACT:
The projected development under the plan was analyzed with the City's new fiscal model. The projected development numbers are:

Existing Development in Study Area		
Retail	352,729	Square feet
Office	178,608	Square feet
Residential	407	Units
Employees	1,682	People
Residents	569	People

Projected 20 year Increase over Existing		
Retail	26,931	Square feet
Office	374,298	Square feet
Residential	546	Units
Employees	1,658	People
Residents	724	People

The projected fiscal impacts from the model are:

20 Year Cumulative Fiscal Impact	
Revenue by Fund	
General Fund	$34,171,000
Urban Revitalization District Fund	$4,461,000
Open Space & Parks Fund	$6,117,000
Lottery Fund	$0
Historic Preservation Fund	$2,166,000
Capital Pojects Fund	$20,081,000
TOTAL REVENUE	$66,966,000
Expenditures by Fund	
General Fund	$28,303,000
Urban Revitalization District Fund	$0
Open Space & Parks Fund	$923,000
Lottery Fund	$0
Historic Preservation Fund	$0
Capital Projects Fund	$25,033,000
TOTAL EXPENDITURES	$54,259,000
Net Fiscal Result by Fund	
General Fund	$5,868,000
Urban Revitalization District Fund	$4,461,000
Open Space & Parks Fund	$5,193,000
Lottery Fund	$0
Historic Preservation Fund	$2,166,000
Capital Projects Fund	($4,952,000)
NET FISCAL IMPACT	$12,736,000

In summary, the assumptions used in the model are:

Residential Low Density		
	Persons/Unit	2.57
	Market Value	$600,000
	Construction Value	$300,000
	Household Income	$132,000
	Spent on Taxable Items	35%
	Taxable Sales in City	40%
	Trips	6.76
	Adjustment Factor	50%

Residential Medium Density		
	Persons/Unit	1.26
	Market Value	$450,000
	Construction Value	$225,000
	Household Income	$99,000
	Spent on Taxable Items	35%
	Taxable Sales in City	40%
	Trips	4.13
	Adjustment Factor	50%
Residential High Density		
	Persons/Unit	1.38
	Market Value	$350,000
	Construction Value	$175,000
	Household Income	$77,000
	Spent on Taxable Items	35%
	Taxable Sales in City	40%
	Trips	4.68
	Adjustment Factor	50%
BCHA Townhomes		
	Persons/Unit	1.26
	Market Value	$0
	Construction Value	$0
	Household Income	$50,000
	Spent on Taxable Items	38%
	Taxable Sales in City	40%
	Trips	3.44
	Adjustment Factor	50%
BCHA Apartments		
	Persons/Unit	1.38
	Market Value	$0
	Construction Value	$0
	Household Income	$46,000
	Spent on Taxable Items	38%
	Taxable Sales in City	40%
	Trips	3.44
	Adjustment Factor	50%
Retail <25k SF		
	Employees/1000 SF	3.33
	Market Value/SF	$272
	Construction Value/SF	$194
	Sales per SF	$300
	Trips	110.32
	Adjustment Factor	28%

Retail 25k-50k SF		
	Employees/1000 SF	2.86
	Market Value/SF	$259
	Construction Value/SF	$185
	Sales per SF	$300
	Trips	85.56
	Adjustment Factor	31%
Retail >50k SF		
	Employees/1000 SF	2.50
	Market Value/SF	$245
	Construction Value/SF	$175
	Sales per SF	$300
	Trips	67.91
	Adjustment Factor	30%
Office <25k SF		
	Employees/1000 SF	4.13
	Market Value/SF	$272
	Construction Value/SF	$194
	Sales per SF	$0
	Trips	18.31
	Adjustment Factor	50%
Office 25k-50k SF		
	Employees/1000 SF	3.88
	Market Value/SF	$259
	Construction Value/SF	$185
	Sales per SF	$0
	Trips	15.50
	Adjustment Factor	50%
Office >50k SF		
	Employees/1000 SF	3.63
	Market Value/SF	$245
	Construction Value/SF	$175
	Sales per SF	$0
	Trips	13.13
	Adjustment Factor	50%

The model assumes the residential development will build out over the first three years, and the commercial over 10 years. The 2013 Comprehensive Plan update calls for positive fiscal impacts from the South Boulder Road area, and staff believes this plan satisfies that requirement. The Adjustment Factor is related to trip generation and, in short, prevents double counting of trips.

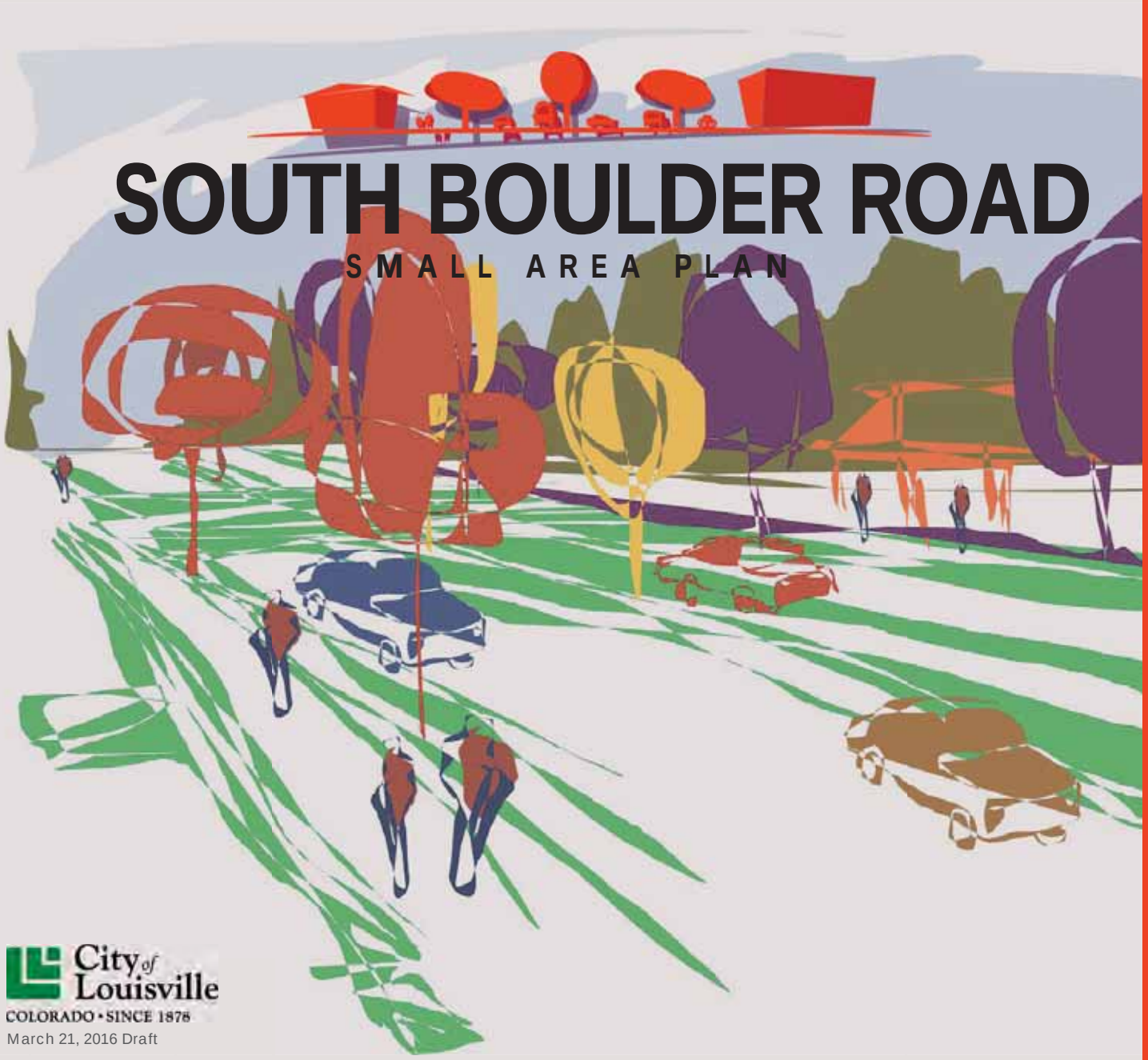
PLANNING COMMISSION ACTION:
Planning Commission reviewed the draft plan at their February 11, 2016 and March 10, 2016 meetings. The minutes from those meetings are attached. In general, Planning Commission was in favor of the plan and only asked that some additional information and clarification be provided at the second meeting. Public comments at the meeting were generally positive and focused on technical matters.

RECOMMENDATION:
Staff recommends City Council discuss the draft South Boulder Road small area plan before it is brought for public hearing to the April 5, 2016 City Council meeting.

ATTACHMENT(S):
1. Draft South Boulder Road small area plan
2. Community survey report
3. Materials from November 2015 placemaking workshop
4. Traffic impact study
5. Public comments
6. Planning Commission minutes
7. Presentation

SOUTH BOULDER ROAD

SMALL AREA PLAN



City of Louisville
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March 21, 2016 Draft

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ACKNOWLEDGEMENTS

City Council

Robert P. Muckle, Mayor
Jeff Lipton, Mayor Pro Tem, Ward 2
Jay Keany, Ward 1
Chris Leh, Ward 1
Susan Loo, Ward 2
Dennis Maloney, Ward 3
Ashley Stolzmann, Ward 3

Planning Commission

Chris Pritchard, Chair
Cary Tengler, Vice-chair
Steve Brauneis
David Hsu
Jeff Moline
Ann O'Connell
Tom Rice

City Boards and Commissions

Business Retention & Development Committee
Open Space Advisory Board
Parks & Public Landscaping Advisory Board
Revitalization Commission

Planning & Building Safety Department

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mySidewalk
National Research Center
ArtHouse Design

South Boulder Road Walkability Audit

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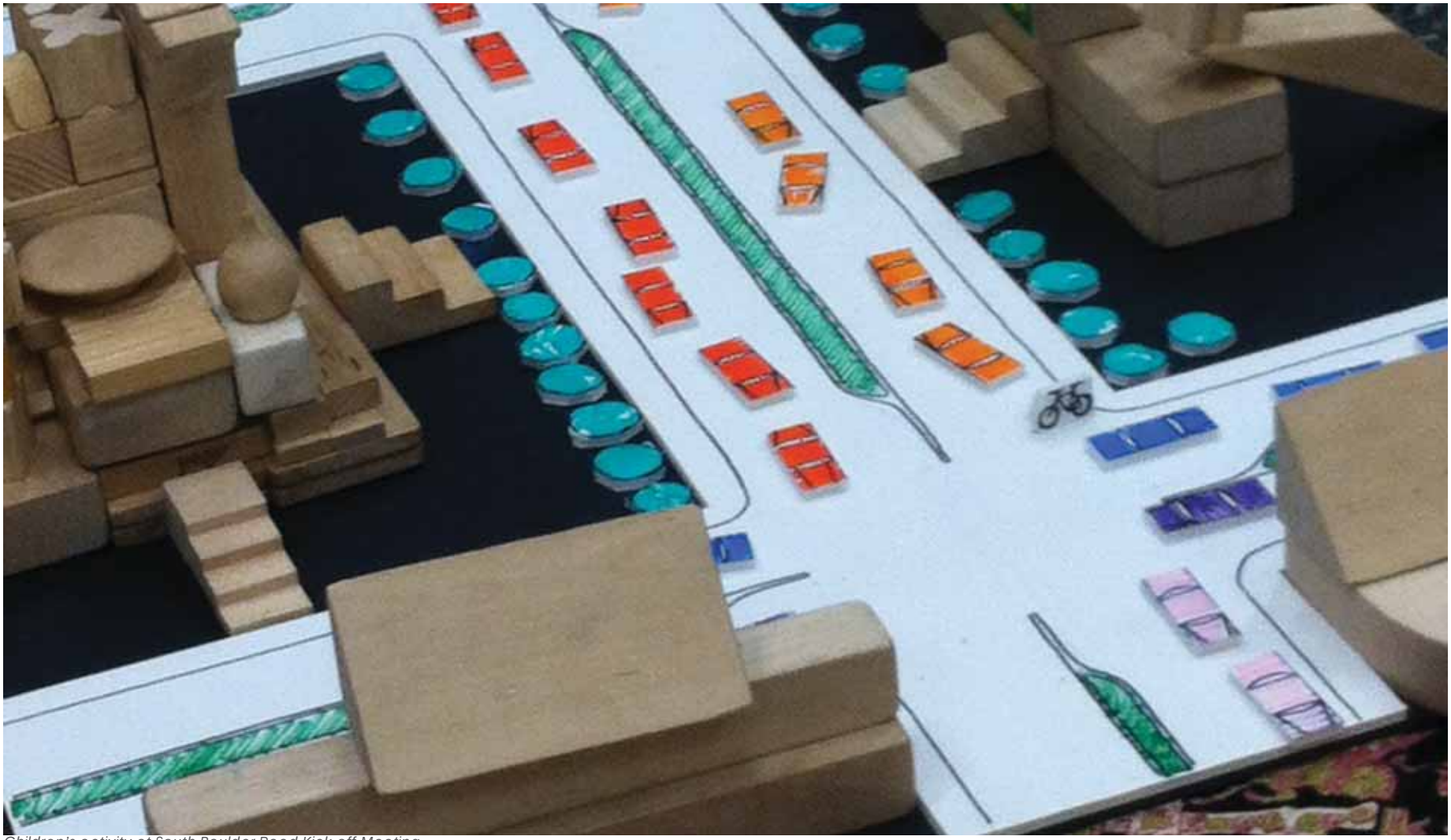


Children's activity at South Boulder Road Kick-off Meeting

The South Boulder Road area of Louisville began being annexed into the City in the late 1970s. Development occurred intermittently and by the time the 2013 Comprehensive Plan update was adopted, the area ranged from undeveloped greenfield sites to sites undergoing redevelopment. Given this diversity, the Comprehensive Plan called for a more in-depth look at how the South Boulder Road area should continue to evolve.

Purpose

The South Boulder Road small area plan is intended to define desired community character, land uses, and public infrastructure priorities to provide a reliable roadmap for public and private investments in the corridor. As an extension of the Comprehensive Plan, the small area plan is a policy document and not a regulatory document. However, the plan will serve as the basis for updated design guidelines, any potential zoning changes, capital improvement project requests, and public dedication requirements from private developers. The South Boulder Road small area plan translates the broad policies of the Comprehensive Plan into the specific actions and regulations that will achieve those policies. The 2013 Comprehensive Plan update had two key purposes:

1. Better meet today's unique challenges of redevelopment versus new development, regional traffic and City transportation policy, the economy and the realities of retail growth, and neighborhood issues and concerns

2. Better clarify the Community's vision in terms of community character and physical design to provide the public and staff with a common language and tools to review and discuss redevelopment requests

The Comprehensive Plan created a framework to address these purposes through changes in land use, design, and infrastructure. The South Boulder Road small area plan takes that framework a step further by setting guidelines for how design and land use regulations should be changed and identifying what infrastructure is needed. The final step, following this plan, will be to draft and adopt the new regulations and build the new infrastructure, through a combination of the City's capital improvement program and private investment.

How to use this plan

The South Boulder Road small area plan defines the community's vision for the corridor to guide future public and private investment. The document is divided into five sections

1. The Process describes the public involvement and community outreach effort used to generate the small area plan

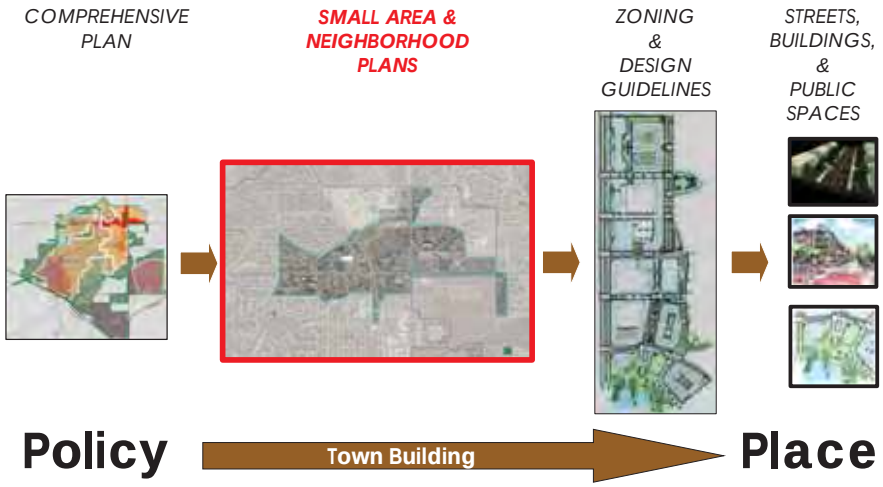
2. The Context describes the current conditions in the study area and key trends and challenges facing the corridor

3. The Principles describe the general goals for the plan, referred to as the Measures of Success, and the broad design principles to guide future action in the corridor

4. The Plan includes maps and illustrations describing the desired land uses, building character, and street, trail, and park improvements in the study area

5. Implementation describes steps to be taken to achieve the goals of the plan, and includes cost estimates for the anticipated public improvements

The South Boulder Road small area plan is a policy document. In order to achieve the community's vision for the corridor described in the plan, regulatory changes will need to be adopted to the Louisville Municipal Code, including the incorporation of new design guidelines for the area. The plan does, however, provide the basis for the City to require private property owners to build or dedicate some public infrastructure or land when properties develop or redevelop. Other public investments will need to be made by the City through the annual capital budgeting process.



South Boulder Road Kick-off Meeting

The South Boulder Road small area plan was developed through a five-step process and involved extensive input from residents, both within the corridor and throughout the community, property owners, business owners, and elected and appointed officials.

Step 1 – Set Goals

Goals, represented by the Measures of Success (see page 17), were needed to guide the development of the plan. This began with stakeholder interviews in December, 2013, with residents, property owners, and business owners in and around the corridor. They discussed their views on the study area and how they would like to see it evolve. Questions were also posted on the City's discussion website, EnvisionLouisvilleCO.com, allowing anyone in the community to provide early input.

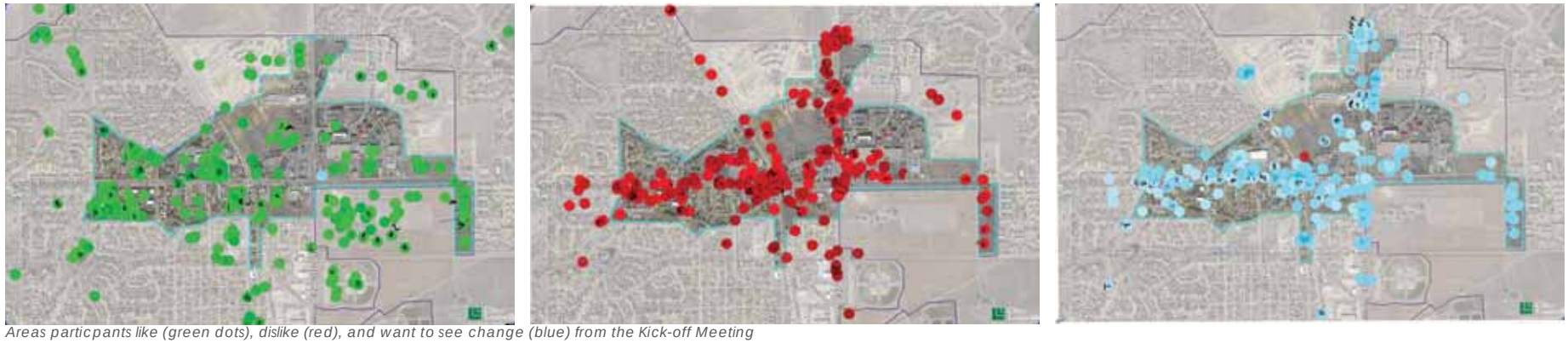
A public Kick-off Meeting was held in October, 2014. Over 120 people attended the meeting. Participants were asked to identify areas they liked, disliked, and wanted to see change. They also discussed how they would like to use the corridor in the future and how the Core Community Values from the Comprehensive Plan could be incorporated into the area. This input was used to develop a Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis (see page 13) and the Measures of Success, which were endorsed by Planning Commission and City Council.

Step 2 – Corridor Analysis

The current built environment of the corridor was analyzed, including the existing regulations and how people currently use the corridor. A corridor character assessment was conducted, as was a buildout analysis estimating how much development the existing zoning would allow. Members of the public participated in a Walkability Audit to identify areas where pedestrian and bicycle facilities could be improved.

A Placemaking Workshop was held where participants could brainstorm ideas for solving the problems identified in the Walkability Audit.

Community members participating in the South Boulder Road Walkability Audit



Areas particpants like (green dots), dislike (red), and want to see change (blue) from the Kick-off Meeting

Ideas for improving the Main and Centennial intersections from Placemaking Workshop #1

Proposed development at Louisville Plaza from Placemaking Workshop #2

Attendees reviewed the major intersections in the corridor and the corridor as a whole, identifying opportunities where connections could be enhanced. The City also conducted a mail and internet survey of 1,200 randomly selected homes throughout the community to received input on the desired land uses and physical character for the corridor.

Step 3 – Development of Alternatives

Three alternative development scenarios were created based on the community's desires for the corridor. A second Placemaking Workshop was held in February, 2015, where participants were asked how they would like to see example sites develop or redevelop in the future. Attendees identified desired land uses and selected sample photos showing the types of buildings and park spaces they would prefer to see on the sites.

The results of this meeting and all the previous public input and analysis were used to develop outlines for three varying development alternatives. Each alternative indicated future allowed land uses and development intensities throughout the corridor. Planning Commission and City Council reviewed and refined the alternatives before endorsing them.

Step 4 – Review of Alternatives

The alternatives were analyzed and the results presented to the public for review. For each alternative, a maximum potential buildout, including employee and population projections, was calculated. These data were used to generate a fiscal impact analysis. Potential transportation improvements were also identified, and the buildout data were used to run traffic analyses.

Drawings showing possible building size, location, and character were created for various sites in the corridor. This information was presented to the public at a third Placemaking Workshop in November, 2015, where attendees were asked to identify the character elements, transportation improvements, and buildout scenarios they preferred.

Step 5 – Creation of Preferred Alternative

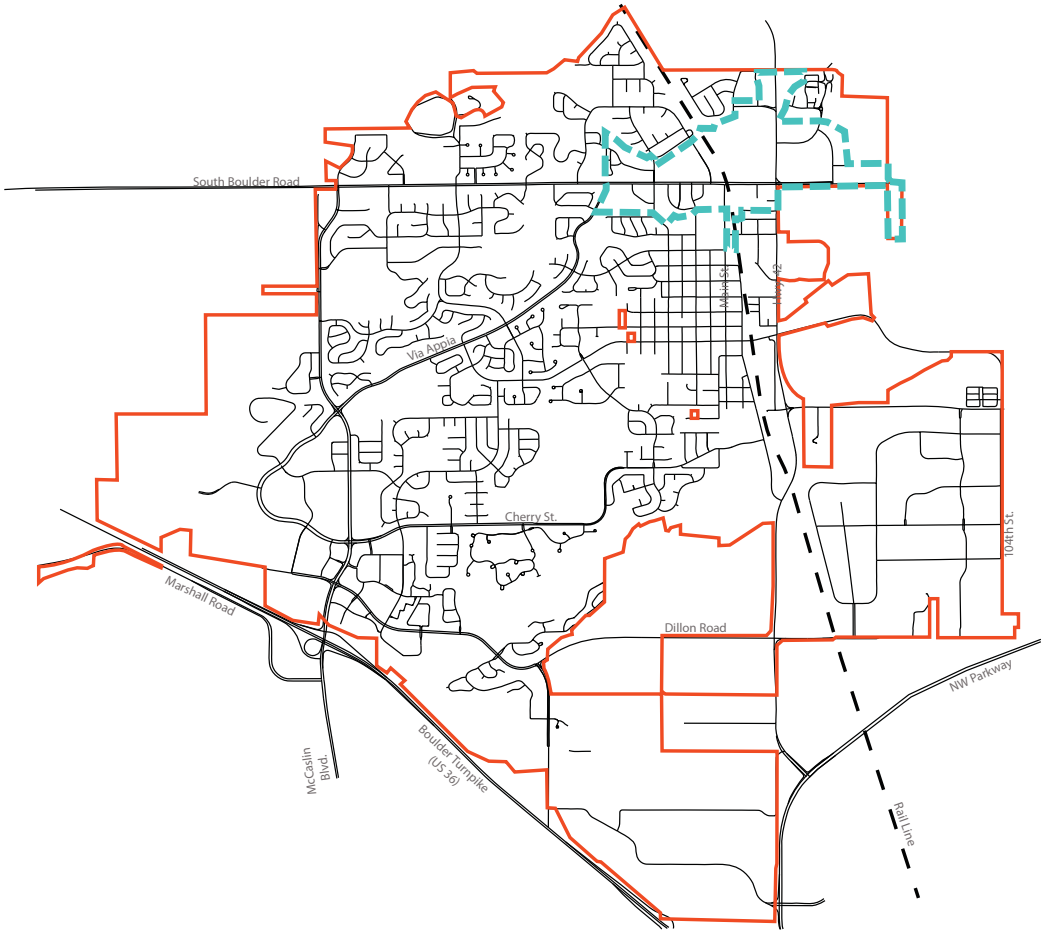
All the input gathered in the previous steps was used to develop a preferred alternative to

serve as the basis for the plan. Input from the third public workshop was utilized to determine favored elements of each alternative to be incorporated into the preferred alternative. Details of the preferred alternative, whcih serves as the basis for this plan, were then developed for analysis.

Staff estimated the maximum amount of development the preferred alternative could generate and analyzed the expected transportation and fiscal impacts. The preferred alternative was also evaluated against the Measures of Success defined in Step 1. The preferred alternative was documented in the draft plan presented to Planning Commission and City Council at public hearings. The South Boulder Road small area plan was adopted by City Council on XX, 2016.

Community comments on the draft roadway improvements plan from Placemaking Workshop #3

City-wide Context



Study Area

The study area for the South Boulder Road small area plan is in the northeast portion of Louisville, stretching along South Boulder Road from Via Appia to the west to the City limit with Lafayette to the east. The study area includes areas on both sides of South Boulder Road, and extends north along Highway 42/96th Street to the City limit at Paschal Drive.

History

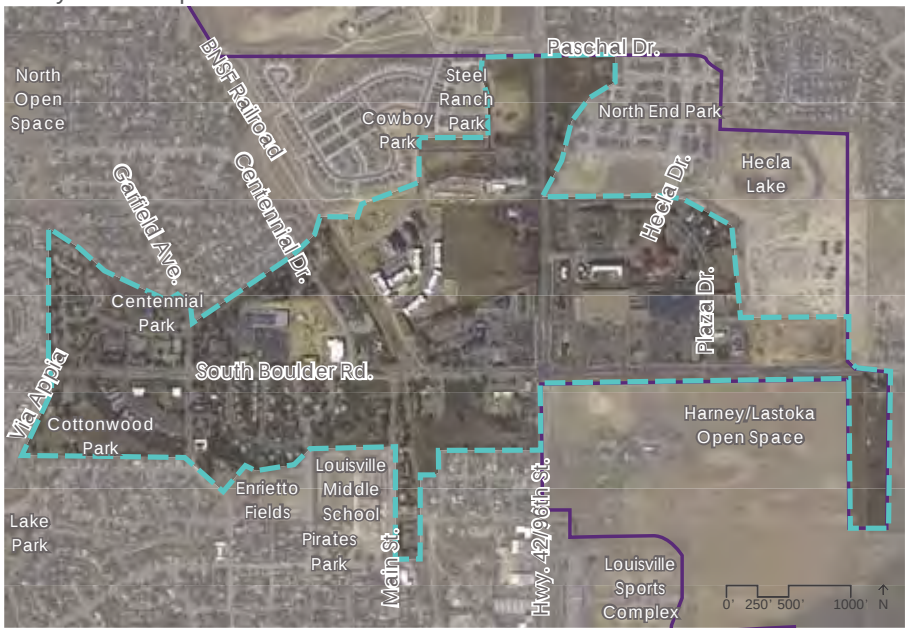
With a modest beginning as a narrow dirt road connecting small mining towns and farms, South Boulder Road follows the township and range system laid out in the early 1860s across Boulder County. South Boulder Road is just outside of the area which Louis Nawatny platted in 1878 for the small mining town of Louisville. The Hecla Mine, north of South Boulder Road, was the setting of the Louisville area's struggle for labor rights during the Long Strike from 1910-1914. Both Louisville and the South Boulder Road area experienced minimal change until after World War II and the closing of the last Louisville area mine in 1955.

In 1962 Louisville reached a population of 2,500. Increasing ease of commute to new employment opportunities led to the first significant population increases in Louisville since the 1910s. The Scenic Heights neighborhood, the first residential subdivision along South Boulder Road, developed in the 1960s to meet the need for more housing. Residential development along the corridor continued to diversify throughout latter part of 20th century, including apartment complexes, affordable housing, a mobile home park and senior living. This residential growth continues today in the northern part of the Louisville.

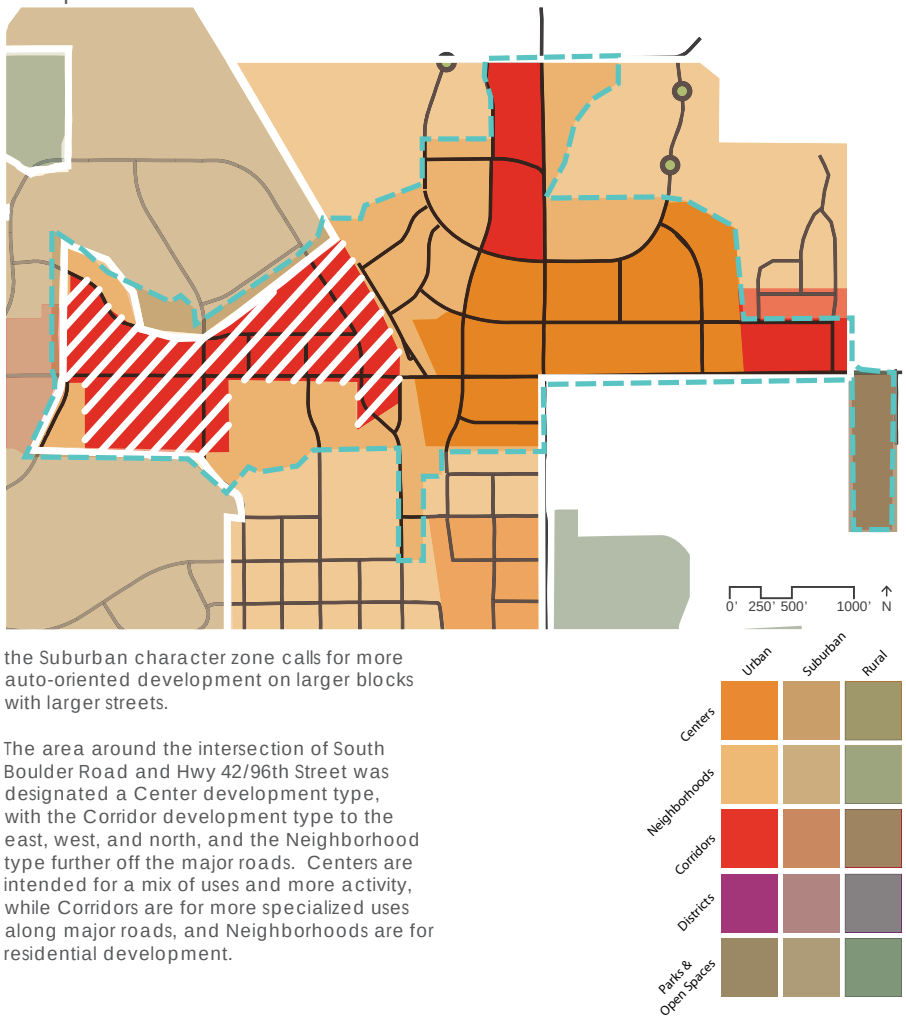
The commercial development along South Boulder Road began with the Wagon Wheel Inn, the building known today as Union Jack's Liquor Store, at the intersection with

CONTEXT

Study Area Map



Comprehensive Plan Framework



Highway 42. From the 1940s until the 1970s, this prominent restaurant brought people throughout the area to Louisville. The Village Square Shopping Center, constructed in the late 1970s, offered shopping to new residents on the north side of the Louisville. Large-scale commercial development continued with Louisville Plaza and Christopher Plaza.

Emphasis on commercial growth along McCaslin Boulevard and South Boulder Road was representative of Louisville's growing economy and contributed to the preservation of historic buildings within the commercial core of Old Town. Both residential and commercial development throughout the area has thrived as Louisville achieved national recognition for being one of the best places to live.

2013 Comprehensive Plan update

The 2013 Comprehensive Plan update divided the City into three character zones and five development types. Most of the South Boulder Road area is in the Urban character zone, except for the western portion of South Boulder Road, which was left undetermined between Urban and Suburban. The final designation was to be decided by this small area plan process. The Urban character zone calls for smaller blocks, more connected streets, and a more pedestrian friendly environment, while the Suburban character zone calls for more auto-oriented development on larger blocks with larger streets.

The area around the intersection of South Boulder Road and Hwy 42/96th Street was designated a Center development type, with the Corridor development type to the east, west, and north, and the Neighborhood type further off the major roads. Centers are intended for a mix of uses and more activity, while Corridors are for more specialized uses along major roads, and Neighborhoods are for residential development.

Character Photos

Figure Ground

Existing Conditions

Character

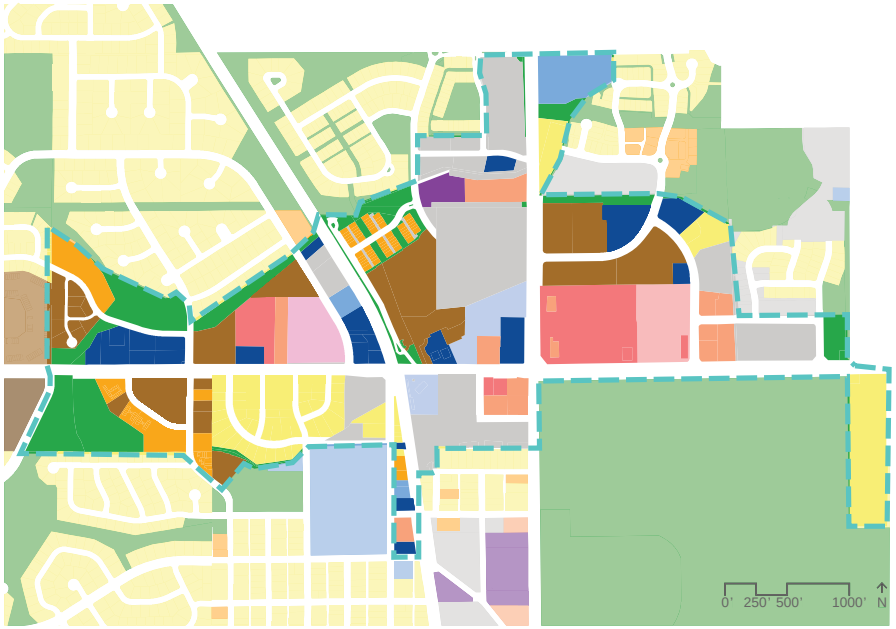
South Boulder Road provides a good cross section of development in Louisville since it was primarily developed in the late 1970's and early 1980's. The corridor contains a mix of land uses: single family residential, multi-family residential, office, neighborhood commercial and big box retail. Building setbacks range from 20 feet to 120 feet from the street with a "sea of parking" located between the building and the road. Because of these large setbacks most businesses have large monument signs, lending to the auto-centric focus of the corridor.

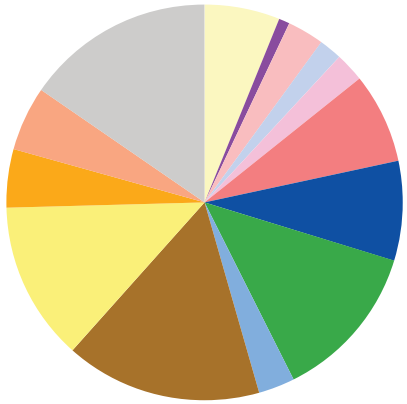
Architecture in this corridor ranges from 1960's ranch (residential), to 1980's stucco and masonry (commercial), to 1990's brick and glass block. Commercial building forms are relatively square with flat roofs and parapets used to hide rooftop mechanical units. The buildings are articulated with large aluminum frame windows, post and lintel awnings with metal roof coverings used to engage the public realm. New commercial development in the corridor is governed by the Commercial Development Design Standards and Guidelines, adopted by the City in 1997.

Pedestrian movement in the corridor is on attached and detached sidewalks that vary from 4 to 6 feet in width. Tree lawns are placed sporadically through the corridor and bicycle movement is in the right-of-way with designated bike lanes.

CONTEXT

Land Use





Land Use

Agricultural	6.15%
Entertainment	0%
Hotel	0%
Industrial	0.88%
Large Format Retail	2.98%
Mixed Use Commercial	1.87%
Mixed Use Residential	2.37%
Mobile Home	0%
Multi-Tenant Retail	7.37%
Office	8.14%
Open Space/ Park	12.84%
Public Service/ Institutional	2.98%
Residential High Density	16.01%
Residential Low Density	12.98%
Residential Medium Density	4.77%
Single Tenant Retail	5.27%
Stand Alone Restaurant	0%
Vacant	15.39%

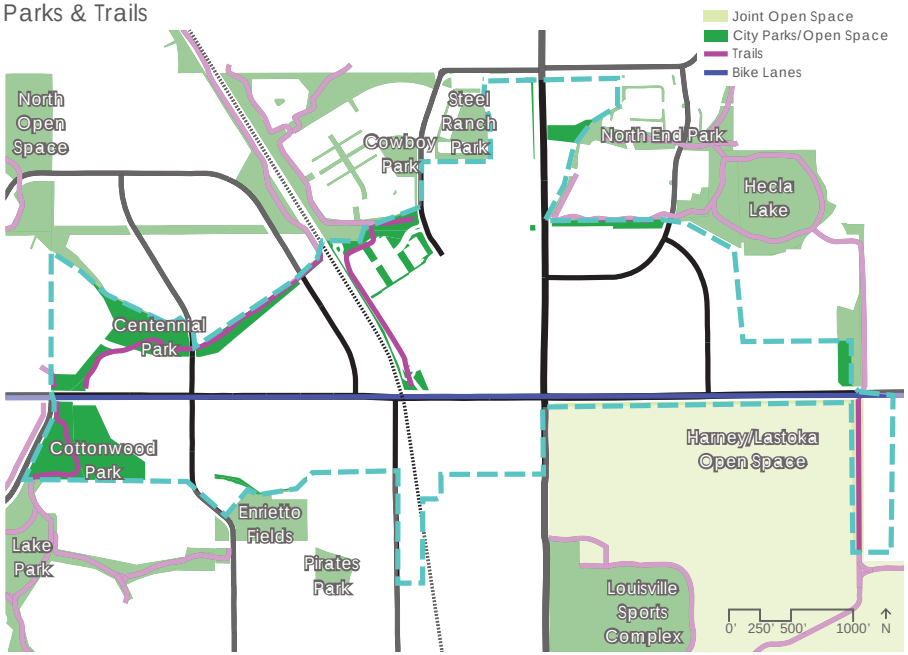
Development

There is a broad mix of uses in the South Boulder Road study area, including a variety of commercial and residential types of use. Taking all types together, commercial and residential uses each make up about 30 percent of the land in the corridor. Most of the land immediately outside the study area is residential development, providing support for the businesses in the corridor. Much of the vacant land in the corridor has development planned or under construction at the time of the small area plan's adoption.

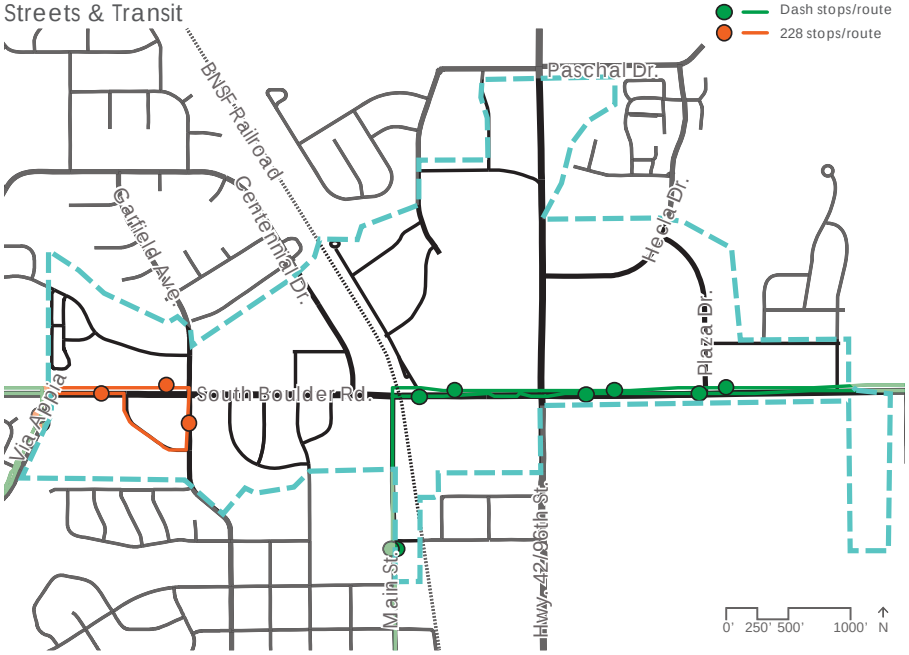
City Utilities

The City provides water, sanitary sewer, and storm sewer in the study area. According to the Public Works Department, the utility infrastructure has the capacity to serve future growth in the area. The sanitary sewer along South Boulder Road and several storm sewer pipes crossing under South Boulder Road are in need of rehabilitation or replacement.

Parks & Trails



Streets & Transit



Parks and Open Space

The study area is fairly well served by parks and open space around the periphery of the corridor, but lacks significant public green space in the core of the area. The nearby amenities range from protected agriculture and open fields to playgrounds and sports facilities, but there is not a central civic gathering space. The recent acquisition of additional land adjacent to Cottonwood Park provides an opportunity to further enhance the park offerings in the corridor.

Pedestrian and Bike Facilities

There are several trails leading into the study area, but few of them connect through the area. The planned underpasses at the BNSF railroad and Hwy 42/96th Street north of South Boulder Road will improve connectivity, but crossing South Boulder Road itself remains difficult. The bike lanes along South Boulder Road have made bike travel easier, but many of the sidewalks in the area are narrow and close to the street, creating an unpleasant walking environment. Connections from sidewalks and trails to destinations in the corridor are often inadequate.

Streets

South Boulder Road and Hwy 42/96th Street are the major roads in the study area, each carrying on average 20,000 to 25,000 cars per day. The street network in the area is not fully connected, but the planned extensions of Hecla Drive, Kaylix Drive, and Front Street (see page 22) will improve connectivity. The Highway 42 Gateway plan, adopted in 2013, includes several modifications to the street to improve operations and safety, which will be completed as funding allows.

Transit

The study area is served by two RTD bus routes: the 228 and the Dash. The 228 serves the west end of the study area, connecting to McCaslin Blvd, Flatirons Crossing mall, and the Broomfield Park'n'Ride, with 30 minute intervals during peak hours, and 60 minute intervals off-peak. The Dash serves the length of the corridor along South Boulder Road, connecting to Downtown Louisville, Lafayette, and Boulder, with 15 minute intervals during peak hours and 30 minute intervals off-peak.

CONTEXT

Redevelopment Pressure

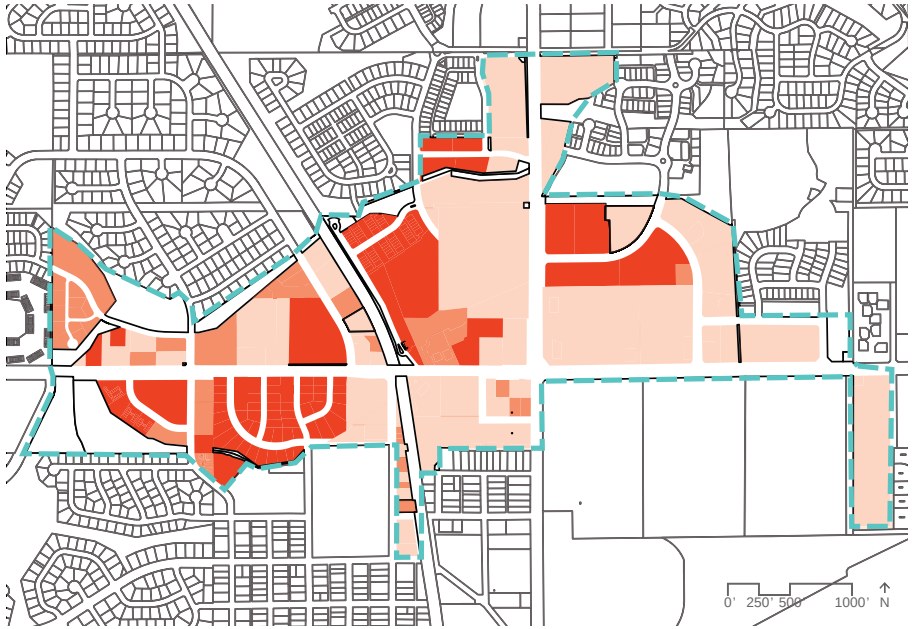
Property Values

The ratio of a property's structure value to total value is one indicator of how likely the property is to redevelop. While many other factors will be considered before a property owner redevelops a property, a low ratio of structure value to property value indicates the property is not being used to its fullest potential. By this measure, there are many stable properties at the core of the study area, but several properties elsewhere in the corridor are potential candidates for redevelopment.

Ratio of structure value to total property value

- More than 0.5 (Little to no pressure)
- 0.4 to 0.5 (Some pressure)
- 0.3 to 0.4 (Moderate pressure)
- Less than 0.3 (Significant pressure)

Development Potential



Existing Zoning

The zoning for a property sets limits for how much can be built on a property based on the allowed building height and lot coverage. The ratio of existing square footage to allowed maximum square footage is another indicator of which properties may redevelop, where additional development is more likely on properties with a low ratio. Several commercial properties in the center of the study area could see additional development under the existing zoning, while many of the residential properties are near their maximum allowed buildout.

Ratio of existing development to maximum potential buildout

- Less than 0.5
- 0.5 to 0.9
- More than 0.9

Remaining potential development in the corridor:

Residential: 645 units
Office: 1,254,406 square feet
Retail: 145,382 square feet

SWOT Analysis

	Positive	Negative
Internal	**Strengths** • Parks and open space near corridor • Physcial form of the corridor (parcel sizes and rights-of-way) • Proximity to existing neighborhooods	**Weaknesses** • Pedestrian and bike connections are lacking, uninviting, and perceived as unsafe • Conformity to community values • Aesthetic appearance of corridor • Connections to adjacent neighborhoods
External	**Opportunities** • Corridor as transportation link • Shops, businesses, and services on corridor • Valuable mix of uses on corridor	**Threats** • Impact of the market and regional competition on existing and desired land uses • Traffic • Train noise and impacts • Lack of community consensus on purpose of corridor • Upkeep of existing buildings

SWOT Analysis

A strengths, weaknesses, opportunities, and threats (SWOT) analysis categorizes characteristics of the study area based on their value and the amount of control the City has over them. Strengths and weaknesses are positives and negatives of the area that are under the direct control of the City. Opportunities and threats are positives and negatives that may be influenced by the City, but are outside the City's direct control.

The above SWOT analysis was compiled based on comments from the public collected at stakeholder interviews, public meetings, and through EnvisionLouisvilleCO.com. The analysis was endorsed by Planning Commission and City Council during the goal setting phase of the project to help identify project principles and measures of success and guide the creation of the plan.

Survey Preferences

Community Survey

The City mailed out a community survey in November, 2014, the results of which were returned in February, 2015. The survey was mailed to 1,200 randomly selected residents, of whom 380 returned the completed survey. The survey included questions about how respondents currently use the corridor and how they would like to use it in the future, as well as which land uses they felt were lacking or over-represented. The survey also included a visual preference portion, providing respondents with photos showing options for different types of buildings, parks, and rights of way, and asking them to rate how appropriate each element was for the study area.

The survey respondents indicated a preference for more senior and affordable housing, but not much residential development otherwise. Respondents also wanted more restaurants and community shops, public gathering spaces, and shared work spaces in mixed-use environments. Pedestrian-friendly buildings of one to three stories were the most desired in the visual preference questions. The most preferred photos are shown above.

Project Principles and Measures of Success

The overall goal of the South Boulder Road small area plan project, based on direction from the Comprehensive Plan and City Council, is to create a land use and infrastructure plan that conforms to Louisville's character and is supported by the community. To that end, the plan must support the core community values identified in the Comprehensive Plan. Based on community input, the four values in which the South Boulder Road area is deficient and most needs improvement are as follows:

- Integrated open space and trail networks
- Our livable small town feel
- A sense of community
- A balanced transportation system

To address these deficiencies the following six project principles were adopted, with associated measures of success for each. The principles and measures of success were endorsed by Planning Commission and City Council early in the planning process and served as guides for the development and evaluation of the alternative scenarios. The preferred alternative adopted as the basis for this plan best satisfied these principles and measures of success.

Principle 1 - Provide for safer and more convenient connections across South Boulder Road and Highway 42 for bikes and pedestrians.
- a) Provide safe and convenient facilities that serve a broad range of users with multiple modes of travel
  - i) Are all modes of travel accommodated?
  - ii) Are users of all ages and ability levels accommodated?
  - iii) Do the improvements proposed provide safer conditions for all users and ability levels?
  - iv) Are existing deficiencies addressed?
- b) Design solutions that the City can realistically maintain over time
- c) Promote regional trail connectivity within the study area

Principle 2 - Utilize policy and design to encourage desired uses to locate in the corridor.
- a) Do allowed uses serve community needs as defined in the survey and elsewhere?
- b) Are allowed uses supported by the market?
  - i) To what extent are incentives needed to induce identified uses to locate in the study area?
- c) Does the land use mix demonstrate positive fiscal benefits?
- d) Is the process for approving desired uses and desired character simpler and more predictable?

Principle 3 - Establish design regulations to ensure development closely reflects the community's vision for the corridor while accommodating creativity in design.
- a) Physical form should incorporate desires expressed in community survey and elsewhere
- b) Allow flexibility to respond to changes in market requirements, design trends, and creativity in design

Principle 4 - Mitigate impacts of trains and improve safety of railroad crossings.
- a) Address train noise
- b) Address traffic impacts from train

Principle 5 - Balance the regional traffic needs of South Boulder Road and Highway 42 with the community's desire for safety and accessibility.
- a) Accommodate future regional transportation plans and maintain the area as a regional corridor
  - i) How does the corridor alternative adequately address future transportation needs?
  - ii) How does the corridor alternative accommodate adopted regional transit plans?
- b) Make sure traffic passing through the corridor does not make it an undesirable place to live, work, play, and travel
  - i) Does traffic noise decrease?
  - ii) Do pedestrians and bicyclists feel safe?
  - iii) How long will a trip take on the corridor?
- c) Provide safe and efficient access and visibility in strategic locations for proposed land uses

Principle 6 - Provide for community gathering spaces and public infrastructure to encourage visitors to spend time in the corridor.
- a) Provide for community amenities identified in survey and elsewhere
- b) Provide programming to activate public spaces

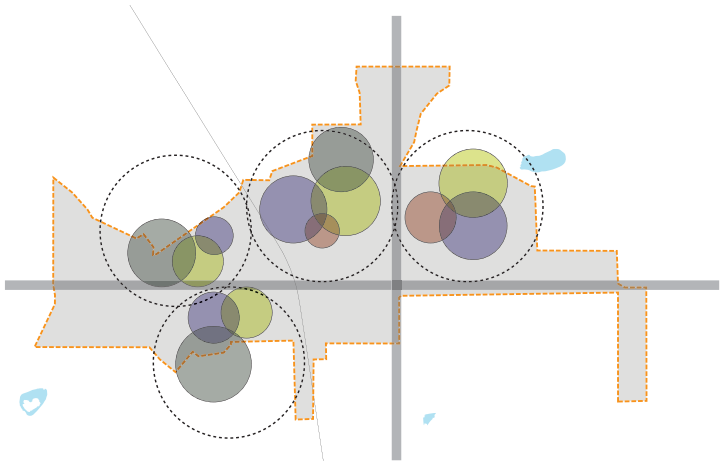
Community Design Principles and Placemaking Concepts

The Project Principles and Measures of Success, along with additional public input and analysis, led to the development of the community design principles and placemaking concepts described on the following pages. While the above section directed the outcome of the plan, the following section provides general guidelines for development in the corridor. The community design principles provide general goals for public and private investment in the corridor, while the placemaking concepts call for more specific items to be included in new development. Both the principles and concepts will be incorporated into new design standards and guidelines to be developed after adoption of this plan.

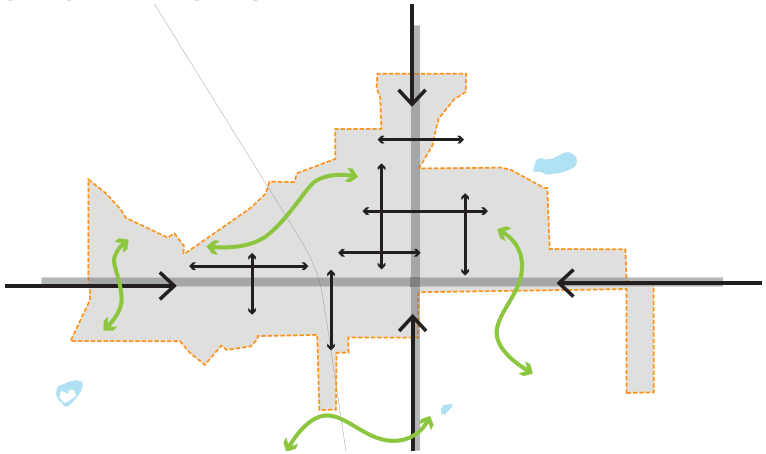
PRINCIPLES

Community Design Principles

Places to go and places to stay



Easy to get to, easy to get around



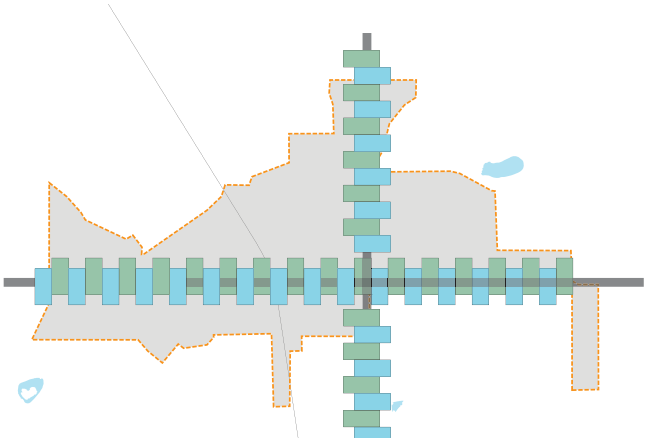
Places to go and places to stay

- Public spaces that encourage gathering and interaction
- A range of retail and entertainment uses that encourage longer visits
- Small parks and plazas that increase the appeal and experience of daily activities

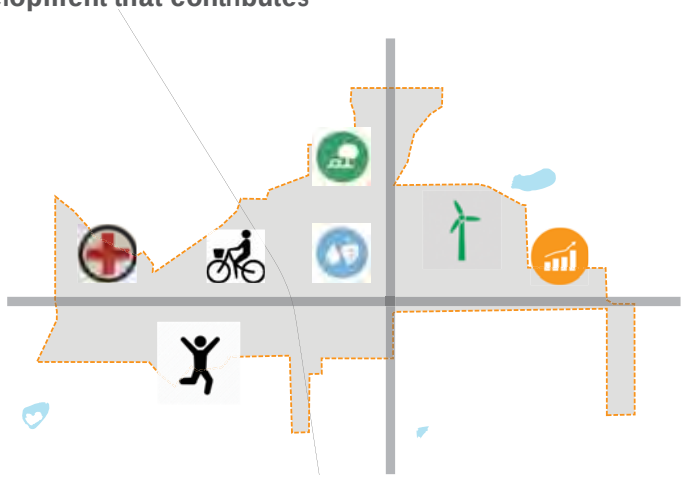
Easy to get to, easy to get around

- Safe trail connections to all quadrants
- Properties connected with driveways and walks
- A street network that offers balanced choices to move around
- Opportunities to “park once and walk”

Knitting the community together



Development that contributes



Knitting the community together

- Sidewalks and plazas facing onto South Boulder Road
- Safe intersections for people to cross South Boulder Road and Hwy 42/96th Street
- Traffic flow and speed that is not detrimental to businesses or people along the corridor
- A continuous and connected high quality pedestrian experience

Development that contributes

- Uses that provide services for the community and are fiscally positive
- Building designs that add to the character of the corridor
- Greenspaces, trails, and semi-public gathering spaces

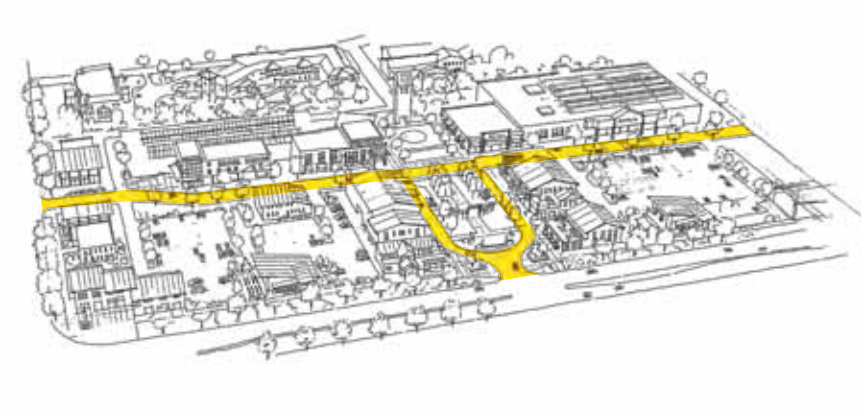
PRINCIPLES

Placemaking Concepts

Parking Rooms

Parking rooms – smaller, comfortable, high-performing places to park your car once and walk from place to place

Transitional Streets



Transitional streets – streets that fill the gap between busy and quiet

Pedestrian Refuges

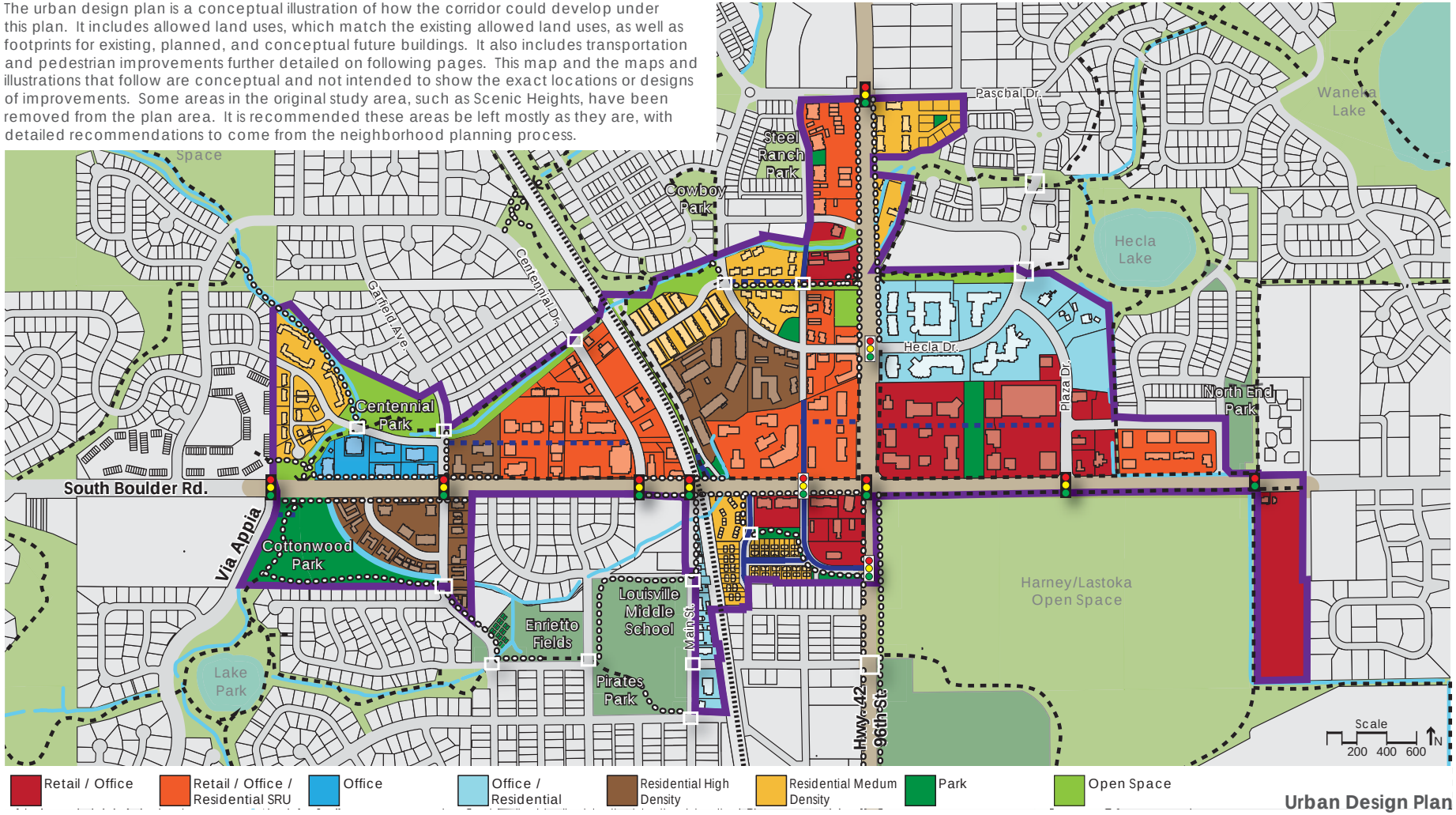
Pedestrian refuges – small, comfortable places along the corridor enhance the pedestrian experience

Views into the Community

Views into the community – perpendicular streets and spaces that showcase the community

Louisville Plaza Concept Illustrative

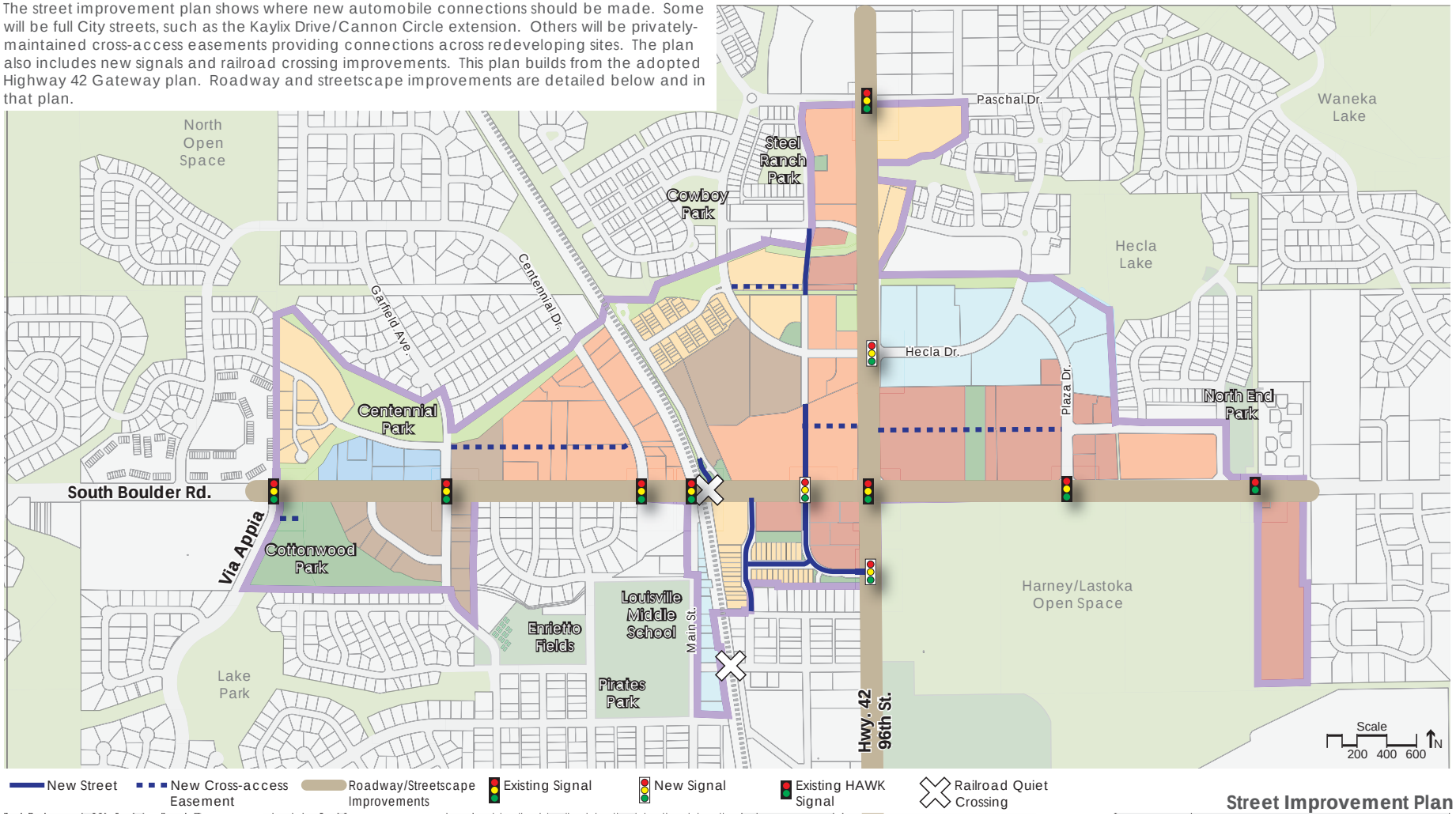
The urban design plan is a conceptual illustration of how the corridor could develop under this plan. It includes allowed land uses, which match the existing allowed land uses, as well as footprints for existing, planned, and conceptual future buildings. It also includes transportation and pedestrian improvements further detailed on following pages. This map and the maps and illustrations that follow are conceptual and not intended to show the exact locations or designs of improvements. Some areas in the original study area, such as Scenic Heights, have been removed from the plan area. It is recommended these areas be left mostly as they are, with detailed recommendations to come from the neighborhood planning process.



Urban Design Plan

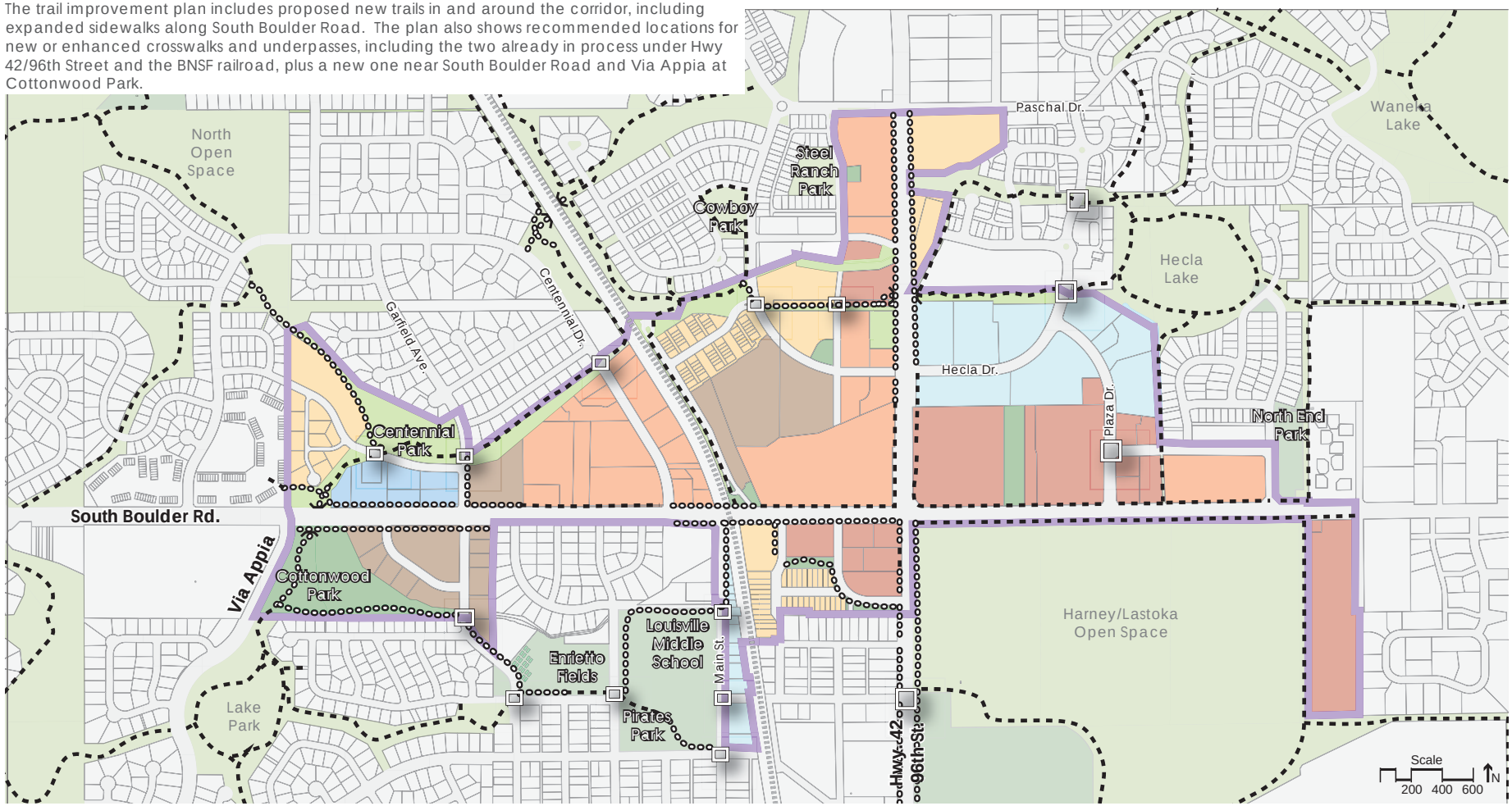
THE PLAN

The street improvement plan shows where new automobile connections should be made. Some will be full City streets, such as the Kaylix Drive/Cannon Circle extension. Others will be privately-maintained cross-access easements providing connections across redeveloping sites. The plan also includes new signals and railroad crossing improvements. This plan builds from the adopted Highway 42 Gateway plan. Roadway and streetscape improvements are detailed below and in that plan.



Street Improvement Plan

The trail improvement plan includes proposed new trails in and around the corridor, including expanded sidewalks along South Boulder Road. The plan also shows recommended locations for new or enhanced crosswalks and underpasses, including the two already in process under Hwy 42/96th Street and the BNSF railroad, plus a new one near South Boulder Road and Via Appia at Cottonwood Park.



Trails Improvement Plan

Roadway Improvements

Roadway Improvements

The roadway improvements map provides an illustration of the transportation and trail improvements. More specifically, this plan calls for modifications to South Boulder Road described by intersection in the table to the right. These improvements will in some places help traffic function more efficiently or provide additional vehicular access, and in others will increase pedestrian safety and accessibility without significant detrimental impacts on traffic operations.

Highway 42/96th Street should be modified in accordance with the adopted Highway 42 Gateway plan. In addition, as properties develop and redevelop, pedestrian connections from streets and sidewalks to destinations inside developments must be provided.

Transit

As the corridor develops, two transit improvements are desired. First is the 96th Street bus route described in the Highway 42 Gateway plan. Second is the extension of the 228 bus route, from its current turnaround at Cottonwood, further east toward Highway 42/96th Street. The Dash route, which already serves most of the South Boulder Road corridor, should be periodically evaluated to ensure it is providing adequate service as development occurs. The City should continue to work with RTD to implement these enhancements.

South Boulder Road Traffic Improvements by Intersection	
Via Appia	Build underpass under South Boulder Road and eliminate north-south crosswalk. Adjust signal timing to eliminate walk phase. Move Cottonwood Park entrance 150 feet east, extend westbound left-turn storage 150 feet east.
Cottonwood Drive	Close median in South Boulder Road.
Garfield Avenue	Introduce protected left-turn signal. Eliminate eastbound acceleration and deceleration lanes. Shift roadway to accomodate offset left-turn lanes.
Longs Peak Drive	Convert to 3/4 movement, eliminating lefts onto South Boulder Road.
Jefferson Avenue	Close north-south through movement. Allow left turns onto Jefferson from South Boulder Road.
Centennial Drive	Remove on-street parking on Centennial Drive to extend right-turn queue.
Main Street	Add pedestrian island at eastbound right-turn lane on South Boulder Road and improve geometrics of northbound Main Street right turn. Modify westbound South Boulder Road left-turn lane to create offset configuration and provide pedestrian refuge.
Steel Street	Allow southbound movement on Steel Street and right turn onto South Boulder Road. Extend offset left median on South Boulder Road to prevent new southbound Steel Street traffic from making a left onto Main Street.
Front Street	Convert to 3/4 movement, eliminating lefts onto South Boulder Road. Remove right-turn lane.
Cannon Circle/Kaylix Drive	Option 1 - Close westbound left-turn movement from South Boulder Road. Option 2 - Install new signal. Allow full movement except westbound left turn from South Boulder Road.
Hwy 42/96th Street	Extend eastbound and westbound left-turn lane storage on South Boulder Road.
Louisville Plaza Entrance	Reduce eastbound left-turn lane storage on South Boulder Road. Remove continuous acceleration/deceleration lane on westbound South Boulder Road.
Plaza Drive	Introduce protected left-turn signal on South Boulder Road. Remove continuous acceleration/deceleration lane on westbound South Boulder Road.
Blue Star Lane	Allow un-signalized full movement. Remove continuous acceleration/deceleration lane on westbound South Boulder Road.

Parks and Open Space

The expansion of Cottonwood Park is an opportunity to provide a significant benefit to the surrounding area. The City should use a robust public process to identify what the community would like to see in the park as it is redesigned. This plan recommends the existing driveway entrance to the park be moved east to improve operations on South Boulder Road. A new driveway from Via Appia should also be investigated. This plan also recommends improved trail connections to the east to the Enrietto Ballfields and to the north, via an underpass under South Boulder Road.

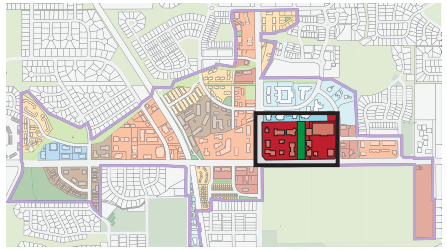
The plan also recommends a new green space and public plaza on the Louisville Plaza site. The space can be acquired either through dedication or easement if and when the shopping center redevelops. The public space should provide connections to South Boulder Road and the Balfour development to the north.

Finally, the City should evaluate the purchase of the Santilli property, at the southeast corner of the study area, for public land when the property becomes available.

Village Square Concept Illustrative

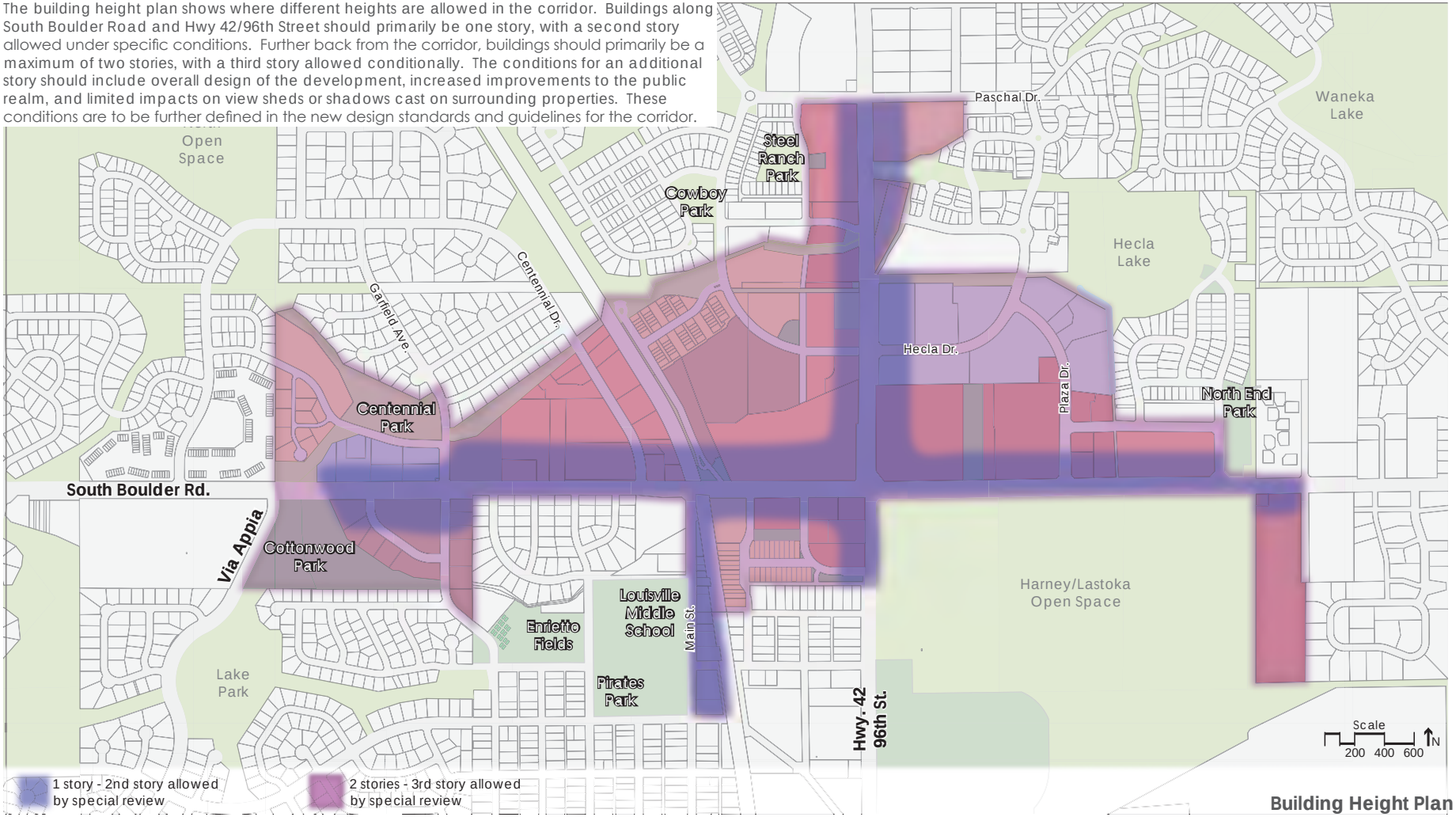
Urban Design Elements

Louisville Plaza Concept Illustrative



THE PLAN

The building height plan shows where different heights are allowed in the corridor. Buildings along South Boulder Road and Hwy 42/96th Street should primarily be one story, with a second story allowed under specific conditions. Further back from the corridor, buildings should primarily be a maximum of two stories, with a third story allowed conditionally. The conditions for an additional story should include overall design of the development, increased improvements to the public realm, and limited impacts on view sheds or shadows cast on surrounding properties. These conditions are to be further defined in the new design standards and guidelines for the corridor.



Building Height Plan

Development Impact

This plan does not change allowed land uses in the corridor, but it does affect the amount of development allowed. The tables below show what development is currently in the study area and how much more development could occur under this plan at full buildout. This is a reduction from what the existing zoning allows at the time of adoption, mostly because of the decreased height allowances.

Existing Development in Study Area		
Retail	352,729	Square feet
Office	178,608	Square feet
Residential	407	Units
Employees	1,682	People
Residents	569	People

Projected 20 year Increase over Existing		
Retail	26,931	Square feet
Office	374,298	Square feet
Residential	546	Units
Employees	1,658	People
Residents	724	People

Fiscal Impact

The table below shows the projected 20 year cumulative fiscal impact based on the projected maximum buildout and the City's 2015 fiscal model. As required by the 2013 Comprehensive Plan update, the area will have a positive fiscal impact.

20 Year Cumulative Fiscal Impact	
Revenue by Fund	
General Fund	$34,171,000
Urban Revitalization District Fund	$4,461,000
Open Space & Parks Fund	$6,117,000
Lottery Fund	$0
Historic Preservation Fund	$2,166,000
Capital Pojects Fund	$20,081,000
TOTAL REVENUE	$66,966,000
Expenditures by Fund	
General Fund	$28,303,000
Urban Revitalization District Fund	$0
Open Space & Parks Fund	$923,000
Lottery Fund	$0
Historic Preservation Fund	$0
Capital Projects Fund	$25,033,000
TOTAL EXPENDITURES	$54,259,000
Net Fiscal Result by Fund	
General Fund	$5,868,000
Urban Revitalization District Fund	$4,461,000
Open Space & Parks Fund	$5,193,000
Lottery Fund	$0
Historic Preservation Fund	$2,166,000
Capital Projects Fund	($4,952,000)
NET FISCAL IMPACT	$12,736,000

Schools Impact

The South Boulder Road corridor includes portions of the attendance areas of two elementary schools, one middle school, and one high school. The table below shows the projected peak enrollment for each of the schools as provided by Boulder Valley School District. This plan does not increase the amount of residential allowed in the study area, so increases in enrollment come from previously approved or entitled residential development under the existing zoning.

BVSD Schools		
	Peak Projected Enrollment	Percent of Capacity Filled
Coal Creek Elementary	438	78%
Louisville Elementary	655	101%
Louisville Middle	676	98%
Monarch High	1,832	100%

Traffic Impact

The table below summarizes traffic impacts by using the amount of time it would take a car to travel the length of the South Boulder Road corridor during the morning and evening rush hours. By optimizing signal timing, current travel times can be reduced and much of the impact from buildout and regional traffic increases can be mitigated. Adding an additional signal at Kaylix Drive/Cannon Circle and South Boulder Road would allow for increased access to developments and provide a parallel north-south connection to Hwy 42/96th Street, but would also slow travel through the corridor.

South Boulder Road Corridor		
Average Corridor Travel Time		
	Eastbound	Westbound
Existing Network		
AM Peak	3 min 17 sec	3 min 0 sec
PM Peak	3 min 38 sec	3 min 0 sec
Existing Optimized		
AM Peak	2 min 53 sec	2 min 33 sec
PM Peak	3 min 8 sec	3 min 0 sec
Buildout		
AM Peak (w/Kaylix)	3 min 38 sec	3 min 17 sec
PM Peak (w/Kaylix)	4 min 19 sec	4 min 4 sec
AM Peak (w/o Kaylix)	3 min 27 sec	3 min 38 sec
PM Peak (w/o Kaylix)	3 min 50 sec	3 min 50 sec

South Boulder Road Placemaking Workshop #2

The South Boulder Road small area plan does not call for any rezoning or changes in allowed uses in the study area. The major recommendations of the plan will be implemented through the adoption of new design standards and guidelines for the corridor. The design elements highlighted in the Plan section will serve as the basis for the new guidelines, which will need to be adopted by Planning Commission and City Council. The new design standards and guidelines will ensure future private development in the corridor complies with the community's vision and this plan. Funding for this will come from the City's annual operating budget.

Public improvements in the corridor will be implemented either by City funding, contributions from private developers, or a combination. The City's annual capital improvement program budgeting process provides an opportunity for the City to fund and construct infrastructure. The capital improvements listed in the table below are recommended for inclusion in upcoming budgets to help meet the goals of the plan. The timeline is intended to guide requests as funding and opportunity allows.

Some public infrastructure may be built and paid for by private property owners in conjunction with development of their property. The City may require such improvements if the need for them is identified in an adopted plan, such as this one. Some of the capital improvements identified in this plan and listed below can be required from private development projects, and some may be funded or built jointly by the developer and the City.

Infrastructure design, whether built by the City or by private developers, is governed by the Public Works Department's construction standards. The construction standards control the design of streets, sidewalks, and public utilities. The standards will need to be updated along with the design standards and guidelines so public infrastructure conforms to the principles of this plan.

The plan also calls for additional public spaces, including plazas, parks, and open space. The expanded Cottonwood Park will require a future public process to determine the community's desires for the park, then funded through the capital budgeting process. The Louisville Plaza public space should be acquired when and if the shopping center redevelops. The Santilli property should be evaluated by the Open Space Advisory Board and purchased if determined appropriate when it becomes available.

Cost Estimates

Cost estimates in the table below use broad ranges because the improvements have not been designed yet and to account for changing construction costs. Estimates are categorized as follows:

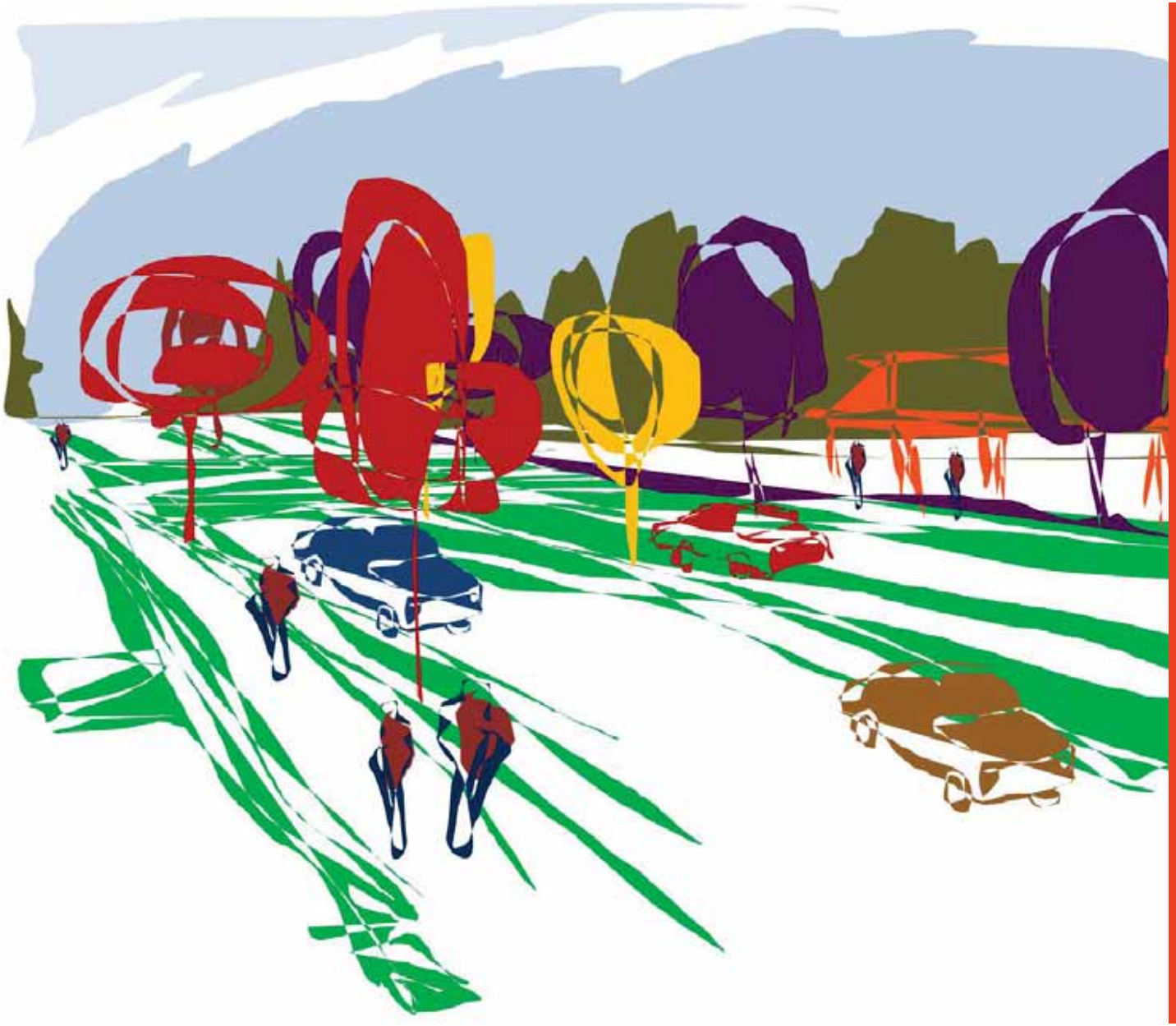
$	Less than $100,000
$$	Between $100,000 and $500,000
$$$	Between $500,000 and $1 million
$$$$	More than $1 million

Recommended Public Improvements

Project	Description	Opinion of Probable Cost	Schedule		
			1-5 Years	6-10 Years	11-20 Years
PLANNING (Operating Budget)					
South Boulder Road Design Guidelines	New design standards and guidelines for the study area based on this plan	$	•		
Cottonwood Park Master Plan	Public process to determine the future of the expanded Cottonwood Park	$		•	
DESIGN AND CONSTRUCTION (Capital Budget)					
Parks and Public Spaces					
Cottonwood Park	Improvements to Cottonwood Park based on Master Plan	$$$$		•	
Louisville Plaza Public Space	Public plaza and green space in the Louisivlle Plaza development				•
Santilli Property	Possible purchase of Santilli property for open space	$$$$			•
Pedestrian and Bicycle Underpasses					
Hwy 42/96th Street	Underpass connecting North End and Kestrel between Hecla Drive and Summit View	$$$$	•		
BNSF/Bullhead Gulch	Underpass connecting North Louisville and Steel Ranch	$$$$	•		
South Boulder Road/Cottonwood Park	Underpass connecting Cottonwood Park and Centennial Park	$$$$			•

Recommended Public Improvements					
Project	Description	Opinion of Probable Cost	Schedule		
			1-5 Years	6-10 Years	11-20 Years
Trails					
Kestrel	Trail between Steel Ranch and Hwy 42/96th Street underpass	$	•		
Centennial Park to North Open Space	Trail along Goodhue Ditch	$$		•	
Enrietto Fields and LMS Connections	Connect Enrietto Ballfields and Louisville Middle School to existing and future trails	$		•	
LMS and Main Street North	Trail from LMS to South Boulder Road along Main Street	$		•	
LMS South	Trail from LMS and Pirate Park to Main Street	$			•
Hwy 42/96th Street Northeast	Trail along east side of Hwy 42/96th Street north of South Boulder Road	$$		•	
Hwy 42/96th Street Northwest	Trail along west side of Hwy 42/96th Street north of South Boulder Road	$$	•		
Hwy 42/96th Street Southeast	Trail along east side of Hwy 42/96th Street south of South Boulder Road	$$		•	
Hwy 42/96th Street Southwest	Trail along west side of Hwy 42/96th Street south of South Boulder Road	$$		•	
South Boulder Road North-Central	Trail along north side of South Boulder Road between Centennial Drive and Steel Street	$		•	
South Boulder Road South-Central	Trail along south side of South Boulder Road between Centennial Drive and BNSF railroad	$$		•	
South Boulder Road Northwest	Trail along north side of South Boulder Road between Via Appia and Village Square	$$		•	
South Boulder Road Southwest	Trail along south side of South Boulder Road between Via Appia and Garfield	$$		•	
Coal Creek Station	Trails along and through Coal Creek Station development	$	•		
Roadways (Public)					
Kaylix Drive North	Extension between Kestrel development and Summit View Drive	$$		•	
Kaylix Drive South	Extension between Kestrel development and South Boulder Road	$$		•	
Steel Street	Conversion to two-way traffic	$			•
Cottonwood Park Access Drive	New access drive off of Via Appia	$		•	
Pedestrian Crossings/Traffic Calming					
Davidson Trail	Crossings at Regal, Garfield, and Centennial	$		•	
Kestrel and North End Trail	Crossings at West Hecla and Kaylix	$	•		
Plaza Drive and Hecla Way	Crosswalks and intersection improvements	$			•
Cottonwood Trail	Crossing at Garfield	$			•
Coyote Run Trail	Crossings at Lincoln, Jefferson, Main Street	$		•	
LMS Trail	Crossing at Main Street	$			•
Louisville Middle School	Crosswalks at Main Street and Griffith Street	$		•	
Hwy 42/96th Street	Crosswalks at Griffith Street	$		•	

Recommended Public Improvements					
Project	Description	Opinion of Probable Cost	Schedule		
			1-5 Years	6-10 Years	11-20 Years
Hwy 42 Plan					
New Signals					
Cannon Circle	As part of Coal Creek Station development	$$	•		
Roadway					
Hwy 42/96th Street North of S Boulder Rd	Improvements described in Highway 42 Gateway plan	$$$$	•	•	•
Hwy 42/96th Street South of S Boulder Rd	Improvements described in Highway 42 Gateway plan	$$$$	•	•	•
South Boulder Road Plan					
New Signals					
Kaylix Drive/Cannon Circle	Optional new signal	$$			•
Intersection Improvements					
Via Appia and South Boulder Road	With underpass, remove crosswalk and extend left-turn storage	$			•
Garfield and South Boulder Road	Remove acceleration and deceleration lanes, install offset left	$$$			•
Jefferson and South Boulder Road	Close north-south through movement	$			•
Main Street and South Boulder Road	Add pedestrian island in eastbound right turn lane, create offset left, tighten geometrics	$$		•	
Kaylix Drive/Cannon Circle	Close westbound left movement	$			•
Plaza and South Boulder Road	Introduce protected left phase	$		•	
Blue Star and South Boulder Road	Allow un-signalized full movement	$		•	
Median Improvements					
Cottonwood Park	Move access east, extend median	$			•
Cottonwood Drive	Close median	$$			•
Longs Peak Drive	Make 3/4 movement, allow left in	$$		•	
Front Street	Make 3/4 movement, allow left in	$$		•	
Curb Adjustments and Landscaping					
Westbound South Boulder Road	Remove continuous acceleration/deceleration lane along westbound South Boulder Road	$$$		•	



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City of Louisville

South Boulder Road Planning Survey

2015

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National Research Center Inc

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Prepared by National Research Center, Inc.

Summary

- The City of Louisville and Cuningham Group Architecture, Inc. contracted with National Research Center, Inc. to develop and administer a topical survey to residents regarding future development of the South Boulder Road area in northeast Louisville.
- The 2014 South Boulder Road Planning Survey was mailed to a random sample of 1,200 households in the city.
- A total of 380 surveys were returned, providing a response rate of 32%.
- The margin of error is plus or minus five percentage points around any given percentage point for the entire sample.

Overall, residents of Louisville enjoy a high quality of life.

- Almost all survey respondents (98%) rated the overall quality of life in the city as excellent or good (Table 1).
- Respondents identified the overall quality of parks, trails and open spaces, the city's overall economic health, ease of travel by car and their sense of safety traveling throughout the city as the most positive aspects of the city; about 9 in 10 respondents rated these aspects as excellent or good.
- Most residents (about 85%) rated the physical condition of commercial and residential buildings favorably. However, they gave more tentative ratings of the variety and affordability housing throughout the city (58% and 25% excellent or good, respectively).

Residents view the South Boulder Road area as an opportunity to improve the aspects they value most.

- As with the city overall, the more positively rated characteristics of the South Boulder Road area included the quality of parks, trails and open spaces (76% excellent or good) and sense of safety traveling through the corridor (79%; Table 2). In general, though, most aspects of the South Boulder Road area were not rated as favorably as when compared to the city overall.
- Residents cited sense of safety traveling through the corridor, quality of parks, trails and open spaces and ease of travel walking as the most important aspects to improve (Table 3); about four in five respondents felt these aspects were essential or very important for the City of attempt to improve.
- Overall quality of shopping and dining opportunities, ease of travel by car and ease of travel by bicycle were rated important to improve by about 7 in 10 respondents.

The South Boulder Road area is frequented for errands and recreation.

- Nine in 10 respondents reported that they shop/dine in the area and about three-quarters use the parks and trails in the area. About two in five respondents lived in the study area (Table 4).
- Louisville Plaza/King Soopers (Stores east of Hwy 42) was reported as the most commonly visited location in the South Boulder Road area; about 7 in 10 respondents said they visit this plaza at least one a week and almost all visited it at least once a month (Table 5).

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- Other common destinations included Village Square/Alfalfa's (Stores at Centennial) and recreational trails in the area, visited by about two in five respondents at least weekly.
- Over three quarters of respondents reported driving through the South Boulder Road area multiple times a week, if not daily (Table 6); but over half said they would like to be able to travel through the area on a bicycle or by walking more often than they currently do (Table 7)

The general mix of amenities in the South Boulder Road is about right, with some opportunities.

- Overall, a majority of respondents felt there was the right amount of most amenities in the area (Table 8).
- Residents saw “too few” amenities in the categories of affordable (subsidized) housing; live/work (combined living and working spaces); and outdoor community gathering space (amphitheater, commons, etc.).
- Respondents were split between the right amount and too few of the following: housing for seniors (smaller one-level single-family house, apartments with elevators); restaurants, cafes, coffee shops, pubs/bars; work-share spaces Bike and pedestrian amenities/recreational trails; small “parklets”/plazas; neighborhood parks (like Cottonwood Park); and indoor community gathering space (arts center, community center, etc.).

Respondents were clear in some design element preferences and flexible about others.

- For commercial buildings, respondents preferred 1- and 2-story buildings (Table 9) with 10 or 15-20 feet setbacks (Table 10).
- For multi-family residential housing, respondents preferred 2-story townhouses (Table 11) with a 15 - 20 foot setback with porches and small yards (Table 12).
- Respondents were open to a variety of park/plaza options, except the parklet (Table 13).
- For the streetscape, respondents were open to a variety options, except for the sidewalk right up against street (Table 14).
- Most respondents preferred parking lots on the sides of buildings (Table 15) with a landscaped buffer with amenities (Table 16).
- Respondents liked the options of projecting or awnings for business signage (Table 17).

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Tables of Results

The following pages contain a complete set of responses to each question on the survey, excluding the "don't know" responses.

Survey Results

Table 1: Question 1

Please rate each of the following for Louisville (City-wide):	Excellent	Good	Fair	Poor	Total
Overall quality of life	71%	27%	3%	0%	100%
Overall economic health	34%	54%	9%	2%	100%
Variety of housing options	13%	45%	32%	10%	100%
Availability of affordable quality housing	4%	21%	41%	34%	100%
Overall quality of shopping and dining opportunities	25%	54%	19%	2%	100%
Overall quality of parks, trails and open spaces	61%	32%	4%	2%	100%
Ease of travel by car	44%	45%	8%	3%	100%
Ease of travel walking	43%	40%	12%	5%	100%
Ease of travel by bicycle	50%	35%	14%	1%	100%
Ease of travel by bus	24%	35%	30%	10%	100%
Sense of safety traveling throughout the city	64%	32%	4%	0%	100%
Physical condition of commercial buildings	25%	60%	14%	1%	100%
Physical condition of residential buildings	18%	69%	12%	1%	100%

Table 2: Question 2 (Quality)

First, please rate the quality of each of the following aspects or characteristics as they relate to the South Boulder Road study area (shown in the letter). Then, please tell us how important to you, if at all, it is that the City attempt to improve each of the following in the South Boulder Road study area.	Excellent	Good	Fair	Poor	Total
Variety of housing options	11%	47%	32%	10%	100%
Availability of affordable quality housing	4%	31%	37%	27%	100%
Overall quality of shopping and dining opportunities	13%	42%	36%	10%	100%
Overall quality of parks, trails and open space	30%	46%	19%	5%	100%
Ease of travel by car	27%	54%	12%	7%	100%
Ease of travel walking	24%	41%	22%	13%	100%
Ease of travel by bicycle	26%	35%	29%	10%	100%
Ease of travel by bus	20%	39%	30%	11%	100%
Sense of safety traveling through the corridor	34%	45%	17%	4%	100%
Physical condition of commercial buildings	9%	49%	38%	5%	100%
Physical condition of residential buildings	7%	54%	33%	6%	100%

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Table 3: Question 2 (Importance)

First, please rate the quality of each of the following aspects or characteristics as they relate to the South Boulder Road study area (shown in the letter). Then, please tell us how important to you, if at all, it is that the City attempt to improve each of the following in the South Boulder Road study area.	Essential	Very important	Somewhat important	Not at all important	Total
Variety of housing options	13%	36%	37%	14%	100%
Availability of affordable quality housing	20%	35%	31%	15%	100%
Overall quality of shopping and dining opportunities	21%	47%	24%	7%	100%
Overall quality of parks, trails and open space	37%	45%	12%	5%	100%
Ease of travel by car	23%	46%	24%	7%	100%
Ease of travel walking	34%	44%	17%	4%	100%
Ease of travel by bicycle	35%	36%	22%	7%	100%
Ease of travel by bus	21%	38%	30%	11%	100%
Sense of safety traveling through the corridor	49%	34%	11%	6%	100%
Physical condition of commercial buildings	14%	42%	37%	7%	100%
Physical condition of residential buildings	13%	46%	36%	5%	100%

Table 4: Question 3

Which, if any, of the following applies to you in relation to the South Boulder Road study area? (Mark all that apply.)	Percent
I live in the area (see map in attached letter)	41%
My child attends LMS	8%
I use parks and trails in the area	75%
I shop/dine in the area	90%
I use medical/professional services in the area	47%
I only travel through the area	13%
I work in the area	7%
None of the above	1%

Total may exceed 100% as respondents could select more than one option.

Table 5: Question 4

In a typical month, how many times, if at all, do you visit each of the following?	Never	1-3 times a month	Once a week	Multiple times a week	Daily	Total
Village Square/Alfalfa's (Stores at Centennial)	11%	52%	18%	16%	3%	100%
Christopher Village (Stores west of Hwy 42/96th St)	42%	48%	6%	3%	0%	100%
Louisville Plaza/King Soopers (Stores east of Hwy 42)	2%	26%	33%	36%	3%	100%
Medical and professional offices along South Boulder Road	56%	39%	2%	2%	1%	100%
Cottonwood Park	45%	41%	8%	5%	2%	100%
Harney/Lastoka Open Space	67%	27%	3%	3%	1%	100%
Recreational trails in the area	17%	41%	18%	18%	6%	100%

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Table 6: Question 5 (Actual Use)

First, tell us how many times in a typical month, if at all, you travel through the study area using each of the following modes. Then, please indicate if you'd like to use each mode more, the same amount or less in the study area.	Never	1-3 times a month	Once a week	Multiple times a week	Daily	Total
In a car	1%	10%	10%	37%	42%	100%
In a bus	82%	13%	2%	2%	2%	100%
On a bicycle	43%	36%	8%	9%	4%	100%
Walking	36%	30%	9%	16%	8%	100%

Table 7: Question 5 (Preferred Use)

First, tell us how many times in a typical month, if at all, you travel through the study area using each of the following modes. Then, please indicate if you'd like to use each mode more, the same amount or less in the study area.	Use more	Use the same	Use less	Total
In a car	5%	73%	22%	100%
In a bus	31%	57%	12%	100%
On a bicycle	55%	41%	5%	100%
Walking	55%	44%	2%	100%

Table 8: Question 6

Please indicate whether you feel that there are too many, the right amount or not enough of each of the following in the South Boulder Road study area:	Too many	Right amount	Too few	Total
Housing for singles / couples (apartments, townhomes, smaller duplex, single-family)	18%	48%	34%	100%
Housing for families with children (smaller duplex, single-family)	7%	65%	28%	100%
Housing for seniors (smaller one-level single-family house, apartments with elevators)	4%	45%	51%	100%
Affordable (subsidized) housing	10%	36%	54%	100%
Live/work (combined living and working spaces)	4%	37%	59%	100%
Restaurants, cafes, coffee shops, pubs/bars	1%	50%	49%	100%
Neighborhood shops (dry cleaners, barbers/beauty salon, etc.)	1%	69%	30%	100%
Community shops (grocery store, drug store, etc.)	0%	86%	14%	100%
Regional shops, such as big box retailers	19%	60%	22%	100%
Work-share spaces	3%	48%	49%	100%
Health clinics / medical offices	6%	88%	6%	100%
Professional services (lawyers, accountants, etc.)	5%	87%	8%	100%
General business offices (corporate offices, etc.)	9%	72%	18%	100%
Research and development	4%	57%	39%	100%
Bike and pedestrian amenities/recreational trails	1%	49%	51%	100%
Small "Parklets" / plazas	3%	50%	47%	100%
Neighborhood parks (like Cottonwood Park)	0%	59%	41%	100%
Regional park (like Community Park)	0%	64%	36%	100%
Indoor community gathering space (arts center, community center, etc.)	1%	45%	54%	100%
Outdoor community gathering space (amphitheater, commons, etc.)	1%	38%	61%	100%

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Design Elements

Table 9: Design Element #1: Commercial Building Height/Size

For each photo below, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area.		Excellent fit	Good fit	Fair fit	Poor fit	Total
	1-story	27%	35%	24%	14%	100%
	2-story	35%	40%	18%	8%	100%
	2 or 3-story	23%	31%	24%	22%	100%
	3.5-story	11%	22%	24%	43%	100%

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Table 10: Design Element #2: Commercial Building Placement (Setback)

For each photo below, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area.		Excellent fit	Good fit	Fair fit	Poor fit	Total
	Setback 15-20 feet from street and sidewalk	21%	39%	26%	14%	100%
	Parking lot in front	17%	35%	23%	25%	100%
	No setback	18%	25%	22%	35%	100%
	10 foot setback, directly adjacent to sidewalk	20%	39%	27%	14%	100%

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Table 11: Design Element #3: Multi Family Residential Building Height/Size

For each photo below, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area.		Excellent fit	Good fit	Fair fit	Poor fit	Total
	1-story duplex	19%	33%	30%	17%	100%
	2-story townhouses	21%	48%	22%	9%	100%
	3-story apartment building	5%	18%	24%	54%	100%
	Apartments/condos above retail/commercial (mixed-use building)	22%	30%	16%	33%	100%

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Table 12: Design Element #4: Multi Family Residential Building Placement (Setback)

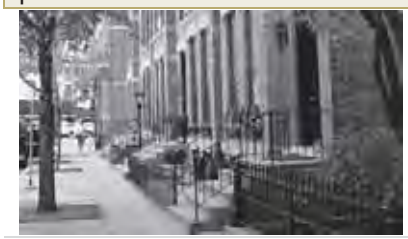
For each photo below, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area.		Excellent fit	Good fit	Fair fit	Poor fit	Total
	5 foot setback with stoop	9%	17%	27%	47%	100%
	5 - 10 foot setback with porches	15%	36%	28%	21%	100%
	15 - 20 foot setback with porches and small yards	30%	39%	21%	10%	100%
	20+ foot setback with shared entryways	9%	26%	30%	35%	100%

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Table 13: Design Element #5: Park/Plaza

For each photo below, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area.		Excellent fit	Good fit	Fair fit	Poor fit	Total
	Recreational Park	31%	38%	20%	11%	100%
	Town Green	35%	38%	20%	7%	100%
	Parklet	18%	28%	27%	27%	100%
	Plaza	40%	35%	16%	10%	100%

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Table 14: Design Element #6: Streetscape

For each photo below, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area.		Excellent fit	Good fit	Fair fit	Poor fit	Total
	Sidewalk right up against street	2%	9%	38%	50%	100%
	Sidewalk buffered from street and parking with landscaping	25%	48%	20%	6%	100%
	Regular size sidewalk with some amenities	11%	46%	34%	9%	100%
	Wide sidewalk with many pedestrian amenities	45%	30%	18%	6%	100%

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Table 15: Design Element #7: Parking Placement

For each photo below, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area.		Excellent fit	Good fit	Fair fit	Poor fit	Total
	Parking lot on side of building	17%	57%	22%	4%	100%
	Diagonal parking in street	9%	28%	25%	38%	100%
	Parallel street parking	6%	31%	33%	30%	100%
	Large parking lot in front of building	4%	18%	23%	55%	100%

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Table 16: Design Element #8: Parking Edge

For each photo below, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area.		Excellent fit	Good fit	Fair fit	Poor fit	Total
	No buffer between parking and sidewalk	1%	12%	29%	58%	100%
	Minimal landscaped buffer	8%	40%	40%	12%	100%
	Landscaped buffer with amenities	37%	46%	15%	2%	100%
	Low wall	7%	29%	38%	27%	100%

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Table 17: Design Element #9: Business Signage

For each photo below, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area.		Excellent fit	Good fit	Fair fit	Poor fit	Total
	Projecting	37%	46%	11%	6%	100%
	Internally-illuminated	9%	39%	41%	11%	100%
	Awning	29%	49%	18%	5%	100%
	Monument with tenant change panels	6%	17%	25%	52%	100%

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Respondent Characteristics

Table 18: Question D1

Which best describes the building you live in?	Percent
One family house detached from any other houses	74%
Building with two or more homes (duplex, townhome, apartment or condominium)	23%
Mobile home	0%
Other	3%
Total	100%

Table 19: Question D2

Do you rent or own your home?	Percent
Rent	27%
Own	73%
Total	100%

Table 20: Question D3

How many people, including yourself, live in your household?	Percent
1	16%
2	34%
3	20%
4	24%
5	4%
6+	2%
Total	100%

Table 21: Question D4

What is your gender?	Percent
Female	51%
Male	49%
Total	100%

Table 22: Question D5

18-24 years	2%
25-34 years	21%
35-44 years	22%
45-54 years	24%
55-64 years	17%
65-74 years	10%
75 years or older	5%
Total	100%

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Table 23: Question D6

Are you currently employed?	Percent
Yes	79%
No	21%
Total	100%

Table 24: Question D7

In which city do you work?	Percent
Boulder, Longmont, Niwot	27%
Broomfield, Westminster, Arvada, Lafayette, Superior	14%
Denver, Lakewood, Aurora	9%
Louisville	36%
Multiple areas	7%
Other	6%
Total	100%

Table 25: Question D8

About how much do you estimate your household's total income before taxes will be for the current year?	Percent
Less than $24,999	4%
$25,000 to $49,999	9%
$50,000 to $99,999	30%
$100,000 to $149,999	22%
$150,000 or more	23%
Prefer not to answer	14%
Total	100%

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Complete Survey Responses

The following pages contain a complete set of responses to each question on the survey, including the "don't know" responses. The percent of respondents giving a particular response is shown followed by the number of respondents.

Table 26: Question 1

Please rate each of the following for Louisville (City-wide):	Excellent		Good		Fair		Poor		Not familiar		Total	
Overall quality of life	71%	N=266	27%	N=101	3%	N=10	0%	N=0	0%	N=1	100%	N=377
Overall economic health	33%	N=125	53%	N=199	9%	N=35	2%	N=8	3%	N=10	100%	N=376
Variety of housing options	12%	N=46	44%	N=164	31%	N=117	10%	N=38	3%	N=11	100%	N=376
Availability of affordable quality housing	4%	N=14	18%	N=68	36%	N=135	30%	N=112	12%	N=44	100%	N=373
Overall quality of shopping and dining opportunities	25%	N=93	54%	N=202	19%	N=71	2%	N=7	0%	N=0	100%	N=374
Overall quality of parks, trails and open spaces	61%	N=229	32%	N=120	4%	N=16	2%	N=8	0%	N=1	100%	N=375
Ease of travel by car	44%	N=166	45%	N=170	8%	N=29	3%	N=11	0%	N=0	100%	N=376
Ease of travel walking	43%	N=162	39%	N=147	12%	N=46	5%	N=17	1%	N=2	100%	N=374
Ease of travel by bicycle	46%	N=171	32%	N=119	12%	N=47	1%	N=5	9%	N=33	100%	N=375
Ease of travel by bus	17%	N=64	24%	N=92	21%	N=77	7%	N=27	31%	N=116	100%	N=376
Sense of safety traveling throughout the city	64%	N=240	32%	N=119	4%	N=16	0%	N=1	0%	N=0	100%	N=376
Physical condition of commercial buildings	25%	N=93	60%	N=225	14%	N=54	1%	N=3	0%	N=1	100%	N=377
Physical condition of residential buildings	18%	N=68	68%	N=256	12%	N=45	1%	N=3	1%	N=3	100%	N=375

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Table 27: Question 2 (Quality)

First, please rate the quality of each of the following aspects or characteristics as they relate to the South Boulder Road study area (shown in the letter). Then, please tell us how important to you, if at all, it is that the City attempt to improve each of the following in the South Boulder Road study area.	Excellent		Good		Fair		Poor		Not familiar		Total	
Variety of housing options	10%	N=37	42%	N=152	29%	N=106	9%	N=32	11%	N=38	100%	N=365
Availability of affordable quality housing	3%	N=12	25%	N=88	29%	N=105	21%	N=76	21%	N=75	100%	N=356
Overall quality of shopping and dining opportunities	12%	N=43	41%	N=144	35%	N=124	10%	N=35	2%	N=6	100%	N=354
Overall quality of parks, trails and open space	29%	N=102	43%	N=153	18%	N=64	5%	N=17	5%	N=18	100%	N=353
Ease of travel by car	27%	N=96	53%	N=188	12%	N=42	7%	N=25	2%	N=7	100%	N=357
Ease of travel walking	22%	N=81	39%	N=141	21%	N=76	12%	N=45	5%	N=17	100%	N=359
Ease of travel by bicycle	23%	N=83	31%	N=110	25%	N=90	8%	N=30	13%	N=47	100%	N=359
Ease of travel by bus	13%	N=46	25%	N=90	19%	N=68	7%	N=25	36%	N=129	100%	N=358
Sense of safety traveling through the corridor	33%	N=119	44%	N=157	17%	N=60	4%	N=13	2%	N=7	100%	N=356
Physical condition of commercial buildings	8%	N=30	47%	N=169	37%	N=132	5%	N=18	3%	N=10	100%	N=359
Physical condition of residential buildings	7%	N=24	52%	N=185	32%	N=113	6%	N=22	4%	N=14	100%	N=358

Table 28: Question 2 (Importance)

First, please rate the quality of each of the following aspects or characteristics as they relate to the South Boulder Road study area (shown in the letter). Then, please tell us how important to you, if at all, it is that the City attempt to improve each of the following in the South Boulder Road study area.	Essential		Very important		Somewhat important		Not at all important		Not familiar		Total	
Variety of housing options	12%	N=43	34%	N=123	35%	N=126	14%	N=49	5%	N=17	100%	N=359
Availability of affordable quality housing	18%	N=63	32%	N=112	28%	N=99	14%	N=48	8%	N=29	100%	N=352
Overall quality of shopping and dining opportunities	21%	N=76	47%	N=166	24%	N=86	7%	N=24	0%	N=1	100%	N=353
Overall quality of parks, trails and open space	36%	N=129	44%	N=156	12%	N=42	5%	N=17	3%	N=10	100%	N=354
Ease of travel by car	23%	N=82	46%	N=162	24%	N=82	7%	N=25	0%	N=0	100%	N=351
Ease of travel walking	34%	N=119	44%	N=154	17%	N=60	4%	N=15	2%	N=6	100%	N=354
Ease of travel by bicycle	32%	N=114	34%	N=118	21%	N=73	7%	N=24	7%	N=23	100%	N=353
Ease of travel by bus	16%	N=57	30%	N=104	24%	N=83	8%	N=29	21%	N=74	100%	N=347
Sense of safety traveling through the corridor	49%	N=171	34%	N=120	11%	N=39	6%	N=22	0%	N=0	100%	N=351
Physical condition of commercial buildings	14%	N=48	42%	N=147	36%	N=128	7%	N=23	2%	N=6	100%	N=352
Physical condition of residential buildings	13%	N=44	45%	N=159	35%	N=124	5%	N=18	2%	N=5	100%	N=351

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Table 29: Question 3

Which, if any, of the following applies to you in relation to the South Boulder Road study area? (Mark all that apply.)	Percent	Number
I live in the area (see map in attached letter)	41%	N=151
My child attends LMS	8%	N=29
I use parks and trails in the area	75%	N=279
I shop/dine in the area	90%	N=335
I use medical/professional services in the area	47%	N=173
I only travel through the area	13%	N=50
I work in the area	7%	N=27
None of the above	1%	N=4

Total may exceed 100% as respondents could select more than one option.

Table 30: Question 4

In a typical month, how many times, if at all, do you visit each of the following?	Never		1-3 times a month		Once a week		Multiple times a week		Daily		Total	
Village Square/Alfalfa's (Stores at Centennial)	11%	N=42	52%	N=191	18%	N=66	16%	N=57	3%	N=11	100%	N=367
Christopher Village (Stores west of Hwy 42/96th St)	42%	N=151	48%	N=170	6%	N=23	3%	N=12	0%	N=1	100%	N=357
Louisville Plaza/King Soopers (Stores east of Hwy 42)	2%	N=7	26%	N=95	33%	N=121	36%	N=135	3%	N=12	100%	N=371
Medical and professional offices along South Boulder Road	56%	N=203	39%	N=141	2%	N=6	2%	N=8	1%	N=3	100%	N=361
Cottonwood Park	45%	N=161	41%	N=147	8%	N=27	5%	N=19	2%	N=6	100%	N=360
Harney/Lastoka Open Space	67%	N=242	27%	N=99	3%	N=9	3%	N=11	1%	N=3	100%	N=364
Recreational trails in the area	17%	N=64	41%	N=152	18%	N=65	18%	N=67	6%	N=21	100%	N=369

Prepared by National Research Center, Inc.

Table 31: Question 5 (Actual Use)

First, tell us how many times in a typical month, if at all, you travel through the study area using each of the following modes. Then, please indicate if you'd like to use each mode more, the same amount or less in the study area.	Never		1-3 times a month		Once a week		Multiple times a week		Daily		Total	
In a car	1%	N=4	10%	N=38	10%	N=38	37%	N=137	42%	N=157	100%	N=373
In a bus	82%	N=300	13%	N=46	2%	N=6	2%	N=7	2%	N=7	100%	N=367
On a bicycle	43%	N=157	36%	N=133	8%	N=29	9%	N=33	4%	N=13	100%	N=365
Walking	36%	N=133	30%	N=112	9%	N=33	16%	N=60	8%	N=31	100%	N=369

Table 32: Question 5 (Preferred Use)

First, tell us how many times in a typical month, if at all, you travel through the study area using each of the following modes. Then, please indicate if you'd like to use each mode more, the same amount or less in the study area.	Use more		Use the same		Use less		Total	
In a car	5%	N=15	73%	N=225	22%	N=67	100%	N=307
In a bus	31%	N=88	57%	N=162	12%	N=35	100%	N=286
On a bicycle	55%	N=163	41%	N=121	5%	N=14	100%	N=297
Walking	55%	N=164	44%	N=131	2%	N=5	100%	N=300

Table 33: Question 6

Please indicate whether you feel that there are too many, the right amount or not enough of each of the following in the South Boulder Road study area:	Too many		Right amount		Too few		Not familiar		Total	
Housing for singles / couples (apartments, townhomes, smaller duplex, single-family)	14%	N=52	37%	N=136	26%	N=95	22%	N=80	100%	N=363
Housing for families with children (smaller duplex, single-family)	5%	N=20	48%	N=173	21%	N=75	26%	N=95	100%	N=363
Housing for seniors (smaller one-level single-family house, apartments with elevators)	2%	N=9	29%	N=106	33%	N=120	35%	N=128	100%	N=362
Affordable (subsidized) housing	6%	N=23	23%	N=82	34%	N=122	38%	N=136	100%	N=363
Live/work (combined living and working spaces)	2%	N=7	20%	N=71	31%	N=112	48%	N=173	100%	N=362
Restaurants, cafes, coffee shops, pubs/bars	1%	N=3	49%	N=178	48%	N=173	3%	N=9	100%	N=363
Neighborhood shops (dry cleaners, barbers/beauty salon, etc.)	1%	N=4	64%	N=230	28%	N=100	7%	N=27	100%	N=362

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Please indicate whether you feel that there are too many, the right amount or not enough of each of the following in the South Boulder Road study area:	Too many		Right amount		Too few		Not familiar		Total	
Community shops (grocery store, drug store, etc.)	0%	N=0	84%	N=307	13%	N=48	2%	N=9	100%	N=364
Regional shops, such as big box retailers	18%	N=64	57%	N=207	21%	N=75	5%	N=17	100%	N=364
Work-share spaces	1%	N=5	22%	N=80	23%	N=82	54%	N=195	100%	N=362
Health clinics / medical offices	4%	N=16	65%	N=236	4%	N=15	26%	N=95	100%	N=362
Professional services (lawyers, accountants, etc.)	3%	N=12	53%	N=191	5%	N=17	39%	N=141	100%	N=361
General business offices (corporate offices, etc.)	6%	N=21	46%	N=168	12%	N=43	36%	N=130	100%	N=362
Research and development	2%	N=6	24%	N=88	16%	N=59	58%	N=208	100%	N=361
Bike and pedestrian amenities/recreational trails	0%	N=2	44%	N=163	47%	N=171	8%	N=31	100%	N=366
Small "Parklets" / plazas	2%	N=8	42%	N=153	39%	N=144	16%	N=59	100%	N=364
Neighborhood parks (like Cottonwood Park)	0%	N=1	54%	N=197	37%	N=136	8%	N=29	100%	N=363
Regional park (like Community Park)	0%	N=1	59%	N=214	33%	N=120	8%	N=27	100%	N=362
Indoor community gathering space (arts center, community center, etc.)	1%	N=3	39%	N=141	46%	N=166	15%	N=53	100%	N=364
Outdoor community gathering space (amphitheater, commons, etc.)	1%	N=3	33%	N=119	52%	N=189	14%	N=52	100%	N=363

Table 34: Question D1

Which best describes the building you live in?	Percent	Number
One family house detached from any other houses	74%	N=272
Building with two or more homes (duplex, townhome, apartment or condominium)	23%	N=86
Mobile home	0%	N=0
Other	3%	N=9
Total	100%	N=367

Table 35: Question D2

Do you rent or own your home?	Percent	Number
Rent	27%	N=99
Own	73%	N=268
Total	100%	N=367

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Table 36: Question D3

How many people, including yourself, live in your household?	Percent	Number
1	16%	N=59
2	34%	N=123
3	20%	N=74
4	24%	N=88
5	4%	N=13
6+	2%	N=6
Total	100%	N=364

Table 37: Question D4

What is your gender?	Percent	Number
Female	51%	N=185
Male	49%	N=175
Total	100%	N=360

Table 38: Question D5

In which category is your age?	Percent	Number
18-24 years	2%	N=6
25-34 years	21%	N=75
35-44 years	22%	N=80
45-54 years	24%	N=87
55-64 years	17%	N=62
65-74 years	10%	N=36
75 years or older	5%	N=17
Total	100%	N=364

Prepared by National Research Center, Inc.

Table 39: Question D6

Are you currently employed?	Percent	Number
Yes	79%	N=285
No	21%	N=78
Total	100%	N=363

Table 40: Question D7

In which city do you work?	Percent	Number
Boulder, Longmont, Niwot	27%	N=70
Broomfield, Westminster, Arvada, Lafayette, Superior	14%	N=37
Denver, Lakewood, Aurora	9%	N=23
Louisville	36%	N=93
Multiple areas	7%	N=18
Other	6%	N=16
Total	100%	N=257

Table 41: Question D8

About how much do you estimate your household's total income before taxes will be for the current year?	Percent	Number
Less than $24,999	4%	N=13
$25,000 to $49,999	9%	N=32
$50,000 to $99,999	30%	N=108
$100,000 to $149,999	22%	N=79
$150,000 or more	23%	N=83
Prefer not to answer	14%	N=51
Total	100%	N=365

Prepared by National Research Center, Inc.

Table 42: Design Element #1: Commercial Building Height/Size

For each photo below, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area.	Excellent fit		Good fit		Fair fit		Poor fit		Total	
1-story	27%	N=84	35%	N=109	24%	N=74	14%	N=42	100%	N=309
2-story	35%	N=107	40%	N=123	18%	N=54	8%	N=25	100%	N=309
2 or 3-story	23%	N=72	31%	N=96	24%	N=74	22%	N=70	100%	N=312
3.5-story	11%	N=36	22%	N=69	24%	N=73	43%	N=133	100%	N=311

Table 43: Design Element #2: Commercial Building Placement (Setback)

For each photo below, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area.	Excellent fit		Good fit		Fair fit		Poor fit		Total	
Setback 15-20 feet from street and sidewalk	21%	N=64	39%	N=121	26%	N=80	14%	N=45	100%	N=310
Parking lot in front	17%	N=53	35%	N=107	23%	N=70	25%	N=79	100%	N=310
No setback	18%	N=56	25%	N=77	22%	N=69	35%	N=108	100%	N=310
10 foot setback, directly adjacent to sidewalk	20%	N=64	39%	N=120	27%	N=85	14%	N=42	100%	N=311

Table 44: Design Element #3: Multi Family Residential Building Height/Size

For each photo below, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area.	Excellent fit		Good fit		Fair fit		Poor fit		Total	
1-story duplex	19%	N=61	33%	N=104	30%	N=93	17%	N=54	100%	N=312
2-story townhouses	21%	N=67	48%	N=150	22%	N=67	9%	N=28	100%	N=312
3-story apartment building	5%	N=15	18%	N=55	24%	N=75	54%	N=167	100%	N=312
Apartments/condos above retail/commercial (mixed-use building)	22%	N=68	30%	N=92	16%	N=50	33%	N=102	100%	N=312

Prepared by National Research Center, Inc.

Table 45: Design Element #4: Multi Family Residential Building Placement (Setback)

For each photo below, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area.	Excellent fit		Good fit		Fair fit		Poor fit		Total	
5 foot setback with stoop	9%	N=27	17%	N=53	27%	N=85	47%	N=147	100%	N=311
5 - 10 foot setback with porches	15%	N=45	36%	N=113	28%	N=88	21%	N=64	100%	N=310
15 - 20 foot setback with porches and small yards	30%	N=94	39%	N=122	21%	N=65	10%	N=30	100%	N=311
20+ foot setback with shared entryways	9%	N=29	26%	N=80	30%	N=94	35%	N=109	100%	N=311

Table 46: Design Element #5: Park/Plaza

For each photo below, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area.	Excellent fit		Good fit		Fair fit		Poor fit		Total	
Recreational Park	31%	N=97	38%	N=118	20%	N=62	11%	N=36	100%	N=313
Town Green	35%	N=108	38%	N=118	20%	N=64	7%	N=22	100%	N=312
Parklet	18%	N=56	28%	N=89	27%	N=85	27%	N=83	100%	N=313
Plaza	40%	N=124	35%	N=109	16%	N=50	10%	N=30	100%	N=313

Table 47: Design Element #6: Streetscape

For each photo below, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area.	Excellent fit		Good fit		Fair fit		Poor fit		Total	
Sidewalk right up against street	2%	N=7	9%	N=29	38%	N=118	50%	N=157	100%	N=312
Sidewalk buffered from street and parking with landscaping	25%	N=79	48%	N=150	20%	N=64	6%	N=19	100%	N=311
Regular size sidewalk with some amenities	11%	N=35	46%	N=144	34%	N=105	9%	N=30	100%	N=313
Wide sidewalk with many pedestrian amenities	45%	N=142	30%	N=93	18%	N=57	6%	N=20	100%	N=312

Prepared by National Research Center, Inc.

Table 48: Design Element #7: Parking Placement

For each photo below, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area.	Excellent fit		Good fit		Fair fit		Poor fit		Total	
Parking lot on side of building	17%	N=54	57%	N=177	22%	N=68	4%	N=12	100%	N=311
Diagonal parking in street	9%	N=28	28%	N=87	25%	N=78	38%	N=116	100%	N=309
Parallel street parking	6%	N=18	31%	N=97	33%	N=103	30%	N=94	100%	N=312
Large parking lot in front of building	4%	N=12	18%	N=55	23%	N=72	55%	N=172	100%	N=311

Table 49: Design Element #8: Parking Edge

For each photo below, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area.	Excellent fit		Good fit		Fair fit		Poor fit		Total	
No buffer between parking and sidewalk	1%	N=2	12%	N=36	29%	N=92	58%	N=182	100%	N=312
Minimal landscaped buffer	8%	N=24	40%	N=126	40%	N=124	12%	N=38	100%	N=312
Landscaped buffer with amenities	37%	N=116	46%	N=143	15%	N=46	2%	N=8	100%	N=312
Low wall	7%	N=21	29%	N=91	38%	N=118	27%	N=83	100%	N=312

Table 50: Design Element #9: Business Signage

For each photo below, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area.	Excellent fit		Good fit		Fair fit		Poor fit		Total	
Projecting	37%	N=115	46%	N=144	11%	N=35	6%	N=18	100%	N=312
Internally-illuminated	9%	N=27	39%	N=121	41%	N=129	11%	N=35	100%	N=312
Awning	29%	N=89	49%	N=151	18%	N=55	5%	N=16	100%	N=312
Monument with tenant change panels	6%	N=19	17%	N=54	25%	N=77	52%	N=163	100%	N=312

Prepared by National Research Center, Inc.

Responses to Open-ended Questions

Following are verbatim responses to the open-ended question on the survey, grouped by coded theme. The verbatim responses were not edited for grammar or punctuation.

Question D7: In which city do you work?

Boulder, Longmont, Niwot

- BOULDER
- BOULDER
- BOULDER
- BOULDER
- BOULDER
- Boulder
- LONGMONT
- Boulder, CO
- NIWOT
- LONGMONT
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Broomfield, Westminster, Arvada, Lafayette, Superior

- Lafayette
- Broomfield
- LAFAYETTE
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- WESTMINSTER
- Westminster
- Lafayette
- Broomfield
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- ARVADA
- LAFAYETTE
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- LAFAYETTE
- lafayette
- LAFAYETTE
- Lafayette
- Westminster
- broomfield
- Superior
- Broomfield, CO
- lafayette
- BROOMFIELD

Denver, Lakewood, Aurora

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- AURORA
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- LAKEWOOD

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- LOUISVILLE

Multiple areas

- LOUISVILLE & BOULDER
- DENVER/ BOULDER
- Travel throughout Boulder Valley School District, base in Boulder
- NORTHGLENN/ THORNTON
- Front Range
- BOULDER, LOUISVILLE, BROOMFIELD
- BROOMFIELD/ LOUISVILLE
- LAFAYETTE & DENVER
- LONGMONT & GOLDEN
- Boulder and Louisville
- LOUISVILLE/ LAFAYETTE
- LOUISVILLE/ ARVADA
- BOULDER & LOUISVILLE
- Boulder & Longmont
- Numerous
- LOUISVILLE & BOULDER
- Louisville and others
- LOUISVILLE & BOULDER
- DENVER METRO

Other

- Golden
- BOULDER COUNTY
- BOULDER COUNTY
- GOLDEN
- Fort Collins
- BRIGHTON
- GOLDEN
- BOULDER COUNTY
- boulder county
- Golden
- GOLDEN
- FORT COLLINS

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Appendix A: Subgroup Comparisons for Selected Survey Questions

Responses in the following tables show only the proportion of respondents giving a certain answer; for example, the percent of respondents who rated the quality of life as "excellent" or "good," or the percent of respondents who attended a public meeting more than once a month. ANOVA and chi-square tests of significance were applied to these comparisons of survey questions. A "p-value" of 0.05 or less indicates that there is less than a 5% probability that differences observed between subgroups are due to chance; or in other words, a greater than 95% probability that the differences observed are "real." Where differences were statistically significant, they have been shaded grey.

Comparisons by Respondent Characteristics

- The youngest respondents, those living in attached housing units and renters tended view aspects of housing and ease travel by a variety of modes less favorably than their counterparts in the South Boulder Road area (Table 52). They also placed higher emphasis on the importance of improving housing variety and affordability (Table 54).
- Respondents under age 55 were the most likely to bicycle through the area (Table 55), but would also like to be able to bike more (Table 56). They also tended to feel there were too few bike and pedestrian amenities/recreational trails (Table 57).
- The youngest residents, those living in attached housing units and renters tended to feel there were too few housing options available, including housing for singles/couples, housing for families and affordable (subsidized) housing (Table 57).
- Regarding preferences for design elements of the South Boulder Road area, few differences were found based on gender, housing unit type and housing tenure. Among limited differences, most were by age, with the youngest residents preferring such options as no setbacks for commercial buildings, mixed-used buildings and recreational parks (Table 58 to Table 66).

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Table 51: Question 1

Please rate each of the following for Louisville (City-wide) (Percent excellent or good):	Gender		Age			Housing type		Housing tenure		Overall
	Female	Male	18 to 34	35 to 54	55 and over	Detached	Attached	Rent	Own	
Overall quality of life	99%	96%	94%	98%	99%	98%	95%	95%	98%	97%
Overall economic health	90%	88%	89%	87%	91%	88%	90%	94%	86%	88%
Variety of housing options	57%	58%	39%	65%	60%	60%	51%	43%	63%	57%
Availability of affordable quality housing	26%	25%	21%	29%	24%	26%	24%	17%	29%	25%
Overall quality of shopping and dining opportunities	78%	81%	79%	79%	78%	80%	74%	75%	80%	79%
Overall quality of parks, trails and open spaces	94%	93%	88%	94%	96%	96%	85%	86%	96%	93%
Ease of travel by car	89%	89%	88%	93%	84%	90%	86%	84%	91%	89%
Ease of travel walking	80%	87%	71%	85%	87%	86%	75%	74%	86%	83%
Ease of travel by bicycle	83%	87%	85%	84%	84%	85%	83%	84%	85%	85%
Ease of travel by bus	58%	61%	52%	66%	57%	58%	65%	63%	58%	60%
Sense of safety traveling throughout the city	96%	95%	94%	96%	96%	96%	92%	94%	96%	95%
Physical condition of commercial buildings	83%	87%	78%	87%	86%	85%	84%	83%	85%	85%
Physical condition of residential buildings	90%	84%	89%	87%	86%	89%	82%	86%	87%	87%

Prepared by National Research Center, Inc.

Table 52: Question 2 (Quality)

First, please rate the quality of each of the following aspects or characteristics as they relate to the South Boulder Road study area (shown in the letter). (Percent excellent or good)	Gender		Age			Housing type		Housing tenure		
	Female	Male	18 to 34	35 to 54	55 and over	Detached	Attached	Rent	Own	Overall
Variety of housing options	56%	60%	42%	70%	52%	64%	41%	42%	64%	58%
Availability of affordable quality housing	37%	33%	26%	46%	26%	40%	20%	22%	41%	36%
Overall quality of shopping and dining opportunities	50%	56%	56%	50%	56%	51%	61%	60%	51%	54%
Overall quality of parks, trails and open space	72%	78%	68%	75%	82%	78%	68%	71%	77%	76%
Ease of travel by car	83%	80%	79%	85%	77%	81%	80%	78%	82%	81%
Ease of travel walking	65%	63%	50%	63%	76%	65%	63%	63%	65%	65%
Ease of travel by bicycle	59%	65%	51%	62%	71%	62%	61%	62%	61%	62%
Ease of travel by bus	64%	56%	50%	67%	60%	55%	73%	61%	60%	60%
Sense of safety traveling through the corridor	78%	79%	73%	76%	87%	79%	77%	73%	81%	79%
Physical condition of commercial buildings	53%	61%	46%	57%	66%	56%	61%	56%	57%	57%
Physical condition of residential buildings	60%	61%	52%	61%	65%	61%	58%	60%	61%	61%

Table 53: Question 2 (Importance)

Then, please tell us how important to you, if at all, it is that the City attempt to improve each of the following in the South Boulder Road study area. (Percent essential or very important)	Gender		Age			Housing type		Housing tenure		
	Female	Male	18 to 34	35 to 54	55 and over	Detached	Attached	Rent	Own	Overall
Variety of housing options	52%	46%	59%	40%	54%	45%	62%	62%	44%	49%
Availability of affordable quality housing	57%	52%	73%	44%	59%	47%	79%	76%	47%	54%
Overall quality of shopping and dining opportunities	69%	67%	66%	73%	63%	69%	67%	66%	69%	69%
Overall quality of parks, trails and open space	84%	82%	92%	87%	72%	85%	77%	77%	85%	83%
Ease of travel by car	71%	68%	64%	68%	75%	73%	57%	63%	71%	69%
Ease of travel walking	81%	77%	75%	85%	73%	78%	83%	80%	79%	79%
Ease of travel by bicycle	69%	72%	65%	75%	65%	73%	61%	64%	73%	71%
Ease of travel by bus	65%	53%	71%	56%	53%	56%	67%	67%	56%	59%
Sense of safety traveling through the corridor	86%	79%	78%	84%	83%	84%	80%	81%	83%	83%
Physical condition of commercial buildings	62%	51%	42%	58%	65%	61%	42%	38%	63%	56%
Physical condition of residential buildings	60%	57%	49%	59%	65%	61%	52%	51%	61%	59%

Prepared by National Research Center, Inc.

Table 54: Question 4

In a typical month, how many times, if at all, do you visit each of the following? (Percent at least once a month)	Gender		Age			Housing type		Housing tenure		Overall
	Female	Male	18 to 34	35 to 54	55 and over	Detached	Attached	Rent	Own	
Village Square/Alfalfa's (Stores at Centennial)	87%	90%	84%	92%	87%	89%	89%	88%	89%	89%
Christopher Village (Stores west of Hwy 42/96th St)	52%	64%	60%	58%	56%	57%	59%	64%	55%	58%
Louisville Plaza/King Soopers (Stores east of Hwy 42)	97%	99%	100%	98%	97%	98%	98%	98%	98%	98%
Medical and professional offices along South Boulder Road	53%	35%	42%	51%	36%	49%	30%	43%	44%	44%
Cottonwood Park	58%	53%	76%	59%	36%	52%	65%	76%	48%	55%
Harney/Lastoka Open Space	37%	29%	44%	32%	26%	31%	38%	50%	27%	33%
Recreational trails in the area	83%	83%	93%	86%	70%	80%	92%	96%	78%	83%

Table 55: Question 5 (Actual Use)

First, tell us how many times in a typical month, if at all, you travel through the study area using each of the following modes. (Percent at least once a month)	Gender		Age			Housing type		Housing tenure		Overall
	Female	Male	18 to 34	35 to 54	55 and over	Detached	Attached	Rent	Own	
In a car	99%	99%	100%	100%	98%	100%	97%	97%	100%	99%
In a bus	13%	24%	25%	20%	11%	16%	25%	21%	17%	18%
On a bicycle	50%	64%	68%	64%	37%	57%	56%	64%	54%	57%
Walking	64%	64%	81%	61%	55%	58%	79%	83%	57%	64%

Prepared by National Research Center, Inc.

Table 56: Question 5 (Preferred Use)

First, tell us how many times in a typical month, if at all, you travel through the study area using each of the following modes. Then, please indicate if you'd like to use each mode more, the same amount or less in the study area.		Gender		Age			Housing type		Housing tenure		
		Female	Male	18 to 34	35 to 54	55 and over	Detached	Attached	Rent	Own	Overall
In a car	Use more	3%	5%	0%	3%	9%	4%	5%	5%	4%	5%
	Use the same	70%	76%	55%	80%	78%	78%	60%	65%	77%	73%
	Use less	26%	19%	45%	17%	14%	18%	35%	30%	19%	22%
In a bus	Use more	30%	32%	33%	32%	29%	29%	35%	38%	28%	31%
	Use the same	64%	49%	50%	59%	56%	60%	47%	48%	59%	57%
	Use less	6%	19%	17%	9%	15%	11%	17%	13%	12%	12%
On a bicycle	Use more	63%	48%	64%	64%	33%	54%	60%	62%	53%	55%
	Use the same	34%	46%	31%	34%	58%	44%	30%	30%	44%	41%
	Use less	3%	6%	5%	2%	9%	3%	10%	8%	4%	5%
Walking	Use more	60%	50%	57%	60%	43%	53%	60%	62%	52%	55%
	Use the same	40%	48%	43%	38%	54%	46%	38%	36%	46%	44%
	Use less	1%	2%	0%	1%	3%	1%	2%	2%	1%	2%

Prepared by National Research Center, Inc.

Table 57: Question 6

Please indicate whether you feel that there are too many, the right amount or not enough of each of the following in the South Boulder Road study area:		Gender		Age			Housing type		Housing tenure		
		Female	Male	18 to 34	35 to 54	55 and over	Detached	Attached	Rent	Own	Overall
Housing for singles / couples (apartments, townhomes, smaller duplex, single-family)	Too many	19%	17%	5%	25%	18%	23%	7%	4%	24%	18%
	Right amount	44%	52%	32%	54%	52%	54%	34%	37%	53%	48%
	Too few	37%	31%	63%	21%	30%	24%	59%	59%	23%	34%
Housing for families with children (smaller duplex, single-family)	Too many	10%	4%	5%	10%	5%	9%	0%	8%	7%	7%
	Right amount	59%	70%	61%	69%	58%	69%	48%	52%	68%	65%
	Too few	31%	27%	34%	21%	37%	22%	52%	41%	24%	28%
Housing for seniors (smaller one-level single-family house, apartments with elevators)	Too many	4%	3%	0%	7%	1%	5%	0%	0%	5%	4%
	Right amount	39%	50%	72%	50%	25%	42%	55%	61%	41%	45%
	Too few	57%	47%	28%	43%	74%	53%	45%	39%	54%	51%
Affordable (subsidized) housing	Too many	8%	12%	5%	13%	10%	12%	5%	0%	14%	10%
	Right amount	30%	40%	23%	44%	34%	42%	22%	28%	40%	36%
	Too few	62%	48%	72%	43%	57%	45%	74%	72%	46%	54%
Live/work (combined living and working spaces)	Too many	4%	3%	0%	7%	0%	5%	0%	0%	5%	4%
	Right amount	28%	46%	48%	33%	35%	36%	41%	38%	38%	37%
	Too few	68%	50%	52%	60%	65%	59%	59%	62%	58%	59%
Restaurants, cafes, coffee shops, pubs/bars	Too many	1%	1%	0%	1%	1%	1%	0%	0%	1%	1%
	Right amount	46%	54%	57%	39%	62%	46%	62%	59%	47%	50%
	Too few	53%	45%	43%	60%	37%	53%	38%	41%	52%	49%
Neighborhood shops (dry cleaners, barbers/beauty salon, etc.)	Too many	1%	2%	0%	2%	1%	2%	0%	0%	2%	1%
	Right amount	62%	75%	75%	63%	73%	65%	79%	79%	65%	69%
	Too few	37%	23%	25%	35%	26%	33%	21%	21%	33%	30%
Community shops (grocery store, drug store, etc.)	Too many	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Right amount	86%	86%	94%	83%	86%	83%	95%	92%	84%	86%
	Too few	14%	14%	6%	17%	14%	17%	5%	8%	16%	14%
Regional shops, such as big box retailers	Too many	23%	15%	21%	17%	19%	20%	14%	25%	16%	19%
	Right amount	57%	61%	63%	62%	53%	59%	62%	56%	61%	60%
	Too few	20%	23%	16%	21%	28%	21%	24%	19%	23%	22%
Work-share spaces	Too many	3%	3%	0%	6%	0%	4%	0%	7%	2%	3%
	Right amount	34%	59%	36%	44%	70%	50%	42%	29%	56%	48%

Prepared by National Research Center, Inc.

Please indicate whether you feel that there are too many, the right amount or not enough of each of the following in the South Boulder Road study area:		Gender		Age			Housing type		Housing tenure		
		Female	Male	18 to 34	35 to 54	55 and over	Detached	Attached	Rent	Own	Overall
	Too few	63%	38%	64%	50%	30%	46%	58%	65%	43%	49%
	Too many	7%	5%	0%	11%	1%	6%	5%	8%	5%	6%
	Right amount	89%	88%	96%	84%	92%	88%	89%	86%	89%	88%
Health clinics / medical offices	Too few	5%	7%	4%	6%	7%	6%	6%	6%	5%	6%
	Too many	5%	6%	0%	9%	4%	7%	0%	3%	6%	5%
Professional services (lawyers, accountants, etc.)	Right amount	86%	87%	96%	82%	87%	85%	94%	93%	85%	87%
	Too few	9%	7%	4%	9%	9%	8%	6%	5%	9%	8%
	Too many	14%	5%	12%	6%	13%	9%	9%	12%	8%	9%
General business offices (corporate offices, etc.)	Right amount	71%	73%	70%	74%	72%	71%	76%	81%	69%	72%
	Too few	15%	22%	19%	20%	15%	20%	15%	7%	22%	18%
	Too many	6%	3%	0%	4%	6%	4%	4%	4%	4%	4%
	Right amount	65%	51%	67%	50%	59%	53%	75%	93%	48%	57%
Research and development	Too few	29%	46%	33%	46%	35%	43%	21%	3%	48%	39%
	Too many	0%	1%	0%	1%	1%	1%	0%	0%	1%	1%
Bike and pedestrian amenities/recreational trails	Right amount	43%	55%	48%	41%	62%	44%	61%	50%	48%	49%
	Too few	57%	44%	52%	59%	38%	55%	39%	50%	52%	51%
	Too many	4%	1%	3%	4%	1%	3%	3%	3%	3%	3%
	Right amount	44%	57%	43%	48%	59%	50%	51%	48%	51%	50%
Small "Parklets" / plazas	Too few	52%	42%	54%	48%	40%	47%	46%	49%	46%	47%
	Too many	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%
Neighborhood parks (like Cottonwood Park)	Right amount	56%	62%	53%	55%	69%	60%	56%	47%	63%	59%
	Too few	44%	37%	47%	44%	31%	40%	44%	53%	36%	41%
	Too many	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%
Regional park (like Community Park)	Right amount	61%	67%	66%	59%	70%	62%	69%	61%	65%	64%
	Too few	39%	32%	34%	40%	30%	37%	31%	39%	35%	36%
Indoor community gathering space (arts center, community center, etc.)	Too many	1%	1%	0%	1%	1%	1%	0%	0%	1%	1%
	Right amount	38%	53%	30%	47%	55%	45%	46%	41%	47%	45%
	Too few	61%	46%	70%	51%	44%	54%	54%	59%	52%	54%
Outdoor community gathering space (amphitheater, commons, etc.)	Too many	0%	2%	0%	1%	2%	1%	0%	0%	1%	1%
	Right amount	29%	47%	23%	40%	49%	39%	35%	29%	42%	38%
	Too few	70%	51%	77%	60%	49%	59%	65%	71%	57%	61%

Prepared by National Research Center, Inc.

Table 58: Design Element #1: Commercial Building Height/Size

For each photo below, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area. (Percent excellent or good fit)	Gender		Age			Housing type		Housing tenure		
	Female	Male	18 to 34	35 to 54	55 and over	Detached	Attached	Rent	Own	Overall
1-story	63%	61%	57%	63%	64%	63%	58%	61%	62%	62%
2-story	76%	72%	87%	78%	56%	72%	82%	87%	70%	74%
2 or 3-story	56%	53%	79%	52%	37%	50%	66%	65%	50%	54%
3.5-story	33%	34%	39%	28%	38%	32%	38%	32%	34%	34%

Table 59: Design Element #2: Commercial Building Placement (Setback)

For each photo below, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area. (Percent excellent or good fit)	Gender		Age			Housing type		Housing tenure		
	Female	Male	18 to 34	35 to 54	55 and over	Detached	Attached	Rent	Own	Overall
Setback 15-20 feet from street and sidewalk	66%	53%	48%	60%	68%	63%	48%	55%	61%	60%
Parking lot in front	55%	48%	59%	47%	55%	49%	59%	58%	49%	52%
No setback	46%	39%	60%	43%	27%	40%	53%	52%	40%	43%
10 foot setback, directly adjacent to sidewalk	61%	55%	48%	64%	59%	61%	55%	56%	60%	59%

Table 60: Design Element #3: Multi Family Residential Building Height/Size

For each photo below, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area. (Percent excellent or good fit)	Gender		Age			Housing type		Housing tenure		
	Female	Male	18 to 34	35 to 54	55 and over	Detached	Attached	Rent	Own	Overall
1-story duplex	60%	45%	52%	52%	54%	53%	54%	58%	51%	53%
2-story townhouses	72%	68%	72%	72%	65%	73%	62%	68%	71%	69%
3-story apartment building	19%	27%	30%	19%	23%	20%	31%	24%	22%	22%
Apartments/condos above retail/commercial (mixed-use building)	56%	48%	67%	51%	40%	47%	65%	63%	48%	51%

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Table 61: Design Element #4: Multi Family Residential Building Placement (Setback)

For each photo below, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area. (Percent excellent or good fit)	Gender		Age			Housing type		Housing tenure		
	Female	Male	18 to 34	35 to 54	55 and over	Detached	Attached	Rent	Own	Overall
5 foot setback with stoop	26%	25%	28%	30%	16%	26%	25%	24%	26%	25%
5 - 10 foot setback with porches	60%	42%	63%	49%	44%	47%	65%	59%	48%	51%
15 - 20 foot setback with porches and small yards	72%	66%	67%	71%	69%	68%	74%	73%	68%	69%
20+ foot setback with shared entryways	34%	35%	15%	37%	48%	40%	19%	20%	40%	35%

Table 62: Design Element #5: Park/Plaza

For each photo below, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area. (Percent excellent or good fit)	Gender		Age			Housing type		Housing tenure		
	Female	Male	18 to 34	35 to 54	55 and over	Detached	Attached	Rent	Own	Overall
Recreational Park	72%	65%	79%	62%	72%	68%	71%	74%	67%	69%
Town Green	72%	73%	76%	73%	68%	74%	67%	69%	74%	72%
Parklet	49%	43%	56%	41%	47%	43%	57%	54%	43%	46%
Plaza	76%	73%	77%	74%	73%	73%	79%	76%	74%	75%

Table 63: Design Element #6: Streetscape

For each photo below, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area. (Percent excellent or good fit)	Gender		Age			Housing type		Housing tenure		
	Female	Male	18 to 34	35 to 54	55 and over	Detached	Attached	Rent	Own	Overall
Sidewalk right up against street	11%	13%	19%	7%	14%	12%	13%	18%	10%	12%
Sidewalk buffered from street and parking with landscaping	73%	73%	58%	78%	78%	79%	58%	58%	79%	73%
Regular size sidewalk with some amenities	62%	51%	51%	62%	54%	56%	60%	58%	57%	57%
Wide sidewalk with many pedestrian amenities	79%	71%	69%	80%	72%	76%	72%	72%	77%	75%

Prepared by National Research Center, Inc.

Table 64: Design Element #7: Parking Placement

For each photo below, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area. (Percent excellent or good fit)	Gender		Age			Housing type		Housing tenure		Overall
	Female	Male	18 to 34	35 to 54	55 and over	Detached	Attached	Rent	Own	
Parking lot on side of building	78%	71%	74%	76%	72%	74%	76%	73%	75%	74%
Diagonal parking in street	39%	35%	47%	37%	28%	40%	31%	34%	39%	37%
Parallel street parking	36%	37%	36%	38%	34%	39%	32%	33%	38%	37%
Large parking lot in front of building	23%	19%	16%	18%	33%	22%	20%	19%	22%	22%

Table 65: Design Element #8: Parking Edge

For each photo below, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area. (Percent excellent or good fit)	Gender		Age			Housing type		Housing tenure		Overall
	Female	Male	18 to 34	35 to 54	55 and over	Detached	Attached	Rent	Own	
No buffer between parking and sidewalk	13%	11%	22%	11%	6%	10%	20%	18%	10%	12%
Minimal landscaped buffer	54%	41%	46%	55%	37%	48%	49%	51%	47%	48%
Landscaped buffer with amenities	82%	84%	86%	78%	88%	82%	85%	85%	82%	83%
Low wall	38%	34%	45%	27%	44%	36%	35%	35%	36%	36%

Table 66: Design Element #9: Business Signage

For each photo below, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area. (Percent excellent or good fit)	Gender		Age			Housing type		Housing tenure		Overall
	Female	Male	18 to 34	35 to 54	55 and over	Detached	Attached	Rent	Own	
Projecting	83%	84%	92%	89%	65%	82%	86%	93%	80%	83%
Internally-illuminated	54%	42%	37%	45%	63%	50%	41%	41%	51%	48%
Awning	74%	79%	65%	82%	77%	83%	59%	68%	80%	77%
Monument with tenant change panels	25%	21%	22%	17%	38%	23%	25%	19%	25%	23%

Prepared by National Research Center, Inc.

Comparisons by Proximity to South Boulder Road Study Area

- Those living in the South Boulder Road area tended to give lower rating than those outside the area to city-wide quality of life ratings (Table 67).
- As may be expected, those living in the South Boulder Road area tended to visit the various nearby amenities more often than those outside the area (Table 70).
- Residents in the study area tended to use the bus more, bike more and walk more than those outside the area (Table 71). However, South Boulder Road residents wanted to use the bus less and walk more (Table 72).
- Few differences between residents and non-residents of the South Boulder Road area were found when examining preferences for the nine design elements. Where differences were found, those who did not live in the area indicated stronger preferences for 3.5-story commercial buildings, 2-story townhouses and mixed-use buildings (Table 74 to Table 82).

Table 67: Question 1

Please rate each of the following for Louisville (City-wide) (Percent excellent or good):	Proximity to SBR		Overall
	Live in area	Do NOT live in area	
Overall quality of life	95%	99%	97%
Overall economic health	84%	92%	88%
Variety of housing options	60%	56%	57%
Availability of affordable quality housing	23%	26%	25%
Overall quality of shopping and dining opportunities	74%	83%	79%
Overall quality of parks, trails and open spaces	88%	98%	93%
Ease of travel by car	86%	92%	89%
Ease of travel walking	74%	89%	83%
Ease of travel by bicycle	75%	91%	85%
Ease of travel by bus	60%	60%	60%
Sense of safety traveling throughout the city	91%	99%	95%
Physical condition of commercial buildings	80%	88%	85%
Physical condition of residential buildings	83%	90%	87%

Prepared by National Research Center, Inc.

Table 68: Question 2 (Quality)

First, please rate the quality of each of the following aspects or characteristics as they relate to the South Boulder Road study area (shown in the letter). (Percent excellent or good)	Proximity to SBR		Overall
	Live in area	Do NOT live in area	
Variety of housing options	61%	55%	58%
Availability of affordable quality housing	39%	33%	36%
Overall quality of shopping and dining opportunities	61%	49%	54%
Overall quality of parks, trails and open space	79%	75%	76%
Ease of travel by car	75%	85%	81%
Ease of travel walking	64%	66%	65%
Ease of travel by bicycle	66%	59%	62%
Ease of travel by bus	58%	61%	60%
Sense of safety traveling through the corridor	81%	78%	79%
Physical condition of commercial buildings	65%	52%	57%
Physical condition of residential buildings	65%	58%	61%

Table 69: Question 2 (Importance)

Then, please tell us how important to you, if at all, it is that the City attempt to improve each of the following in the South Boulder Road study area. (Percent essential or very important)	Proximity to SBR		Overall
	Live in area	Do NOT live in area	
Variety of housing options	45%	52%	49%
Availability of affordable quality housing	56%	53%	54%
Overall quality of shopping and dining opportunities	70%	68%	69%
Overall quality of parks, trails and open space	83%	83%	83%
Ease of travel by car	72%	68%	69%
Ease of travel walking	78%	79%	79%
Ease of travel by bicycle	69%	72%	71%
Ease of travel by bus	63%	56%	59%
Sense of safety traveling through the corridor	82%	84%	83%
Physical condition of commercial buildings	47%	63%	56%
Physical condition of residential buildings	55%	61%	59%

Table 70: Question 4

In a typical month, how many times, if at all, do you visit each of the following? (Percent at least once a month)	Proximity to SBR		Overall
	Live in area	Do NOT live in area	
Village Square/Alfalfa's (Stores at Centennial)	93%	85%	89%
Christopher Village (Stores west of Hwy 42/96th St)	69%	50%	58%
Louisville Plaza/King Soopers (Stores east of Hwy 42)	99%	97%	98%
Medical and professional offices along South Boulder Road	38%	48%	44%
Cottonwood Park	69%	46%	55%
Harney/Lastoka Open Space	42%	27%	33%
Recreational trails in the area	94%	75%	83%

Prepared by National Research Center, Inc.

Table 71: Question 5 (Actual Use)

First, tell us how many times in a typical month, if at all, you travel through the study area using each of the following modes. (Percent at least once a month)	Proximity to SBR		Overall
	Live in area	Do NOT live in area	
In a car	100%	98%	99%
In a bus	26%	13%	18%
On a bicycle	64%	53%	57%
Walking	90%	47%	64%

Table 72: Question 5 (Preferred Use)

First, tell us how many times in a typical month, if at all, you travel through the study area using each of the following modes. Then, please indicate if you'd like to use each mode more, the same amount or less in the study area.		Proximity to SBR		Overall
		Live in area	Do NOT live in area	
In a car	Use more	4%	5%	5%
	Use the same	72%	74%	73%
	Use less	24%	21%	22%
In a bus	Use more	31%	31%	31%
	Use the same	49%	62%	57%
	Use less	20%	6%	12%
On a bicycle	Use more	55%	55%	55%
	Use the same	38%	43%	41%
	Use less	7%	3%	5%
Walking	Use more	62%	50%	55%
	Use the same	36%	50%	44%
	Use less	2%	1%	2%

Table 73: Question 6

Please indicate whether you feel that there are too many, the right amount or not enough of each of the following in the South Boulder Road study area:		Proximity to SBR		Overall
		Live in area	Do NOT live in area	
Housing for singles / couples (apartments, townhomes, smaller duplex, single-family)	Too many	23%	14%	18%
	Right amount	41%	54%	48%
	Too few	36%	32%	34%
Housing for families with children (smaller duplex, single-family)	Too many	7%	7%	7%
	Right amount	59%	69%	65%
	Too few	34%	24%	28%
Housing for seniors (smaller one-level single-family house, apartments with elevators)	Too many	4%	3%	4%
	Right amount	53%	39%	45%
	Too few	43%	57%	51%
Affordable (subsidized) housing	Too many	13%	8%	10%
	Right amount	42%	32%	36%
	Too few	45%	60%	54%
Live/work (combined living and working spaces)	Too many	4%	4%	4%
	Right amount	48%	29%	37%
	Too few	48%	67%	59%
Restaurants, cafes, coffee shops, pubs/bars	Too many	2%	0%	1%
	Right amount	53%	48%	50%
	Too few	45%	52%	49%

Prepared by National Research Center, Inc.

Please indicate whether you feel that there are too many, the right amount or not enough of each of the following in the South Boulder Road study area:		Proximity to SBR		
		Live in area	Do NOT live in area	Overall
Neighborhood shops (dry cleaners, barbers/beauty salon, etc.)	Too many	2%	0%	1%
	Right amount	67%	71%	69%
	Too few	31%	29%	30%
Community shops (grocery store, drug store, etc.)	Too many	0%	0%	0%
	Right amount	91%	84%	86%
	Too few	9%	16%	14%
Regional shops, such as big box retailers	Too many	22%	17%	19%
	Right amount	56%	63%	60%
	Too few	23%	21%	22%
Work-share spaces	Too many	4%	3%	3%
	Right amount	52%	44%	48%
	Too few	44%	53%	49%
Health clinics / medical offices	Too many	6%	6%	6%
	Right amount	90%	87%	88%
	Too few	4%	7%	6%
Professional services (lawyers, accountants, etc.)	Too many	5%	6%	5%
	Right amount	90%	84%	87%
	Too few	5%	10%	8%
General business offices (corporate offices, etc.)	Too many	10%	8%	9%
	Right amount	73%	71%	72%
	Too few	16%	20%	18%
Research and development	Too many	6%	2%	4%
	Right amount	56%	58%	57%
	Too few	38%	40%	39%
Bike and pedestrian amenities/recreational trails	Too many	1%	0%	1%
	Right amount	49%	48%	49%
	Too few	49%	52%	51%
Small "Parklets" / plazas	Too many	3%	3%	3%
	Right amount	52%	49%	50%
	Too few	45%	48%	47%
Neighborhood parks (like Cottonwood Park)	Too many	1%	0%	0%
	Right amount	55%	62%	59%
	Too few	44%	38%	41%
Regional park (like Community Park)	Too many	1%	0%	0%
	Right amount	60%	67%	64%
	Too few	39%	33%	36%
Indoor community gathering space (arts center, community center, etc.)	Too many	1%	1%	1%
	Right amount	40%	50%	45%
	Too few	59%	49%	54%
Outdoor community gathering space (amphitheater, commons, etc.)	Too many	1%	1%	1%
	Right amount	34%	42%	38%
	Too few	65%	58%	61%

Prepared by National Research Center, Inc.

Table 74: Design Element #1: Commercial Building Height/Size

For each photo below, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area. (Percent excellent or good fit)	Proximity to SBR		Overall
	Live in area	Do NOT live in area	
1-story	62%	62%	62%
2-story	75%	74%	74%
2 or 3-story	52%	56%	54%
3.5-story	25%	40%	34%

Table 75: Design Element #2: Commercial Building Placement (Setback)

For each photo below, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area. (Percent excellent or good fit)	Proximity to SBR		Overall
	Live in area	Do NOT live in area	
Setback 15-20 feet from street and sidewalk	53%	64%	60%
Parking lot in front	54%	51%	52%
No setback	43%	43%	43%
10 foot setback, directly adjacent to sidewalk	53%	63%	59%

Table 76: Design Element #3: Multi Family Residential Building Height/Size

For each photo below, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area. (Percent excellent or good fit)	Proximity to SBR		Overall
	Live in area	Do NOT live in area	
1-story duplex	53%	53%	53%
2-story townhouses	55%	80%	69%
3-story apartment building	16%	27%	22%
Apartments/condos above retail/commercial (mixed-use building)	43%	57%	51%

Table 77: Design Element #4: Multi Family Residential Building Placement (Setback)

For each photo below, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area. (Percent excellent or good fit)	Proximity to SBR		Overall
	Live in area	Do NOT live in area	
5 foot setback with stoop	21%	29%	25%
5 - 10 foot setback with porches	45%	55%	51%
15 - 20 foot setback with porches and small yards	70%	69%	69%
20+ foot setback with shared entryways	35%	35%	35%

Prepared by National Research Center, Inc.

Table 78: Design Element #5: Park/Plaza

For each photo below, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area. (Percent excellent or good fit)	Proximity to SBR		Overall
	Live in area	Do NOT live in area	
Recreational Park	65%	72%	69%
Town Green	76%	70%	72%
Parklet	48%	45%	46%
Plaza	72%	77%	75%

Table 79: Design Element #6: Streetscape

For each photo below, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area. (Percent excellent or good fit)	Proximity to SBR		Overall
	Live in area	Do NOT live in area	
Sidewalk right up against street	16%	10%	12%
Sidewalk buffered from street and parking with landscaping	65%	79%	73%
Regular size sidewalk with some amenities	60%	56%	57%
Wide sidewalk with many pedestrian amenities	70%	79%	75%

Table 80: Design Element #7: Parking Placement

For each photo below, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area. (Percent excellent or good fit)	Proximity to SBR		Overall
	Live in area	Do NOT live in area	
Parking lot on side of building	73%	75%	74%
Diagonal parking in street	32%	41%	37%
Parallel street parking	33%	39%	37%
Large parking lot in front of building	28%	18%	22%

Table 81: Design Element #8: Parking Edge

For each photo below, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area. (Percent excellent or good fit)	Proximity to SBR		Overall
	Live in area	Do NOT live in area	
No buffer between parking and sidewalk	13%	11%	12%
Minimal landscaped buffer	46%	50%	48%
Landscaped buffer with amenities	83%	82%	83%
Low wall	35%	36%	36%

Table 82: Design Element #9: Business Signage

For each photo below, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area. (Percent excellent or good fit)	Proximity to SBR		Overall
	Live in area	Do NOT live in area	
Projecting	84%	83%	83%
Internally-illuminated	45%	50%	48%
Awning	70%	82%	77%
Monument with tenant change panels	25%	23%	23%

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Appendix B: Survey Methodology

Survey Instrument Development

Louisville has conducted a general residential survey every two or three years for more than 20 years. The general residential surveys ask recipients about their perspectives on the quality of life in the city, use of city amenities, opinion on policy issues facing the city and assessment of City service delivery. This topical survey was developed to explore key issues related to the development of the South Boulder Road area. The survey instrument development process began with a review of the topics to be explored. In an iterative process between City staff, Cuningham Group Architecture, Inc. and NRC staff, a final 12-page questionnaire was developed.

Selecting Survey Recipients

"Sampling" refers to the method by which survey recipients are chosen. The "sample" refers to all those who were given a chance to participate in the survey. All households located in the city boundaries were eligible for the survey. Because City governments generally do not have inclusive lists of all the residences in the jurisdiction (tax assessor and utility billing databases often omit rental units), lists from the United States Postal Service (USPS), updated every three months, usually provide the best representation of all households in a specific geographic location. NRC used USPS data to randomly select the sample of households.

A larger list than needed was sampled so that a process referred to as "geocoding" could be used to eliminate addresses from the list that were outside the study boundaries. Geocoding is a computerized process in which addresses are compared to electronically mapped boundaries and coded as inside or outside desired boundaries. All addresses determined to be outside the study boundaries were eliminated from the sample. A random selection was made of the remaining addresses to create a final list of 1,200 addresses. Attached household units were over-sampled because residents of this type of housing typically respond at lower rates to surveys than do those in detached housing units.

An individual within each household was randomly selected to complete the survey using the birthday method. The birthday method selects a person within the household by asking the "person whose birthday has most recently passed" to complete the questionnaire. The underlying assumption in this method is that day of birth has no relationship to the way people respond to surveys. This instruction was contained in the cover letter accompanying the questionnaire.

Survey Administration and Response

Two versions of the survey were created. The full 12-page version included three pages of questions and demographics, plus nine pages of images representing the design elements for respondents to rates. The shorter, 3-page version included just the 3 pages of questions and demographics. Households selected to participate were randomly assigned the 3- or 12-page

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version of the survey. All survey recipients were provided the option to complete the survey online. Those households that received the 3-page version of the survey were given the option to complete the entire survey of just the photographic comparison portion of the survey online. All surveys were given a unique identifier to access the online survey; this identifier also permitted the matching of responses from the 3-page hard copies to the online photographic comparisons submitted via the Internet.

Each selected household was contacted three times. First, a prenotification announcement, informing the household members that they had been selected to participate in the South Boulder Road Planning Survey, was sent. Approximately one week after mailing the prenotification, each household was mailed a survey and a cover letter signed by the Mayor enlisting participation. The packet also contained a postage-paid return envelope in which the survey recipients could return the completed questionnaire to NRC. A reminder letter and survey, scheduled to arrive one week after the first survey, was the final contact. The second cover letter asked those who had not completed the survey to do so and those who had already done so to refrain from turning in another survey.

The mailings were sent in November 2014 and completed surveys were collected over the following six weeks. About 2% of the 1,200 surveys mailed were returned because the housing unit was vacant or the postal service was unable to deliver the survey as addressed. Of the remaining 1,179 households, 380 completed the survey, providing a response rate of 32%; average response rates for a mailed resident survey range from 25% to 40%.

95% Confidence Intervals

The 95% confidence interval (or “margin of error”) quantifies the “sampling error” or precision of the estimates made from the survey results. A 95% confidence interval can be calculated for any sample size, and indicates that in 95 of 100 surveys conducted like this one, for a particular item, a result would be found that is within plus or minus five percentage points of the result that would be found if everyone in the population of interest was surveyed. The practical difficulties of conducting any resident survey may introduce other sources of error in addition to sampling error. Despite best efforts to boost participation and ensure potential inclusion of all households, some selected households will decline participation in the survey (potentially introducing non-response error) and some eligible households may be unintentionally excluded from the listed sources for the sample (referred to as coverage error).

While the 95 percent confidence interval for the survey is generally no greater than plus or minus five percentage points around any given percent reported for the entire sample; results for subgroups will have wider confidence intervals. Where estimates are given for subgroups, they are less precise. For each subgroup from the survey, the margin of error rises to as much as plus or minus 10% for a sample size of 100 completed surveys.

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Survey Processing (Data Entry)

Mailed surveys were submitted via postage-paid business reply envelopes. Each survey was reviewed and "cleaned" as necessary. For example, a question may have asked a respondent to pick two items out of a list of five, but the respondent checked three; staff would choose randomly two of the three selected items to be coded in the survey responses dataset.

All surveys are entered into an electronic dataset, which was subject to a data entry protocol of "key and verify." In this process, data were entered twice into an electronic dataset and then compared. Discrepancies were evaluated against the original survey form and corrected. Range checks as well as other forms of quality control were also performed.

Weighting the Data

The primary objective of weighting survey data is to make the survey sample reflective of the larger population of the city. This is done by: 1) reviewing the sample demographics and comparing them to the population norms from the most recent Census or other sources and 2) comparing the responses to different questions for demographic subgroups. The demographic characteristics that are least similar to the Census and yield the most different results are the best candidates for data weighting. Several different weighting "schemes" are tested to ensure the best fit for the data. The data were weighted by housing tenure (rent or own), housing type (attached or detached), age and gender. The results of the weighting scheme are presented in Table 83.

Table 83: Weighting Table for the City of Louisville South Boulder Road Planning Survey

	2010 Census*	Unweighted	Weighted
Rent	27%	11%	27%
Own	73%	89%	73%
Detached†	74%	86%	74%
Attached†	26%	14%	26%
Female	51%	52%	51%
Male	49%	48%	49%
Age 18-34	23%	7%	22%
Age 35-54	46%	43%	46%
Age 55 and over	31%	50%	32%
Female 18-34	11%	4%	13%
Female 35-54	24%	25%	25%
Female 55 and over	16%	23%	14%
Male 18-34	12%	3%	9%
Male 35-54	22%	18%	22%
Male 55 and over	15%	27%	18%

* Population in households
† ACS 2011 5-year estimates

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Analyzing the Data

The surveys were analyzed using the Statistical Package for the Social Sciences (SPSS). Frequency distributions are presented in the body of the report. Chi-square and ANOVA tests of significance were applied to breakdowns of selected survey questions by respondent and geographic characteristics. A "p-value" of 0.05 or less indicates that there is less than a 5% probability that differences observed between groups are due to chance; or in other words, a greater than 95% probability that the differences observed in the selected categories of our sample represent "real" differences among those populations. Where differences between subgroups are statistically significant, they are marked with grey shading in the appendices.

Prepared by National Research Center, Inc.

Appendix C: Survey Materials

Prepared by National Research Center, Inc.

Dear Louisville Resident,

It won't take much of your time to make a big difference!

Your household has been randomly selected to participate in a survey about the development of South Boulder Road. Even if you don't live in the area, we still want to hear from you. Your survey will arrive in the mail in a few days.

If you prefer, you can complete the survey online at (please enter the address exactly as it appears here):

www.n-r-c.com/survey/louisvillesbr.htm

To complete the survey online, please enter the access code printed above the word "RESIDENT" on the other side of the postcard. Your responses are completely confidential and will be reported in group form only.

Thank you for helping create a better Louisville.

Sincerely,

Robert P. Muckle, Mayor
City of Louisville

Dear Louisville Resident,

It won't take much of your time to make a big difference!

Your household has been randomly selected to participate in a survey about the development of South Boulder Road. Even if you don't live in the area, we still want to hear from you. Your survey will arrive in the mail in a few days.

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Thank you for helping create a better Louisville.

Sincerely,

Robert P. Muckle, Mayor
City of Louisville

City of Louisville
749 Main Street ● Louisville, CO 80027

Presorted
First Class Mail
US Postage
PAID
Boulder, CO
Permit NO. 94

City of Louisville
749 Main Street ● Louisville, CO 80027

Presorted
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US Postage
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Presorted
First Class Mail
US Postage
PAID
Boulder, CO
Permit NO. 94

City of Louisville

749 Main Street
Louisville, CO 80027
303.335.4596
FAX 303.335.4550

Dear City of Louisville Resident:

Please help us shape the future of Louisville and the South Boulder Road corridor. As part of the City's South Boulder Road Small Area Plan process, we are trying to determine the community's vision and desired uses for the area. The enclosed survey shows different possibilities for the area and we want to know what you think it should look like. Even if you live outside the South Boulder Road corridor, we still want to hear from you.

Your participation in this survey is very important – especially since your household is one of only 1,200 Louisville households being surveyed.

A few things to remember:

- Your responses are completely confidential.
- In order to hear from a diverse group of residents, the adult 18 years or older in your household who most recently had a birthday should complete this survey.
- You may return the survey by mail in the enclosed postage-paid envelope, or you can complete the survey online at (please type the address exactly as it appears):

  www.n-r-c.com/survey/louisvillesbr.htm

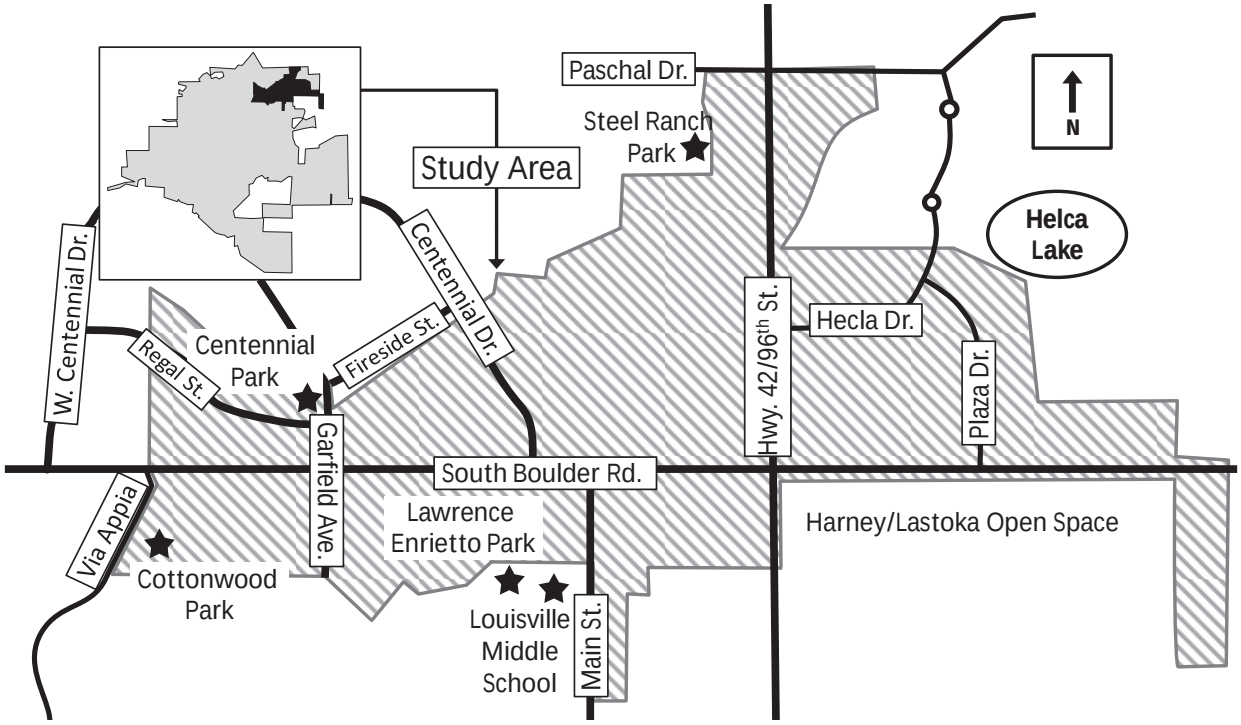
If you choose to complete the survey online, please enter the access code printed at the top of this letter. If you have any questions about the survey please call 303-335-4596.

Thank you for your time and participation.

Sincerely,

Robert P. Muckle, Mayor

Map of Study Area



City of Louisville

749 Main Street
Louisville, CO 80027
303.335.4596
FAX 303.335.4550

Dear City of Louisville Resident:

Here's a second chance if you haven't already responded to the survey about the South Boulder Road Small Area Plan in Louisville. (If you completed it and sent it back, we thank you for your time and ask you to recycle this survey. Please do not respond twice.)

The survey shows pictures of what the South Boulder Road area could look like and asks you what you would prefer to see. Even if you live outside the South Boulder Road corridor, we still want to hear from you. Don't miss this opportunity to provide input about an important area in our city. Your participation in this survey is very important – especially since your household is one of 1,200 Louisville households being surveyed.

A few things to remember:

- Your responses are completely confidential.
- In order to hear from a diverse group of residents, the adult 18 years or older in your household who most recently had a birthday should complete this survey.
- You may return the survey by mail in the enclosed postage-paid envelope, or you can complete the survey online at (please type the address exactly as it appears):

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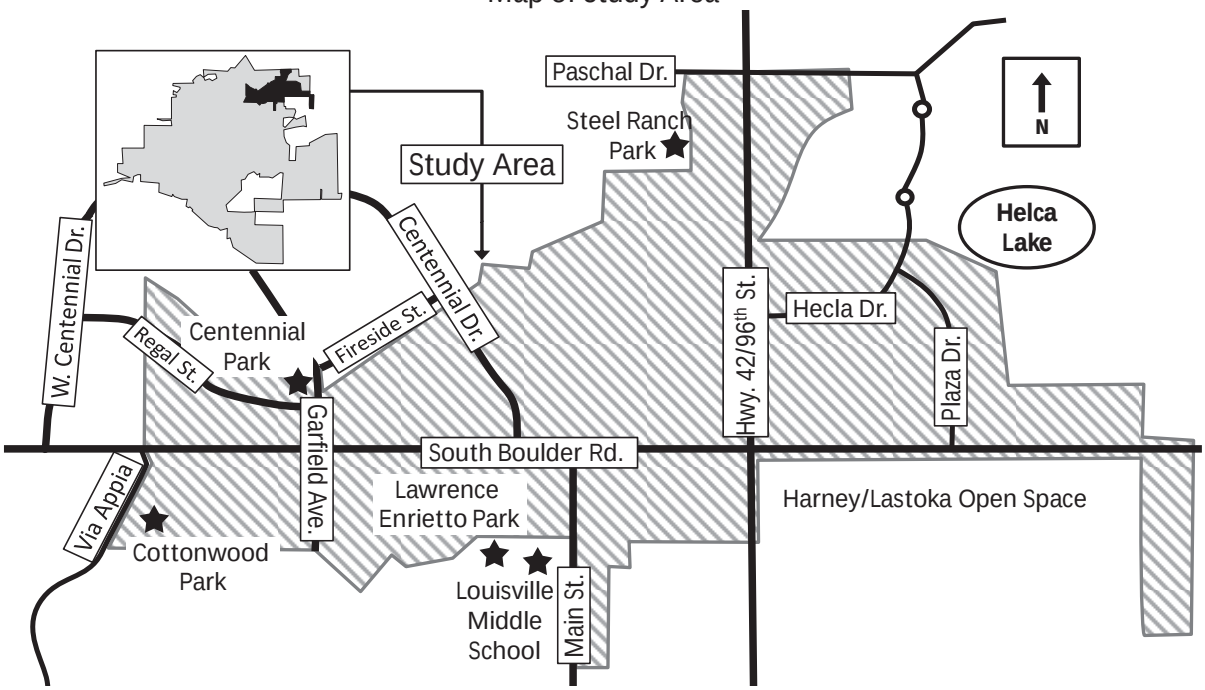
If you choose to complete the survey online, please enter the access code printed at the top of this letter. If you have any questions about the survey please call 303-335-4596.

Thank you for your time and participation.

Sincerely,

Robert P. Muckle, Mayor

Map of Study Area



Please circle the response that most closely represents your opinion for each question. Your responses are confidential and will be reported in group form only.

1. Please rate each of the following for Louisville (City-wide):

	QUALITY				
	Excellent	Good	Fair	Poor	Not familiar
Overall quality of life	1	2	3	4	5
Overall economic health	1	2	3	4	5
Variety of housing options	1	2	3	4	5
Availability of affordable quality housing	1	2	3	4	5
Overall quality of shopping and dining opportunities	1	2	3	4	5
Overall quality of parks, trails and open spaces	1	2	3	4	5
Ease of travel by car	1	2	3	4	5
Ease of travel walking	1	2	3	4	5
Ease of travel by bicycle	1	2	3	4	5
Ease of travel by bus	1	2	3	4	5
Sense of safety traveling throughout the city	1	2	3	4	5
Physical condition of commercial buildings	1	2	3	4	5
Physical condition of residential buildings	1	2	3	4	5

2. First, please rate the quality of each of the following aspects or characteristics as they relate to the South Boulder Road study area (shown in the letter). Then, please tell us how important to you, if at all, it is that the City attempt to improve each of the following in the South Boulder Road study area.

	QUALITY					IMPORTANCE				
	Excellent	Good	Fair	Poor	Not familiar	Essential	Very important	Somewhat important	Not at all important	Not familiar
Variety of housing options	1	2	3	4	5	1	2	3	4	5
Availability of affordable quality housing	1	2	3	4	5	1	2	3	4	5
Overall quality of shopping and dining opportunities	1	2	3	4	5	1	2	3	4	5
Overall quality of parks, trails and open space	1	2	3	4	5	1	2	3	4	5
Ease of travel by car	1	2	3	4	5	1	2	3	4	5
Ease of travel walking	1	2	3	4	5	1	2	3	4	5
Ease of travel by bicycle	1	2	3	4	5	1	2	3	4	5
Ease of travel by bus	1	2	3	4	5	1	2	3	4	5
Sense of safety traveling through the corridor	1	2	3	4	5	1	2	3	4	5
Physical condition of commercial buildings	1	2	3	4	5	1	2	3	4	5
Physical condition of residential buildings	1	2	3	4	5	1	2	3	4	5

3. Which, if any, of the following applies to you in relation to the South Boulder Road study area? (Mark all that apply.)

- ❑ I live in the area (see map in attached letter)
- ❑ My child attends LMS
- ❑ I use parks and trails in the area
- ❑ I shop/dine in the area
- ❑ I use medical/professional services in the area
- ❑ I only travel through the area
- ❑ I work in the area
- ❑ None of the above

4. In a typical month, how many times, if at all, do you visit each of the following?

	Never	1-3 times a month	Once a week	Multiple times a week	Daily
Village Square/Alfalfa's (Stores at Centennial)	1	2	3	4	5
Christopher Village (Stores west of Hwy 42/96th St)	1	2	3	4	5
Louisville Plaza/King Soopers (Stores east of Hwy 42)	1	2	3	4	5
Medical and professional offices along South Boulder Road	1	2	3	4	5
Cottonwood Park	1	2	3	4	5
Harney/Lastoka Open Space	1	2	3	4	5
Recreational trails in the area	1	2	3	4	5

5. First, tell us how many times in a typical month, if at all, you travel through the study area using each of the following modes. Then, please indicate if you'd like to use each mode more, the same amount or less in the study area.

	Never	1-3 times a month	Once a week	Multiple times a week	Daily	Use more	Use the same	Use less
In a car	1	2	3	4	5	1	2	3
In a bus	1	2	3	4	5	1	2	3
On a bicycle	1	2	3	4	5	1	2	3
Walking	1	2	3	4	5	1	2	3

6. Please indicate whether you feel that there are too many, the right amount or not enough of each of the following in the South Boulder Road study area:

HOUSING OPPORTUNITIES	Too many	Right amount	Not enough	Not familiar
Housing for singles / couples (apartments, townhomes, smaller duplex, single-family)	1	2	3	4
Housing for families with children (smaller duplex, single-family)	1	2	3	4
Housing for seniors (smaller one-level single-family house, apartments with elevators)	1	2	3	4
Affordable (subsidized) housing	1	2	3	4
Live/work (combined living and working spaces)	1	2	3	4
SHOPPING AND DINING OPPORTUNITIES				
Restaurants, cafes, coffee shops, pubs/bars	1	2	3	4
Neighborhood shops (dry cleaners, barbers/beauty salon, etc.)	1	2	3	4
Community shops (grocery store, drug store, etc.)	1	2	3	4
Regional shops, such as big box retailers	1	2	3	4
BUSINESS AND PROFESSIONAL SERVICE OPPORTUNITIES				
Work-share spaces	1	2	3	4
Health clinics / medical offices	1	2	3	4
Professional services (lawyers, accountants, etc.)	1	2	3	4
General business offices (corporate offices, etc.)	1	2	3	4
Research and development	1	2	3	4
PARKS AND PUBLIC SPACES				
Bike and pedestrian amenities/recreational trails	1	2	3	4
Small "Parklets" / plazas	1	2	3	4
Neighborhood parks (like Cottonwood Park)	1	2	3	4
Regional park (like Community Park)	1	2	3	4
Indoor community gathering space (arts center, community center, etc.)	1	2	3	4
Outdoor community gathering space (amphitheater, commons, etc.)	1	2	3	4

The following questions are about you and your household. Again, all of your responses to this survey are completely confidential and will be reported in group form only.

D1. Which best describes the building you live in?

- ❑ One family house detached from any other houses
- ❑ Building with two or more homes (duplex, townhome, apartment or condominium)
- ❑ Mobile home
- ❑ Other

D2. Do you rent or own your home?

❑ Rent ❑ Own

D3. How many people, including yourself, live in your household?

❑ 1 ❑ 2 ❑ 3 ❑ 4 ❑ 5 ❑ 6+

D4. What is your gender?

❑ Female ❑ Male

D5. In which category is your age?

- ❑ 18-24 years
- ❑ 25-34 years
- ❑ 35-44 years
- ❑ 45-54 years
- ❑ 55-64 years
- ❑ 65-74 years
- ❑ 75 years or older

D6. Are you currently employed?

- ❑ Yes→**Go to question D7**
- ❑ No

D7. In which city do you work? _____

D8. About how much do you estimate your household's total income before taxes will be for the current year?

- ❑ Less than $24,999
- ❑ $25,000 to $49,999
- ❑ $50,000 to $99,999
- ❑ $100,000 to $149,999
- ❑ $150,000 or more
- ❑ Prefer not to answer

Design Element Photograph Comparisons

There are a number of things that contribute to the way South Boulder Road could look, which we call design elements. We have chosen a set of four photos to show options for each of nine design elements. For each photo on the pages that follow, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area. Please evaluate only the design element asked about in each question.

Design Element #1: Commercial Building Height/Size

For each photo below, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area. (Below each photo is a brief description of the specific design element being asked about, followed by the question and response options.)

1A. 1-story.
For the South Boulder Road study area, is this an…
❑ Excellent fit ❑ Good fit ❑ Fair fit ❑ Poor fit

1B. 2-story.
For the South Boulder Road study area, is this an…
❑ Excellent fit ❑ Good fit ❑ Fair fit ❑ Poor fit

1C. 2 or 3-story.
For the South Boulder Road study area, is this an…
❑ Excellent fit ❑ Good fit ❑ Fair fit ❑ Poor fit

1D. 3.5-story.
For the South Boulder Road study area, is this an…
❑ Excellent fit ❑ Good fit ❑ Fair fit ❑ Poor fit

Design Element #2: Commercial Building Placement (Setback)

For each photo below, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area. (Below each photo is a brief description of the specific design element followed by the question and response options.)

2A. Setback 15-20 feet from street and sidewalk.
For the South Boulder Road study area, is this an…
❑ Excellent fit ❑ Good fit ❑ Fair fit ❑ Poor fit

2B. Parking lot in front.
For the South Boulder Road study area, is this an…
❑ Excellent fit ❑ Good fit ❑ Fair fit ❑ Poor fit

2C. No setback.
For the South Boulder Road study area, is this an…
❑ Excellent fit ❑ Good fit ❑ Fair fit ❑ Poor fit

2D. 10 foot setback, directly adjacent to sidewalk.
For the South Boulder Road study area, is this an…
❑ Excellent fit ❑ Good fit ❑ Fair fit ❑ Poor fit

Design Element #3: Multi Family Residential Building Height/Size

For each photo below, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area. (Below each photo is a brief description of the specific design element followed by the question and response options.)

3A. 1-story duplex.
For the South Boulder Road study area, is this an…
❑ Excellent fit ❑ Good fit ❑ Fair fit ❑ Poor fit

3B. 2-story townhouses.
For the South Boulder Road study area, is this an…
❑ Excellent fit ❑ Good fit ❑ Fair fit ❑ Poor fit

3C. 3-story apartment building.
For the South Boulder Road study area, is this an…
❑ Excellent fit ❑ Good fit ❑ Fair fit ❑ Poor fit

3D. Apartments/condos above retail/commercial (mixed-use building).
For the South Boulder Road study area, is this an…
❑ Excellent fit ❑ Good fit ❑ Fair fit ❑ Poor fit

Design Element #4: Multi Family Residential Building Placement (Setback)

For each photo below, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area. (Below each photo is a brief description of the specific design element followed by the question and response options.)

4A. 5 foot setback with stoop.
For the South Boulder Road study area, is this an…
❑ Excellent fit ❑ Good fit ❑ Fair fit ❑ Poor fit

4B. 5 - 10 foot setback with porches.
For the South Boulder Road study area, is this an…
❑ Excellent fit ❑ Good fit ❑ Fair fit ❑ Poor fit

4C. 15 - 20 foot setback with porches and small yards.
For the South Boulder Road study area, is this an…
❑ Excellent fit ❑ Good fit ❑ Fair fit ❑ Poor fit

4D. 20+ foot setback with shared entryways.
For the South Boulder Road study area, is this an…
❑ Excellent fit ❑ Good fit ❑ Fair fit ❑ Poor fit

Design Element #5: Park/Plaza

For each photo below, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area. (Below each photo is a brief description of the specific design element followed by the question and response options.)

5A. Recreational Park.
For the South Boulder Road study area, is this an…
❑ Excellent fit ❑ Good fit ❑ Fair fit ❑ Poor fit

5B. Town Green.
For the South Boulder Road study area, is this an…
❑ Excellent fit ❑ Good fit ❑ Fair fit ❑ Poor fit

5C. Parklet.
For the South Boulder Road study area, is this an…
❑ Excellent fit ❑ Good fit ❑ Fair fit ❑ Poor fit

5D. Plaza.
For the South Boulder Road study area, is this an…
❑ Excellent fit ❑ Good fit ❑ Fair fit ❑ Poor fit

Design Element #6: Streetscape

For each photo below, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area. (Below each photo is a brief description of the specific design element followed by the question and response options.)

6A. Sidewalk right up against street.
For the South Boulder Road study area, is this an…
❑ Excellent fit ❑ Good fit ❑ Fair fit ❑ Poor fit

6B. Sidewalk buffered from street and parking with landscaping.
For the South Boulder Road study area, is this an…
❑ Excellent fit ❑ Good fit ❑ Fair fit ❑ Poor fit

6C. Regular size sidewalk with some amenities.
For the South Boulder Road study area, is this an…
❑ Excellent fit ❑ Good fit ❑ Fair fit ❑ Poor fit

6D. Wide sidewalk with many pedestrian amenities.
For the South Boulder Road study area, is this an…
❑ Excellent fit ❑ Good fit ❑ Fair fit ❑ Poor fit

Design Element #7: Parking Placement

For each photo below, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area. (Below each photo is a brief description of the specific design element followed by the question and response options.)

7A. Parking lot on side of building.
For the South Boulder Road study area, is this an…
❑ Excellent fit ❑ Good fit ❑ Fair fit ❑ Poor fit

7B. Diagonal parking in street.
For the South Boulder Road study area, is this an…
❑ Excellent fit ❑ Good fit ❑ Fair fit ❑ Poor fit

7C. Parallel street parking.
For the South Boulder Road study area, is this an…
❑ Excellent fit ❑ Good fit ❑ Fair fit ❑ Poor fit

7D. Large parking lot in front of building.
For the South Boulder Road study area, is this an…
❑ Excellent fit ❑ Good fit ❑ Fair fit ❑ Poor fit

Design Element #8: Parking Edge

For each photo below, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area. (Below each photo is a brief description of the specific design element followed by the question and response options.)

8A. No buffer between parking and sidewalk.
For the South Boulder Road study area, is this an…
❑ Excellent fit ❑ Good fit ❑ Fair fit ❑ Poor fit

8B. Minimal landscaped buffer.
For the South Boulder Road study area, is this an…
❑ Excellent fit ❑ Good fit ❑ Fair fit ❑ Poor fit

8C. Landscaped buffer with amenities.
For the South Boulder Road study area, is this an…
❑ Excellent fit ❑ Good fit ❑ Fair fit ❑ Poor fit

8D. Low wall.
For the South Boulder Road study area, is this an…
❑ Excellent fit ❑ Good fit ❑ Fair fit ❑ Poor fit

Design Element #9: Business Signage

For each photo below, tell us whether you think the design element shown would be an excellent fit, a good fit, a fair fit or a poor fit for the South Boulder Road study area. (Below each photo is a brief description of the specific design element followed by the question and response options.)

9A. Projecting.
For the South Boulder Road study area, is this an…
❑ Excellent fit ❑ Good fit ❑ Fair fit ❑ Poor fit

9B. Internally-illuminated.
For the South Boulder Road study area, is this an…
❑ Excellent fit ❑ Good fit ❑ Fair fit ❑ Poor fit

9C. Awning.
For the South Boulder Road study area, is this an…
❑ Excellent fit ❑ Good fit ❑ Fair fit ❑ Poor fit

9D. Monument with tenant change panels.
For the South Boulder Road study area, is this an…
❑ Excellent fit ❑ Good fit ❑ Fair fit ❑ Poor fit

City of Louisville

749 Main Street
Louisville, CO 80027
303.335.4596
FAX 303.335.4550

Dear City of Louisville Resident:

Please help us shape the future of Louisville and the South Boulder Road corridor. As part of the City's South Boulder Road Small Area Plan process, we are trying to determine the community's vision and desired uses for the area. The enclosed survey shows different possibilities for the area and we want to know what you think it should look like. Even if you live outside the South Boulder Road corridor, we still want to hear from you.

Your participation in this survey is very important – especially since your household is one of only 1,200 Louisville households being surveyed.

A few things to remember:

- Your responses are completely confidential.
- In order to hear from a diverse group of residents, the adult 18 years or older in your household who most recently had a birthday should complete this survey.
- After the two pages of survey questions, you will be asked to go online to complete the photograph comparison portion of the survey.
- You may complete and return the two pages of survey questions that follow by mail in the enclosed postage-paid envelope, or you can complete the entire survey online at (please type the address exactly as it appears): www.n-r-c.com/survey/louisvillesbr.htm

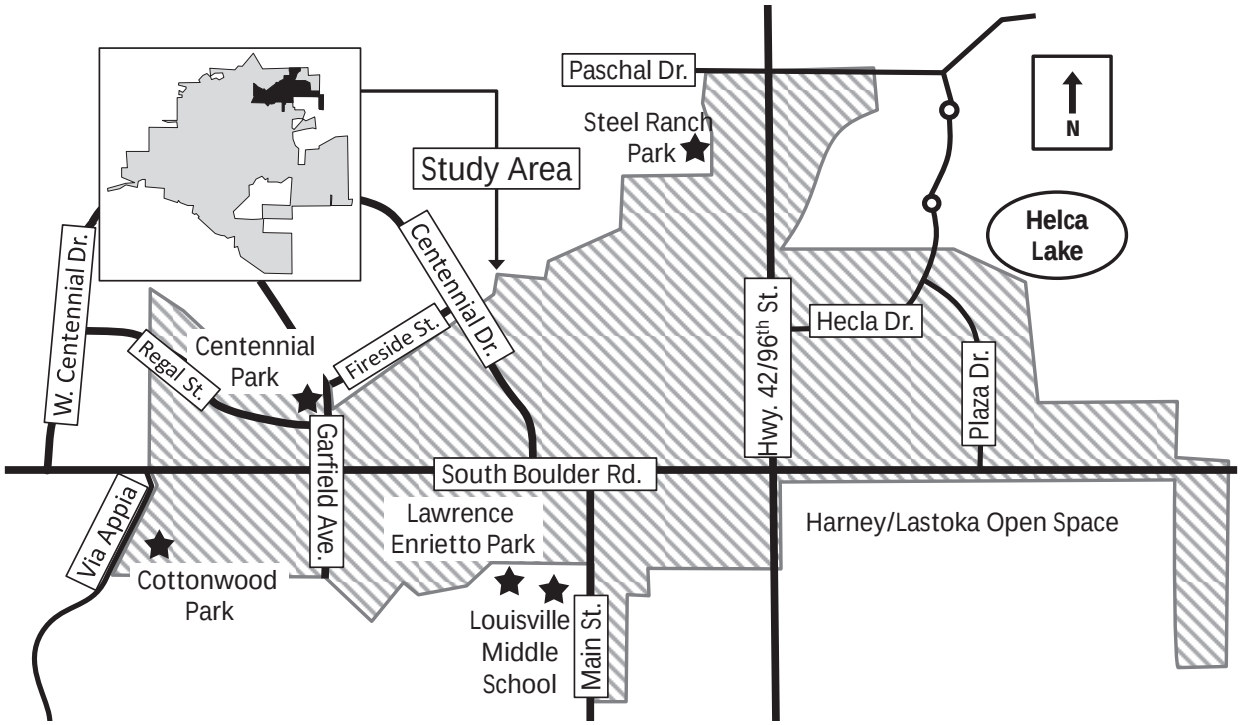
To complete the survey online, please enter the access code printed at the top of this letter. If you have any questions about the survey please call 303-335-4596.

Thank you for your time and participation.

Sincerely,

Robert P. Muckle, Mayor

Map of Study Area



City of Louisville

749 Main Street
Louisville, CO 80027
303.335.4596
FAX 303.335.4550

Dear City of Louisville Resident:

Here's a second chance if you haven't already responded to the survey about the South Boulder Road Small Area Plan in Louisville. (If you completed it and sent it back, we thank you for your time and ask you to recycle this survey. Please do not respond twice.)

The survey shows pictures of what the South Boulder Road area could look like and asks you what you would prefer to see. Even if you live outside the South Boulder Road corridor, we still want to hear from you. Don't miss this opportunity to provide input about an important area in our city. Your participation in this survey is very important – especially since your household is one of 1,200 Louisville households being surveyed.

A few things to remember:

- Your responses are completely confidential.
- In order to hear from a diverse group of residents, the adult 18 years or older in your household who most recently had a birthday should complete this survey.
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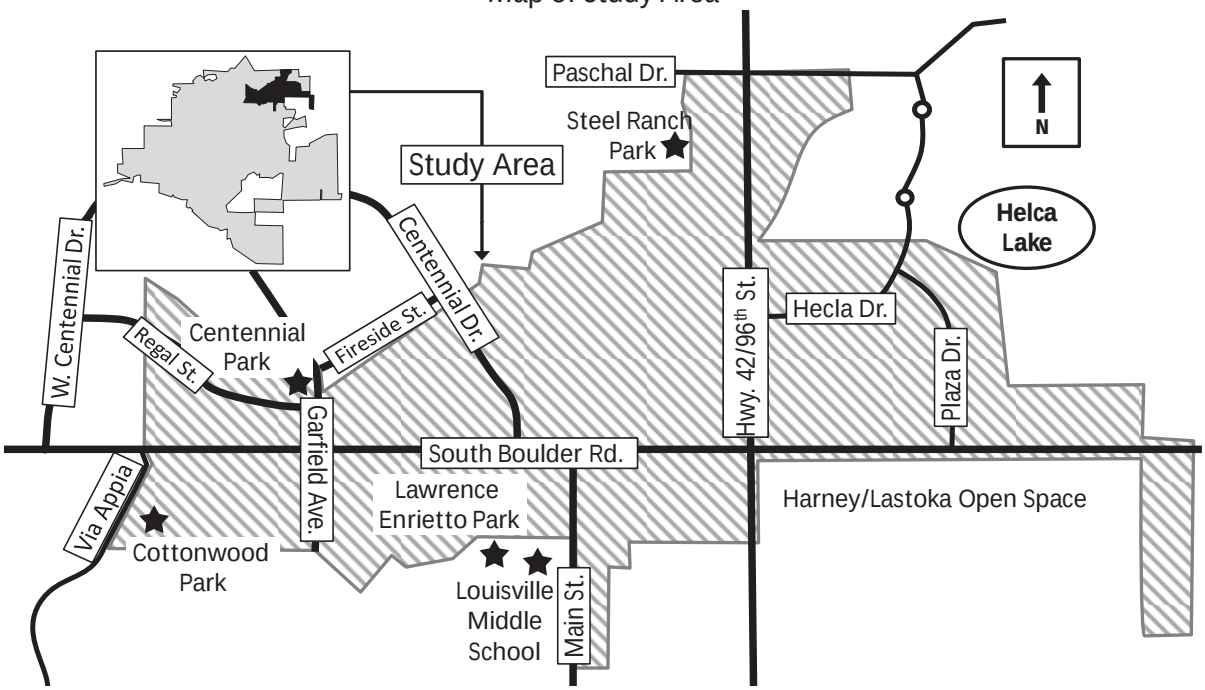
Map of Study Area



Please circle the response that most closely represents your opinion for each question. Your responses are confidential and will be reported in group form only.

1. Please rate each of the following for Louisville (City-wide):

	QUALITY				
	Excellent	Good	Fair	Poor	Not familiar
Overall quality of life	1	2	3	4	5
Overall economic health	1	2	3	4	5
Variety of housing options	1	2	3	4	5
Availability of affordable quality housing	1	2	3	4	5
Overall quality of shopping and dining opportunities	1	2	3	4	5
Overall quality of parks, trails and open spaces	1	2	3	4	5
Ease of travel by car	1	2	3	4	5
Ease of travel walking	1	2	3	4	5
Ease of travel by bicycle	1	2	3	4	5
Ease of travel by bus	1	2	3	4	5
Sense of safety traveling throughout the city	1	2	3	4	5
Physical condition of commercial buildings	1	2	3	4	5
Physical condition of residential buildings	1	2	3	4	5

2. First, please rate the quality of each of the following aspects or characteristics as they relate to the South Boulder Road study area (shown in the letter). Then, please tell us how important to you, if at all, it is that the City attempt to improve each of the following in the South Boulder Road study area.

	QUALITY					IMPORTANCE				
	Excellent	Good	Fair	Poor	Not familiar	Essential	Very important	Somewhat important	Not at all important	Not familiar
Variety of housing options	1	2	3	4	5	1	2	3	4	5
Availability of affordable quality housing	1	2	3	4	5	1	2	3	4	5
Overall quality of shopping and dining opportunities	1	2	3	4	5	1	2	3	4	5
Overall quality of parks, trails and open space	1	2	3	4	5	1	2	3	4	5
Ease of travel by car	1	2	3	4	5	1	2	3	4	5
Ease of travel walking	1	2	3	4	5	1	2	3	4	5
Ease of travel by bicycle	1	2	3	4	5	1	2	3	4	5
Ease of travel by bus	1	2	3	4	5	1	2	3	4	5
Sense of safety traveling through the corridor	1	2	3	4	5	1	2	3	4	5
Physical condition of commercial buildings	1	2	3	4	5	1	2	3	4	5
Physical condition of residential buildings	1	2	3	4	5	1	2	3	4	5

3. Which, if any, of the following applies to you in relation to the South Boulder Road study area? (Mark all that apply.)

- ❑ I live in the area (see map in attached letter)
- ❑ My child attends LMS
- ❑ I use parks and trails in the area
- ❑ I shop/dine in the area
- ❑ I use medical/professional services in the area
- ❑ I only travel through the area
- ❑ I work in the area
- ❑ None of the above

4. In a typical month, how many times, if at all, do you visit each of the following?

	Never	1-3 times a month	Once a week	Multiple times a week	Daily
Village Square/Alfalfa's (Stores at Centennial)	1	2	3	4	5
Christopher Village (Stores west of Hwy 42/96th St)	1	2	3	4	5
Louisville Plaza/King Soopers (Stores east of Hwy 42)	1	2	3	4	5
Medical and professional offices along South Boulder Road	1	2	3	4	5
Cottonwood Park	1	2	3	4	5
Harney/Lastoka Open Space	1	2	3	4	5
Recreational trails in the area	1	2	3	4	5

5. First, tell us how many times in a typical month, if at all, you travel through the study area using each of the following modes. Then, please indicate if you'd like to use each mode more, the same amount or less in the study area.

	Never	1-3 times a month	Once a week	Multiple times a week	Daily	Use more	Use the same	Use less
In a car	1	2	3	4	5	1	2	3
In a bus	1	2	3	4	5	1	2	3
On a bicycle	1	2	3	4	5	1	2	3
Walking	1	2	3	4	5	1	2	3

6. Please indicate whether you feel that there are too many, the right amount or not enough of each of the following in the South Boulder Road study area:

HOUSING OPPORTUNITIES	Too many	Right amount	Not enough	Not familiar
Housing for singles / couples (apartments, townhomes, smaller duplex, single-family)	1	2	3	4
Housing for families with children (smaller duplex, single-family)	1	2	3	4
Housing for seniors (smaller one-level single-family house, apartments with elevators)	1	2	3	4
Affordable (subsidized) housing	1	2	3	4
Live/work (combined living and working spaces)	1	2	3	4
SHOPPING AND DINING OPPORTUNITIES				
Restaurants, cafes, coffee shops, pubs/bars	1	2	3	4
Neighborhood shops (dry cleaners, barbers/beauty salon, etc.)	1	2	3	4
Community shops (grocery store, drug store, etc.)	1	2	3	4
Regional shops, such as big box retailers	1	2	3	4
BUSINESS AND PROFESSIONAL SERVICE OPPORTUNITIES				
Work-share spaces	1	2	3	4
Health clinics / medical offices	1	2	3	4
Professional services (lawyers, accountants, etc.)	1	2	3	4
General business offices (corporate offices, etc.)	1	2	3	4
Research and development	1	2	3	4
PARKS AND PUBLIC SPACES				
Bike and pedestrian amenities/recreational trails	1	2	3	4
Small "Parklets" / plazas	1	2	3	4
Neighborhood parks (like Cottonwood Park)	1	2	3	4
Regional park (like Community Park)	1	2	3	4
Indoor community gathering space (arts center, community center, etc.)	1	2	3	4
Outdoor community gathering space (amphitheater, commons, etc.)	1	2	3	4

The following questions are about you and your household. Again, all of your responses to this survey are completely confidential and will be reported in group form only.

D1. Which best describes the building you live in?

- ❑ One family house detached from any other houses
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- ❑ Mobile home
- ❑ Other

D2. Do you rent or own your home?

❑ Rent ❑ Own

D3. How many people, including yourself, live in your household?

❑ 1 ❑ 2 ❑ 3 ❑ 4 ❑ 5 ❑ 6+

D4. What is your gender?

❑ Female ❑ Male

D5. In which category is your age?

- ❑ 18-24 years
- ❑ 25-34 years
- ❑ 35-44 years
- ❑ 45-54 years
- ❑ 55-64 years
- ❑ 65-74 years
- ❑ 75 years or older

D6. Are you currently employed?

- ❑ Yes→**Go to question D7**
- ❑ No

D7. In which city do you work? _____

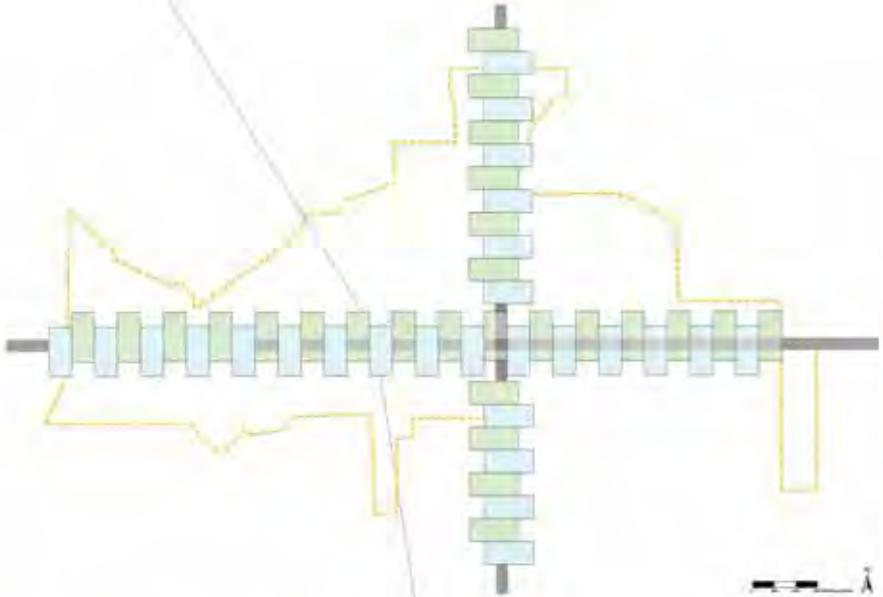
D8. About how much do you estimate your household's total income before taxes will be for the current year?

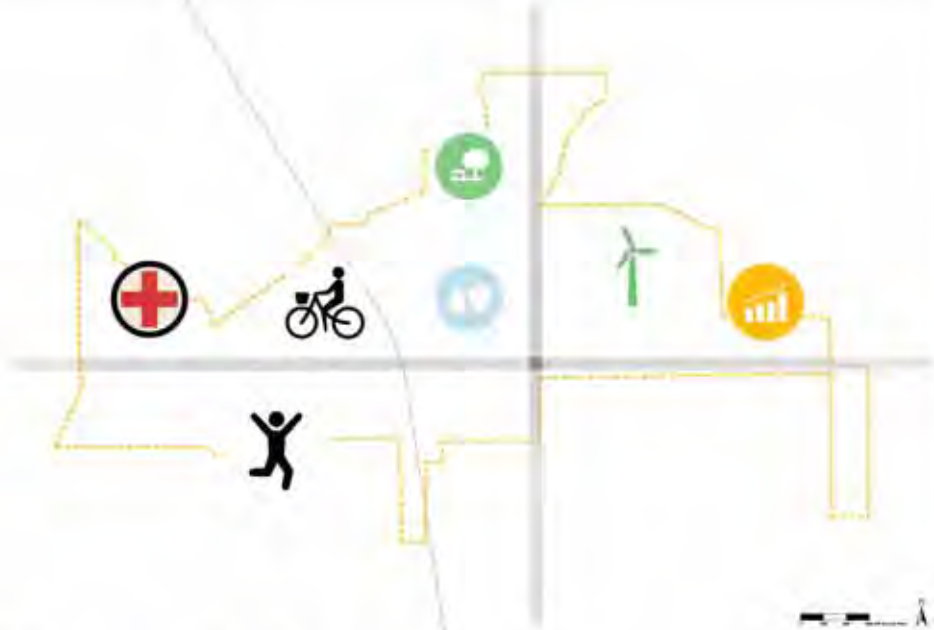
- ❑ Less than $24,999
- ❑ $25,000 to $49,999
- ❑ $50,000 to $99,999
- ❑ $100,000 to $149,999
- ❑ $150,000 or more
- ❑ Prefer not to answer

Design Element Photograph Comparisons (Please go online to complete!)

There are a number of things that contribute to the way South Boulder Road could look, which we call design elements. We have chosen a set of four photos to show options for each of nine design elements. To complete the photograph comparison section only, please go to the following website: www.n-r-c.com/survey/louisvillesbrphotos.htm You will need to enter your access code located in the upper right corner of the letter attached to this survey. Thank you in advance for completing this important portion of the survey online! We appreciate your feedback.

URBAN DESIGN PRINCIPLES





A Zipper, not a barrier

Sidewalks and plazas facing onto South Boulder Road

Safe intersections that allow people to cross South Boulder Road and 42

Traffic flow / speed that is not detrimental to businesses or people along the corridor

A continuous and connected high quality pedestrian experience

Development that Contributes

To be defined by the community

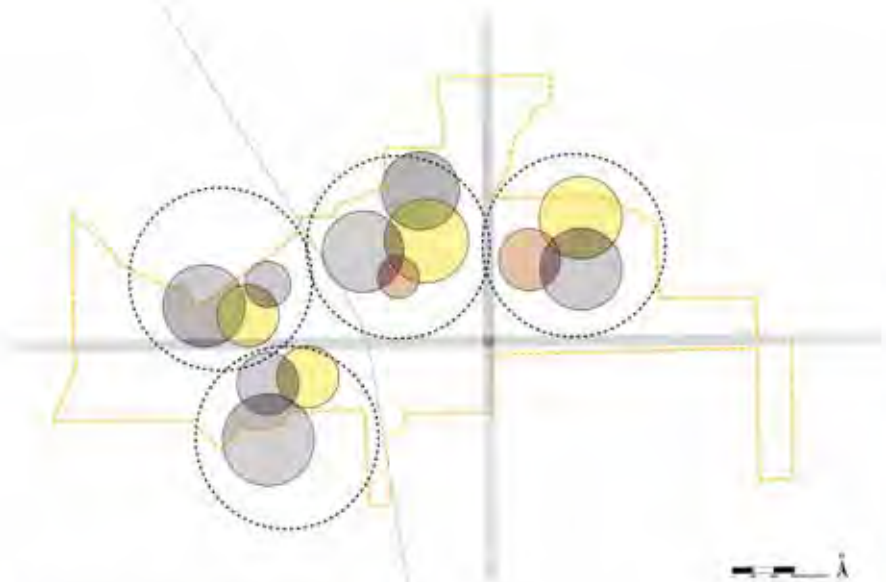
Greenspaces

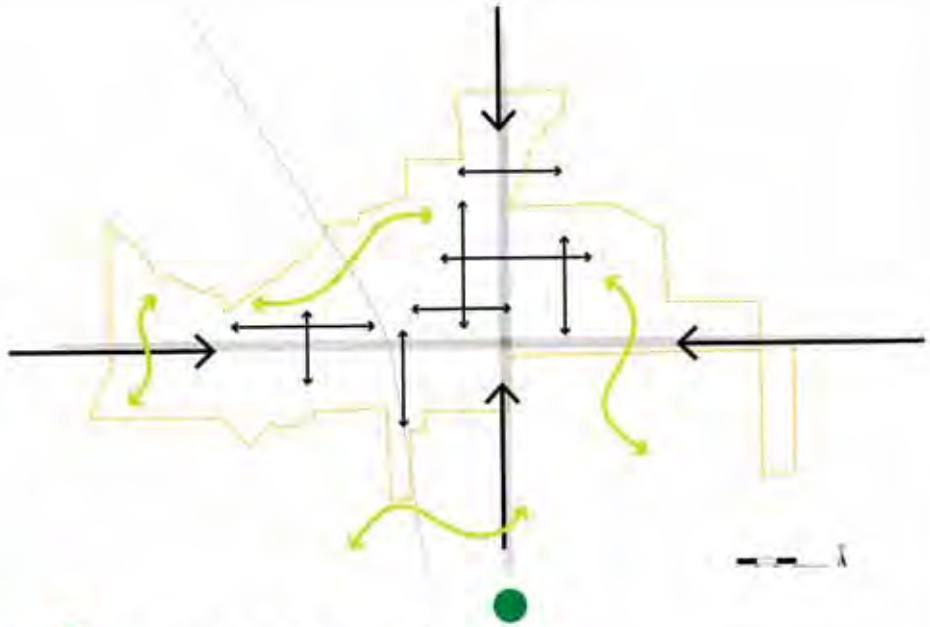
Housing Choices

New trail connections

Semi-public gathering spaces

URBAN DESIGN PRINCIPLES





Go to and Stay at Places

Public spaces that encourage gathering and interaction

A range of retail and entertainment uses that encourage longer visits

Small parks and plazas that increase the appeal and experience of daily activities.

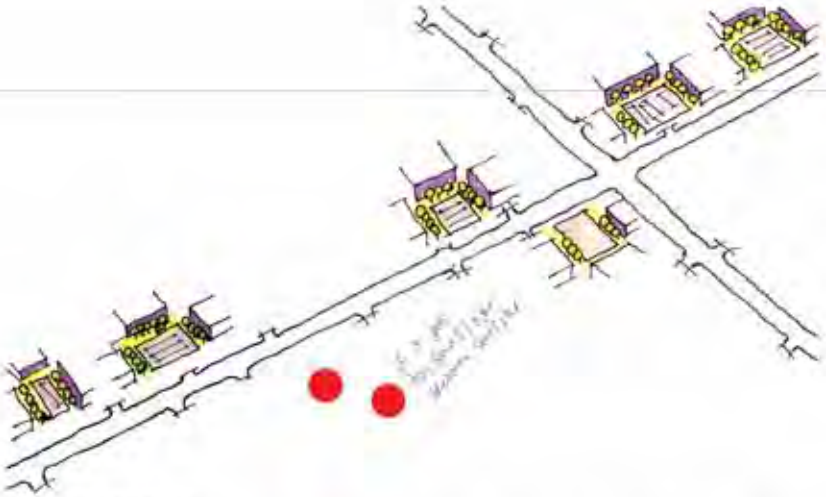
Easy to get to, easy to get around

Safe grade separated trail connections to all quadrants

Properties connected with driveways and walks

A street network that offers balanced choices to move around

Opportunities to "park once and walk"

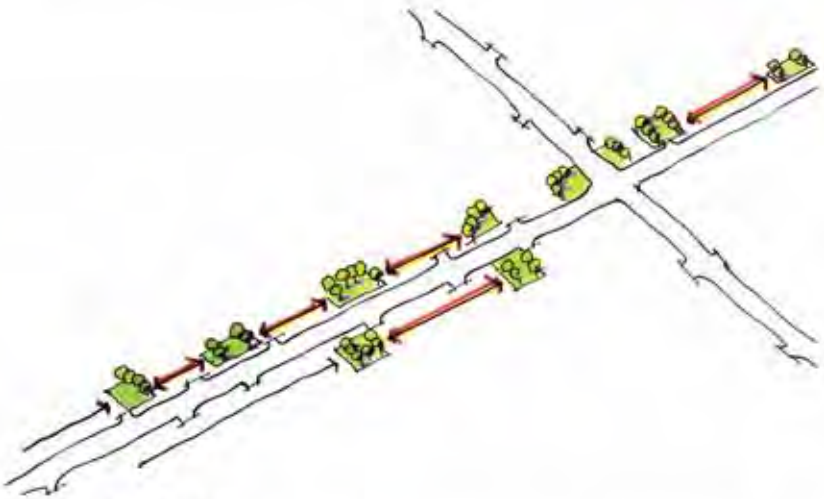


Parking rooms

Smaller, comfortable, high performing, places to park your car once and walk from place to place

Transitional Streets

Streets that fill the gap between busy and quiet.



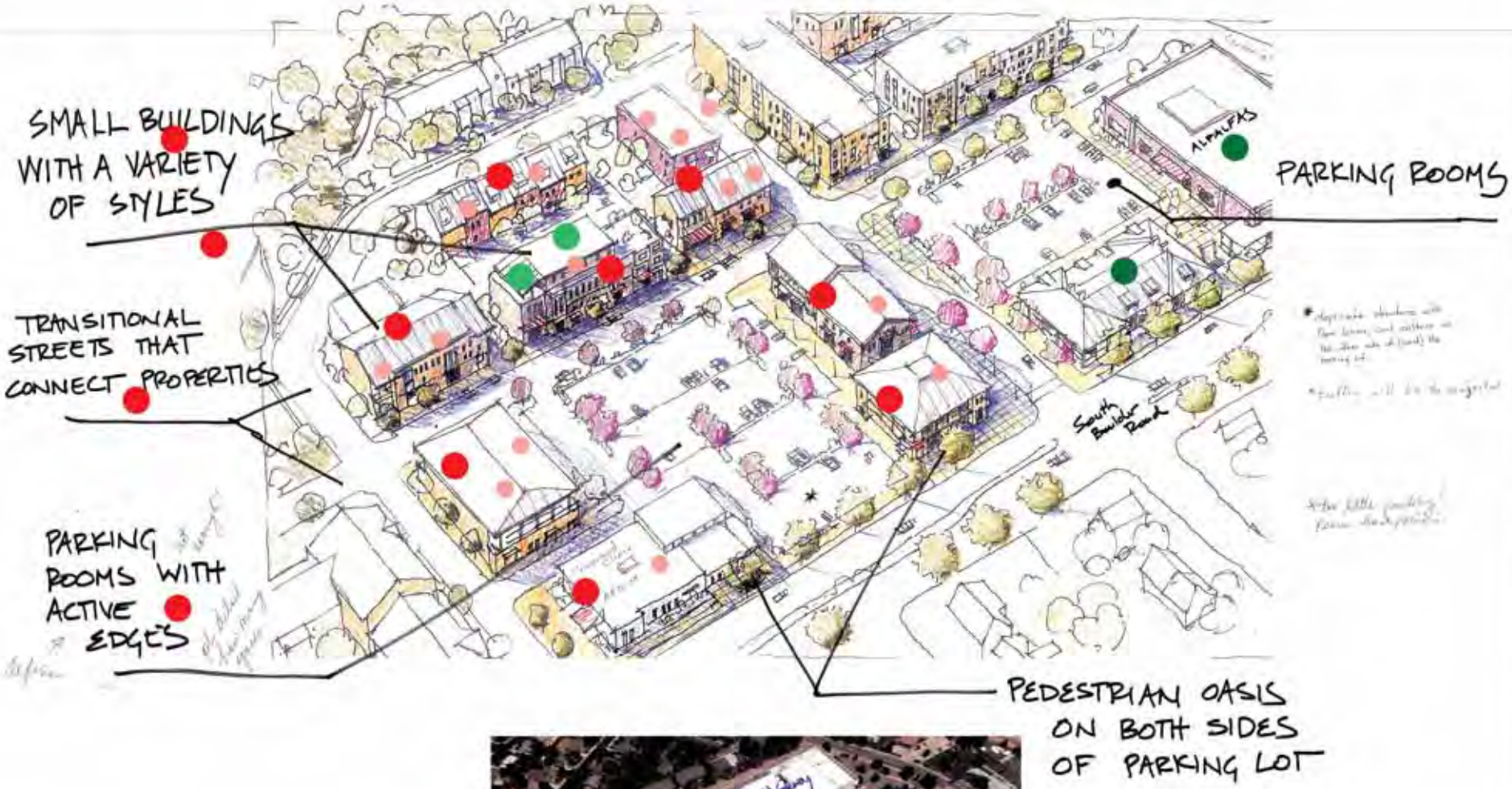
Pedestrian Oasis

Small comfortable places along the corridor that humanize the corrridor

Windows to the Comm

Perpendicular streets and spaces that showcase the community

Village Square


SMALL BUILDINGS WITH A VARIETY OF STYLES
TRANSITIONAL STREETS THAT CONNECT PROPERTIES
PARKING ROOMS WITH ACTIVE EDGES
PARKING ROOMS
ALMALFAS
South Boulder Road
PEDESTRIAN OASIS ON BOTH SIDES OF PARKING LOT

Louisville Plaza.

Christopher Plaza & Louisville Plaza (Kings)

VIEWS INTO THE COMMUNITY
INCORPORATE EXISTING ANCHORS INTO NEW DEVELOPMENT
VARIETY OF BUILDINGS AND STYLES
WIDE SIDEWALKS
SOUTH BOULDER RD
OPEN SPACES FOR GATHERING

Existing Conditions

Existing Conditions with recently planned or constructed projects

One Story Scenario

Two Story Scenario

Three Story Scenario

Existing Conditions

Existing Conditions with recently planned or constructed projects

One Story Scenario

Two Story Scenario

Three Story Scenario

Development Scenario
Mobility Measures

South Boulder Road Corridor	Average Speed (mph)		Average Corridor Travel Time		Fuel Consumed (gal)	
	EB	WB	EB	WB	EB	WB
Existing Network						
AM Peak	21	23	3 min 17 sec	3 min 0 sec	53	94
PM Peak	19	23	3 min 38 sec	3 min 0 sec	111	64
Existing Optimized						
AM Peak	24	27	2 min 53 sec	2 min 33 sec	48	74
PM Peak	22	23	3 min 8 sec	3 min 0 sec	96	65
Buildout (1 Story)						
AM Peak	22	24	3 min 8 sec	2 min 53 sec	64	88
PM Peak	18	19	3 min 50 sec	3 min 38 sec	133	111
Buildout (2 Story)						
AM Peak	20	23	3 min 27 sec	3 min 0 sec	83	100
PM Peak	16	18	4 min 19 sec	3 min 50 sec	142	121
Buildout (3 Story)						
AM Peak	18	22	3 min 50 sec	3 min 8 sec	110	114
PM Peak	12	14	5 min 45 sec	4 min 56 sec	196	172

Fiscal Analysis

Projected Development by Scenario	
Existing in Study Area	
Retail	352,729 Square feet
Office	178,608 Square feet
Residential	407 Units
Employees	1,682 People
Residents	569 People
20 yr Increase over Existing	
1-story scenario	
Retail	632,683 Square feet
Office	277,963 Square feet
Residential	626 Units
Employees	3,089 People
Residents	921 People
2-story scenario	
Retail	507,523 Square feet
Office	872,132 Square feet
Residential	710 Units
Employees	4,981 People
Residents	959 People
3-story scenario	
Retail	504,019 Square feet
Office	1,518,738 Square feet
Residential	1,006 Units
Employees	7,280 People
Residents	1,359 People

20 yr Cumulative Fiscal Impact			
Revenue by Fund	**1-story**	**2-story**	**3-story**
General Fund	$45,637,802	$41,012,330	$44,704,012
Urban Revitalization District Fund	$3,392,039	$4,947,234	$7,927,491
Open Spaces & Parks Fund	$8,253,024	$7,306,719	$8,151,589
Lottery Fund	$0	$0	$0
Historic Preservation Fund	$2,834,333	$2,558,353	$2,895,181
Capital Projects Fund	$24,467,970	$22,290,478	$25,931,125
TOTAL REVENUE	**$84,585,166**	**$78,115,113**	**$89,609,398**
Expenditures by Fund			
General Fund	$23,032,000	$29,769,825	$38,172,674
Urban Revitalization District Fund	$0	$0	$0
Open Spaces & Parks Fund	$510,666	$531,620	$1,365,031
Lottery Fund	$0	$0	$0
Historic Preservation Fund	$0	$0	$0
Capital Projects Fund	$21,429,557	$36,822,139	$45,024,018
TOTAL EXPENDITURES	**$44,972,222**	**$67,123,585**	**$84,561,723**
NET FISCAL RESULT BY FUND			
General Fund	$22,605,802	$11,242,504	$6,531,337
Urban Revitalization District Fund	$3,392,039	$4,947,234	$7,927,491
Open Spaces & Parks Fund	$7,742,357	$6,775,099	$6,786,558
Lottery Fund	$0	$0	$0
Historic Preservation Fund	$2,834,333	$2,558,353	$2,895,181
Capital Projects Fund	$3,038,413	-$14,531,661	-$19,092,892
NET FISCAL IMPACT	**$39,612,944**	**$10,991,528**	**$5,047,675**

DUPLICATE COPY

DUPLICATE COPY

Hwy 42 Underpass budgeted for 2018
Remove right turn lane or consider introducing an off-set left turn lanes at Garfield
Pedestrian improvements at Via Appia if an underpass in not constructed
Consider constructing an off-set left turn at Main Street and allow Steel Street to function as a two-way Street
Add crosswalk to Plaza Drive at Hecla Way
Consider nonsignalized full movement at Blue Star
Add bike lanes and consider removing acceleration and deceleration lanes
Alternatives for the eastbound right turn lane at Main Street
Create a southern trail parallel to South Boulder
Tighten Main Street's turn radii
Consider a pedestrian underpass at Via Appia
Development Scenario
Mobility Measures
SOUTH BOULDER ROAD SMALL AREA PLAN
Transportation Improvement Alternatives

City of Louisville
South Boulder Road
Small Area Plan

TRANSPORATION ASSESSMENT MEMORANDUM

JANUARY 2016

Prepared By:

Kimley»Horn

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INTRODUCTION

This Transportation Assessment Memorandum has been prepared for the City of Louisville (Louisville) to help understand how well the existing transportation system along the South Boulder Road corridor performs. For the purposes of this assessment, the South Boulder Road corridor is generally bound by Via Appia to the west and the Louisville City Limits to the east.

A map illustrating the study area is provided in **Figure 1**.

EXISTING CONDITIONS

ROADWAY CHARACTERISTICS

According to Louisville's Comprehensive Plan, South Boulder Road is an "Urban Corridor" throughout the study area with the exception of the segment at Highway 42 where it transitions to "Urban Center". South Boulder Road provides two lanes of travel in each direction (eastbound and westbound) and has a posted speed limit of 35 miles per hour (MPH) through the corridor. South Boulder Road services both local and commuter traffic. The roadway provides a connection between Louisville and the communities east and west, primarily Boulder and Lafayette. According to the Comprehensive Plan, approximately 64 percent of the total trips along South Boulder Road through the study area are local.

The following six signalized Intersections are located along South Boulder Road within the study area:

- Via Appia
- Garfield Avenue
- Centennial Drive
- Main Street
- Highway 42
- Plaza Drive

There is one signalized pedestrian crossing within the study area, directly east of the Plaza Drive intersection. The existing intersection lane configuration and control for each of the signalized intersections are shown in **Figure 2**.

TRAFFIC VOLUMES

Existing peak hour turning movement counts were provided by Louisville for each signalized intersection along South Boulder Road. The turning movement counts were conducted on Tuesday, October 8, 2013 for the Via Appia, Garfield Avenue, Centennial Drive, Main Street, and Plaza Drive intersections along South Boulder Road and on Wednesday, November 16, 2011 for the Highway 42 and South Boulder Road intersection. The counts were conducted in 15-minute intervals during the morning (AM) and afternoon (PM) peak hours of adjacent street traffic from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM on the count days. Existing traffic volumes from the turning movement counts are shown in **Figure 3** and the count sheets are provided in the **Appendix**.

LEVEL OF SERVICE

Kimley-Horn performed a level of service analysis of the corridor to determine any existing capacity deficiencies at the six signalized intersections. The acknowledged source for determining overall capacity is the Transportation Research Board's *Highway Capacity Manual, Special Report 209* (2010). Per the Highway Capacity Manual, capacity analysis results are listed in terms of level of service (LOS). LOS is a qualitative term describing operating conditions a driver will experience while traveling on a particular street or highway during a specific time interval. It ranges from A (very little delay) to F (long delays and congestion). **Table 1** shows the definition of level of service for signalized and unsignalized intersections. LOS for a signalized and four-way stop controlled intersection is defined for the intersection as a whole as well as each approach.

Table 1. Level of Service Definitions

Level of Service	Signalized Intersection Average Total Delay (sec/veh)
A	≤ 10
B	> 10 and ≤ 20
C	> 20 and ≤ 35
D	> 35 and ≤ 55
E	> 55 and ≤ 80
F	> 80
Source: **Highway Capacity Manual, Special Report 209, Transportation Research Board (2010)**	

Synchro traffic analysis software was used to analyze the study area intersections for LOS. The Synchro software utilizes Highway Capacity Manual (HCM) methodology to calculate intersection delay and LOS. The results of the Syncho LOS analysis for the six signalized intersections and each of their approaches within the study corridor are shown in **Table 2** and on **Figure 2**. The Synchro worksheets for the LOS analysis are provided in the **Appendix**.

The LOS analysis was conducted utilizing the existing signal cycle lengths and phasing observed during a site visit. Also reported within **Table 2** are the LOS analysis results when the cycle lengths are optimized along the corridor. The optimization involved several changes to the existing signal lengths during the peak hour along the corridor. The signal lengths used for the optimized LOS analysis are provided in **Table 3**. Optimizing the signal cycle lengths results in an improved LOS for several intersection approaches along the corridor, most notably for the eastbound approach at the Main Street intersection, the north and southbound approaches at Garfield Avenue, and the southbound approach at Plaza Drive.

Table 2. Existing Intersection LOS

Intersection	Intersection Approach	LOS (AM/PM)	Optimized LOS (AM/PM)
Via Appia		**A/B**	**A/B**
	Northbound	D/D	C/D
	Eastbound	A/B	A/B
	Westbound	A/A	A/A
Garfield Avenue		**B/A**	**A/A**
	Northbound	D/D	C/C
	Southbound	C/D	B/C
	Eastbound	A/A	A/A
	Westbound	A/A	A/A
Centennial Drive		**A/A**	**A/A**
	Southbound	D/D	D/D
	Eastbound	A/A	A/A
	Westbound	A/A	A/A
Main Street		**B/B**	**A/B**
	Northbound	D/D	D/D
	Eastbound	B/B	A/A
	Westbound	A/A	A/A
Highway 42		**C/D**	**C/D**
	Northbound	C/D	D/D
	Southbound	D/D	D/D
	Eastbound	C/D	C/C
	Westbound	C/D	C/D
Plaza Drive		**B/B**	**A/A**
	Southbound	C/D	B/C
	Eastbound	A/A	A/A
	Westbound	A/A	A/A

Table 3. Peak Hour Signal Cycle Length

Intersection	Existing Cycle Length (seconds, AM/PM)	Optimized Cycle Length (seconds, AM/PM)
Via Appia	100/120	90/120
Garfield Avenue	100/120	45/60
Centennial Drive	120/120	90/120
Main Street	120/120	90/120
Highway 42	75/120	90/120
Plaza Drive	105/120	45/60

QUEUE LENGTHS

Queue lengths were also analyzed utilizing the Synchro traffic analysis software. The Synchro software utilizes Highway Capacity Manual (HCM) methodology to calculate queue lengths at each intersection approach. The results of the queue analysis for each approach of the six study signalized intersections is provided in **Table 4**. The Synchro worksheets showing the queue length analysis are provided in the **Appendix**.

Table 4. Existing Queue Lengths

Intersection	Movement	Existing Length (feet)	Existing AM (feet)	Existing PM (feet)	Optimized AM (feet)	Optimized PM (feet)
Via Appia						
	Northbound Right	180	92	324	92	324
	Northbound Left	C	70	83	63	83
	Eastbound Right	100’	10	37	11	37
	Westbound Left	140’	58	**193**	23	74
Garfield Avenue						
	Northbound Left	65	**113**	64	64	38
	Southbound Left	65	44	**92**	25	53
	Eastbound Left	75	6	4	3	8
	Eastbound Right	80	3	1	1	10
	Westbound Left	70	16	17	8	27
Centennial Drive						
	Southbound Left	C	130	144	103	146
	Southbound Right	90	33	36	28	37
	Eastbound Left	90	13	14	4	5
Main Street						
	Northbound Left	C	109	131	91	131
	Northbound Right	120	49	114	46	114
	Eastbound Right	120	12	38	3	40
	Westbound Left	180	51	75	8	69
Highway 42						
	Northbound Left	220	138	89	139	89
	Southbound Left	155	65	96	61	96
	Southbound Right	260	114	70	127	70
	Eastbound Left	150/300	124	219	126	189
	Westbound Left	220	112	147	121	141
	Westbound Right	260	19	1	36	10
Plaza Drive						
	Southbound Left	150	52	**238**	29	124

Intersection	Movement	Existing Length (feet)	Existing AM (feet)	Existing PM (feet)	Optimized AM (feet)	Optimized PM (feet)
	Southbound Right	C	47	54	39	36
	Eastbound Left	275	21	23	5	18
	Westbound Right	100	19	18	13	18

As shown in the table, all existing queues of the South Boulder Road key intersections are accommodated within the existing storage bays except for the following:

- Westbound Left Turn at Via Appia,
- Northbound and Southbound Left Turns at the Garfield Avenue, and
- Southbound Left Turn at Plaza Drive

Traffic signal optimization of the Via Appia, Garfield Avenue, and Plaza Drive intersections along South Boulder Road address the existing queueing issues observed.

TRAVEL TIMES

Actual travel time data was collected along the segment of South Boulder Road between Via Appia and Plaza Drive based on vehicle travel runs. The eastbound and westbound AM and PM peak hour travel times for this segment of the study corridor are provided in **Table 5** below.

Table 5. South Boulder Road – Existing Peak Hour Travel Times

Direction	Travel Time	
	AM Peak Hour	**PM Peak Hour**
Eastbound	3 minutes, 20 seconds	3 minutes, 44 seconds
Westbound	2 minutes, 56 seconds	2 minutes, 52 seconds
Source: **Kimley-Horn and Associates, Inc. (2015)**		

ACCIDENT HISTORY

Louisville provided accident history data for the study. Based on this data, a total of 157 accidents were reported at the signalized intersections along the study corridor over the three year study period of 2012, 2013, and 2014. The 157 accidents involved 308 vehicles, resulting in 48 injuries. Data on the severity of the injuries was not provided. The intersection with the highest accident concentration was the South Boulder Road/Highway 42 intersection, where 62 of the crashes occurred. The remaining five study area intersections all had similar crash numbers and rates. The reported accidents by intersection are shown in **Figure 4**.

FUTURE CONDITIONS

Louisville's Comprehensive Plan provides several recommendations for South Boulder Road. These recommendations include:

- A silent railroad crossing of at-grade crossing east of Main Street;
- Consideration of a realignment for Main Street to Centennial Drive;
- Introducing a new roadway network connection between Main Street and Highway 42; and
- Locating retail and commercial land uses in close proximity to South Boulder Road to provide visibility and access

Of the four recommendations provided above, it is understood that the City of Louisville does not desire to evaluate a realignment of Main Street to Centennial Drive. The recommendation included for evaluation within this study is introducing the new roadway network connection, herein named Kaylix Avenue/Cannon Street to intersection South Boulder Road at a signalized intersection between Main Street and SH-42. In addition, right turn lanes were removed where feasible as directed by the City's Planning Department to determine if acceptable operations would result.

Future traffic volumes were identified for the study area based on the planned development locations, uses, and type. These were refined into three separate development densities, known as 1-story, 2-story, and 3-story. The 3-story development uses are possible to develop per the current zoning. An evaluation of the 1-story and 2-story build out options was conducted to provide an overall comparison. The trip generation for the new development in the study area for each development density is shown in **Table 6**.

Table 6. South Boulder Road Trip Generation

Vehicle Trip Generation							
		AM			**PM**		
Scenario	**Size**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
3 Story							
Residential	1,006 Units	107	322	429	331	195	526
Office	1,518,737 SF	1343	183	1526	268	1311	1579
Retail	504,019 SF	125	76	201	380	411	791
Total		**1575**	**581**	**2156**	**979**	**1917**	**2896**
2 Story							
Residential	711 Units	56	167	223	180	106	286
Office	872,132 SF	793	108	901	145	710	855
Retail	507,522 SF	126	78	204	385	418	803
Total		**975**	**353**	**1328**	**710**	**1234**	**1944**
1 Story							
Residential	627 Units	41	123	164	135	79	214
Office	277,963 SF	167	23	190	32	158	190
Retail	632,682 SF	181	111	292	573	621	1194
Total		**389**	**257**	**646**	**740**	**858**	**1598**

As shown in the trip generation table, the 3-story alternative of development is anticipated to generate approximately 2,156 morning peak hour and 2,896 afternoon peak hour new trips to the surrounding street network. By comparison, the 2-story development alternative would generate approximately 1,328 morning peak hour trips and 1,944 afternoon peak hour trips. The 1-story development would generate approximately 646 morning peak hour trips and 1,598 afternoon peak hour trips. The future traffic volumes for the three studied development horizons are shown in **Figure 5** for the 1-Story Build Out, **Figure 6** for the 2-Story Build Out, and **Figure 7** for the 3-Story Build Out.

Based on these future traffic volume estimates for the three build out options, Synchro traffic models were developed to identify future level of service at the intersections. These are summarized in **Table 7**.

Table 7. South Boulder Road Intersection Delay and Level of Service

Intersection		AM Peak Hour		PM Peak Hour	
		Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
1	**Via Appia**				
	Existing Network	6.9	A	19.0	B
	Existing Optimized	8.7	A	21.8	C
	Buildout (1 Story)	11.7	B	29.6	C
	Buildout (2 Story)	14.0	B	31.7	C
	Buildout (3 Story)	17.2	B	42.9	D
2	**Garfield Avenue**				
	Existing Network	9.9	A	5.4	A
	Existing Optimized	8.2	A	3.6	A
	Buildout (1 Story)	10.1	B	9.0	A
	Buildout (2 Story)	10.1	B	9.4	A
	Buildout (3 Story)	10.3	B	20.6	C
3	**Centennial Drive**				
	Existing Network	12.8	B	7.8	A
	Existing Optimized	12.2	B	5.7	A
	Buildout (1 Story)	7.0	A	13.7	B
	Buildout (2 Story)	8.3	A	13.8	B
	Buildout (3 Story)	9.0	A	12.0	B
4	**Main Street**				
	Existing Network	8.8	A	9.4	A
	Existing Optimized	11.3	B	8.6	A
	Buildout (1 Story)	5.6	A	8.8	A
	Buildout (2 Story)	7.2	A	9.7	A
	Buildout (3 Story)	6.8	A	15.8	B

Intersection		AM Peak Hour		PM Peak Hour	
		Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
5	**Highway 42**				
	Existing Network	42.8	D	48.8	D
	Existing Optimized	41.9	D	44.8	D
	Buildout (1 Story)	46.8	D	57.1	E
	Buildout (2 Story)	57.2	E	58.7	E
	Buildout (3 Story)	64.6	E	100.7	F
6	**Plaza Drive**				
	Existing Network	10.7	B	9.8	A
	Existing Optimized	5.7	A	5.8	A
	Buildout (1 Story)	14.4	B	15.7	B
	Buildout (2 Story)	15.7	B	16.4	B
	Buildout (3 Story)	17.4	B	20.2	C
7	**Kaylix Avenue/Cannon Street**				
	Buildout (1 Story)	10.4	B	8.2	A
	Buildout (2 Story)	11.0	B	9.3	A
	Buildout (3 Story)	19.1	B	30.1	C

The increased development density results in an increase to the average vehicle delay through the intersections. Although all study intersections are anticipated to operate acceptably (LOS D or better) during the morning and afternoon peak hours, with exception of the SH-42 and South Boulder Road intersection. This intersection is anticipated to operate at LOS D during the morning peak hour and a LOS E during the afternoon peak hour with the 1-Story development alternative. This degrades to LOS E during both peak hours under the 2-Story development alternative and further degrades to LOS E during the morning peak hour and LOS F during the afternoon peak hour with the 3-Story development build out. Improvements that should be considered at this intersection to improve operations include an eastbound right turn lane and northbound right turn lane if and when right-of-way becomes available.

In addition, a comparison of the corridor travel times was performed to provide a comparison of congestion levels anticipated through the corridor based on each buildout alternative. This is shown in **Table 8**.

Table 8. South Boulder Road Measures of Effectiveness Comparison

South Boulder Road Corridor	Average Speed (mph)		Average Corridor Travel Time		Fuel Consumed (gal)	
	EB	WB	EB	WB	EB	WB
Existing Network						
AM Peak	21	23	3 min 17 sec	3 min 0 sec	53	94
PM Peak	19	23	3 min 38 sec	3 min 0 sec	111	64
Existing Optimized						
AM Peak	24	27	2 min 53 sec	2 min 33 sec	48	74
PM Peak	22	23	3 min 8 sec	3 min 0 sec	96	65
Buildout (1 Story)						
AM Peak	21	23	3 min 17 sec	3 min 0 sec	68	91
PM Peak	17	18	4 min 4 sec	3 min 50 sec	139	116
AM Peak – Without Cannon/Kaylix Signal	23	25	3 min 0 sec	2 min 46 sec	61	84
PM Peak – Without Cannon/Kaylix Signal	20	19	3 min 27 sec	3 min 38 sec	129	114
Buildout (2 Story)						
AM Peak	19	21	3 min 38 sec	3 min 17 sec	88	108
PM Peak	16	17	4 min 19 sec	4 min 4 sec	152	128
AM Peak – Without Cannon/Kaylix Signal	20	24	3 min 27 sec	2 min 53 sec	82	96
PM Peak – Without Cannon/Kaylix Signal	18	18	3 min 50 sec	3 min 50 sec	142	125
Buildout (3 Story)						
AM Peak	16	18	4 min 19 sec	3 min 50 sec	112	128
PM Peak	12	13	5 min 45 sec	5 min 18 sec	195	181
AM Peak – Without Cannon/Kaylix Signal	19	20	3 min 38 sec	3 min 27 sec	104	117
PM Peak – Without Cannon/Kaylix Signal	13	14	5 min 18 sec	4 min 56 sec	183	170

As shown in the measures of effectiveness comparison table, optimization of the corridor traffic signal timing and coordination can reduce existing travel times by around 25 seconds both directions during the morning peak hour and by 30 seconds on eastbound South Boulder Road during the afternoon peak hour. A new traffic signal at the Cannon Drive/Kaylix Avenue intersection with South Boulder Road may increase South Boulder Road travel times through the study corridor by 11 seconds eastbound and 24

seconds westbound during the morning peak hour and by 29 seconds eastbound and 14 seconds westbound during the afternoon peak hour with the 2 Story Buildout Option, for example.

The operational analysis of the study intersections along South Boulder Road results in the following recommendations, as summarized in **Figure 8**.

Via Appia

- Lengthen Westbound Left Turn Lane to 300 feet
- Operate Northbound Right Turn on Overlap Phase (NB Right Turn Green Arrow During WB Left Turn Protected Green Arrow Phase)

Garfield Avenue

Protected/Permissive Left Turn Phasing Eastbound and Westbound

Centennial Drive

Remove On-Street Parking to Lengthen Southbound Right Turn Lane to 200 feet

Kaylix Avenue/Cannon Street

- New Signalized Intersection
- Restrict Westbound Left Turns

Highway 42

- Lengthen Eastbound Dual Left Turn Lanes to 300 feet
- Lengthen Westbound Dual Left Turn Lanes to 300 feet
- Construct Separate 250-foot Westbound Right Turn Lane with removal of Westbound Auxiliary Lane

Plaza Drive

- Protected/Permissive Left Turn Phasing Eastbound
- Remove Westbound Right Turn Deceleration Lane
- Remove Westbound Right Turn Acceleration Lane

APPENDIX

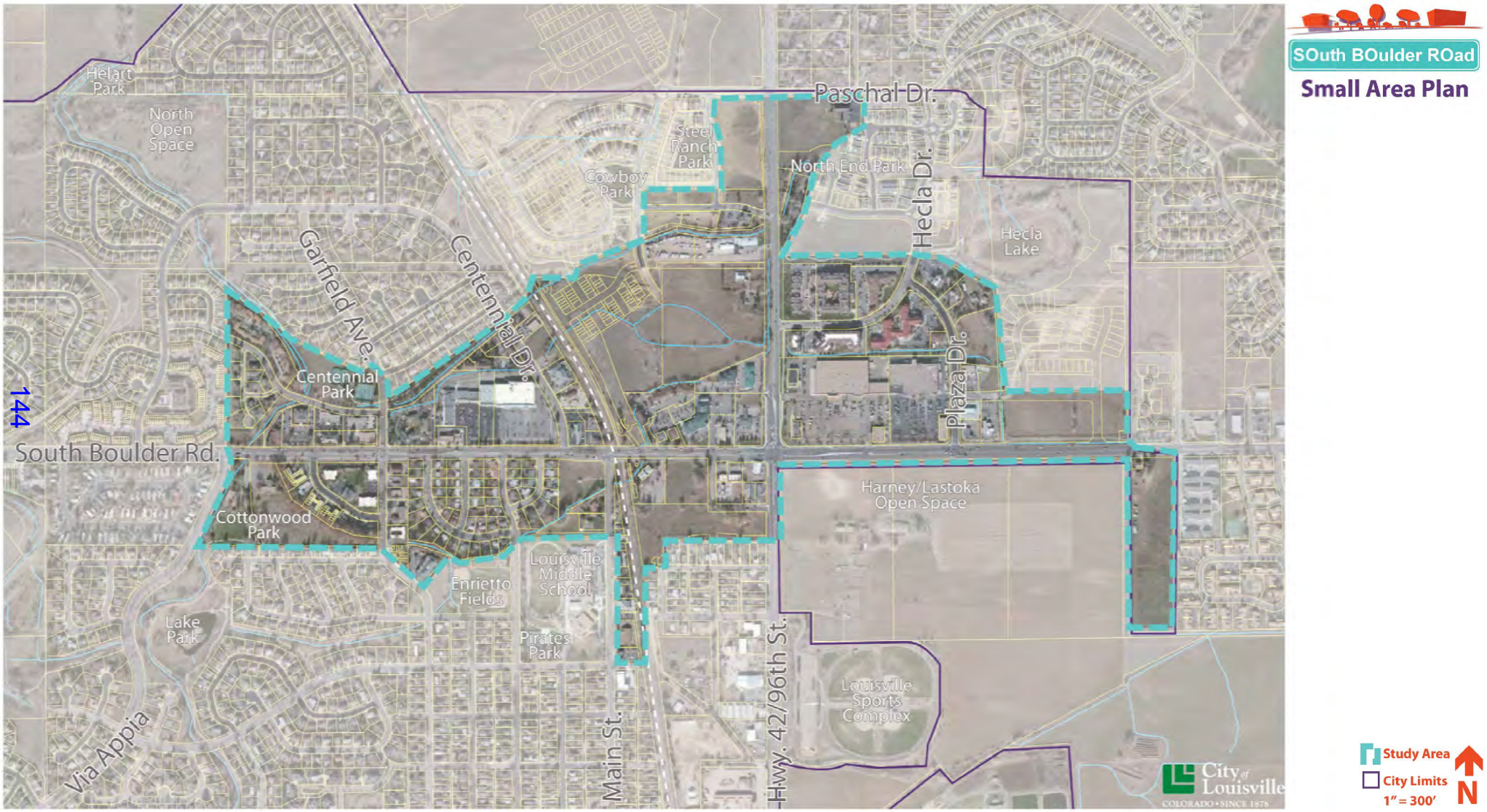
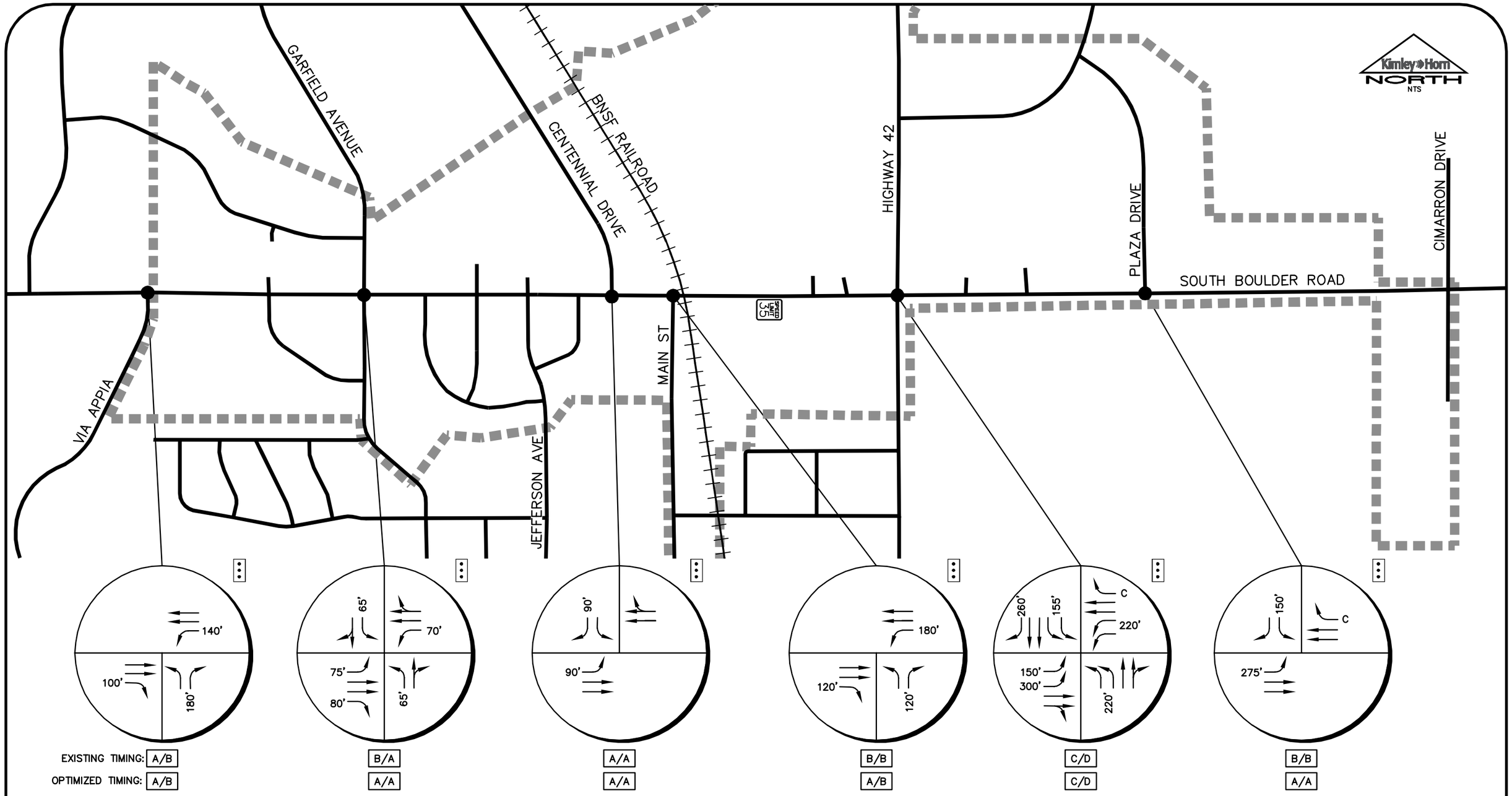


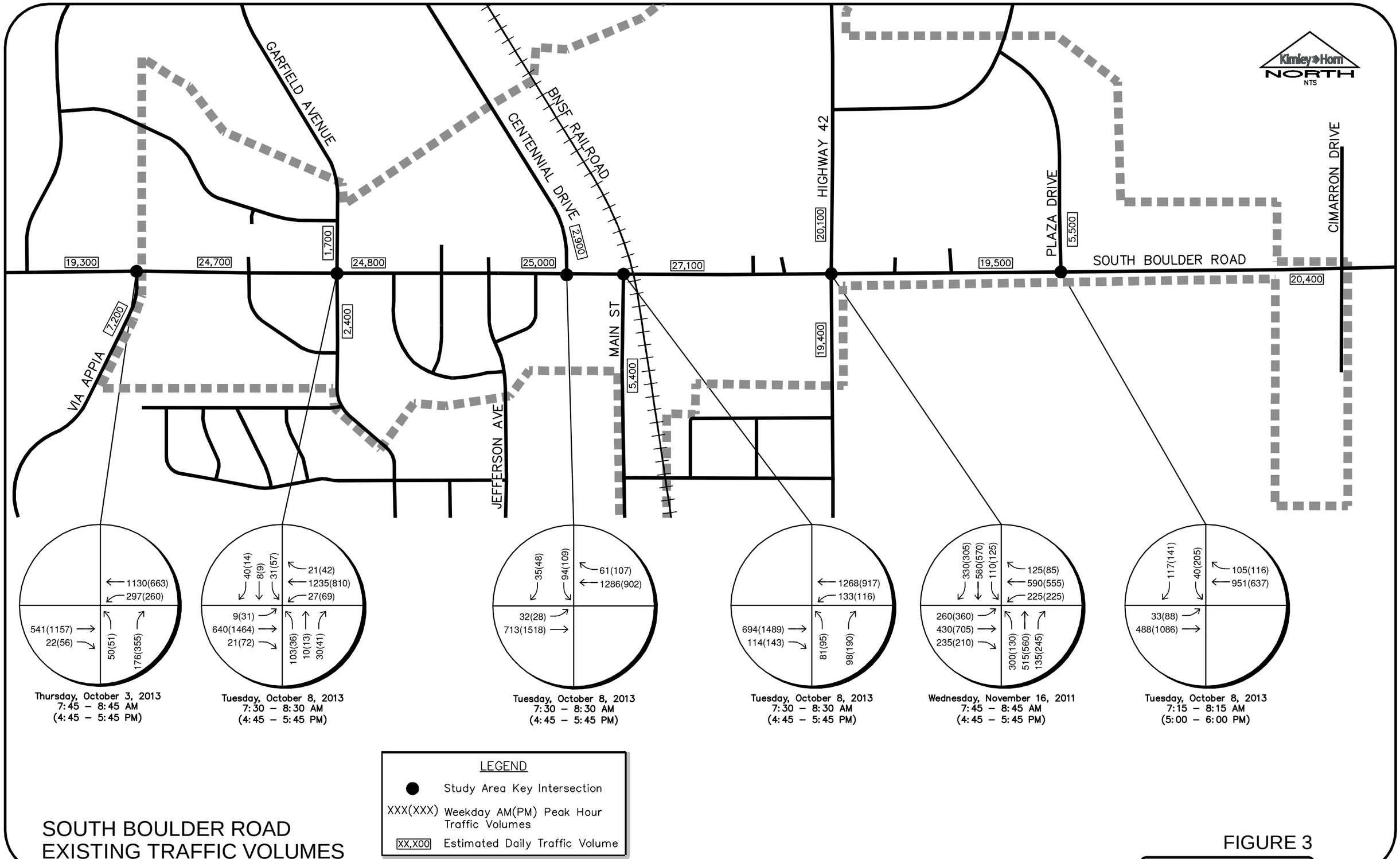
Figure 1: Study Area



SOUTH BOULDER ROAD
EXISTING LANE CONFIGURATIONS, CONTROL AND LEVEL OF SERVICE

FIGURE 2

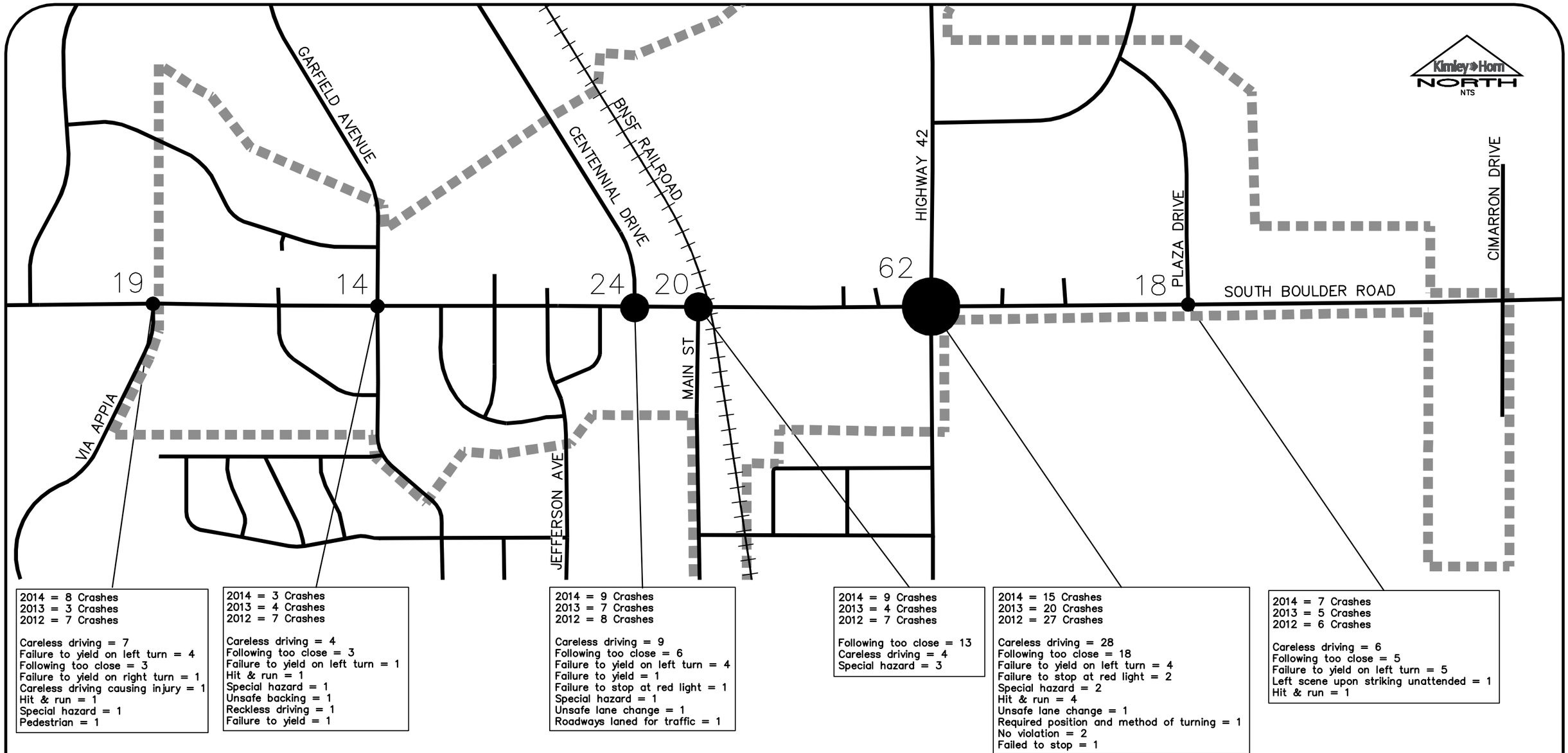
Kimley»Horn



SOUTH BOULDER ROAD
EXISTING TRAFFIC VOLUMES

FIGURE 3

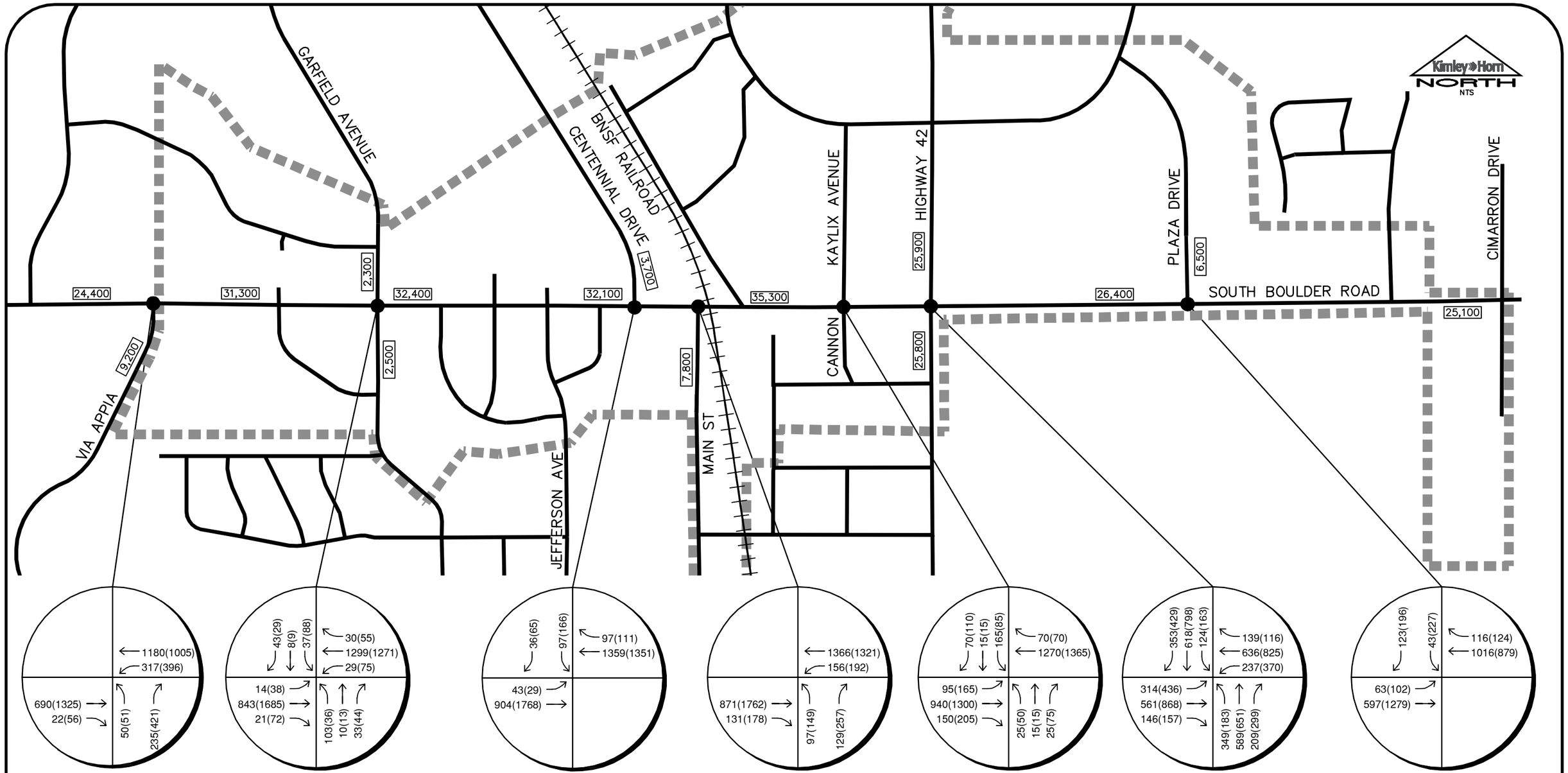
Kimley»Horn



SOUTH BOULDER ROAD
2012-2014 ACCIDENT HISTORY

FIGURE 4

Kimley»Horn



LEGEND

● Study Area Key Intersection

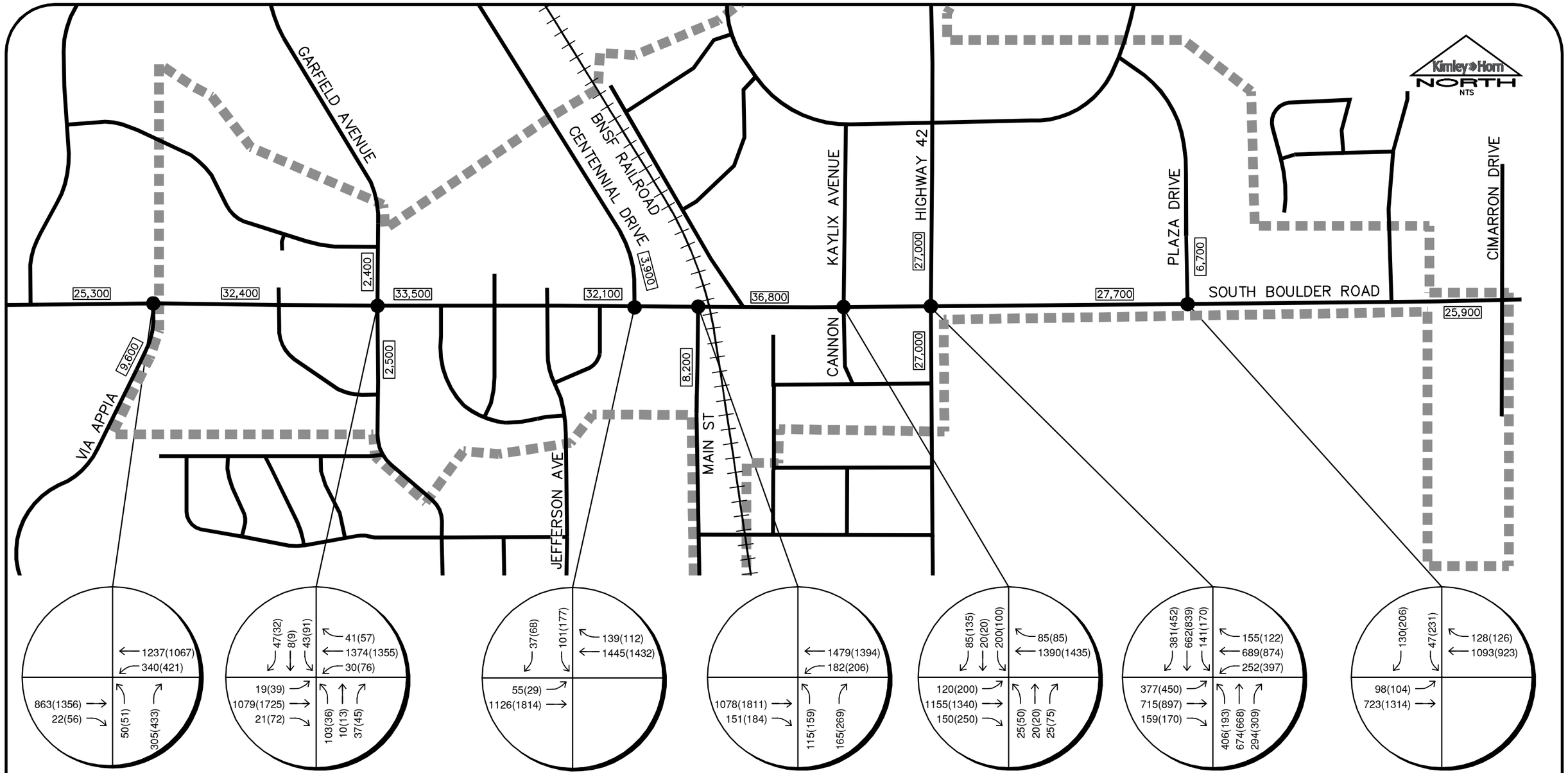
XXX(XXX) Weekday AM(PM) Peak Hour Traffic Volumes

XX,X00 Estimated Daily Traffic Volume

SOUTH BOULDER ROAD
FUTURE BUILDOUT (1 STORY)
TRAFFIC VOLUMES

FIGURE 5

Kimley»Horn



LEGEND

● Study Area Key Intersection

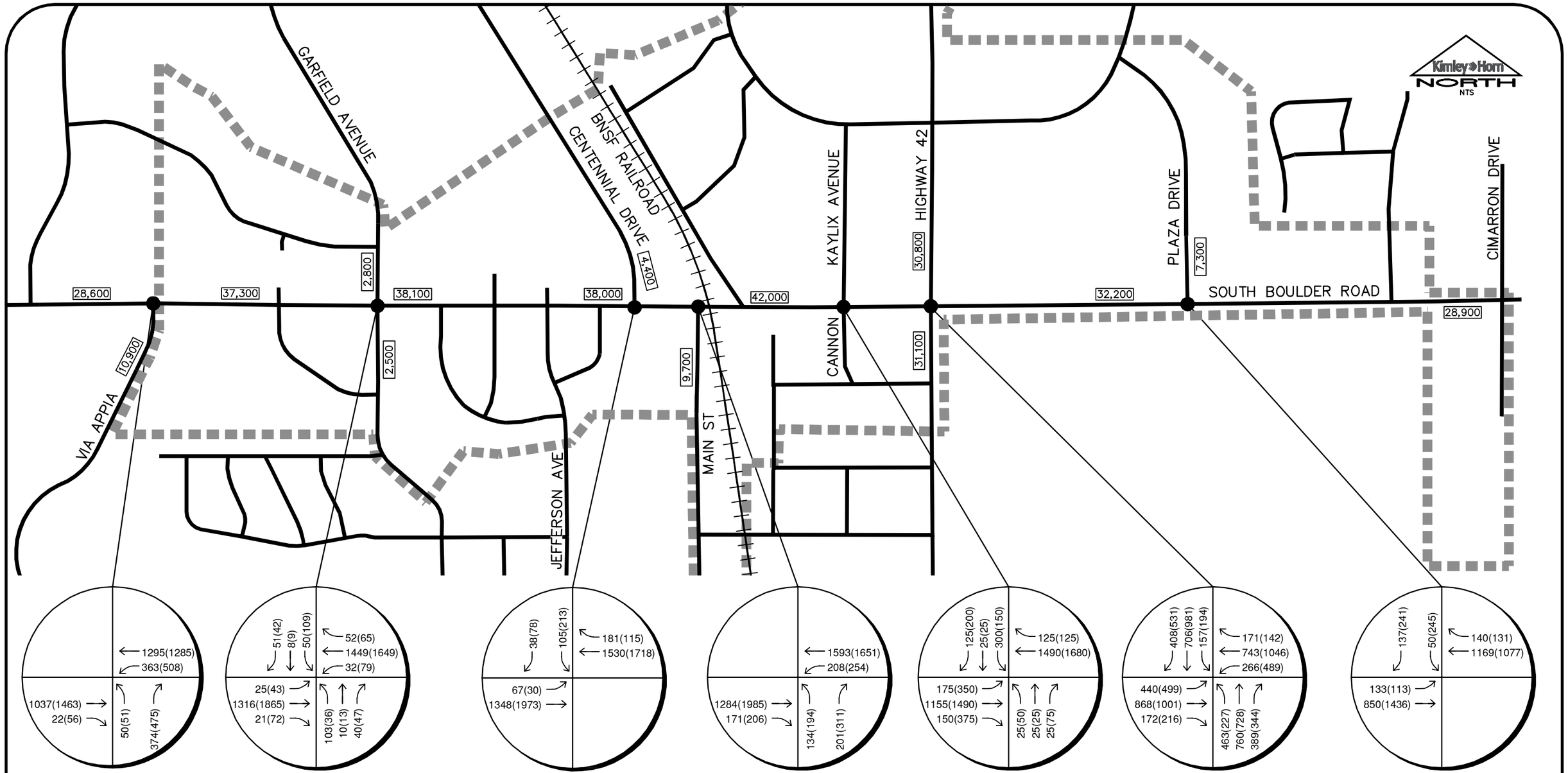
XXX(XXX) Weekday AM(PM) Peak Hour Traffic Volumes

XX,X00 Estimated Daily Traffic Volume

SOUTH BOULDER ROAD
FUTURE BUILDOUT (2 STORY)
TRAFFIC VOLUMES

FIGURE 6

Kimley»Horn



LEGEND

● Study Area Key Intersection

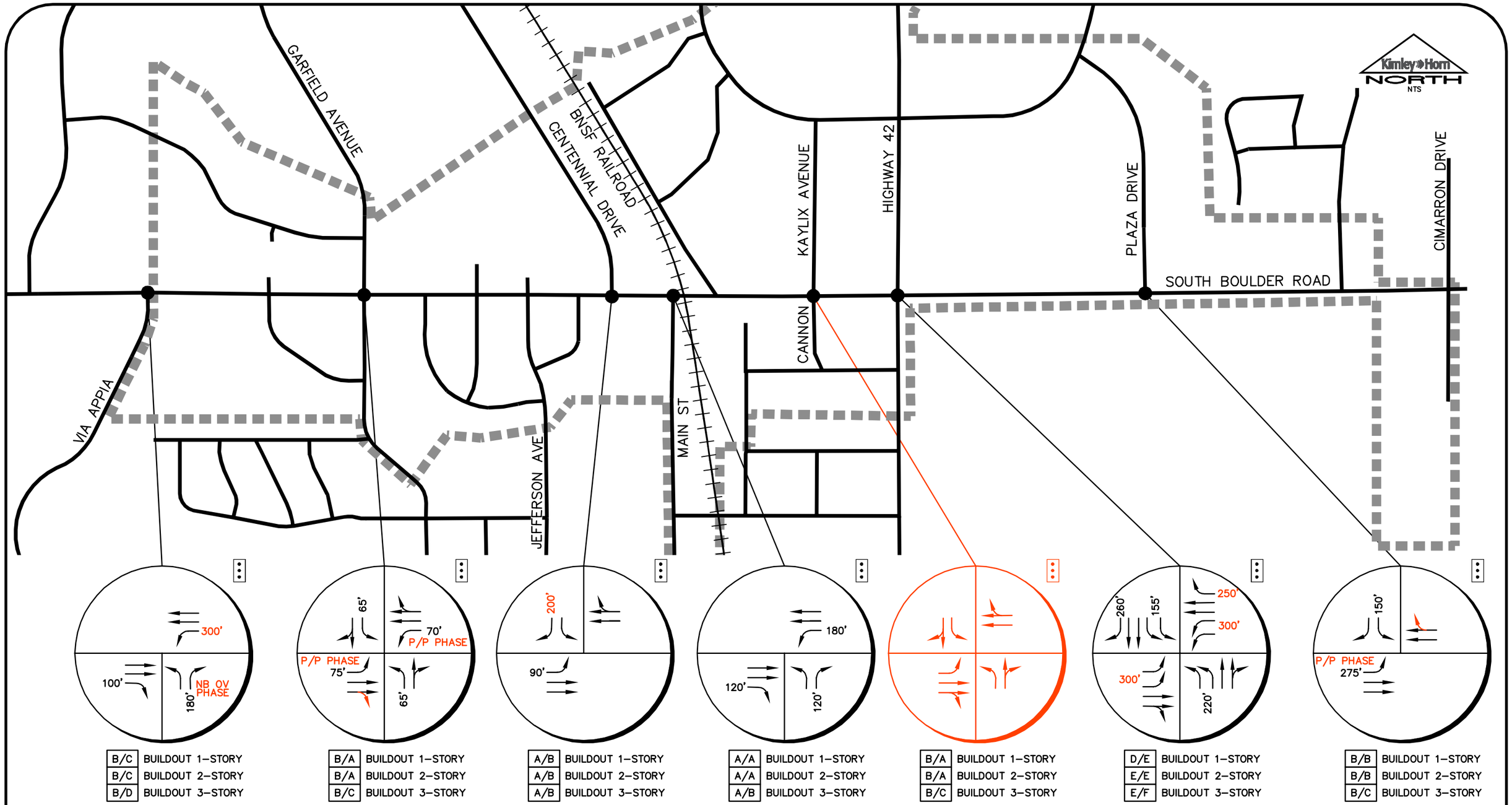
XXX(XXX) Weekday AM(PM) Peak Hour Traffic Volumes

XX,X00 Estimated Daily Traffic Volume

SOUTH BOULDER ROAD
FUTURE BUILDOUT (3 STORY)
TRAFFIC VOLUMES

FIGURE 7

Kimley»Horn



SOUTH BOULDER ROAD
BUILDOUT LANE CONFIGURATIONS
CONTROL AND LEVEL OF SERVICE

FIGURE 8

Kimley»Horn

APPENDIX

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	541	22	297	1130	50	176
Future Volume (veh/h)	541	22	297	1130	50	176
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	588	24	323	1228	54	191
Adj No. of Lanes	2	1	1	2	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	2172	972	671	2680	235	358
Arrive On Green	0.61	0.61	0.19	1.00	0.13	0.13
Sat Flow, veh/h	3632	1583	1774	3632	1774	1583
Grp Volume(v), veh/h	588	24	323	1228	54	191
Grp Sat Flow(s),veh/h/ln	1770	1583	1774	1770	1774	1583
Q Serve(g_s), s	7.7	0.6	7.0	0.0	2.7	10.6
Cycle Q Clear(g_c), s	7.7	0.6	7.0	0.0	2.7	10.6
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2172	972	671	2680	235	358
V/C Ratio(X)	0.27	0.02	0.48	0.46	0.23	0.53
Avail Cap(c_a), veh/h	2172	972	860	2680	514	608
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.81	0.81	1.00	1.00
Uniform Delay (d), s/veh	8.9	7.6	4.8	0.0	38.8	34.0
Incr Delay (d2), s/veh	0.3	0.0	0.2	0.5	0.5	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	0.3	3.3	0.2	1.4	4.8
LnGrp Delay(d),s/veh	9.3	7.6	5.0	0.5	39.3	35.3
LnGrp LOS	A	A	A	A	D	D
Approach Vol, veh/h	612			1551	245	
Approach Delay, s/veh	9.2			1.4	36.2	
Approach LOS	A			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	14.4	67.4				81.7		18.3
Change Period (Y+Rc), s	5.0	6.0				6.0		5.0
Max Green Setting (Gmax), s	20.0	35.0				60.0		29.0
Max Q Clear Time (g_c+I1), s	9.0	9.7				2.0		12.6
Green Ext Time (p_c), s	0.4	21.2				40.7		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	6.9
HCM 2010 LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1157	56	260	663	51	355
Future Volume (veh/h)	1157	56	260	663	51	355
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	1258	61	283	721	55	386
Adj No. of Lanes	2	1	1	2	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1906	853	343	2384	417	519
Arrive On Green	0.54	0.54	0.19	1.00	0.23	0.23
Sat Flow, veh/h	3632	1583	1774	3632	1774	1583
Grp Volume(v), veh/h	1258	61	283	721	55	386
Grp Sat Flow(s),veh/h/ln	1770	1583	1774	1770	1774	1583
Q Serve(g_s), s	30.5	2.2	8.9	0.0	2.9	26.0
Cycle Q Clear(g_c), s	30.5	2.2	8.9	0.0	2.9	26.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1906	853	343	2384	417	519
V/C Ratio(X)	0.66	0.07	0.82	0.30	0.13	0.74
Avail Cap(c_a), veh/h	1906	853	503	2384	429	530
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.95	0.95	1.00	1.00
Uniform Delay (d), s/veh	19.8	13.3	17.6	0.0	36.2	35.8
Incr Delay (d2), s/veh	1.8	0.2	4.4	0.3	0.1	5.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.3	1.0	5.1	0.1	1.5	12.1
LnGrp Delay(d),s/veh	21.6	13.4	21.9	0.3	36.4	41.3
LnGrp LOS	C	B	C	A	D	D
Approach Vol, veh/h	1319			1004	441	
Approach Delay, s/veh	21.2			6.4	40.7	
Approach LOS	C			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	16.2	70.6				86.8		33.2
Change Period (Y+Rc), s	5.0	6.0				6.0		5.0
Max Green Setting (Gmax), s	22.0	53.0				80.0		29.0
Max Q Clear Time (g_c+I1), s	10.9	32.5				2.0		28.0
Green Ext Time (p_c), s	0.3	18.3				55.6		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	19.0
HCM 2010 LOS	B

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	541	22	297	1130	50	176
Future Volume (veh/h)	541	22	297	1130	50	176
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	588	24	323	1228	54	191
Adj No. of Lanes	2	1	1	2	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1283	574	901	2828	113	673
Arrive On Green	0.36	0.36	0.48	1.00	0.06	0.06
Sat Flow, veh/h	3632	1583	1774	3632	1774	1583
Grp Volume(v), veh/h	588	24	323	1228	54	191
Grp Sat Flow(s),veh/h/ln	1770	1583	1774	1770	1774	1583
Q Serve(g_s), s	10.2	0.8	0.0	0.0	2.4	0.0
Cycle Q Clear(g_c), s	10.2	0.8	0.0	0.0	2.4	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1283	574	901	2828	113	673
V/C Ratio(X)	0.46	0.04	0.36	0.43	0.48	0.28
Avail Cap(c_a), veh/h	1283	574	901	2828	643	1146
HCM Platoon Ratio	1.00	1.00	1.33	1.33	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.85	0.85	1.00	1.00
Uniform Delay (d), s/veh	19.5	16.5	8.8	0.0	36.2	15.0
Incr Delay (d2), s/veh	1.2	0.1	0.1	0.4	3.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	0.4	3.7	0.2	1.3	2.7
LnGrp Delay(d),s/veh	20.7	16.6	8.9	0.4	39.3	15.3
LnGrp LOS	C	B	A	A	D	B
Approach Vol, veh/h	612			1551	245	
Approach Delay, s/veh	20.5			2.2	20.6	
Approach LOS	C			A	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	34.9	35.0				69.9		10.1
Change Period (Y+Rc), s	6.0	* 6				6.0		5.0
Max Green Setting (Gmax), s	6.0	* 29				40.0		29.0
Max Q Clear Time (g_c+I1), s	2.0	12.2				2.0		4.4
Green Ext Time (p_c), s	3.1	6.2				21.4		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	8.7
HCM 2010 LOS	A

Notes

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1157	56	260	663	51	355
Future Volume (veh/h)	1157	56	260	663	51	355
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	1258	61	283	721	55	386
Adj No. of Lanes	2	1	1	2	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1563	699	743	3005	105	660
Arrive On Green	0.44	0.44	0.71	1.00	0.06	0.06
Sat Flow, veh/h	3632	1583	1774	3632	1774	1583
Grp Volume(v), veh/h	1258	61	283	721	55	386
Grp Sat Flow(s),veh/h/ln	1770	1583	1774	1770	1774	1583
Q Serve(g_s), s	36.9	2.7	0.0	0.0	3.6	0.0
Cycle Q Clear(g_c), s	36.9	2.7	0.0	0.0	3.6	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1563	699	743	3005	105	660
V/C Ratio(X)	0.80	0.09	0.38	0.24	0.52	0.59
Avail Cap(c_a), veh/h	1563	699	743	3005	429	949
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.96	0.96	1.00	1.00
Uniform Delay (d), s/veh	29.0	19.5	9.8	0.0	54.8	27.0
Incr Delay (d2), s/veh	4.5	0.2	0.1	0.2	4.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	19.0	1.2	2.7	0.1	1.9	9.9
LnGrp Delay(d),s/veh	33.5	19.7	9.9	0.2	58.8	27.8
LnGrp LOS	C	B	A	A	E	C
Approach Vol, veh/h	1319			1004	441	
Approach Delay, s/veh	32.9			2.9	31.7	
Approach LOS	C			A	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	48.9	59.0				107.9		12.1
Change Period (Y+Rc), s	6.0	* 6				6.0		5.0
Max Green Setting (Gmax), s	22.0	* 53				80.0		29.0
Max Q Clear Time (g_c+I1), s	2.0	38.9				2.0		5.6
Green Ext Time (p_c), s	8.3	10.8				11.7		1.5

Intersection Summary	
HCM 2010 Ctrl Delay	21.8
HCM 2010 LOS	C

Notes

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	690	22	317	1180	50	235
Future Volume (veh/h)	690	22	317	1180	50	235
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	750	24	345	1283	54	255
Adj No. of Lanes	2	1	1	2	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1319	590	932	2985	101	748
Arrive On Green	0.37	0.37	0.83	1.00	0.06	0.06
Sat Flow, veh/h	3632	1583	1774	3632	1774	1583
Grp Volume(v), veh/h	750	24	345	1283	54	255
Grp Sat Flow(s),veh/h/ln	1770	1583	1774	1770	1774	1583
Q Serve(g_s), s	18.6	1.1	0.0	0.0	3.3	0.0
Cycle Q Clear(g_c), s	18.6	1.1	0.0	0.0	3.3	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1319	590	932	2985	101	748
V/C Ratio(X)	0.57	0.04	0.37	0.43	0.54	0.34
Avail Cap(c_a), veh/h	1319	590	932	2985	468	1076
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.80	0.80	1.00	1.00
Uniform Delay (d), s/veh	27.5	22.0	2.9	0.0	50.5	18.2
Incr Delay (d2), s/veh	1.8	0.1	0.1	0.4	4.4	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.4	0.5	1.4	0.2	1.7	4.9
LnGrp Delay(d),s/veh	29.2	22.1	3.0	0.4	54.9	18.5
LnGrp LOS	C	C	A	A	D	B
Approach Vol, veh/h	774			1628	309	
Approach Delay, s/veh	29.0			0.9	24.9	
Approach LOS	C			A	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	51.8	47.0				98.8		11.2
Change Period (Y+Rc), s	6.0	* 6				6.0		5.0
Max Green Setting (Gmax), s	24.0	* 41				70.0		29.0
Max Q Clear Time (g_c+I1), s	2.0	20.6				2.0		5.3
Green Ext Time (p_c), s	15.6	8.8				30.2		1.0

Intersection Summary	
HCM 2010 Ctrl Delay	11.7
HCM 2010 LOS	B

Notes

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1325	56	396	1005	51	421
Future Volume (veh/h)	1325	56	396	1005	51	421
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	1440	61	430	1092	55	458
Adj No. of Lanes	2	1	1	2	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1445	647	749	2996	110	712
Arrive On Green	0.41	0.41	0.78	1.00	0.06	0.06
Sat Flow, veh/h	3632	1583	1774	3632	1774	1583
Grp Volume(v), veh/h	1440	61	430	1092	55	458
Grp Sat Flow(s),veh/h/ln	1770	1583	1774	1770	1774	1583
Q Serve(g_s), s	48.7	2.8	4.7	0.0	3.6	0.0
Cycle Q Clear(g_c), s	48.7	2.8	4.7	0.0	3.6	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1445	647	749	2996	110	713
V/C Ratio(X)	1.00	0.09	0.57	0.36	0.50	0.64
Avail Cap(c_a), veh/h	1445	647	749	2996	429	997
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.81	0.81	1.00	1.00
Uniform Delay (d), s/veh	35.4	21.8	8.4	0.0	54.5	25.5
Incr Delay (d2), s/veh	22.8	0.3	0.6	0.3	3.5	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	28.4	1.3	4.2	0.1	1.9	11.8
LnGrp Delay(d),s/veh	58.3	22.1	9.0	0.3	58.0	26.5
LnGrp LOS	E	C	A	A	E	C
Approach Vol, veh/h	1501			1522	513	
Approach Delay, s/veh	56.8			2.7	29.9	
Approach LOS	E			A	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	52.6	55.0				107.6		12.4
Change Period (Y+Rc), s	6.0	* 6				6.0		5.0
Max Green Setting (Gmax), s	26.0	* 49				80.0		29.0
Max Q Clear Time (g_c+I1), s	6.7	50.7				2.0		5.6
Green Ext Time (p_c), s	12.4	0.0				23.8		1.8

Intersection Summary	
HCM 2010 Ctrl Delay	29.6
HCM 2010 LOS	C

Notes

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	863	22	340	1237	50	305
Future Volume (veh/h)	863	22	340	1237	50	305
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	938	24	370	1345	54	332
Adj No. of Lanes	2	1	1	2	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1319	590	873	2975	105	748
Arrive On Green	0.37	0.37	0.83	1.00	0.06	0.06
Sat Flow, veh/h	3632	1583	1774	3632	1774	1583
Grp Volume(v), veh/h	938	24	370	1345	54	332
Grp Sat Flow(s),veh/h/ln	1770	1583	1774	1770	1774	1583
Q Serve(g_s), s	24.9	1.1	0.0	0.0	3.2	0.0
Cycle Q Clear(g_c), s	24.9	1.1	0.0	0.0	3.2	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1319	590	873	2975	105	748
V/C Ratio(X)	0.71	0.04	0.42	0.45	0.51	0.44
Avail Cap(c_a), veh/h	1319	590	873	2975	468	1072
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.77	0.77	1.00	1.00
Uniform Delay (d), s/veh	29.4	22.0	4.2	0.0	50.2	19.3
Incr Delay (d2), s/veh	3.3	0.1	0.1	0.4	3.8	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.7	0.5	1.9	0.2	1.7	6.7
LnGrp Delay(d),s/veh	32.7	22.1	4.3	0.4	54.0	19.8
LnGrp LOS	C	C	A	A	D	B
Approach Vol, veh/h	962			1715	386	
Approach Delay, s/veh	32.5			1.2	24.6	
Approach LOS	C			A	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	51.5	47.0				98.5		11.5
Change Period (Y+Rc), s	6.0	* 6				6.0		5.0
Max Green Setting (Gmax), s	24.0	* 41				70.0		29.0
Max Q Clear Time (g_c+I1), s	2.0	26.9				2.0		5.2
Green Ext Time (p_c), s	16.3	8.5				32.8		1.3

Intersection Summary	
HCM 2010 Ctrl Delay	14.0
HCM 2010 LOS	B

Notes

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1356	56	421	1067	51	433
Future Volume (veh/h)	1356	56	421	1067	51	433
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	1474	61	458	1160	55	471
Adj No. of Lanes	2	1	1	2	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1445	647	748	2994	110	712
Arrive On Green	0.41	0.41	0.78	1.00	0.06	0.06
Sat Flow, veh/h	3632	1583	1774	3632	1774	1583
Grp Volume(v), veh/h	1474	61	458	1160	55	471
Grp Sat Flow(s),veh/h/ln	1770	1583	1774	1770	1774	1583
Q Serve(g_s), s	49.0	2.8	6.0	0.0	3.6	0.0
Cycle Q Clear(g_c), s	49.0	2.8	6.0	0.0	3.6	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1445	647	748	2994	110	713
V/C Ratio(X)	1.02	0.09	0.61	0.39	0.50	0.66
Avail Cap(c_a), veh/h	1445	647	748	2994	429	997
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.77	0.77	1.00	1.00
Uniform Delay (d), s/veh	35.5	21.8	8.5	0.0	54.5	25.8
Incr Delay (d2), s/veh	28.8	0.3	0.8	0.3	3.4	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	29.7	1.3	4.7	0.1	1.9	12.4
LnGrp Delay(d),s/veh	64.3	22.1	9.4	0.3	57.9	26.9
LnGrp LOS	F	C	A	A	E	C
Approach Vol, veh/h	1535			1618	526	
Approach Delay, s/veh	62.6			2.9	30.1	
Approach LOS	E			A	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	52.5	55.0				107.5		12.5
Change Period (Y+Rc), s	6.0	* 6				6.0		5.0
Max Green Setting (Gmax), s	26.0	* 49				80.0		29.0
Max Q Clear Time (g_c+I1), s	8.0	51.0				2.0		5.6
Green Ext Time (p_c), s	12.5	0.0				26.7		1.9

Intersection Summary	
HCM 2010 Ctrl Delay	31.7
HCM 2010 LOS	C

Notes

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1037	22	363	1295	50	374
Future Volume (veh/h)	1037	22	363	1295	50	374
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	1127	24	395	1408	54	407
Adj No. of Lanes	2	1	1	2	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1319	590	824	2966	110	748
Arrive On Green	0.37	0.37	0.82	1.00	0.06	0.06
Sat Flow, veh/h	3632	1583	1774	3632	1774	1583
Grp Volume(v), veh/h	1127	24	395	1408	54	407
Grp Sat Flow(s),veh/h/ln	1770	1583	1774	1770	1774	1583
Q Serve(g_s), s	32.2	1.1	0.0	0.0	3.2	0.0
Cycle Q Clear(g_c), s	32.2	1.1	0.0	0.0	3.2	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1319	590	824	2966	110	748
V/C Ratio(X)	0.85	0.04	0.48	0.47	0.49	0.54
Avail Cap(c_a), veh/h	1319	590	824	2966	468	1068
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.71	0.71	1.00	1.00
Uniform Delay (d), s/veh	31.8	22.0	5.5	0.0	49.9	20.6
Incr Delay (d2), s/veh	7.2	0.1	0.1	0.4	3.4	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	17.0	0.5	2.2	0.2	1.7	8.8
LnGrp Delay(d),s/veh	39.0	22.1	5.7	0.4	53.3	21.2
LnGrp LOS	D	C	A	A	D	C
Approach Vol, veh/h	1151			1803	461	
Approach Delay, s/veh	38.6			1.5	25.0	
Approach LOS	D			A	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	51.2	47.0				98.2		11.8
Change Period (Y+Rc), s	6.0	* 6				6.0		5.0
Max Green Setting (Gmax), s	24.0	* 41				70.0		29.0
Max Q Clear Time (g_c+I1), s	2.0	34.2				2.0		5.2
Green Ext Time (p_c), s	16.9	5.3				35.5		1.6

Intersection Summary	
HCM 2010 Ctrl Delay	17.2
HCM 2010 LOS	B

Notes

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1463	56	508	1285	51	475
Future Volume (veh/h)	1463	56	508	1285	51	475
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	1590	61	552	1397	55	516
Adj No. of Lanes	2	1	1	2	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1445	647	745	2988	113	712
Arrive On Green	0.41	0.41	0.51	1.00	0.06	0.06
Sat Flow, veh/h	3632	1583	1774	3632	1774	1583
Grp Volume(v), veh/h	1590	61	552	1397	55	516
Grp Sat Flow(s),veh/h/ln	1770	1583	1774	1770	1774	1583
Q Serve(g_s), s	49.0	2.8	24.1	0.0	3.6	0.0
Cycle Q Clear(g_c), s	49.0	2.8	24.1	0.0	3.6	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1445	647	745	2988	113	713
V/C Ratio(X)	1.10	0.09	0.74	0.47	0.48	0.72
Avail Cap(c_a), veh/h	1445	647	745	2988	429	994
HCM Platoon Ratio	1.00	1.00	1.33	1.33	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.62	0.62	1.00	1.00
Uniform Delay (d), s/veh	35.5	21.8	22.5	0.0	54.3	26.9
Incr Delay (d2), s/veh	56.1	0.3	2.2	0.3	3.2	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	35.1	1.3	14.2	0.1	1.9	14.2
LnGrp Delay(d),s/veh	91.6	22.1	24.7	0.3	57.4	28.5
LnGrp LOS	F	C	C	A	E	C
Approach Vol, veh/h	1651			1949	571	
Approach Delay, s/veh	89.0			7.2	31.3	
Approach LOS	F			A	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	52.3	55.0				107.3		12.7
Change Period (Y+Rc), s	6.0	* 6				6.0		5.0
Max Green Setting (Gmax), s	26.0	* 49				80.0		29.0
Max Q Clear Time (g_c+I1), s	26.1	51.0				2.0		5.6
Green Ext Time (p_c), s	0.0	0.0				38.1		2.1

Intersection Summary	
HCM 2010 Ctrl Delay	42.9
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	640	21	27	1235	21	103	10	30	31	8	40
Future Volume (veh/h)	9	640	21	27	1235	21	103	10	30	31	8	40
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	10	696	23	29	1342	23	112	11	33	34	9	43
Adj No. of Lanes	1	2	1	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	259	2371	1061	561	2386	41	334	90	271	341	62	296
Arrive On Green	1.00	1.00	1.00	0.67	0.67	0.67	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	397	3539	1583	730	3561	61	1347	411	1234	1357	281	1344
Grp Volume(v), veh/h	10	696	23	29	667	698	112	0	44	34	0	52
Grp Sat Flow(s),veh/h/ln	397	1770	1583	730	1770	1852	1347	0	1645	1357	0	1626
Q Serve(g_s), s	0.8	0.0	0.0	1.4	19.9	20.0	7.3	0.0	2.1	2.1	0.0	2.6
Cycle Q Clear(g_c), s	20.8	0.0	0.0	1.4	19.9	20.0	9.9	0.0	2.1	4.2	0.0	2.6
Prop In Lane	1.00		1.00	1.00		0.03	1.00		0.75	1.00		0.83
Lane Grp Cap(c), veh/h	259	2371	1061	561	1186	1241	334	0	362	341	0	358
V/C Ratio(X)	0.04	0.29	0.02	0.05	0.56	0.56	0.34	0.00	0.12	0.10	0.00	0.15
Avail Cap(c_a), veh/h	259	2371	1061	561	1186	1241	334	0	362	341	0	358
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	3.1	0.0	0.0	5.7	8.7	8.7	35.4	0.0	31.3	32.9	0.0	31.4
Incr Delay (d2), s/veh	0.3	0.3	0.0	0.2	1.9	1.9	2.7	0.0	0.7	0.6	0.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.1	0.0	0.3	10.3	10.7	3.0	0.0	1.0	0.8	0.0	1.2
LnGrp Delay(d),s/veh	3.4	0.3	0.0	5.8	10.7	10.6	38.1	0.0	31.9	33.5	0.0	32.3
LnGrp LOS	A	A	A	A	B	B	D		C	C		C
Approach Vol, veh/h		729			1394			156			86	
Approach Delay, s/veh		0.3			10.5			36.4			32.8	
Approach LOS		A			B			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		73.0		27.0		73.0		27.0
Change Period (Y+Rc), s		6.0		5.0		6.0		5.0
Max Green Setting (Gmax), s		67.0		22.0		67.0		22.0
Max Q Clear Time (g_c+I1), s		22.8		11.9		22.0		6.2
Green Ext Time (p_c), s		37.0		0.4		37.5		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	9.9
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	1464	72	69	810	42	36	13	41	57	9	14
Future Volume (veh/h)	31	1464	72	69	810	42	36	13	41	57	9	14
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	34	1591	78	75	880	46	39	14	45	62	10	15
Adj No. of Lanes	1	2	1	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	493	2802	1253	294	2709	142	203	45	146	172	79	118
Arrive On Green	1.00	1.00	1.00	0.79	0.79	0.79	0.12	0.12	0.12	0.12	0.12	0.12
Sat Flow, veh/h	602	3539	1583	296	3422	179	1380	390	1252	1338	674	1011
Grp Volume(v), veh/h	34	1591	78	75	455	471	39	0	59	62	0	25
Grp Sat Flow(s),veh/h/ln	602	1770	1583	296	1770	1831	1380	0	1642	1338	0	1684
Q Serve(g_s), s	0.7	0.0	0.0	8.5	8.7	8.7	3.1	0.0	4.0	5.3	0.0	1.6
Cycle Q Clear(g_c), s	9.3	0.0	0.0	8.5	8.7	8.7	4.7	0.0	4.0	9.3	0.0	1.6
Prop In Lane	1.00		1.00	1.00		0.10	1.00		0.76	1.00		0.60
Lane Grp Cap(c), veh/h	493	2802	1253	294	1401	1450	203	0	192	172	0	197
V/C Ratio(X)	0.07	0.57	0.06	0.25	0.32	0.32	0.19	0.00	0.31	0.36	0.00	0.13
Avail Cap(c_a), veh/h	493	2802	1253	294	1401	1450	203	0	192	172	0	197
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.4	0.0	0.0	3.5	3.5	3.5	49.6	0.0	48.6	52.8	0.0	47.5
Incr Delay (d2), s/veh	0.3	0.8	0.1	2.1	0.6	0.6	2.1	0.0	4.1	5.8	0.0	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.3	0.0	0.9	4.4	4.6	1.3	0.0	2.0	2.3	0.0	0.8
LnGrp Delay(d),s/veh	0.7	0.8	0.1	5.6	4.1	4.1	51.7	0.0	52.7	58.6	0.0	48.9
LnGrp LOS	A	A	A	A	A	A	D		D	E		D
Approach Vol, veh/h		1703			1001			98			87	
Approach Delay, s/veh		0.8			4.2			52.3			55.8	
Approach LOS		A			A			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		101.0		19.0		101.0		19.0
Change Period (Y+Rc), s		6.0		5.0		6.0		5.0
Max Green Setting (Gmax), s		95.0		14.0		95.0		14.0
Max Q Clear Time (g_c+I1), s		11.3		6.7		10.7		11.3
Green Ext Time (p_c), s		75.9		0.2		76.5		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	5.4
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	640	21	27	1235	21	103	10	30	31	8	40
Future Volume (veh/h)	9	640	21	27	1235	21	103	10	30	31	8	40
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	10	696	23	29	1342	23	112	11	33	34	9	43
Adj No. of Lanes	1	2	1	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	312	2567	1148	570	2582	44	237	56	169	244	39	185
Arrive On Green	0.73	0.73	0.73	0.73	0.73	0.73	0.14	0.14	0.14	0.14	0.14	0.14
Sat Flow, veh/h	397	3539	1583	730	3561	61	1347	411	1234	1357	281	1344
Grp Volume(v), veh/h	10	696	23	29	667	698	112	0	44	34	0	52
Grp Sat Flow(s),veh/h/ln	397	1770	1583	730	1770	1852	1347	0	1645	1357	0	1626
Q Serve(g_s), s	0.9	5.4	0.3	1.1	13.3	13.3	6.5	0.0	1.9	1.8	0.0	2.3
Cycle Q Clear(g_c), s	14.2	5.4	0.3	6.5	13.3	13.3	8.7	0.0	1.9	3.7	0.0	2.3
Prop In Lane	1.00		1.00	1.00		0.03	1.00		0.75	1.00		0.83
Lane Grp Cap(c), veh/h	312	2567	1148	570	1283	1343	237	0	226	244	0	223
V/C Ratio(X)	0.03	0.27	0.02	0.05	0.52	0.52	0.47	0.00	0.19	0.14	0.00	0.23
Avail Cap(c_a), veh/h	312	2567	1148	570	1283	1343	338	0	350	346	0	345
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.96	0.96	0.96	0.81	0.81	0.81	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	8.0	3.8	3.1	4.9	4.8	4.8	34.7	0.0	30.6	32.2	0.0	30.8
Incr Delay (d2), s/veh	0.2	0.3	0.0	0.1	1.2	1.2	0.5	0.0	0.2	0.1	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	2.7	0.2	0.2	6.7	7.0	2.4	0.0	0.9	0.7	0.0	1.0
LnGrp Delay(d),s/veh	8.2	4.0	3.1	5.0	6.1	6.0	35.2	0.0	30.7	32.3	0.0	30.9
LnGrp LOS	A	A	A	A	A	A	D		C	C		C
Approach Vol, veh/h		729			1394			156			86	
Approach Delay, s/veh		4.0			6.0			33.9			31.5	
Approach LOS		A			A			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		64.0		16.0		64.0		16.0
Change Period (Y+Rc), s		6.0		5.0		6.0		5.0
Max Green Setting (Gmax), s		52.0		17.0		52.0		17.0
Max Q Clear Time (g_c+I1), s		16.2		10.7		15.3		5.7
Green Ext Time (p_c), s		30.8		0.3		31.5		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	8.2
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	1464	72	69	810	42	36	13	41	57	9	14
Future Volume (veh/h)	31	1464	72	69	810	42	36	13	41	57	9	14
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	34	1591	78	75	880	46	39	14	45	62	10	15
Adj No. of Lanes	1	2	1	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	492	2536	1135	332	2452	128	239	39	125	209	67	101
Arrive On Green	1.00	1.00	1.00	0.72	0.72	0.72	0.10	0.10	0.10	0.10	0.10	0.10
Sat Flow, veh/h	602	3539	1583	296	3422	179	1380	390	1252	1338	674	1011
Grp Volume(v), veh/h	34	1591	78	75	455	471	39	0	59	62	0	25
Grp Sat Flow(s),veh/h/ln	602	1770	1583	296	1770	1831	1380	0	1642	1338	0	1684
Q Serve(g_s), s	0.5	0.0	0.0	5.8	5.9	5.9	1.6	0.0	2.0	2.7	0.0	0.8
Cycle Q Clear(g_c), s	6.4	0.0	0.0	5.8	5.9	5.9	2.4	0.0	2.0	4.7	0.0	0.8
Prop In Lane	1.00		1.00	1.00		0.10	1.00		0.76	1.00		0.60
Lane Grp Cap(c), veh/h	492	2536	1135	332	1268	1312	239	0	164	209	0	168
V/C Ratio(X)	0.07	0.63	0.07	0.23	0.36	0.36	0.16	0.00	0.36	0.30	0.00	0.15
Avail Cap(c_a), veh/h	492	2536	1135	332	1268	1312	239	0	164	209	0	168
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.74	0.74	0.74	0.92	0.92	0.92	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.4	0.0	0.0	3.2	3.2	3.2	25.8	0.0	25.2	27.4	0.0	24.7
Incr Delay (d2), s/veh	0.2	0.9	0.1	1.4	0.7	0.7	0.1	0.0	0.5	0.3	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.3	0.0	0.6	3.0	3.1	0.6	0.0	0.9	1.0	0.0	0.4
LnGrp Delay(d),s/veh	0.6	0.9	0.1	4.7	4.0	3.9	25.9	0.0	25.7	27.7	0.0	24.8
LnGrp LOS	A	A	A	A	A	A	C		C	C		C
Approach Vol, veh/h		1703			1001			98			87	
Approach Delay, s/veh		0.8			4.0			25.8			26.9	
Approach LOS		A			A			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		49.0		11.0		49.0		11.0
Change Period (Y+Rc), s		6.0		5.0		6.0		5.0
Max Green Setting (Gmax), s		43.0		6.0		43.0		6.0
Max Q Clear Time (g_c+I1), s		8.4		4.4		7.9		6.7
Green Ext Time (p_c), s		33.1		0.1		33.6		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	3.6
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	843	21	29	1299	30	103	10	33	37	8	43
Future Volume (veh/h)	14	843	21	29	1299	30	103	10	33	37	8	43
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	15	916	23	32	1412	33	112	11	36	40	9	47
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	224	2245	56	527	2471	58	203	51	167	211	35	181
Arrive On Green	0.03	1.00	1.00	0.08	0.70	0.70	0.13	0.13	0.13	0.13	0.13	0.13
Sat Flow, veh/h	1774	3528	89	1774	3535	83	1342	384	1257	1353	261	1362
Grp Volume(v), veh/h	15	459	480	32	706	739	112	0	47	40	0	56
Grp Sat Flow(s),veh/h/ln	1774	1770	1847	1774	1770	1848	1342	0	1641	1353	0	1622
Q Serve(g_s), s	0.4	0.0	0.0	0.0	22.0	22.1	9.0	0.0	2.8	3.0	0.0	3.4
Cycle Q Clear(g_c), s	0.4	0.0	0.0	0.0	22.0	22.1	12.4	0.0	2.8	5.8	0.0	3.4
Prop In Lane	1.00		0.05	1.00		0.04	1.00		0.77	1.00		0.84
Lane Grp Cap(c), veh/h	224	1126	1175	527	1237	1292	203	0	218	211	0	216
V/C Ratio(X)	0.07	0.41	0.41	0.06	0.57	0.57	0.55	0.00	0.22	0.19	0.00	0.26
Avail Cap(c_a), veh/h	265	1126	1175	527	1237	1292	256	0	283	265	0	280
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.93	0.93	0.93	0.75	0.75	0.75	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	11.5	0.0	0.0	8.1	8.3	8.3	48.4	0.0	42.5	45.1	0.0	42.8
Incr Delay (d2), s/veh	0.1	1.0	1.0	0.0	1.5	1.4	0.9	0.0	0.2	0.2	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.3	0.3	0.4	11.1	11.6	3.4	0.0	1.3	1.1	0.0	1.5
LnGrp Delay(d),s/veh	11.6	1.0	1.0	8.2	9.7	9.7	49.3	0.0	42.7	45.3	0.0	43.0
LnGrp LOS	B	A	A	A	A	A	D		D	D		D
Approach Vol, veh/h		954			1477			159			96	
Approach Delay, s/veh		1.2			9.7			47.3			44.0	
Approach LOS		A			A			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	14.4	76.0		19.6	7.5	82.9		19.6
Change Period (Y+Rc), s	6.0	6.0		5.0	6.0	6.0		5.0
Max Green Setting (Gmax), s	4.0	70.0		19.0	4.0	70.0		19.0
Max Q Clear Time (g_c+I1), s	2.0	2.0		14.4	2.4	24.1		7.8
Green Ext Time (p_c), s	0.8	16.6		0.3	0.0	28.5		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	10.1
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	1685	72	75	1271	55	36	13	44	86	9	29
Future Volume (veh/h)	38	1685	72	75	1271	55	36	13	44	86	9	29
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	41	1832	78	82	1382	60	39	14	48	93	10	32
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	255	2336	99	308	2464	107	192	45	153	175	47	151
Arrive On Green	0.05	1.00	1.00	0.06	0.71	0.71	0.12	0.12	0.12	0.12	0.12	0.12
Sat Flow, veh/h	1774	3460	146	1774	3456	150	1359	370	1269	1335	391	1251
Grp Volume(v), veh/h	41	931	979	82	706	736	39	0	62	93	0	42
Grp Sat Flow(s),veh/h/ln	1774	1770	1837	1774	1770	1836	1359	0	1639	1335	0	1642
Q Serve(g_s), s	1.0	0.0	0.0	0.0	22.9	23.0	3.2	0.0	4.1	8.2	0.0	2.8
Cycle Q Clear(g_c), s	1.0	0.0	0.0	0.0	22.9	23.0	6.0	0.0	4.1	12.4	0.0	2.8
Prop In Lane	1.00		0.08	1.00		0.08	1.00		0.77	1.00		0.76
Lane Grp Cap(c), veh/h	255	1194	1240	308	1262	1309	192	0	197	175	0	198
V/C Ratio(X)	0.16	0.78	0.79	0.27	0.56	0.56	0.20	0.00	0.31	0.53	0.00	0.21
Avail Cap(c_a), veh/h	299	1194	1240	308	1262	1309	210	0	219	192	0	219
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.59	0.59	0.59	0.75	0.75	0.75	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	10.5	0.0	0.0	11.5	8.2	8.2	50.3	0.0	48.2	53.9	0.0	47.6
Incr Delay (d2), s/veh	0.2	3.1	3.1	0.3	1.4	1.3	0.2	0.0	0.3	0.9	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	1.0	1.1	1.5	11.5	11.9	1.2	0.0	1.9	3.1	0.0	1.3
LnGrp Delay(d),s/veh	10.7	3.1	3.1	11.9	9.6	9.6	50.5	0.0	48.6	54.8	0.0	47.8
LnGrp LOS	B	A	A	B	A	A	D		D	D		D
Approach Vol, veh/h		1951			1524			101			135	
Approach Delay, s/veh		3.3			9.7			49.3			52.7	
Approach LOS		A			A			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	13.5	87.0		19.5	9.0	91.6		19.5
Change Period (Y+Rc), s	6.0	6.0		5.0	6.0	6.0		5.0
Max Green Setting (Gmax), s	6.0	81.0		16.0	6.0	81.0		16.0
Max Q Clear Time (g_c+I1), s	2.0	2.0		8.0	3.0	25.0		14.4
Green Ext Time (p_c), s	1.4	60.3		0.3	0.0	32.2		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	9.0
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	1079	21	30	1374	41	103	10	37	43	8	47
Future Volume (veh/h)	19	1079	21	30	1374	41	103	10	37	43	8	47
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	21	1173	23	33	1493	45	112	11	40	47	9	51
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	209	2259	44	450	2429	73	203	48	174	211	33	187
Arrive On Green	0.03	1.00	1.00	0.07	0.69	0.69	0.14	0.14	0.14	0.14	0.14	0.14
Sat Flow, veh/h	1774	3550	70	1774	3508	106	1337	353	1283	1348	243	1377
Grp Volume(v), veh/h	21	585	611	33	752	786	112	0	51	47	0	60
Grp Sat Flow(s),veh/h/ln	1774	1770	1850	1774	1770	1844	1337	0	1636	1348	0	1620
Q Serve(g_s), s	0.5	0.0	0.0	0.0	25.0	25.1	9.0	0.0	3.1	3.5	0.0	3.7
Cycle Q Clear(g_c), s	0.5	0.0	0.0	0.0	25.0	25.1	12.7	0.0	3.1	6.6	0.0	3.7
Prop In Lane	1.00		0.04	1.00		0.06	1.00		0.78	1.00		0.85
Lane Grp Cap(c), veh/h	209	1126	1178	450	1225	1277	203	0	222	211	0	220
V/C Ratio(X)	0.10	0.52	0.52	0.07	0.61	0.62	0.55	0.00	0.23	0.22	0.00	0.27
Avail Cap(c_a), veh/h	243	1126	1178	450	1225	1277	252	0	283	261	0	280
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.86	0.86	0.86	0.69	0.69	0.69	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	12.3	0.0	0.0	8.6	9.0	9.1	48.3	0.0	42.4	45.3	0.0	42.7
Incr Delay (d2), s/veh	0.2	1.5	1.4	0.0	1.6	1.5	0.9	0.0	0.2	0.2	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.5	0.5	0.4	12.7	13.2	3.4	0.0	1.4	1.3	0.0	1.6
LnGrp Delay(d),s/veh	12.4	1.5	1.4	8.6	10.6	10.6	49.2	0.0	42.6	45.5	0.0	42.9
LnGrp LOS	B	A	A	A	B	B	D		D	D		D
Approach Vol, veh/h		1217			1571			163			107	
Approach Delay, s/veh		1.6			10.6			47.1			44.1	
Approach LOS		A			B			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	14.1	76.0		19.9	7.9	82.2		19.9
Change Period (Y+Rc), s	6.0	6.0		5.0	6.0	6.0		5.0
Max Green Setting (Gmax), s	4.0	70.0		19.0	4.0	70.0		19.0
Max Q Clear Time (g_c+I1), s	2.0	2.0		14.7	2.5	27.1		8.6
Green Ext Time (p_c), s	1.2	25.1		0.3	0.0	29.4		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	10.1
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	39	1725	72	76	1355	57	36	13	45	91	9	32
Future Volume (veh/h)	39	1725	72	76	1355	57	36	13	45	91	9	32
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	42	1875	78	83	1473	62	39	14	49	99	10	35
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	234	2338	97	294	2451	103	196	46	159	180	46	159
Arrive On Green	0.05	1.00	1.00	0.06	0.71	0.71	0.13	0.13	0.13	0.13	0.13	0.13
Sat Flow, veh/h	1774	3464	143	1774	3461	145	1356	364	1274	1334	364	1274
Grp Volume(v), veh/h	42	951	1002	83	751	784	39	0	63	99	0	45
Grp Sat Flow(s),veh/h/ln	1774	1770	1837	1774	1770	1837	1356	0	1638	1334	0	1638
Q Serve(g_s), s	1.0	0.0	0.0	0.0	25.9	26.1	3.2	0.0	4.2	8.8	0.0	3.0
Cycle Q Clear(g_c), s	1.0	0.0	0.0	0.0	25.9	26.1	6.2	0.0	4.2	13.0	0.0	3.0
Prop In Lane	1.00		0.08	1.00		0.08	1.00		0.78	1.00		0.78
Lane Grp Cap(c), veh/h	234	1194	1240	294	1253	1301	196	0	205	180	0	205
V/C Ratio(X)	0.18	0.80	0.81	0.28	0.60	0.60	0.20	0.00	0.31	0.55	0.00	0.22
Avail Cap(c_a), veh/h	278	1194	1240	294	1253	1301	207	0	218	191	0	218
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.56	0.56	0.56	0.72	0.72	0.72	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	11.3	0.0	0.0	12.2	8.9	8.9	50.0	0.0	47.8	53.7	0.0	47.2
Incr Delay (d2), s/veh	0.2	3.2	3.3	0.4	1.5	1.5	0.2	0.0	0.3	1.4	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	1.1	1.1	1.6	13.1	13.6	1.2	0.0	1.9	3.3	0.0	1.3
LnGrp Delay(d),s/veh	11.5	3.2	3.3	12.6	10.4	10.4	50.2	0.0	48.1	55.0	0.0	47.4
LnGrp LOS	B	A	A	B	B	B	D		D	E		D
Approach Vol, veh/h		1995			1618			102			144	
Approach Delay, s/veh		3.4			10.5			48.9			52.6	
Approach LOS		A			B			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	13.0	87.0		20.0	9.0	91.0		20.0
Change Period (Y+Rc), s	6.0	6.0		5.0	6.0	6.0		5.0
Max Green Setting (Gmax), s	6.0	81.0		16.0	6.0	81.0		16.0
Max Q Clear Time (g_c+I1), s	2.0	2.0		8.2	3.0	28.1		15.0
Green Ext Time (p_c), s	1.5	62.1		0.4	0.0	34.1		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	9.4
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	1316	21	32	1449	52	103	10	40	50	8	51
Future Volume (veh/h)	25	1316	21	32	1449	52	103	10	40	50	8	51
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	27	1430	23	35	1575	57	112	11	43	54	9	55
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	194	2269	36	389	2392	86	203	46	180	212	31	192
Arrive On Green	0.04	1.00	1.00	0.07	0.69	0.69	0.14	0.14	0.14	0.14	0.14	0.14
Sat Flow, veh/h	1774	3565	57	1774	3484	126	1332	333	1301	1345	227	1390
Grp Volume(v), veh/h	27	709	744	35	798	834	112	0	54	54	0	64
Grp Sat Flow(s),veh/h/ln	1774	1770	1853	1774	1770	1841	1332	0	1633	1345	0	1617
Q Serve(g_s), s	0.7	0.0	0.0	0.0	28.3	28.6	9.1	0.0	3.2	4.1	0.0	3.9
Cycle Q Clear(g_c), s	0.7	0.0	0.0	0.0	28.3	28.6	13.0	0.0	3.2	7.3	0.0	3.9
Prop In Lane	1.00		0.03	1.00		0.07	1.00		0.80	1.00		0.86
Lane Grp Cap(c), veh/h	194	1126	1179	389	1215	1264	203	0	226	212	0	224
V/C Ratio(X)	0.14	0.63	0.63	0.09	0.66	0.66	0.55	0.00	0.24	0.25	0.00	0.29
Avail Cap(c_a), veh/h	222	1126	1179	389	1215	1264	248	0	282	258	0	279
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.76	0.76	0.76	0.61	0.61	0.61	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.3	0.0	0.0	9.1	9.8	9.9	48.3	0.0	42.2	45.5	0.0	42.5
Incr Delay (d2), s/veh	0.2	2.0	1.9	0.1	1.7	1.7	0.9	0.0	0.2	0.2	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.6	0.6	0.5	14.1	15.0	3.4	0.0	1.5	1.5	0.0	1.8
LnGrp Delay(d),s/veh	13.5	2.0	1.9	9.1	11.5	11.5	49.2	0.0	42.4	45.7	0.0	42.8
LnGrp LOS	B	A	A	A	B	B	D		D	D		D
Approach Vol, veh/h		1480			1667			166			118	
Approach Delay, s/veh		2.2			11.5			47.0			44.1	
Approach LOS		A			B			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	13.8	76.0		20.2	8.2	81.5		20.2
Change Period (Y+Rc), s	6.0	6.0		5.0	6.0	6.0		5.0
Max Green Setting (Gmax), s	4.0	70.0		19.0	4.0	70.0		19.0
Max Q Clear Time (g_c+I1), s	2.0	2.0		15.0	2.7	30.6		9.3
Green Ext Time (p_c), s	1.5	35.5		0.3	0.0	29.6		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	10.3
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	43	1865	72	79	1649	65	36	13	47	109	9	42
Future Volume (veh/h)	43	1865	72	79	1649	65	36	13	47	109	9	42
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	47	2027	78	86	1792	71	39	14	51	118	10	46
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	170	2288	87	208	2425	96	197	47	171	190	39	178
Arrive On Green	0.03	0.66	0.66	0.07	0.70	0.70	0.13	0.13	0.13	0.13	0.13	0.13
Sat Flow, veh/h	1774	3476	133	1774	3471	137	1342	352	1284	1331	291	1336
Grp Volume(v), veh/h	47	1026	1079	86	909	954	39	0	65	118	0	56
Grp Sat Flow(s),veh/h/ln	1774	1770	1839	1774	1770	1839	1342	0	1636	1331	0	1627
Q Serve(g_s), s	1.2	56.5	58.3	0.0	38.2	39.0	3.2	0.0	4.3	10.5	0.0	3.7
Cycle Q Clear(g_c), s	1.2	56.5	58.3	0.0	38.2	39.0	6.9	0.0	4.3	14.8	0.0	3.7
Prop In Lane	1.00		0.07	1.00		0.07	1.00		0.78	1.00		0.82
Lane Grp Cap(c), veh/h	170	1165	1211	208	1236	1284	197	0	218	190	0	217
V/C Ratio(X)	0.28	0.88	0.89	0.41	0.73	0.74	0.20	0.00	0.30	0.62	0.00	0.26
Avail Cap(c_a), veh/h	182	1165	1211	208	1236	1284	197	0	218	190	0	217
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.46	0.46	0.46	0.53	0.53	0.53	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.3	16.7	17.0	49.0	11.2	11.3	49.8	0.0	46.9	53.6	0.0	46.7
Incr Delay (d2), s/veh	0.4	4.8	5.1	0.7	2.1	2.1	0.2	0.0	0.3	4.6	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	28.9	30.8	2.7	19.1	20.4	1.2	0.0	2.0	4.1	0.0	1.7
LnGrp Delay(d),s/veh	17.7	21.4	22.0	49.7	13.3	13.4	50.0	0.0	47.2	58.2	0.0	46.9
LnGrp LOS	B	C	C	D	B	B	D		D	E		D
Approach Vol, veh/h		2152			1949			104			174	
Approach Delay, s/veh		21.7			15.0			48.2			54.6	
Approach LOS		C			B			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	14.0	85.0		21.0	9.2	89.8		21.0
Change Period (Y+Rc), s	6.0	6.0		5.0	6.0	6.0		5.0
Max Green Setting (Gmax), s	8.0	79.0		16.0	4.0	83.0		16.0
Max Q Clear Time (g_c+I1), s	2.0	60.3		8.9	3.2	41.0		16.8
Green Ext Time (p_c), s	5.6	17.9		0.4	0.0	35.4		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	20.6
HCM 2010 LOS	C

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	32	713	1286	61	94	35
Future Volume (veh/h)	32	713	1286	61	94	35
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	35	775	1398	66	102	38
Adj No. of Lanes	1	2	2	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	301	2713	2294	108	251	224
Arrive On Green	0.05	0.77	0.67	0.67	0.14	0.14
Sat Flow, veh/h	1774	3632	3535	162	1774	1583
Grp Volume(v), veh/h	35	775	717	747	102	38
Grp Sat Flow(s),veh/h/ln	1774	1770	1770	1834	1774	1583
Q Serve(g_s), s	0.0	7.9	27.3	27.5	6.3	2.5
Cycle Q Clear(g_c), s	0.0	7.9	27.3	27.5	6.3	2.5
Prop In Lane	1.00			0.09	1.00	1.00
Lane Grp Cap(c), veh/h	301	2713	1180	1223	251	224
V/C Ratio(X)	0.12	0.29	0.61	0.61	0.41	0.17
Avail Cap(c_a), veh/h	301	2713	1180	1223	251	224
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.6	4.2	11.2	11.2	46.9	45.3
Incr Delay (d2), s/veh	0.8	0.3	2.3	2.3	4.8	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	3.9	13.9	14.5	3.4	2.4
LnGrp Delay(d),s/veh	19.4	4.4	13.5	13.5	51.7	46.9
LnGrp LOS	B	A	B	B	D	D
Approach Vol, veh/h		810	1464		140	
Approach Delay, s/veh		5.1	13.5		50.4	
Approach LOS		A	B		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		98.0		22.0	12.0	86.0		
Change Period (Y+Rc), s		6.0		5.0	6.0	6.0		
Max Green Setting (Gmax), s		92.0		17.0	6.0	80.0		
Max Q Clear Time (g_c+I1), s		9.9		8.3	2.0	29.5		
Green Ext Time (p_c), s		13.6		0.1	2.6	30.6		

Intersection Summary	
HCM 2010 Ctrl Delay	12.8
HCM 2010 LOS	B

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	28	1518	902	107	109	48
Future Volume (veh/h)	28	1518	902	107	109	48
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	30	1650	980	116	118	52
Adj No. of Lanes	1	2	2	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	385	2654	2099	248	281	251
Arrive On Green	0.08	1.00	0.66	0.66	0.16	0.16
Sat Flow, veh/h	1774	3632	3282	377	1774	1583
Grp Volume(v), veh/h	30	1650	544	552	118	52
Grp Sat Flow(s),veh/h/ln	1774	1770	1770	1796	1774	1583
Q Serve(g_s), s	0.0	0.0	18.2	18.2	7.2	3.4
Cycle Q Clear(g_c), s	0.0	0.0	18.2	18.2	7.2	3.4
Prop In Lane	1.00			0.21	1.00	1.00
Lane Grp Cap(c), veh/h	385	2654	1165	1182	281	251
V/C Ratio(X)	0.08	0.62	0.47	0.47	0.42	0.21
Avail Cap(c_a), veh/h	385	2654	1165	1182	281	251
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.3	0.0	10.1	10.1	45.5	43.9
Incr Delay (d2), s/veh	0.4	1.1	1.3	1.3	4.6	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.4	9.2	9.3	3.9	3.3
LnGrp Delay(d),s/veh	13.7	1.1	11.5	11.4	50.1	45.8
LnGrp LOS	B	A	B	B	D	D
Approach Vol, veh/h		1680	1096		170	
Approach Delay, s/veh		1.3	11.4		48.8	
Approach LOS		A	B		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		96.0		24.0	11.0	85.0		
Change Period (Y+Rc), s		6.0		5.0	6.0	6.0		
Max Green Setting (Gmax), s		90.0		19.0	5.0	79.0		
Max Q Clear Time (g_c+I1), s		2.0		9.2	2.0	20.2		
Green Ext Time (p_c), s		51.4		0.2	2.8	20.9		

Intersection Summary	
HCM 2010 Ctrl Delay	7.8
HCM 2010 LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	32	713	1286	61	94	35
Future Volume (veh/h)	32	713	1286	61	94	35
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	35	775	1398	66	102	38
Adj No. of Lanes	1	2	2	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	446	2776	1905	90	139	124
Arrive On Green	0.31	1.00	0.55	0.55	0.08	0.08
Sat Flow, veh/h	1774	3632	3535	162	1774	1583
Grp Volume(v), veh/h	35	775	717	747	102	38
Grp Sat Flow(s),veh/h/ln	1774	1770	1770	1834	1774	1583
Q Serve(g_s), s	0.0	0.0	24.4	24.5	4.5	1.8
Cycle Q Clear(g_c), s	0.0	0.0	24.4	24.5	4.5	1.8
Prop In Lane	1.00			0.09	1.00	1.00
Lane Grp Cap(c), veh/h	446	2776	980	1015	139	124
V/C Ratio(X)	0.08	0.28	0.73	0.74	0.73	0.31
Avail Cap(c_a), veh/h	446	2776	1106	1146	222	198
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.98	0.98	0.86	0.86	1.00	1.00
Uniform Delay (d), s/veh	13.7	0.0	13.4	13.4	36.1	34.8
Incr Delay (d2), s/veh	0.0	0.2	2.6	2.6	2.8	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.1	12.5	13.0	2.3	1.6
LnGrp Delay(d),s/veh	13.7	0.2	16.0	16.0	38.9	35.3
LnGrp LOS	B	A	B	B	D	D
Approach Vol, veh/h		810	1464		140	
Approach Delay, s/veh		0.8	16.0		37.9	
Approach LOS		A	B		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		68.7		11.3	18.4	50.3		
Change Period (Y+Rc), s		6.0		5.0	6.0	6.0		
Max Green Setting (Gmax), s		59.0		10.0	3.0	50.0		
Max Q Clear Time (g_c+I1), s		2.0		6.5	2.0	26.5		
Green Ext Time (p_c), s		13.0		0.1	0.7	17.8		

Intersection Summary	
HCM 2010 Ctrl Delay	12.2
HCM 2010 LOS	B

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	28	1518	902	107	109	48
Future Volume (veh/h)	28	1518	902	107	109	48
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	30	1650	980	116	118	52
Adj No. of Lanes	1	2	2	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	423	2921	2422	287	147	131
Arrive On Green	0.03	1.00	0.76	0.76	0.08	0.08
Sat Flow, veh/h	1774	3632	3282	377	1774	1583
Grp Volume(v), veh/h	30	1650	544	552	118	52
Grp Sat Flow(s),veh/h/ln	1774	1770	1770	1796	1774	1583
Q Serve(g_s), s	0.4	0.0	12.8	12.8	7.8	3.7
Cycle Q Clear(g_c), s	0.4	0.0	12.8	12.8	7.8	3.7
Prop In Lane	1.00			0.21	1.00	1.00
Lane Grp Cap(c), veh/h	423	2921	1344	1364	147	131
V/C Ratio(X)	0.07	0.56	0.40	0.40	0.80	0.40
Avail Cap(c_a), veh/h	468	2921	1344	1364	281	251
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.83	0.83	0.93	0.93	1.00	1.00
Uniform Delay (d), s/veh	3.6	0.0	5.0	5.0	54.0	52.2
Incr Delay (d2), s/veh	0.0	0.7	0.4	0.4	3.8	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.3	6.3	6.4	4.0	3.3
LnGrp Delay(d),s/veh	3.6	0.7	5.4	5.4	57.8	52.9
LnGrp LOS	A	A	A	A	E	D
Approach Vol, veh/h		1680	1096		170	
Approach Delay, s/veh		0.7	5.4		56.3	
Approach LOS		A	A		E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		105.0		15.0	7.9	97.1		
Change Period (Y+Rc), s		6.0		5.0	6.0	6.0		
Max Green Setting (Gmax), s		90.0		19.0	5.0	79.0		
Max Q Clear Time (g_c+I1), s		2.0		9.8	2.4	14.8		
Green Ext Time (p_c), s		79.6		0.2	0.0	59.6		

Intersection Summary	
HCM 2010 Ctrl Delay	5.7
HCM 2010 LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	43	904	1359	97	97	36
Future Volume (veh/h)	43	904	1359	97	97	36
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	47	983	1477	105	105	39
Adj No. of Lanes	1	2	2	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	279	2916	2510	178	135	120
Arrive On Green	0.03	1.00	0.75	0.75	0.08	0.08
Sat Flow, veh/h	1774	3632	3446	237	1774	1583
Grp Volume(v), veh/h	47	983	776	806	105	39
Grp Sat Flow(s),veh/h/ln	1774	1770	1770	1821	1774	1583
Q Serve(g_s), s	0.6	0.0	21.6	21.9	6.4	2.6
Cycle Q Clear(g_c), s	0.6	0.0	21.6	21.9	6.4	2.6
Prop In Lane	1.00			0.13	1.00	1.00
Lane Grp Cap(c), veh/h	279	2916	1325	1363	135	120
V/C Ratio(X)	0.17	0.34	0.59	0.59	0.78	0.32
Avail Cap(c_a), veh/h	339	2916	1325	1363	210	187
HCM Platoon Ratio	1.33	1.33	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.94	0.94	0.83	0.83	1.00	1.00
Uniform Delay (d), s/veh	5.6	0.0	6.2	6.2	49.9	48.1
Incr Delay (d2), s/veh	0.1	0.3	0.9	0.9	3.7	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.1	10.7	11.1	3.3	2.3
LnGrp Delay(d),s/veh	5.7	0.3	7.1	7.1	53.6	48.7
LnGrp LOS	A	A	A	A	D	D
Approach Vol, veh/h		1030	1582		144	
Approach Delay, s/veh		0.5	7.1		52.3	
Approach LOS		A	A		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		96.6		13.4	8.3	88.3		
Change Period (Y+Rc), s		6.0		5.0	6.0	6.0		
Max Green Setting (Gmax), s		86.0		13.0	6.0	74.0		
Max Q Clear Time (g_c+I1), s		2.0		8.4	2.6	23.9		
Green Ext Time (p_c), s		73.6		0.1	0.0	46.1		

Intersection Summary	
HCM 2010 Ctrl Delay	7.0
HCM 2010 LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	29	1768	1351	111	166	65
Future Volume (veh/h)	29	1768	1351	111	166	65
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	32	1922	1468	121	180	71
Adj No. of Lanes	1	2	2	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	420	2796	1910	157	210	187
Arrive On Green	0.33	1.00	0.58	0.58	0.12	0.12
Sat Flow, veh/h	1774	3632	3406	272	1774	1583
Grp Volume(v), veh/h	32	1922	780	809	180	71
Grp Sat Flow(s),veh/h/ln	1774	1770	1770	1815	1774	1583
Q Serve(g_s), s	0.0	0.0	40.1	40.8	11.9	5.0
Cycle Q Clear(g_c), s	0.0	0.0	40.1	40.8	11.9	5.0
Prop In Lane	1.00			0.15	1.00	1.00
Lane Grp Cap(c), veh/h	420	2796	1020	1046	210	187
V/C Ratio(X)	0.08	0.69	0.76	0.77	0.86	0.38
Avail Cap(c_a), veh/h	420	2796	1150	1180	325	290
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.59	0.59	0.82	0.82	1.00	1.00
Uniform Delay (d), s/veh	20.0	0.0	19.2	19.4	51.9	48.8
Incr Delay (d2), s/veh	0.0	0.8	3.0	3.1	8.2	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.3	20.4	21.3	6.3	4.5
LnGrp Delay(d),s/veh	20.0	0.8	22.2	22.5	60.2	49.3
LnGrp LOS	B	A	C	C	E	D
Approach Vol, veh/h		1954	1589		251	
Approach Delay, s/veh		1.1	22.4		57.1	
Approach LOS		A	C		E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		100.8		19.2	25.6	75.2		
Change Period (Y+Rc), s		6.0		5.0	6.0	6.0		
Max Green Setting (Gmax), s		87.0		22.0	3.0	78.0		
Max Q Clear Time (g_c+I1), s		2.0		13.9	2.0	42.8		
Green Ext Time (p_c), s		63.0		0.2	1.0	26.3		

Intersection Summary	
HCM 2010 Ctrl Delay	13.7
HCM 2010 LOS	B

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	55	1126	1445	139	101	37
Future Volume (veh/h)	55	1126	1445	139	101	37
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	60	1224	1571	151	110	40
Adj No. of Lanes	1	2	2	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	247	2906	2429	231	140	125
Arrive On Green	0.02	0.82	0.74	0.74	0.08	0.08
Sat Flow, veh/h	1774	3632	3360	311	1774	1583
Grp Volume(v), veh/h	60	1224	844	878	110	40
Grp Sat Flow(s),veh/h/ln	1774	1770	1770	1808	1774	1583
Q Serve(g_s), s	0.8	10.4	25.7	26.6	6.7	2.6
Cycle Q Clear(g_c), s	0.8	10.4	25.7	26.6	6.7	2.6
Prop In Lane	1.00			0.17	1.00	1.00
Lane Grp Cap(c), veh/h	247	2906	1316	1344	140	125
V/C Ratio(X)	0.24	0.42	0.64	0.65	0.79	0.32
Avail Cap(c_a), veh/h	303	2906	1316	1344	210	187
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.89	0.89	0.78	0.78	1.00	1.00
Uniform Delay (d), s/veh	7.4	2.7	6.9	7.0	49.7	47.9
Incr Delay (d2), s/veh	0.2	0.4	1.2	1.2	5.6	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	5.1	12.9	13.6	3.5	2.4
LnGrp Delay(d),s/veh	7.5	3.1	8.1	8.3	55.3	48.4
LnGrp LOS	A	A	A	A	E	D
Approach Vol, veh/h		1284	1722		150	
Approach Delay, s/veh		3.3	8.2		53.5	
Approach LOS		A	A		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		96.3		13.7	8.5	87.8		
Change Period (Y+Rc), s		6.0		5.0	6.0	6.0		
Max Green Setting (Gmax), s		86.0		13.0	6.0	74.0		
Max Q Clear Time (g_c+I1), s		12.4		8.7	2.8	28.6		
Green Ext Time (p_c), s		69.9		0.1	0.0	43.9		

Intersection Summary	
HCM 2010 Ctrl Delay	8.3
HCM 2010 LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	29	1814	1432	112	177	68
Future Volume (veh/h)	29	1814	1432	112	177	68
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	32	1972	1557	122	192	74
Adj No. of Lanes	1	2	2	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	369	2773	1982	154	222	198
Arrive On Green	0.28	1.00	0.60	0.60	0.12	0.12
Sat Flow, veh/h	1774	3632	3421	259	1774	1583
Grp Volume(v), veh/h	32	1972	823	856	192	74
Grp Sat Flow(s),veh/h/ln	1774	1770	1770	1817	1774	1583
Q Serve(g_s), s	0.0	0.0	42.2	43.2	12.7	5.1
Cycle Q Clear(g_c), s	0.0	0.0	42.2	43.2	12.7	5.1
Prop In Lane	1.00			0.14	1.00	1.00
Lane Grp Cap(c), veh/h	369	2773	1054	1082	222	198
V/C Ratio(X)	0.09	0.71	0.78	0.79	0.87	0.37
Avail Cap(c_a), veh/h	369	2773	1150	1181	325	290
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.56	0.56	0.79	0.79	1.00	1.00
Uniform Delay (d), s/veh	23.0	0.0	18.4	18.6	51.5	48.2
Incr Delay (d2), s/veh	0.0	0.9	3.2	3.4	11.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.3	21.3	22.7	6.9	4.6
LnGrp Delay(d),s/veh	23.0	0.9	21.6	22.0	62.5	48.6
LnGrp LOS	C	A	C	C	E	D
Approach Vol, veh/h		2004	1679		266	
Approach Delay, s/veh		1.2	21.8		58.7	
Approach LOS		A	C		E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		100.0		20.0	22.6	77.5		
Change Period (Y+Rc), s		6.0		5.0	6.0	6.0		
Max Green Setting (Gmax), s		87.0		22.0	3.0	78.0		
Max Q Clear Time (g_c+I1), s		2.0		14.7	2.0	45.2		
Green Ext Time (p_c), s		65.1		0.2	1.0	26.2		

Intersection Summary	
HCM 2010 Ctrl Delay	13.8
HCM 2010 LOS	B

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	67	1348	1530	181	105	38
Future Volume (veh/h)	67	1348	1530	181	105	38
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	73	1465	1663	197	114	41
Adj No. of Lanes	1	2	2	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	219	2898	2362	275	144	129
Arrive On Green	0.02	0.82	0.74	0.74	0.08	0.08
Sat Flow, veh/h	1774	3632	3288	372	1774	1583
Grp Volume(v), veh/h	73	1465	909	951	114	41
Grp Sat Flow(s),veh/h/ln	1774	1770	1770	1797	1774	1583
Q Serve(g_s), s	1.0	14.1	30.3	32.2	6.9	2.7
Cycle Q Clear(g_c), s	1.0	14.1	30.3	32.2	6.9	2.7
Prop In Lane	1.00			0.21	1.00	1.00
Lane Grp Cap(c), veh/h	219	2898	1309	1329	144	129
V/C Ratio(X)	0.33	0.51	0.69	0.72	0.79	0.32
Avail Cap(c_a), veh/h	272	2898	1309	1329	210	187
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.81	0.81	0.73	0.73	1.00	1.00
Uniform Delay (d), s/veh	10.3	3.1	7.7	7.9	49.6	47.7
Incr Delay (d2), s/veh	0.3	0.5	1.5	1.7	7.1	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	6.9	14.9	16.2	3.7	2.4
LnGrp Delay(d),s/veh	10.5	3.6	9.2	9.6	56.7	48.2
LnGrp LOS	B	A	A	A	E	D
Approach Vol, veh/h		1538	1860		155	
Approach Delay, s/veh		3.9	9.4		54.4	
Approach LOS		A	A		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		96.1		13.9	8.7	87.3		
Change Period (Y+Rc), s		6.0		5.0	6.0	6.0		
Max Green Setting (Gmax), s		86.0		13.0	6.0	74.0		
Max Q Clear Time (g_c+I1), s		16.1		8.9	3.0	34.2		
Green Ext Time (p_c), s		68.5		0.1	0.0	39.3		

Intersection Summary	
HCM 2010 Ctrl Delay	9.0
HCM 2010 LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	30	1973	1718	115	213	78
Future Volume (veh/h)	30	1973	1718	115	213	78
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	33	2145	1867	125	232	85
Adj No. of Lanes	1	2	2	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	156	2696	2342	155	260	232
Arrive On Green	0.03	1.00	0.70	0.70	0.15	0.15
Sat Flow, veh/h	1774	3632	3463	223	1774	1583
Grp Volume(v), veh/h	33	2145	970	1022	232	85
Grp Sat Flow(s),veh/h/ln	1774	1770	1770	1823	1774	1583
Q Serve(g_s), s	0.6	0.0	44.4	46.6	15.4	5.8
Cycle Q Clear(g_c), s	0.6	0.0	44.4	46.6	15.4	5.8
Prop In Lane	1.00			0.12	1.00	1.00
Lane Grp Cap(c), veh/h	156	2696	1230	1267	260	232
V/C Ratio(X)	0.21	0.80	0.79	0.81	0.89	0.37
Avail Cap(c_a), veh/h	171	2696	1230	1267	310	277
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.41	0.41	0.67	0.67	1.00	1.00
Uniform Delay (d), s/veh	15.8	0.0	12.4	12.7	50.3	46.2
Incr Delay (d2), s/veh	0.1	1.1	2.7	3.0	21.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.4	22.2	24.0	9.1	5.3
LnGrp Delay(d),s/veh	15.9	1.1	15.1	15.7	71.5	46.5
LnGrp LOS	B	A	B	B	E	D
Approach Vol, veh/h		2178	1992		317	
Approach Delay, s/veh		1.3	15.4		64.8	
Approach LOS		A	B		E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		97.4		22.6	8.0	89.4		
Change Period (Y+Rc), s		6.0		5.0	6.0	6.0		
Max Green Setting (Gmax), s		88.0		21.0	3.0	79.0		
Max Q Clear Time (g_c+I1), s		2.0		17.4	2.6	48.6		
Green Ext Time (p_c), s		85.6		0.2	0.0	30.3		

Intersection Summary	
HCM 2010 Ctrl Delay	12.0
HCM 2010 LOS	B

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	694	114	133	1268	81	98
Future Volume (veh/h)	694	114	133	1268	81	98
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	754	124	145	1378	88	107
Adj No. of Lanes	2	1	1	2	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1917	858	612	2536	325	290
Arrive On Green	1.00	1.00	0.13	0.72	0.18	0.18
Sat Flow, veh/h	3632	1583	1774	3632	1774	1583
Grp Volume(v), veh/h	754	124	145	1378	88	107
Grp Sat Flow(s),veh/h/ln	1770	1583	1774	1770	1774	1583
Q Serve(g_s), s	0.0	0.0	0.0	21.7	5.1	7.1
Cycle Q Clear(g_c), s	0.0	0.0	0.0	21.7	5.1	7.1
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1917	858	612	2536	325	290
V/C Ratio(X)	0.39	0.14	0.24	0.54	0.27	0.37
Avail Cap(c_a), veh/h	1917	858	612	2536	325	290
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	9.6	7.9	42.1	42.9
Incr Delay (d2), s/veh	0.6	0.4	0.9	0.8	2.0	3.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.1	2.3	10.8	2.7	3.4
LnGrp Delay(d),s/veh	0.6	0.4	10.5	8.7	44.1	46.5
LnGrp LOS	A	A	B	A	D	D
Approach Vol, veh/h	878			1523	195	
Approach Delay, s/veh	0.6			8.9	45.4	
Approach LOS	A			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	21.0	71.0				92.0		28.0
Change Period (Y+Rc), s	6.0	6.0				6.0		6.0
Max Green Setting (Gmax), s	15.0	65.0				86.0		22.0
Max Q Clear Time (g_c+I1), s	2.0	2.0				23.7		9.1
Green Ext Time (p_c), s	10.8	14.5				34.7		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	8.8
HCM 2010 LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1489	143	116	917	95	190
Future Volume (veh/h)	1489	143	116	917	95	190
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	1618	155	126	997	103	207
Adj No. of Lanes	2	1	1	2	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	2212	990	371	2684	251	224
Arrive On Green	1.00	1.00	0.17	1.00	0.14	0.14
Sat Flow, veh/h	3632	1583	1774	3632	1774	1583
Grp Volume(v), veh/h	1618	155	126	997	103	207
Grp Sat Flow(s),veh/h/ln	1770	1583	1774	1770	1774	1583
Q Serve(g_s), s	0.0	0.0	0.0	0.0	6.3	15.5
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	6.3	15.5
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2212	990	371	2684	251	224
V/C Ratio(X)	0.73	0.16	0.34	0.37	0.41	0.92
Avail Cap(c_a), veh/h	2212	990	371	2684	251	224
HCM Platoon Ratio	2.00	2.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	9.1	0.0	46.9	50.9
Incr Delay (d2), s/veh	2.2	0.3	2.5	0.4	4.9	42.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.1	2.3	0.1	3.5	9.5
LnGrp Delay(d),s/veh	2.2	0.3	11.5	0.4	51.8	93.8
LnGrp LOS	A	A	B	A	D	F
Approach Vol, veh/h	1773			1123	310	
Approach Delay, s/veh	2.0			1.6	79.8	
Approach LOS	A			A	E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	16.0	81.0				97.0		23.0
Change Period (Y+Rc), s	6.0	6.0				6.0		6.0
Max Green Setting (Gmax), s	10.0	75.0				91.0		17.0
Max Q Clear Time (g_c+I1), s	2.0	2.0				2.0		17.5
Green Ext Time (p_c), s	5.9	47.9				22.9		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	9.4
HCM 2010 LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	694	114	133	1268	81	98
Future Volume (veh/h)	694	114	133	1268	81	98
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	754	124	145	1378	88	107
Adj No. of Lanes	2	1	1	2	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	2205	987	474	2683	163	146
Arrive On Green	0.21	0.21	0.06	0.76	0.09	0.09
Sat Flow, veh/h	3632	1583	1774	3632	1774	1583
Grp Volume(v), veh/h	754	124	145	1378	88	107
Grp Sat Flow(s),veh/h/ln	1770	1583	1774	1770	1774	1583
Q Serve(g_s), s	14.6	5.1	2.1	12.3	3.8	5.3
Cycle Q Clear(g_c), s	14.6	5.1	2.1	12.3	3.8	5.3
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2205	987	474	2683	163	146
V/C Ratio(X)	0.34	0.13	0.31	0.51	0.54	0.74
Avail Cap(c_a), veh/h	2205	987	545	2683	355	317
HCM Platoon Ratio	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.96	0.96	0.70	0.70	1.00	1.00
Uniform Delay (d), s/veh	17.8	14.0	5.9	3.8	34.7	35.4
Incr Delay (d2), s/veh	0.4	0.3	0.5	0.2	1.0	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.3	2.3	1.1	6.0	1.9	2.4
LnGrp Delay(d),s/veh	18.2	14.3	6.5	4.1	35.7	38.1
LnGrp LOS	B	B	A	A	D	D
Approach Vol, veh/h	878			1523	195	
Approach Delay, s/veh	17.6			4.3	37.0	
Approach LOS	B			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	10.8	55.8				66.6		13.4
Change Period (Y+Rc), s	6.0	6.0				6.0		6.0
Max Green Setting (Gmax), s	8.0	38.0				52.0		16.0
Max Q Clear Time (g_c+I1), s	4.1	16.6				14.3		7.3
Green Ext Time (p_c), s	0.3	19.8				33.2		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	11.3
HCM 2010 LOS	B

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1489	143	116	917	95	190
Future Volume (veh/h)	1489	143	116	917	95	190
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	1618	155	126	997	103	207
Adj No. of Lanes	2	1	1	2	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	2212	990	371	2684	251	224
Arrive On Green	1.00	1.00	0.17	1.00	0.14	0.14
Sat Flow, veh/h	3632	1583	1774	3632	1774	1583
Grp Volume(v), veh/h	1618	155	126	997	103	207
Grp Sat Flow(s),veh/h/ln	1770	1583	1774	1770	1774	1583
Q Serve(g_s), s	0.0	0.0	0.0	0.0	6.3	15.5
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	6.3	15.5
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2212	990	371	2684	251	224
V/C Ratio(X)	0.73	0.16	0.34	0.37	0.41	0.92
Avail Cap(c_a), veh/h	2212	990	371	2684	251	224
HCM Platoon Ratio	2.00	2.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.78	0.78	0.83	0.83	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	9.1	0.0	46.9	50.9
Incr Delay (d2), s/veh	1.7	0.3	1.0	0.2	0.4	38.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.1	2.1	0.1	3.1	9.2
LnGrp Delay(d),s/veh	1.7	0.3	10.0	0.2	47.3	89.7
LnGrp LOS	A	A	B	A	D	F
Approach Vol, veh/h	1773			1123	310	
Approach Delay, s/veh	1.6			1.3	75.6	
Approach LOS	A			A	E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	16.0	81.0				97.0		23.0
Change Period (Y+Rc), s	6.0	6.0				6.0		6.0
Max Green Setting (Gmax), s	10.0	75.0				91.0		17.0
Max Q Clear Time (g_c+I1), s	2.0	2.0				2.0		17.5
Green Ext Time (p_c), s	5.9	47.9				22.9		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	8.6
HCM 2010 LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	871	131	156	1366	97	129
Future Volume (veh/h)	871	131	156	1366	97	129
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	947	142	170	1485	105	140
Adj No. of Lanes	2	1	1	2	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	2397	1072	487	2776	189	169
Arrive On Green	0.90	0.90	0.11	1.00	0.11	0.11
Sat Flow, veh/h	3632	1583	1774	3632	1774	1583
Grp Volume(v), veh/h	947	142	170	1485	105	140
Grp Sat Flow(s),veh/h/ln	1770	1583	1774	1770	1774	1583
Q Serve(g_s), s	4.5	1.1	3.1	0.0	6.2	9.5
Cycle Q Clear(g_c), s	4.5	1.1	3.1	0.0	6.2	9.5
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2397	1072	487	2776	189	169
V/C Ratio(X)	0.40	0.13	0.35	0.53	0.56	0.83
Avail Cap(c_a), veh/h	2397	1072	652	2776	274	245
HCM Platoon Ratio	1.33	1.33	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.94	0.94	0.42	0.42	1.00	1.00
Uniform Delay (d), s/veh	2.0	1.8	3.9	0.0	46.7	48.2
Incr Delay (d2), s/veh	0.5	0.2	0.4	0.2	1.0	9.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	0.5	1.5	0.1	3.1	4.6
LnGrp Delay(d),s/veh	2.4	2.1	4.3	0.2	47.6	58.0
LnGrp LOS	A	A	A	A	D	E
Approach Vol, veh/h	1089			1655	245	
Approach Delay, s/veh	2.4			0.6	53.6	
Approach LOS	A			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	11.8	80.5				92.3		17.7
Change Period (Y+Rc), s	6.0	6.0				6.0		6.0
Max Green Setting (Gmax), s	16.0	59.0				81.0		17.0
Max Q Clear Time (g_c+I1), s	5.1	6.5				2.0		11.5
Green Ext Time (p_c), s	0.7	47.8				68.9		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	5.6
HCM 2010 LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1762	178	192	1321	149	257
Future Volume (veh/h)	1762	178	192	1321	149	257
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	1915	193	209	1436	162	279
Adj No. of Lanes	2	1	1	2	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	2183	976	398	2803	192	369
Arrive On Green	1.00	1.00	0.25	1.00	0.11	0.11
Sat Flow, veh/h	3632	1583	1774	3632	1774	1583
Grp Volume(v), veh/h	1915	193	209	1436	162	279
Grp Sat Flow(s),veh/h/ln	1770	1583	1774	1770	1774	1583
Q Serve(g_s), s	0.0	0.0	0.0	0.0	10.8	4.7
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	10.8	4.7
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2183	976	398	2803	192	369
V/C Ratio(X)	0.88	0.20	0.53	0.51	0.84	0.76
Avail Cap(c_a), veh/h	2183	976	398	2803	222	396
HCM Platoon Ratio	2.00	2.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.64	0.64	0.45	0.45	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	19.4	0.0	52.5	42.8
Incr Delay (d2), s/veh	3.6	0.3	1.1	0.1	20.0	6.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.1	5.3	0.1	6.3	2.7
LnGrp Delay(d),s/veh	3.6	0.3	20.5	0.1	72.5	49.3
LnGrp LOS	A	A	C	A	E	D
Approach Vol, veh/h	2108			1645	441	
Approach Delay, s/veh	3.3			2.7	57.8	
Approach LOS	A			A	E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	21.0	80.0				101.0		19.0
Change Period (Y+Rc), s	6.0	6.0				6.0		6.0
Max Green Setting (Gmax), s	13.0	74.0				93.0		15.0
Max Q Clear Time (g_c+I1), s	2.0	2.0				2.0		12.8
Green Ext Time (p_c), s	9.6	58.1				46.1		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	8.8
HCM 2010 LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1078	151	182	1479	115	165
Future Volume (veh/h)	1078	151	182	1479	115	165
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	1172	164	198	1608	125	179
Adj No. of Lanes	2	1	1	2	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	2277	1019	404	2692	231	207
Arrive On Green	0.86	0.86	0.13	1.00	0.13	0.13
Sat Flow, veh/h	3632	1583	1774	3632	1774	1583
Grp Volume(v), veh/h	1172	164	198	1608	125	179
Grp Sat Flow(s),veh/h/ln	1770	1583	1774	1770	1774	1583
Q Serve(g_s), s	9.4	1.9	4.1	0.0	7.3	12.2
Cycle Q Clear(g_c), s	9.4	1.9	4.1	0.0	7.3	12.2
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2277	1019	404	2692	231	207
V/C Ratio(X)	0.51	0.16	0.49	0.60	0.54	0.87
Avail Cap(c_a), veh/h	2277	1019	551	2692	274	245
HCM Platoon Ratio	1.33	1.33	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.89	0.89	0.33	0.33	1.00	1.00
Uniform Delay (d), s/veh	3.5	3.0	5.4	0.0	44.7	46.9
Incr Delay (d2), s/veh	0.7	0.3	0.6	0.2	0.7	21.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	0.9	1.9	0.1	3.6	6.6
LnGrp Delay(d),s/veh	4.3	3.3	6.1	0.2	45.5	68.1
LnGrp LOS	A	A	A	A	D	E
Approach Vol, veh/h	1336			1806	304	
Approach Delay, s/veh	4.1			0.8	58.8	
Approach LOS	A			A	E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	12.9	76.8				89.7		20.3
Change Period (Y+Rc), s	6.0	6.0				6.0		6.0
Max Green Setting (Gmax), s	16.0	59.0				81.0		17.0
Max Q Clear Time (g_c+I1), s	6.1	11.4				2.0		14.2
Green Ext Time (p_c), s	0.8	45.7				72.1		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	7.2
HCM 2010 LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1811	184	206	1394	159	269
Future Volume (veh/h)	1811	184	206	1394	159	269
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	1968	200	224	1515	173	292
Adj No. of Lanes	2	1	1	2	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	2183	976	381	2782	202	369
Arrive On Green	1.00	1.00	0.24	1.00	0.11	0.11
Sat Flow, veh/h	3632	1583	1774	3632	1774	1583
Grp Volume(v), veh/h	1968	200	224	1515	173	292
Grp Sat Flow(s),veh/h/ln	1770	1583	1774	1770	1774	1583
Q Serve(g_s), s	0.0	0.0	0.1	0.0	11.5	6.5
Cycle Q Clear(g_c), s	0.0	0.0	0.1	0.0	11.5	6.5
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2183	976	381	2782	202	369
V/C Ratio(X)	0.90	0.20	0.59	0.54	0.86	0.79
Avail Cap(c_a), veh/h	2183	976	381	2782	222	387
HCM Platoon Ratio	2.00	2.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.61	0.61	0.38	0.38	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	22.7	0.0	52.2	43.2
Incr Delay (d2), s/veh	4.2	0.3	1.4	0.2	23.3	9.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.1	5.8	0.1	6.9	3.7
LnGrp Delay(d),s/veh	4.2	0.3	24.1	0.2	75.5	52.4
LnGrp LOS	A	A	C	A	E	D
Approach Vol, veh/h	2168			1739	465	
Approach Delay, s/veh	3.8			3.2	61.0	
Approach LOS	A			A	E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	20.3	80.0				100.3		19.7
Change Period (Y+Rc), s	6.0	6.0				6.0		6.0
Max Green Setting (Gmax), s	13.0	74.0				93.0		15.0
Max Q Clear Time (g_c+I1), s	2.1	2.0				2.0		13.5
Green Ext Time (p_c), s	9.7	59.6				50.8		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	9.7
HCM 2010 LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1284	171	208	1593	134	201
Future Volume (veh/h)	1284	171	208	1593	134	201
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	1396	186	226	1732	146	218
Adj No. of Lanes	2	1	1	2	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	2157	965	392	2610	272	243
Arrive On Green	1.00	1.00	0.15	1.00	0.15	0.15
Sat Flow, veh/h	3632	1583	1774	3632	1774	1583
Grp Volume(v), veh/h	1396	186	226	1732	146	218
Grp Sat Flow(s),veh/h/ln	1770	1583	1774	1770	1774	1583
Q Serve(g_s), s	0.0	0.0	5.2	0.0	8.4	14.9
Cycle Q Clear(g_c), s	0.0	0.0	5.2	0.0	8.4	14.9
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2157	965	392	2610	272	243
V/C Ratio(X)	0.65	0.19	0.58	0.66	0.54	0.90
Avail Cap(c_a), veh/h	2157	965	520	2610	274	245
HCM Platoon Ratio	2.00	2.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.84	0.84	0.12	0.12	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	5.3	0.0	43.0	45.7
Incr Delay (d2), s/veh	1.3	0.4	0.3	0.1	1.1	31.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.1	2.4	0.0	4.2	8.6
LnGrp Delay(d),s/veh	1.3	0.4	5.6	0.1	44.0	76.7
LnGrp LOS	A	A	A	A	D	E
Approach Vol, veh/h	1582			1958	364	
Approach Delay, s/veh	1.2			0.7	63.6	
Approach LOS	A			A	E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	14.1	73.0				87.1		22.9
Change Period (Y+Rc), s	6.0	6.0				6.0		6.0
Max Green Setting (Gmax), s	16.0	59.0				81.0		17.0
Max Q Clear Time (g_c+I1), s	7.2	2.0				2.0		16.9
Green Ext Time (p_c), s	0.9	55.7				74.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	6.8
HCM 2010 LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1985	206	254	1651	194	311
Future Volume (veh/h)	1985	206	254	1651	194	311
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	2158	224	276	1795	211	338
Adj No. of Lanes	2	1	1	2	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	2183	976	340	2743	222	369
Arrive On Green	1.00	1.00	0.14	1.00	0.13	0.13
Sat Flow, veh/h	3632	1583	1774	3632	1774	1583
Grp Volume(v), veh/h	2158	224	276	1795	211	338
Grp Sat Flow(s),veh/h/ln	1770	1583	1774	1770	1774	1583
Q Serve(g_s), s	0.0	0.0	7.5	0.0	14.2	12.0
Cycle Q Clear(g_c), s	0.0	0.0	7.5	0.0	14.2	12.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2183	976	340	2743	222	369
V/C Ratio(X)	0.99	0.23	0.81	0.65	0.95	0.91
Avail Cap(c_a), veh/h	2183	976	340	2743	222	369
HCM Platoon Ratio	2.00	2.00	1.33	1.33	1.00	1.00
Upstream Filter(I)	0.48	0.48	0.09	0.09	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	35.5	0.0	52.1	44.8
Incr Delay (d2), s/veh	11.0	0.3	1.6	0.1	46.4	26.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	0.1	8.7	0.0	9.8	7.9
LnGrp Delay(d),s/veh	11.0	0.3	37.1	0.1	98.5	71.1
LnGrp LOS	B	A	D	A	F	E
Approach Vol, veh/h	2382			2071	549	
Approach Delay, s/veh	10.0			5.0	81.6	
Approach LOS	B			A	F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	19.0	80.0				99.0		21.0
Change Period (Y+Rc), s	6.0	6.0				6.0		6.0
Max Green Setting (Gmax), s	13.0	74.0				93.0		15.0
Max Q Clear Time (g_c+I1), s	9.5	2.0				2.0		16.2
Green Ext Time (p_c), s	3.4	64.1				66.1		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	15.8
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	260	430	235	225	590	125	300	515	135	110	580	330
Future Volume (veh/h)	260	430	235	225	590	125	300	515	135	110	580	330
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	283	467	255	245	641	0	326	560	147	120	630	359
Adj No. of Lanes	2	2	0	2	2	1	2	2	0	2	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	367	621	337	321	944	422	413	778	203	184	755	338
Arrive On Green	0.11	0.28	0.28	0.09	0.27	0.00	0.12	0.28	0.28	0.05	0.21	0.21
Sat Flow, veh/h	3442	2217	1203	3442	3539	1583	3442	2777	727	3442	3539	1583
Grp Volume(v), veh/h	283	372	350	245	641	0	326	356	351	120	630	359
Grp Sat Flow(s),veh/h/ln	1721	1770	1650	1721	1770	1583	1721	1770	1735	1721	1770	1583
Q Serve(g_s), s	6.0	14.4	14.5	5.2	12.2	0.0	6.9	13.6	13.7	2.6	12.8	16.0
Cycle Q Clear(g_c), s	6.0	14.4	14.5	5.2	12.2	0.0	6.9	13.6	13.7	2.6	12.8	16.0
Prop In Lane	1.00		0.73	1.00		1.00	1.00		0.42	1.00		1.00
Lane Grp Cap(c), veh/h	367	495	462	321	944	422	413	495	486	184	755	338
V/C Ratio(X)	0.77	0.75	0.76	0.76	0.68	0.00	0.79	0.72	0.72	0.65	0.83	1.06
Avail Cap(c_a), veh/h	367	495	462	321	944	422	413	495	486	184	755	338
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.6	24.6	24.7	33.2	24.6	0.0	32.1	24.3	24.4	34.8	28.2	29.5
Incr Delay (d2), s/veh	14.5	10.1	11.0	15.7	3.9	0.0	14.2	8.7	9.0	16.7	10.5	66.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	8.4	8.0	3.2	6.4	0.0	4.1	7.8	7.7	1.6	7.3	13.2
LnGrp Delay(d),s/veh	47.1	34.7	35.7	48.9	28.6	0.0	46.3	33.0	33.4	51.5	38.8	96.1
LnGrp LOS	D	C	D	D	C		D	C	C	D	D	F
Approach Vol, veh/h		1005			886			1033			1109	
Approach Delay, s/veh		38.5			34.2			37.3			58.7	
Approach LOS		D			C			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	27.0	14.0	22.0	13.0	26.0	9.0	27.0
Change Period (Y+Rc), s	5.0	6.0	5.0	6.0	5.0	6.0	5.0	6.0
Max Green Setting (Gmax), s	7.0	21.0	9.0	16.0	8.0	20.0	4.0	21.0
Max Q Clear Time (g_c+I1), s	7.2	16.5	8.9	18.0	8.0	14.2	4.6	15.7
Green Ext Time (p_c), s	0.0	3.1	0.0	0.0	0.0	3.8	0.0	3.9

Intersection Summary	
HCM 2010 Ctrl Delay	42.8
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	360	705	210	225	555	85	130	560	245	125	570	305
Future Volume (veh/h)	360	705	210	225	555	85	130	560	245	125	570	305
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	391	766	228	245	603	0	141	609	266	136	620	332
Adj No. of Lanes	2	2	0	2	2	1	2	2	0	2	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	574	986	294	344	1062	475	258	700	306	201	973	435
Arrive On Green	0.11	0.25	0.25	0.20	0.60	0.00	0.08	0.29	0.29	0.06	0.28	0.28
Sat Flow, veh/h	3442	2690	801	3442	3539	1583	3442	2400	1048	3442	3539	1583
Grp Volume(v), veh/h	391	504	490	245	603	0	141	449	426	136	620	332
Grp Sat Flow(s),veh/h/ln	1721	1770	1721	1721	1770	1583	1721	1770	1678	1721	1770	1583
Q Serve(g_s), s	13.1	31.8	31.9	8.0	12.4	0.0	4.7	28.9	28.9	4.6	18.5	23.1
Cycle Q Clear(g_c), s	13.1	31.8	31.9	8.0	12.4	0.0	4.7	28.9	28.9	4.6	18.5	23.1
Prop In Lane	1.00		0.47	1.00		1.00	1.00		0.62	1.00		1.00
Lane Grp Cap(c), veh/h	574	649	631	344	1062	475	258	516	489	201	973	435
V/C Ratio(X)	0.68	0.78	0.78	0.71	0.57	0.00	0.55	0.87	0.87	0.68	0.64	0.76
Avail Cap(c_a), veh/h	574	649	631	344	1062	475	258	516	489	201	973	435
HCM Platoon Ratio	0.67	0.67	0.67	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.2	40.7	40.7	46.4	19.3	0.0	53.5	40.3	40.4	55.4	38.2	39.9
Incr Delay (d2), s/veh	6.4	8.9	9.1	11.8	2.2	0.0	8.1	17.9	18.7	16.9	3.2	11.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.8	17.2	16.7	4.3	6.2	0.0	2.5	16.7	15.9	2.7	9.5	11.5
LnGrp Delay(d),s/veh	56.7	49.5	49.8	58.2	21.5	0.0	61.6	58.2	59.1	72.3	41.4	51.8
LnGrp LOS	E	D	D	E	C		E	E	E	E	D	D
Approach Vol, veh/h		1385			848			1016			1088	
Approach Delay, s/veh		51.6			32.1			59.0			48.5	
Approach LOS		D			C			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.0	50.0	14.0	39.0	25.0	42.0	12.0	41.0
Change Period (Y+Rc), s	5.0	6.0	5.0	6.0	5.0	6.0	5.0	6.0
Max Green Setting (Gmax), s	12.0	44.0	9.0	33.0	20.0	36.0	7.0	35.0
Max Q Clear Time (g_c+I1), s	10.0	33.9	6.7	25.1	15.1	14.4	6.6	30.9
Green Ext Time (p_c), s	0.1	6.7	0.0	5.7	0.4	11.1	0.0	3.2

Intersection Summary	
HCM 2010 Ctrl Delay	48.8
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	260	430	235	225	590	125	300	515	135	110	580	330
Future Volume (veh/h)	260	430	235	225	590	125	300	515	135	110	580	330
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	283	467	255	245	641	0	326	560	147	120	630	359
Adj No. of Lanes	2	2	0	2	2	1	2	2	0	2	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	367	637	346	349	1042	466	406	666	174	288	728	326
Arrive On Green	0.04	0.09	0.09	0.20	0.59	0.00	0.12	0.24	0.24	0.08	0.21	0.21
Sat Flow, veh/h	3442	2217	1203	3442	3539	1583	3442	2777	727	3442	3539	1583
Grp Volume(v), veh/h	283	372	350	245	641	0	326	356	351	120	630	359
Grp Sat Flow(s),veh/h/ln	1721	1770	1650	1721	1770	1583	1721	1770	1735	1721	1770	1583
Q Serve(g_s), s	6.5	16.4	16.5	5.3	9.3	0.0	7.4	15.3	15.4	2.6	13.8	11.4
Cycle Q Clear(g_c), s	6.5	16.4	16.5	5.3	9.3	0.0	7.4	15.3	15.4	2.6	13.8	11.4
Prop In Lane	1.00		0.73	1.00		1.00	1.00		0.42	1.00		1.00
Lane Grp Cap(c), veh/h	367	509	474	349	1042	466	406	424	416	288	728	326
V/C Ratio(X)	0.77	0.73	0.74	0.70	0.61	0.00	0.80	0.84	0.84	0.42	0.87	1.10
Avail Cap(c_a), veh/h	387	509	474	349	1042	466	430	487	477	288	752	336
HCM Platoon Ratio	0.33	0.33	0.33	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.94	0.94	0.94	0.93	0.93	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.6	33.2	33.3	30.8	13.5	0.0	34.4	28.9	29.0	34.8	30.7	15.2
Incr Delay (d2), s/veh	7.3	8.4	9.2	5.0	2.5	0.0	9.1	11.1	11.7	0.4	10.1	80.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	9.2	8.8	2.8	4.8	0.0	4.0	8.7	8.8	1.3	7.8	12.2
LnGrp Delay(d),s/veh	44.9	41.6	42.5	35.8	16.1	0.0	43.5	40.0	40.7	35.1	40.8	95.3
LnGrp LOS	D	D	D	D	B		D	D	D	D	D	F
Approach Vol, veh/h		1005			886			1033			1109	
Approach Delay, s/veh		42.8			21.5			41.3			57.8	
Approach LOS		D			C			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.1	29.0	14.4	22.5	13.5	29.6	11.7	25.2
Change Period (Y+Rc), s	6.0	* 6	5.0	6.0	5.0	6.0	5.0	6.0
Max Green Setting (Gmax), s	8.0	* 23	10.0	17.0	9.0	22.0	5.0	22.0
Max Q Clear Time (g_c+I1), s	7.3	18.5	9.4	15.8	8.5	11.3	4.6	17.4
Green Ext Time (p_c), s	0.1	1.8	0.1	0.7	0.0	3.5	0.0	1.8

Intersection Summary	
HCM 2010 Ctrl Delay	41.9
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	360	705	210	225	555	85	130	560	245	125	570	305
Future Volume (veh/h)	360	705	210	225	555	85	130	560	245	125	570	305
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	391	766	228	245	603	0	141	609	266	136	620	332
Adj No. of Lanes	2	2	0	2	2	1	2	2	0	2	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	577	1049	312	296	1062	475	196	666	290	190	1005	450
Arrive On Green	0.11	0.26	0.26	0.17	0.60	0.00	0.06	0.28	0.28	0.06	0.28	0.28
Sat Flow, veh/h	3442	2690	801	3442	3539	1583	3442	2400	1048	3442	3539	1583
Grp Volume(v), veh/h	391	504	490	245	603	0	141	449	426	136	620	332
Grp Sat Flow(s),veh/h/ln	1721	1770	1721	1721	1770	1583	1721	1770	1678	1721	1770	1583
Q Serve(g_s), s	13.1	31.2	31.2	8.2	12.4	0.0	4.8	29.5	29.5	4.7	18.2	14.3
Cycle Q Clear(g_c), s	13.1	31.2	31.2	8.2	12.4	0.0	4.8	29.5	29.5	4.7	18.2	14.3
Prop In Lane	1.00		0.47	1.00		1.00	1.00		0.62	1.00		1.00
Lane Grp Cap(c), veh/h	577	690	671	296	1062	475	196	491	465	190	1005	450
V/C Ratio(X)	0.68	0.73	0.73	0.83	0.57	0.00	0.72	0.91	0.92	0.72	0.62	0.74
Avail Cap(c_a), veh/h	577	690	671	344	1062	475	258	516	489	201	1005	450
HCM Platoon Ratio	0.67	0.67	0.67	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.69	0.69	0.69	0.96	0.96	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.2	38.6	38.6	48.8	19.3	0.0	55.7	42.0	42.0	55.8	37.3	15.3
Incr Delay (d2), s/veh	1.8	4.7	4.8	11.4	2.1	0.0	3.8	20.4	21.4	9.1	1.1	6.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.4	16.2	15.8	4.3	6.2	0.0	2.4	17.1	16.5	2.5	9.1	7.0
LnGrp Delay(d),s/veh	52.0	43.2	43.4	60.2	21.4	0.0	59.5	62.4	63.4	64.9	38.4	21.6
LnGrp LOS	D	D	D	E	C		E	E	E	E	D	C
Approach Vol, veh/h		1385			848			1016			1088	
Approach Delay, s/veh		45.7			32.6			62.4			36.6	
Approach LOS		D			C			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.3	52.8	11.8	40.1	26.1	42.0	12.6	39.3
Change Period (Y+Rc), s	5.0	6.0	5.0	6.0	6.0	* 6	6.0	* 6
Max Green Setting (Gmax), s	12.0	44.0	9.0	33.0	20.0	* 36	7.0	* 35
Max Q Clear Time (g_c+I1), s	10.2	33.2	6.8	20.2	15.1	14.4	6.7	31.5
Green Ext Time (p_c), s	0.1	5.3	0.0	4.6	2.4	4.0	0.0	1.8

Intersection Summary	
HCM 2010 Ctrl Delay	44.8
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	314	561	146	237	636	139	349	589	209	124	618	353
Future Volume (veh/h)	314	561	146	237	636	139	349	589	209	124	618	353
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	341	610	159	258	691	0	379	640	227	135	672	384
Adj No. of Lanes	2	2	0	2	2	1	2	2	0	2	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	400	809	210	434	1096	490	442	815	289	193	869	389
Arrive On Green	0.15	0.39	0.39	0.13	0.31	0.00	0.13	0.32	0.32	0.06	0.25	0.25
Sat Flow, veh/h	3442	2781	724	3442	3539	1583	3442	2563	909	3442	3539	1583
Grp Volume(v), veh/h	341	388	381	258	691	0	379	442	425	135	672	384
Grp Sat Flow(s),veh/h/ln	1721	1770	1735	1721	1770	1583	1721	1770	1702	1721	1770	1583
Q Serve(g_s), s	10.6	20.9	20.9	7.8	18.4	0.0	11.9	25.0	25.0	4.2	19.5	26.6
Cycle Q Clear(g_c), s	10.6	20.9	20.9	7.8	18.4	0.0	11.9	25.0	25.0	4.2	19.5	26.6
Prop In Lane	1.00		0.42	1.00		1.00	1.00		0.53	1.00		1.00
Lane Grp Cap(c), veh/h	400	515	505	434	1096	490	442	562	541	193	869	389
V/C Ratio(X)	0.85	0.75	0.76	0.59	0.63	0.00	0.86	0.79	0.79	0.70	0.77	0.99
Avail Cap(c_a), veh/h	469	515	505	434	1096	490	532	579	557	250	869	389
HCM Platoon Ratio	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.82	0.82	0.82	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.6	30.3	30.3	45.4	32.6	0.0	46.9	34.1	34.1	51.0	38.7	41.3
Incr Delay (d2), s/veh	9.3	8.2	8.4	1.5	2.8	0.0	10.0	6.9	7.2	3.2	4.4	42.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	11.3	11.1	3.8	9.4	0.0	6.2	13.2	12.8	2.1	10.0	16.2
LnGrp Delay(d),s/veh	54.8	38.5	38.7	46.9	35.3	0.0	56.9	41.0	41.3	54.2	43.0	83.7
LnGrp LOS	D	D	D	D	D		E	D	D	D	D	F
Approach Vol, veh/h		1110			949			1246			1191	
Approach Delay, s/veh		43.6			38.5			45.9			57.4	
Approach LOS		D			D			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.9	38.0	19.1	33.0	17.8	40.1	11.2	41.0
Change Period (Y+Rc), s	6.0	* 6	5.0	6.0	5.0	6.0	5.0	6.0
Max Green Setting (Gmax), s	12.0	* 32	17.0	27.0	15.0	29.0	8.0	36.0
Max Q Clear Time (g_c+I1), s	9.8	22.9	13.9	28.6	12.6	20.4	6.2	27.0
Green Ext Time (p_c), s	0.3	3.2	0.3	0.0	0.2	3.3	0.0	6.6

Intersection Summary	
HCM 2010 Ctrl Delay	46.8
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	436	868	157	370	825	116	183	651	299	163	798	429
Future Volume (veh/h)	436	868	157	370	825	116	183	651	299	163	798	429
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	474	943	171	402	897	0	199	708	325	177	867	466
Adj No. of Lanes	2	2	0	2	2	1	2	2	0	2	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	516	1023	185	913	1648	737	253	688	316	201	950	425
Arrive On Green	0.30	0.68	0.68	0.27	0.47	0.00	0.07	0.29	0.29	0.06	0.27	0.27
Sat Flow, veh/h	3442	2994	543	3442	3539	1583	3442	2359	1082	3442	3539	1583
Grp Volume(v), veh/h	474	557	557	402	897	0	199	531	502	177	867	466
Grp Sat Flow(s),veh/h/ln	1721	1770	1767	1721	1770	1583	1721	1770	1672	1721	1770	1583
Q Serve(g_s), s	16.0	32.3	32.4	11.7	21.8	0.0	6.8	35.0	35.0	6.1	28.5	28.1
Cycle Q Clear(g_c), s	16.0	32.3	32.4	11.7	21.8	0.0	6.8	35.0	35.0	6.1	28.5	28.1
Prop In Lane	1.00		0.31	1.00		1.00	1.00		0.65	1.00		1.00
Lane Grp Cap(c), veh/h	516	605	604	913	1648	737	253	517	488	201	950	425
V/C Ratio(X)	0.92	0.92	0.92	0.44	0.54	0.00	0.79	1.03	1.03	0.88	0.91	1.10
Avail Cap(c_a), veh/h	516	605	604	913	1648	737	258	517	488	201	973	435
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.70	0.70	0.70	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.3	17.6	17.6	36.7	23.0	0.0	54.7	42.5	42.5	56.1	42.5	33.5
Incr Delay (d2), s/veh	16.3	16.6	16.8	0.1	1.3	0.0	13.3	47.0	48.3	32.5	12.5	72.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.7	18.0	18.0	5.5	10.9	0.0	3.7	23.8	22.7	3.8	15.6	20.8
LnGrp Delay(d),s/veh	57.6	34.3	34.4	36.8	24.3	0.0	67.9	89.5	90.8	88.5	55.0	106.0
LnGrp LOS	E	C	C	D	C		E	F	F	F	E	F
Approach Vol, veh/h		1588			1299			1232			1510	
Approach Delay, s/veh		41.3			28.1			86.5			74.7	
Approach LOS		D			C			F			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	38.0	47.0	14.8	38.2	23.0	62.0	12.0	41.0
Change Period (Y+Rc), s	6.0	* 6	6.0	* 6	5.0	6.0	5.0	6.0
Max Green Setting (Gmax), s	15.0	* 41	9.0	* 33	18.0	38.0	7.0	35.0
Max Q Clear Time (g_c+I1), s	13.7	34.4	8.8	30.5	18.0	23.8	8.1	37.0
Green Ext Time (p_c), s	0.5	3.7	0.0	1.7	0.0	5.9	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	57.1
HCM 2010 LOS	E

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	377	715	159	252	689	155	406	674	294	141	662	381
Future Volume (veh/h)	377	715	159	252	689	155	406	674	294	141	662	381
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	410	777	173	274	749	0	441	733	320	153	720	414
Adj No. of Lanes	2	2	0	2	2	1	2	2	0	2	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	466	890	198	335	991	443	499	776	338	211	847	379
Arrive On Green	0.18	0.41	0.41	0.10	0.28	0.00	0.15	0.32	0.32	0.06	0.24	0.24
Sat Flow, veh/h	3442	2878	641	3442	3539	1583	3442	2400	1047	3442	3539	1583
Grp Volume(v), veh/h	410	478	472	274	749	0	441	540	513	153	720	414
Grp Sat Flow(s),veh/h/ln	1721	1770	1750	1721	1770	1583	1721	1770	1678	1721	1770	1583
Q Serve(g_s), s	12.8	27.3	27.3	8.6	21.3	0.0	13.8	32.7	32.8	4.8	21.4	26.3
Cycle Q Clear(g_c), s	12.8	27.3	27.3	8.6	21.3	0.0	13.8	32.7	32.8	4.8	21.4	26.3
Prop In Lane	1.00		0.37	1.00		1.00	1.00		0.62	1.00		1.00
Lane Grp Cap(c), veh/h	466	547	541	335	991	443	499	572	542	211	847	379
V/C Ratio(X)	0.88	0.87	0.87	0.82	0.76	0.00	0.88	0.94	0.95	0.72	0.85	1.09
Avail Cap(c_a), veh/h	501	547	541	344	991	443	532	579	549	219	847	379
HCM Platoon Ratio	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.73	0.73	0.73	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.2	30.4	30.4	48.7	36.2	0.0	46.1	36.3	36.3	50.7	40.0	41.8
Incr Delay (d2), s/veh	11.3	13.4	13.5	13.0	5.4	0.0	14.6	24.4	25.4	9.3	8.2	73.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.8	15.2	15.1	4.7	11.1	0.0	7.6	19.8	18.9	2.6	11.4	19.3
LnGrp Delay(d),s/veh	55.5	43.8	43.9	61.7	41.5	0.0	60.7	60.6	61.7	60.0	48.2	115.3
LnGrp LOS	E	D	D	E	D		E	E	E	E	D	F
Approach Vol, veh/h		1360			1023			1494			1287	
Approach Delay, s/veh		47.4			46.9			61.0			71.2	
Approach LOS		D			D			E			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.7	40.0	21.0	32.3	19.9	36.8	11.7	41.5
Change Period (Y+Rc), s	6.0	* 6	5.0	6.0	5.0	6.0	5.0	6.0
Max Green Setting (Gmax), s	11.0	* 34	17.0	26.0	16.0	29.0	7.0	36.0
Max Q Clear Time (g_c+I1), s	10.6	29.3	15.8	28.3	14.8	23.3	6.8	34.8
Green Ext Time (p_c), s	0.1	2.4	0.1	0.0	0.1	2.7	0.0	0.8

Intersection Summary	
HCM 2010 Ctrl Delay	57.2
HCM 2010 LOS	E

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	450	897	170	397	874	122	193	668	309	170	839	452
Future Volume (veh/h)	450	897	170	397	874	122	193	668	309	170	839	452
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	489	975	185	432	950	0	210	726	336	185	912	491
Adj No. of Lanes	2	2	0	2	2	1	2	2	0	2	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	516	1015	192	1548	2299	1029	229	706	326	201	1003	449
Arrive On Green	0.30	0.68	0.68	0.45	0.65	0.00	0.07	0.30	0.30	0.06	0.28	0.28
Sat Flow, veh/h	3442	2970	563	3442	3539	1583	3442	2352	1088	3442	3539	1583
Grp Volume(v), veh/h	489	580	580	432	950	0	210	546	516	185	912	491
Grp Sat Flow(s),veh/h/ln	1721	1770	1763	1721	1770	1583	1721	1770	1671	1721	1770	1583
Q Serve(g_s), s	16.7	36.2	36.4	9.5	15.4	0.0	7.3	36.0	36.0	6.4	29.9	34.0
Cycle Q Clear(g_c), s	16.7	36.2	36.4	9.5	15.4	0.0	7.3	36.0	36.0	6.4	29.9	34.0
Prop In Lane	1.00		0.32	1.00		1.00	1.00		0.65	1.00		1.00
Lane Grp Cap(c), veh/h	516	605	602	1548	2299	1029	229	531	501	201	1003	449
V/C Ratio(X)	0.95	0.96	0.96	0.28	0.41	0.00	0.92	1.03	1.03	0.92	0.91	1.09
Avail Cap(c_a), veh/h	516	605	602	1548	2299	1029	229	531	501	201	1003	449
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.67	0.67	0.67	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.5	18.2	18.3	20.8	10.1	0.0	55.7	42.0	42.0	56.2	41.5	69.4
Incr Delay (d2), s/veh	20.4	21.8	22.1	0.0	0.6	0.0	36.5	46.6	47.9	41.4	12.0	70.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.3	20.7	20.8	4.5	7.7	0.0	4.6	24.4	23.2	4.2	16.2	8.8
LnGrp Delay(d),s/veh	62.0	40.0	40.4	20.8	10.6	0.0	92.2	88.6	89.9	97.7	53.5	139.9
LnGrp LOS	E	D	D	C	B		F	F	F	F	D	F
Approach Vol, veh/h		1649			1382			1272			1588	
Approach Delay, s/veh		46.7			13.8			89.7			85.4	
Approach LOS		D			B			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	61.0	47.0	14.0	40.0	23.0	85.0	12.0	42.0
Change Period (Y+Rc), s	6.0	* 6	6.0	* 6	5.0	6.0	5.0	6.0
Max Green Setting (Gmax), s	15.0	* 41	8.0	* 34	18.0	38.0	7.0	35.0
Max Q Clear Time (g_c+I1), s	11.5	38.4	9.3	36.0	18.7	17.4	8.4	38.0
Green Ext Time (p_c), s	2.3	1.7	0.0	0.0	0.0	7.5	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	58.7
HCM 2010 LOS	E

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	440	868	172	266	743	171	463	760	380	157	706	408
Future Volume (veh/h)	440	868	172	266	743	171	463	760	380	157	706	408
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	478	943	187	289	808	0	503	826	413	171	767	443
Adj No. of Lanes	2	2	0	2	2	1	2	2	0	2	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	501	964	191	1251	1962	878	532	771	383	188	837	374
Arrive On Green	0.29	0.65	0.65	0.36	0.55	0.00	0.15	0.34	0.34	0.05	0.24	0.24
Sat Flow, veh/h	3442	2946	584	3442	3539	1583	3442	2292	1139	3442	3539	1583
Grp Volume(v), veh/h	478	566	564	289	808	0	503	636	603	171	767	443
Grp Sat Flow(s),veh/h/ln	1721	1770	1760	1721	1770	1583	1721	1770	1662	1721	1770	1583
Q Serve(g_s), s	15.0	33.8	33.9	6.4	14.5	0.0	15.9	37.0	37.0	5.4	23.2	26.0
Cycle Q Clear(g_c), s	15.0	33.8	33.9	6.4	14.5	0.0	15.9	37.0	37.0	5.4	23.2	26.0
Prop In Lane	1.00		0.33	1.00		1.00	1.00		0.69	1.00		1.00
Lane Grp Cap(c), veh/h	501	579	576	1251	1962	878	532	595	559	188	837	374
V/C Ratio(X)	0.95	0.98	0.98	0.23	0.41	0.00	0.95	1.07	1.08	0.91	0.92	1.18
Avail Cap(c_a), veh/h	501	579	576	1251	1962	878	532	595	559	188	837	374
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.65	0.65	0.65	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.6	18.6	18.6	24.3	14.2	0.0	46.0	36.5	36.5	51.7	40.9	42.0
Incr Delay (d2), s/veh	21.9	25.3	25.7	0.0	0.6	0.0	25.8	56.8	60.8	40.7	14.8	106.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.6	19.8	20.1	3.1	7.2	0.0	9.5	27.4	26.4	3.6	13.0	22.4
LnGrp Delay(d),s/veh	60.6	43.9	44.3	24.4	14.8	0.0	71.8	93.3	97.3	92.4	55.7	148.7
LnGrp LOS	E	D	D	C	B		E	F	F	F	E	F
Approach Vol, veh/h		1608			1097			1742			1381	
Approach Delay, s/veh		49.0			17.3			88.5			90.1	
Approach LOS		D			B			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	46.5	42.0	22.0	32.0	21.0	67.5	11.0	43.0
Change Period (Y+Rc), s	6.0	* 6	5.0	6.0	5.0	6.0	5.0	6.0
Max Green Setting (Gmax), s	9.0	* 36	17.0	26.0	16.0	29.0	6.0	37.0
Max Q Clear Time (g_c+I1), s	8.4	35.9	17.9	28.0	17.0	16.5	7.4	39.0
Green Ext Time (p_c), s	0.1	0.1	0.0	0.0	0.0	4.8	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	64.6
HCM 2010 LOS	E

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	499	1001	216	489	1046	142	227	726	344	194	981	531
Future Volume (veh/h)	499	1001	216	489	1046	142	227	726	344	194	981	531
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	542	1088	235	532	1137	0	247	789	374	211	1066	577
Adj No. of Lanes	2	2	0	2	2	1	2	2	0	2	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	1408	1790	385	459	1180	528	201	661	313	172	973	435
Arrive On Green	0.27	0.41	0.41	0.13	0.33	0.00	0.06	0.28	0.28	0.05	0.28	0.28
Sat Flow, veh/h	3442	2899	623	3442	3539	1583	3442	2334	1103	3442	3539	1583
Grp Volume(v), veh/h	542	662	661	532	1137	0	247	598	565	211	1066	577
Grp Sat Flow(s),veh/h/ln	1721	1770	1753	1721	1770	1583	1721	1770	1668	1721	1770	1583
Q Serve(g_s), s	15.3	35.1	35.5	16.0	37.9	0.0	7.0	34.0	34.0	6.0	33.0	33.0
Cycle Q Clear(g_c), s	15.3	35.1	35.5	16.0	37.9	0.0	7.0	34.0	34.0	6.0	33.0	33.0
Prop In Lane	1.00		0.36	1.00		1.00	1.00		0.66	1.00		1.00
Lane Grp Cap(c), veh/h	1408	1093	1082	459	1180	528	201	501	473	172	973	435
V/C Ratio(X)	0.38	0.61	0.61	1.16	0.96	0.00	1.23	1.19	1.20	1.23	1.10	1.33
Avail Cap(c_a), veh/h	1408	1093	1082	459	1180	528	201	501	473	172	973	435
HCM Platoon Ratio	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.52	0.52	0.52	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.3	23.8	23.9	52.0	39.3	0.0	56.5	43.0	43.0	57.0	43.5	43.5
Incr Delay (d2), s/veh	0.0	1.3	1.4	93.6	18.8	0.0	139.3	104.7	107.5	142.3	58.5	161.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.3	17.6	17.7	13.5	21.6	0.0	7.2	31.2	29.7	6.2	24.0	33.9
LnGrp Delay(d),s/veh	31.3	25.1	25.2	145.6	58.1	0.0	195.8	147.7	150.5	199.3	102.0	205.1
LnGrp LOS	C	C	C	F	E		F	F	F	F	F	F
Approach Vol, veh/h		1865			1669			1410			1854	
Approach Delay, s/veh		26.9			86.0			157.2			145.1	
Approach LOS		C			F			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.0	80.6	12.0	39.0	55.6	46.0	11.0	40.0
Change Period (Y+Rc), s	5.0	6.0	5.0	6.0	6.0	* 6	5.0	6.0
Max Green Setting (Gmax), s	16.0	42.0	7.0	33.0	18.0	* 40	6.0	34.0
Max Q Clear Time (g_c+I1), s	18.0	37.5	9.0	35.0	17.3	39.9	8.0	36.0
Green Ext Time (p_c), s	0.0	3.4	0.0	0.0	0.1	0.1	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	100.7
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	33	488	951	105	40	117
Future Volume (veh/h)	33	488	951	105	40	117
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	36	530	1034	114	43	127
Adj No. of Lanes	1	2	2	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	327	2359	2359	1056	405	362
Arrive On Green	0.67	0.67	0.67	0.67	0.23	0.23
Sat Flow, veh/h	488	3632	3632	1583	1774	1583
Grp Volume(v), veh/h	36	530	1034	114	43	127
Grp Sat Flow(s),veh/h/ln	488	1770	1770	1583	1774	1583
Q Serve(g_s), s	3.9	6.2	14.4	2.7	2.0	7.1
Cycle Q Clear(g_c), s	18.4	6.2	14.4	2.7	2.0	7.1
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	327	2359	2359	1056	405	362
V/C Ratio(X)	0.11	0.22	0.44	0.11	0.11	0.35
Avail Cap(c_a), veh/h	327	2359	2359	1056	405	362
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.6	6.9	8.2	6.3	32.0	34.0
Incr Delay (d2), s/veh	0.7	0.2	0.6	0.2	0.5	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	3.0	7.2	1.2	1.0	3.3
LnGrp Delay(d),s/veh	13.3	7.1	8.8	6.5	32.5	36.6
LnGrp LOS	B	A	A	A	C	D
Approach Vol, veh/h		566	1148		170	
Approach Delay, s/veh		7.5	8.6		35.6	
Approach LOS		A	A		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		76.0		29.0		76.0		
Change Period (Y+Rc), s		6.0		5.0		6.0		
Max Green Setting (Gmax), s		70.0		24.0		70.0		
Max Q Clear Time (g_c+I1), s		20.4		9.1		16.4		
Green Ext Time (p_c), s		2.4		0.3		2.4		

Intersection Summary	
HCM 2010 Ctrl Delay	10.7
HCM 2010 LOS	B

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	88	1086	637	116	205	141
Future Volume (veh/h)	88	1086	637	116	205	141
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	96	1180	692	126	223	153
Adj No. of Lanes	1	2	2	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	529	2698	2698	1207	259	231
Arrive On Green	1.00	1.00	0.76	0.76	0.15	0.15
Sat Flow, veh/h	666	3632	3632	1583	1774	1583
Grp Volume(v), veh/h	96	1180	692	126	223	153
Grp Sat Flow(s),veh/h/ln	666	1770	1770	1583	1774	1583
Q Serve(g_s), s	1.6	0.0	6.9	2.5	14.7	11.0
Cycle Q Clear(g_c), s	8.5	0.0	6.9	2.5	14.7	11.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	529	2698	2698	1207	259	231
V/C Ratio(X)	0.18	0.44	0.26	0.10	0.86	0.66
Avail Cap(c_a), veh/h	529	2698	2698	1207	503	449
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.55	0.55	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.3	0.0	4.2	3.7	50.1	48.5
Incr Delay (d2), s/veh	0.4	0.3	0.2	0.2	6.3	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.1	3.5	1.1	7.7	5.0
LnGrp Delay(d),s/veh	0.7	0.3	4.4	3.9	56.4	50.9
LnGrp LOS	A	A	A	A	E	D
Approach Vol, veh/h		1276	818		376	
Approach Delay, s/veh		0.3	4.3		54.1	
Approach LOS		A	A		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		97.5		22.5		97.5		
Change Period (Y+Rc), s		6.0		5.0		6.0		
Max Green Setting (Gmax), s		75.0		34.0		75.0		
Max Q Clear Time (g_c+I1), s		10.5		16.7		8.9		
Green Ext Time (p_c), s		3.1		0.8		3.1		

Intersection Summary	
HCM 2010 Ctrl Delay	9.8
HCM 2010 LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	33	488	951	105	40	117
Future Volume (veh/h)	33	488	951	105	40	117
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	36	530	1034	114	43	127
Adj No. of Lanes	1	2	2	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	412	2686	2686	1202	184	164
Arrive On Green	1.00	1.00	0.76	0.76	0.10	0.10
Sat Flow, veh/h	488	3632	3632	1583	1774	1583
Grp Volume(v), veh/h	36	530	1034	114	43	127
Grp Sat Flow(s),veh/h/ln	488	1770	1770	1583	1774	1583
Q Serve(g_s), s	0.9	0.0	8.0	1.5	1.8	6.3
Cycle Q Clear(g_c), s	8.8	0.0	8.0	1.5	1.8	6.3
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	412	2686	2686	1202	184	164
V/C Ratio(X)	0.09	0.20	0.38	0.09	0.23	0.77
Avail Cap(c_a), veh/h	412	2686	2686	1202	377	336
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.72	0.72	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.6	0.0	3.3	2.5	32.9	34.9
Incr Delay (d2), s/veh	0.3	0.1	0.4	0.2	0.5	5.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	3.9	0.7	0.9	3.0
LnGrp Delay(d),s/veh	0.9	0.1	3.7	2.7	33.4	40.7
LnGrp LOS	A	A	A	A	C	D
Approach Vol, veh/h		566	1148		170	
Approach Delay, s/veh		0.2	3.6		38.8	
Approach LOS		A	A		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		66.7		13.3		66.7		
Change Period (Y+Rc), s		6.0		5.0		6.0		
Max Green Setting (Gmax), s		52.0		17.0		52.0		
Max Q Clear Time (g_c+I1), s		10.8		8.3		10.0		
Green Ext Time (p_c), s		2.4		0.2		2.4		

Intersection Summary	
HCM 2010 Ctrl Delay	5.7
HCM 2010 LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	88	1086	637	116	205	141
Future Volume (veh/h)	88	1086	637	116	205	141
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	96	1180	692	126	223	153
Adj No. of Lanes	1	2	2	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	500	2316	2316	1036	288	257
Arrive On Green	1.00	1.00	0.65	0.65	0.16	0.16
Sat Flow, veh/h	666	3632	3632	1583	1774	1583
Grp Volume(v), veh/h	96	1180	692	126	223	153
Grp Sat Flow(s),veh/h/ln	666	1770	1770	1583	1774	1583
Q Serve(g_s), s	1.4	0.0	5.0	1.8	7.2	5.4
Cycle Q Clear(g_c), s	6.5	0.0	5.0	1.8	7.2	5.4
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	500	2316	2316	1036	288	257
V/C Ratio(X)	0.19	0.51	0.30	0.12	0.78	0.60
Avail Cap(c_a), veh/h	500	2316	2316	1036	473	422
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.60	0.60	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.4	0.0	4.5	3.9	24.1	23.3
Incr Delay (d2), s/veh	0.5	0.5	0.3	0.2	3.3	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.2	2.5	0.8	3.8	2.5
LnGrp Delay(d),s/veh	0.9	0.5	4.8	4.1	27.4	25.0
LnGrp LOS	A	A	A	A	C	C
Approach Vol, veh/h		1276	818		376	
Approach Delay, s/veh		0.5	4.7		26.4	
Approach LOS		A	A		C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		45.3		14.7		45.3		
Change Period (Y+Rc), s		6.0		5.0		6.0		
Max Green Setting (Gmax), s		33.0		16.0		33.0		
Max Q Clear Time (g_c+I1), s		8.5		9.2		7.0		
Green Ext Time (p_c), s		3.1		0.5		3.1		

Intersection Summary	
HCM 2010 Ctrl Delay	5.8
HCM 2010 LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	63	597	1016	116	43	123
Future Volume (veh/h)	63	597	1016	116	43	123
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	68	649	1104	126	47	134
Adj No. of Lanes	1	2	2	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	369	2510	1689	192	161	144
Arrive On Green	0.07	0.71	0.53	0.53	0.09	0.09
Sat Flow, veh/h	1774	3632	3296	365	1774	1583
Grp Volume(v), veh/h	68	649	609	621	47	134
Grp Sat Flow(s),veh/h/ln	1774	1770	1770	1798	1774	1583
Q Serve(g_s), s	0.0	3.6	13.7	13.7	1.4	4.6
Cycle Q Clear(g_c), s	0.0	3.6	13.7	13.7	1.4	4.6
Prop In Lane	1.00			0.20	1.00	1.00
Lane Grp Cap(c), veh/h	369	2510	933	948	161	144
V/C Ratio(X)	0.18	0.26	0.65	0.65	0.29	0.93
Avail Cap(c_a), veh/h	369	2510	933	948	161	144
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.2	2.8	9.4	9.4	23.3	24.8
Incr Delay (d2), s/veh	0.2	0.2	3.5	3.5	0.7	54.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	1.8	7.5	7.7	0.7	6.0
LnGrp Delay(d),s/veh	15.5	3.1	12.9	12.9	24.1	79.1
LnGrp LOS	B	A	B	B	C	E
Approach Vol, veh/h		717	1230		181	
Approach Delay, s/veh		4.3	12.9		64.8	
Approach LOS		A	B		E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		45.0		10.0	10.0	35.0		
Change Period (Y+Rc), s		6.0		5.0	6.0	6.0		
Max Green Setting (Gmax), s		39.0		5.0	4.0	29.0		
Max Q Clear Time (g_c+I1), s		5.6		6.6	2.0	15.7		
Green Ext Time (p_c), s		1.0		0.0	0.3	1.2		

Intersection Summary	
HCM 2010 Ctrl Delay	14.4
HCM 2010 LOS	B

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	102	1279	879	124	227	196
Future Volume (veh/h)	102	1279	879	124	227	196
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	111	1390	955	135	247	213
Adj No. of Lanes	1	2	2	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	378	2282	1402	198	305	272
Arrive On Green	0.09	0.64	0.45	0.45	0.17	0.17
Sat Flow, veh/h	1774	3632	3208	440	1774	1583
Grp Volume(v), veh/h	111	1390	542	548	247	213
Grp Sat Flow(s),veh/h/ln	1774	1770	1770	1785	1774	1583
Q Serve(g_s), s	0.0	13.8	14.6	14.6	8.0	7.7
Cycle Q Clear(g_c), s	0.0	13.8	14.6	14.6	8.0	7.7
Prop In Lane	1.00			0.25	1.00	1.00
Lane Grp Cap(c), veh/h	378	2282	796	803	305	272
V/C Ratio(X)	0.29	0.61	0.68	0.68	0.81	0.78
Avail Cap(c_a), veh/h	378	2282	796	803	355	317
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.4	6.2	13.1	13.1	23.9	23.8
Incr Delay (d2), s/veh	0.4	1.2	4.7	4.6	11.0	9.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	7.0	8.1	8.2	4.8	7.2
LnGrp Delay(d),s/veh	20.8	7.4	17.8	17.7	34.9	33.6
LnGrp LOS	C	A	B	B	C	C
Approach Vol, veh/h		1501	1090		460	
Approach Delay, s/veh		8.4	17.8		34.3	
Approach LOS		A	B		C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		44.7		15.3	11.7	33.0		
Change Period (Y+Rc), s		6.0		5.0	6.0	6.0		
Max Green Setting (Gmax), s		37.0		12.0	4.0	27.0		
Max Q Clear Time (g_c+I1), s		15.8		10.0	2.0	16.6		
Green Ext Time (p_c), s		2.5		0.3	0.8	1.0		

Intersection Summary	
HCM 2010 Ctrl Delay	15.7
HCM 2010 LOS	B

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	98	723	1093	128	47	130
Future Volume (veh/h)	98	723	1093	128	47	130
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	107	786	1188	139	51	141
Adj No. of Lanes	1	2	2	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	346	2510	1684	197	161	144
Arrive On Green	0.07	0.71	0.53	0.53	0.09	0.09
Sat Flow, veh/h	1774	3632	3287	373	1774	1583
Grp Volume(v), veh/h	107	786	657	670	51	141
Grp Sat Flow(s),veh/h/ln	1774	1770	1770	1797	1774	1583
Q Serve(g_s), s	0.0	4.6	15.3	15.5	1.5	4.9
Cycle Q Clear(g_c), s	0.0	4.6	15.3	15.5	1.5	4.9
Prop In Lane	1.00			0.21	1.00	1.00
Lane Grp Cap(c), veh/h	346	2510	933	947	161	144
V/C Ratio(X)	0.31	0.31	0.70	0.71	0.32	0.98
Avail Cap(c_a), veh/h	346	2510	933	947	161	144
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.0	3.0	9.8	9.8	23.4	24.9
Incr Delay (d2), s/veh	0.5	0.3	4.4	4.4	0.8	68.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	2.3	8.4	8.6	0.8	6.8
LnGrp Delay(d),s/veh	19.5	3.3	14.2	14.2	24.2	93.5
LnGrp LOS	B	A	B	B	C	F
Approach Vol, veh/h		893	1327		192	
Approach Delay, s/veh		5.3	14.2		75.1	
Approach LOS		A	B		E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		45.0		10.0	10.0	35.0		
Change Period (Y+Rc), s		6.0		5.0	6.0	6.0		
Max Green Setting (Gmax), s		39.0		5.0	4.0	29.0		
Max Q Clear Time (g_c+I1), s		6.6		6.9	2.0	17.5		
Green Ext Time (p_c), s		1.4		0.0	0.5	1.3		

Intersection Summary	
HCM 2010 Ctrl Delay	15.7
HCM 2010 LOS	B

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	104	1314	923	126	231	206
Future Volume (veh/h)	104	1314	923	126	231	206
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	113	1428	1003	137	251	224
Adj No. of Lanes	1	2	2	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	362	2275	1408	192	308	275
Arrive On Green	0.09	0.64	0.45	0.45	0.17	0.17
Sat Flow, veh/h	1774	3632	3223	427	1774	1583
Grp Volume(v), veh/h	113	1428	567	573	251	224
Grp Sat Flow(s),veh/h/ln	1774	1770	1770	1787	1774	1583
Q Serve(g_s), s	0.0	14.5	15.6	15.6	8.2	8.2
Cycle Q Clear(g_c), s	0.0	14.5	15.6	15.6	8.2	8.2
Prop In Lane	1.00			0.24	1.00	1.00
Lane Grp Cap(c), veh/h	362	2275	796	804	308	275
V/C Ratio(X)	0.31	0.63	0.71	0.71	0.81	0.81
Avail Cap(c_a), veh/h	362	2275	796	804	355	317
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.5	6.4	13.4	13.4	23.8	23.8
Incr Delay (d2), s/veh	0.5	1.3	5.4	5.3	11.4	12.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	7.4	8.7	8.8	5.0	7.7
LnGrp Delay(d),s/veh	22.0	7.7	18.7	18.7	35.3	36.5
LnGrp LOS	C	A	B	B	D	D
Approach Vol, veh/h		1541	1140		475	
Approach Delay, s/veh		8.8	18.7		35.8	
Approach LOS		A	B		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		44.6		15.4	11.6	33.0		
Change Period (Y+Rc), s		6.0		5.0	6.0	6.0		
Max Green Setting (Gmax), s		37.0		12.0	4.0	27.0		
Max Q Clear Time (g_c+I1), s		16.5		10.2	2.0	17.6		
Green Ext Time (p_c), s		2.6		0.3	0.8	1.0		

Intersection Summary	
HCM 2010 Ctrl Delay	16.4
HCM 2010 LOS	B

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	133	850	1169	140	50	137
Future Volume (veh/h)	133	850	1169	140	50	137
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	145	924	1271	152	54	149
Adj No. of Lanes	1	2	2	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	326	2510	1680	200	161	144
Arrive On Green	0.07	0.71	0.53	0.53	0.09	0.09
Sat Flow, veh/h	1774	3632	3279	379	1774	1583
Grp Volume(v), veh/h	145	924	704	719	54	149
Grp Sat Flow(s),veh/h/ln	1774	1770	1770	1796	1774	1583
Q Serve(g_s), s	0.0	5.7	17.2	17.4	1.6	5.0
Cycle Q Clear(g_c), s	0.0	5.7	17.2	17.4	1.6	5.0
Prop In Lane	1.00			0.21	1.00	1.00
Lane Grp Cap(c), veh/h	326	2510	933	947	161	144
V/C Ratio(X)	0.45	0.37	0.75	0.76	0.33	1.04
Avail Cap(c_a), veh/h	326	2510	933	947	161	144
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.5	3.1	10.2	10.3	23.4	25.0
Incr Delay (d2), s/veh	1.0	0.4	5.6	5.7	0.9	84.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.4
%ile BackOfQ(50%),veh/ln	2.1	2.8	9.7	9.9	0.8	7.5
LnGrp Delay(d),s/veh	22.4	3.6	15.8	16.0	24.3	110.0
LnGrp LOS	C	A	B	B	C	F
Approach Vol, veh/h		1069	1423		203	
Approach Delay, s/veh		6.1	15.9		87.2	
Approach LOS		A	B		F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		45.0		10.0	10.0	35.0		
Change Period (Y+Rc), s		6.0		5.0	6.0	6.0		
Max Green Setting (Gmax), s		39.0		5.0	4.0	29.0		
Max Q Clear Time (g_c+I1), s		7.7		7.0	2.0	19.4		
Green Ext Time (p_c), s		1.7		0.0	0.6	1.4		

Intersection Summary	
HCM 2010 Ctrl Delay	17.4
HCM 2010 LOS	B

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	113	1436	1077	131	245	241
Future Volume (veh/h)	113	1436	1077	131	245	241
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	123	1561	1171	142	266	262
Adj No. of Lanes	1	2	2	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	302	2194	1378	167	349	312
Arrive On Green	0.09	0.62	0.43	0.43	0.20	0.20
Sat Flow, veh/h	1774	3632	3273	385	1774	1583
Grp Volume(v), veh/h	123	1561	650	663	266	262
Grp Sat Flow(s),veh/h/ln	1774	1770	1770	1795	1774	1583
Q Serve(g_s), s	0.0	18.0	19.8	19.9	8.5	9.6
Cycle Q Clear(g_c), s	0.0	18.0	19.8	19.9	8.5	9.6
Prop In Lane	1.00			0.21	1.00	1.00
Lane Grp Cap(c), veh/h	302	2194	767	778	349	312
V/C Ratio(X)	0.41	0.71	0.85	0.85	0.76	0.84
Avail Cap(c_a), veh/h	302	2194	767	778	384	343
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.6	7.8	15.2	15.3	22.8	23.2
Incr Delay (d2), s/veh	0.9	2.0	11.3	11.4	7.5	15.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	9.3	12.0	12.2	4.9	9.1
LnGrp Delay(d),s/veh	25.4	9.7	26.5	26.6	30.2	38.4
LnGrp LOS	C	A	C	C	C	D
Approach Vol, veh/h		1684	1313		528	
Approach Delay, s/veh		10.9	26.6		34.3	
Approach LOS		B	C		C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		43.2		16.8	11.2	32.0		
Change Period (Y+Rc), s		6.0		5.0	6.0	6.0		
Max Green Setting (Gmax), s		36.0		13.0	4.0	26.0		
Max Q Clear Time (g_c+I1), s		20.0		11.6	2.0	21.9		
Green Ext Time (p_c), s		2.8		0.2	0.9	0.9		

Intersection Summary	
HCM 2010 Ctrl Delay	20.2
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	95	940	150	0	1270	70	25	15	25	165	15	70
Future Volume (veh/h)	95	940	150	0	1270	70	25	15	25	165	15	70
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	0	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	103	1022	163	0	1380	76	27	16	27	179	16	76
Adj No. of Lanes	1	2	0	0	2	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	0	2	2	2	2	2	2	2	2
Cap, veh/h	226	1673	267	0	1519	83	461	215	362	509	97	462
Arrive On Green	0.09	1.00	1.00	0.00	0.89	0.89	0.34	0.34	0.34	0.34	0.34	0.34
Sat Flow, veh/h	1774	3059	487	0	3505	187	1299	624	1053	1358	283	1343
Grp Volume(v), veh/h	103	591	594	0	714	742	27	0	43	179	0	92
Grp Sat Flow(s),veh/h/ln	1774	1770	1777	0	1770	1830	1299	0	1677	1358	0	1626
Q Serve(g_s), s	3.4	0.0	0.0	0.0	25.3	25.8	1.6	0.0	1.9	11.2	0.0	4.3
Cycle Q Clear(g_c), s	3.4	0.0	0.0	0.0	25.3	25.8	6.0	0.0	1.9	13.1	0.0	4.3
Prop In Lane	1.00		0.27	0.00		0.10	1.00		0.63	1.00		0.83
Lane Grp Cap(c), veh/h	226	968	972	0	788	814	461	0	577	509	0	559
V/C Ratio(X)	0.46	0.61	0.61	0.00	0.91	0.91	0.06	0.00	0.07	0.35	0.00	0.16
Avail Cap(c_a), veh/h	287	1126	1131	0	885	915	461	0	577	509	0	559
HCM Platoon Ratio	2.00	2.00	2.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.91	0.91	0.91	0.00	0.68	0.68	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.9	0.0	0.0	0.0	4.7	4.8	27.2	0.0	24.3	28.7	0.0	25.1
Incr Delay (d2), s/veh	1.3	0.7	0.7	0.0	8.7	8.9	0.2	0.0	0.3	1.9	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.2	0.2	0.0	12.6	13.1	0.6	0.0	0.9	4.5	0.0	2.0
LnGrp Delay(d),s/veh	19.2	0.7	0.7	0.0	13.5	13.6	27.4	0.0	24.5	30.6	0.0	25.7
LnGrp LOS	B	A	A		B	B	C		C	C		C
Approach Vol, veh/h		1288			1456			70			271	
Approach Delay, s/veh		2.2			13.6			25.6			29.0	
Approach LOS		A			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6	7	8
Phs Duration (G+Y+Rc), s		43.8		66.2		43.8	11.2	55.0
Change Period (Y+Rc), s		6.0		6.0		6.0	6.0	6.0
Max Green Setting (Gmax), s		28.0		70.0		28.0	9.0	55.0
Max Q Clear Time (g_c+I1), s		8.0		2.0		15.1	5.4	27.8
Green Ext Time (p_c), s		1.3		39.4		1.1	0.1	21.1

Intersection Summary	
HCM 2010 Ctrl Delay	10.4
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	165	1300	205	0	1365	70	50	15	75	85	15	110
Future Volume (veh/h)	165	1300	205	0	1365	70	50	15	75	85	15	110
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	0	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	179	1413	223	0	1484	76	54	16	82	92	16	120
Adj No. of Lanes	1	2	0	0	2	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	0	2	2	2	2	2	2	2	2
Cap, veh/h	295	1837	286	0	1640	84	356	80	409	392	57	429
Arrive On Green	0.14	1.00	1.00	0.00	0.96	0.96	0.30	0.30	0.30	0.30	0.30	0.30
Sat Flow, veh/h	1774	3069	479	0	3520	175	1248	265	1358	1292	190	1422
Grp Volume(v), veh/h	179	807	829	0	764	796	54	0	98	92	0	136
Grp Sat Flow(s),veh/h/ln	1774	1770	1778	0	1770	1832	1248	0	1623	1292	0	1612
Q Serve(g_s), s	6.1	0.0	0.0	0.0	16.3	17.1	4.1	0.0	5.4	6.8	0.0	7.7
Cycle Q Clear(g_c), s	6.1	0.0	0.0	0.0	16.3	17.1	11.9	0.0	5.4	12.2	0.0	7.7
Prop In Lane	1.00		0.27	0.00		0.10	1.00		0.84	1.00		0.88
Lane Grp Cap(c), veh/h	295	1059	1064	0	847	877	356	0	489	392	0	486
V/C Ratio(X)	0.61	0.76	0.78	0.00	0.90	0.91	0.15	0.00	0.20	0.23	0.00	0.28
Avail Cap(c_a), veh/h	437	1312	1319	0	959	992	356	0	489	392	0	486
HCM Platoon Ratio	2.00	2.00	2.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.44	0.44	0.44	0.00	0.57	0.57	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.5	0.0	0.0	0.0	1.7	1.7	36.5	0.0	31.2	35.7	0.0	32.0
Incr Delay (d2), s/veh	0.9	0.9	1.1	0.0	6.7	6.9	0.9	0.0	0.9	1.4	0.0	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	0.3	0.3	0.0	6.7	7.4	1.5	0.0	2.5	2.6	0.0	3.6
LnGrp Delay(d),s/veh	15.4	0.9	1.1	0.0	8.4	8.6	37.4	0.0	32.1	37.1	0.0	33.4
LnGrp LOS	B	A	A		A	A	D		C	D		C
Approach Vol, veh/h		1815			1560			152			228	
Approach Delay, s/veh		2.4			8.5			34.0			34.9	
Approach LOS		A			A			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6	7	8
Phs Duration (G+Y+Rc), s		42.2		77.8		42.2	14.4	63.4
Change Period (Y+Rc), s		6.0		6.0		6.0	6.0	6.0
Max Green Setting (Gmax), s		19.0		89.0		19.0	18.0	65.0
Max Q Clear Time (g_c+I1), s		13.9		2.0		14.2	8.1	19.1
Green Ext Time (p_c), s		0.8		63.0		0.8	0.3	38.3

Intersection Summary	
HCM 2010 Ctrl Delay	8.2
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	1155	150	0	1390	85	25	20	25	200	20	85
Future Volume (veh/h)	120	1155	150	0	1390	85	25	20	25	200	20	85
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	0	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	130	1255	163	0	1511	92	27	22	27	217	22	92
Adj No. of Lanes	1	2	0	0	2	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	0	2	2	2	2	2	2	2	2
Cap, veh/h	238	1834	237	0	1602	97	393	236	289	455	97	407
Arrive On Green	0.11	1.00	1.00	0.00	0.95	0.95	0.31	0.31	0.31	0.31	0.31	0.31
Sat Flow, veh/h	1774	3153	408	0	3484	206	1273	762	935	1351	315	1316
Grp Volume(v), veh/h	130	702	716	0	786	817	27	0	49	217	0	114
Grp Sat Flow(s),veh/h/ln	1774	1770	1791	0	1770	1826	1273	0	1698	1351	0	1631
Q Serve(g_s), s	4.0	0.0	0.0	0.0	23.8	25.7	1.8	0.0	2.3	15.0	0.0	5.7
Cycle Q Clear(g_c), s	4.0	0.0	0.0	0.0	23.8	25.7	7.5	0.0	2.3	17.2	0.0	5.7
Prop In Lane	1.00		0.23	0.00		0.11	1.00		0.55	1.00		0.81
Lane Grp Cap(c), veh/h	238	1030	1042	0	836	863	393	0	525	455	0	504
V/C Ratio(X)	0.55	0.68	0.69	0.00	0.94	0.95	0.07	0.00	0.09	0.48	0.00	0.23
Avail Cap(c_a), veh/h	286	1142	1156	0	901	930	393	0	525	455	0	504
HCM Platoon Ratio	2.00	2.00	2.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.83	0.83	0.83	0.00	0.56	0.56	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.0	0.0	0.0	0.0	2.2	2.3	31.0	0.0	27.0	33.2	0.0	28.2
Incr Delay (d2), s/veh	1.6	1.2	1.3	0.0	10.7	11.4	0.3	0.0	0.4	3.5	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.4	0.4	0.0	10.7	11.8	0.7	0.0	1.1	6.1	0.0	2.7
LnGrp Delay(d),s/veh	18.6	1.2	1.3	0.0	13.0	13.7	31.3	0.0	27.4	36.7	0.0	29.3
LnGrp LOS	B	A	A		B	B	C		C	D		C
Approach Vol, veh/h		1548			1603			76			331	
Approach Delay, s/veh		2.7			13.4			28.8			34.1	
Approach LOS		A			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6	7	8
Phs Duration (G+Y+Rc), s		40.0		70.0		40.0	12.0	58.0
Change Period (Y+Rc), s		6.0		6.0		6.0	6.0	6.0
Max Green Setting (Gmax), s		27.0		71.0		27.0	9.0	56.0
Max Q Clear Time (g_c+I1), s		9.5		2.0		19.2	6.0	27.7
Green Ext Time (p_c), s		1.5		49.3		1.1	0.1	24.3

Intersection Summary	
HCM 2010 Ctrl Delay	11.0
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	200	1340	250	0	1435	85	50	20	75	100	20	135
Future Volume (veh/h)	200	1340	250	0	1435	85	50	20	75	100	20	135
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	0	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	217	1457	272	0	1560	92	54	22	82	109	22	147
Adj No. of Lanes	1	2	0	0	2	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	0	2	2	2	2	2	2	2	2
Cap, veh/h	314	1853	339	0	1662	98	297	97	361	357	59	393
Arrive On Green	0.16	1.00	1.00	0.00	0.98	0.98	0.28	0.28	0.28	0.28	0.28	0.28
Sat Flow, veh/h	1774	2988	548	0	3491	199	1211	346	1289	1285	210	1405
Grp Volume(v), veh/h	217	852	877	0	809	843	54	0	104	109	0	169
Grp Sat Flow(s),veh/h/ln	1774	1770	1766	0	1770	1828	1211	0	1635	1285	0	1615
Q Serve(g_s), s	7.3	0.0	0.0	0.0	13.8	15.5	4.5	0.0	5.9	8.6	0.0	10.1
Cycle Q Clear(g_c), s	7.3	0.0	0.0	0.0	13.8	15.5	14.6	0.0	5.9	14.5	0.0	10.1
Prop In Lane	1.00		0.31	0.00		0.11	1.00		0.79	1.00		0.87
Lane Grp Cap(c), veh/h	314	1097	1095	0	866	894	297	0	458	357	0	452
V/C Ratio(X)	0.69	0.78	0.80	0.00	0.93	0.94	0.18	0.00	0.23	0.31	0.00	0.37
Avail Cap(c_a), veh/h	436	1312	1310	0	959	990	297	0	458	357	0	452
HCM Platoon Ratio	2.00	2.00	2.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.39	0.39	0.39	0.00	0.48	0.48	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.8	0.0	0.0	0.0	0.8	0.8	40.6	0.0	33.2	38.8	0.0	34.7
Incr Delay (d2), s/veh	1.1	1.0	1.2	0.0	8.4	9.1	1.3	0.0	1.2	2.2	0.0	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	0.3	0.4	0.0	3.8	4.1	1.6	0.0	2.8	3.2	0.0	4.8
LnGrp Delay(d),s/veh	14.9	1.0	1.2	0.0	9.2	9.9	42.0	0.0	34.4	41.0	0.0	37.1
LnGrp LOS	B	A	A		A	A	D		C	D		D
Approach Vol, veh/h		1946			1652			158			278	
Approach Delay, s/veh		2.7			9.6			37.0			38.6	
Approach LOS		A			A			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6	7	8
Phs Duration (G+Y+Rc), s		39.5		80.5		39.5	15.7	64.8
Change Period (Y+Rc), s		6.0		6.0		6.0	6.0	6.0
Max Green Setting (Gmax), s		19.0		89.0		19.0	18.0	65.0
Max Q Clear Time (g_c+I1), s		16.6		2.0		16.5	9.3	17.5
Green Ext Time (p_c), s		0.5		68.4		0.6	0.4	41.4

Intersection Summary	
HCM 2010 Ctrl Delay	9.3
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	175	1155	150	0	1490	125	25	25	25	300	25	125
Future Volume (veh/h)	175	1155	150	0	1490	125	25	25	25	300	25	125
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	0	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	190	1255	163	0	1620	136	27	27	27	326	27	136
Adj No. of Lanes	1	2	0	0	2	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	0	2	2	2	2	2	2	2	2
Cap, veh/h	239	1947	252	0	1609	134	296	234	234	398	74	370
Arrive On Green	0.15	1.00	1.00	0.00	0.97	0.97	0.27	0.27	0.27	0.27	0.27	0.27
Sat Flow, veh/h	1774	3153	408	0	3402	275	1218	856	856	1345	269	1355
Grp Volume(v), veh/h	190	702	716	0	860	896	27	0	54	326	0	163
Grp Sat Flow(s),veh/h/ln	1774	1770	1791	0	1770	1814	1218	0	1712	1345	0	1624
Q Serve(g_s), s	5.8	0.0	0.0	0.0	51.6	53.5	2.0	0.0	2.6	26.5	0.0	8.9
Cycle Q Clear(g_c), s	5.8	0.0	0.0	0.0	51.6	53.5	11.3	0.0	2.6	29.4	0.0	8.9
Prop In Lane	1.00		0.23	0.00		0.15	1.00		0.50	1.00		0.83
Lane Grp Cap(c), veh/h	239	1093	1106	0	860	882	296	0	468	398	0	444
V/C Ratio(X)	0.79	0.64	0.65	0.00	1.00	1.02	0.09	0.00	0.12	0.82	0.00	0.37
Avail Cap(c_a), veh/h	248	1126	1140	0	885	907	296	0	468	398	0	444
HCM Platoon Ratio	2.00	2.00	2.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.71	0.71	0.71	0.00	0.42	0.42	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.3	0.0	0.0	0.0	1.5	1.5	37.0	0.0	30.0	41.2	0.0	32.3
Incr Delay (d2), s/veh	11.6	0.9	0.9	0.0	19.2	23.6	0.6	0.0	0.5	17.0	0.0	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	0.3	0.3	0.0	13.6	15.0	0.7	0.0	1.3	11.8	0.0	4.3
LnGrp Delay(d),s/veh	32.9	0.9	0.9	0.0	20.7	25.1	37.6	0.0	30.5	58.2	0.0	34.6
LnGrp LOS	C	A	A		C	F	D		C	E		C
Approach Vol, veh/h		1608			1756			81			489	
Approach Delay, s/veh		4.7			22.9			32.8			50.3	
Approach LOS		A			C			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6	7	8
Phs Duration (G+Y+Rc), s		35.6		74.4		35.6	14.1	60.2
Change Period (Y+Rc), s		6.0		6.0		6.0	6.0	6.0
Max Green Setting (Gmax), s		28.0		70.0		28.0	9.0	55.0
Max Q Clear Time (g_c+I1), s		13.3		2.0		31.4	7.8	55.5
Green Ext Time (p_c), s		2.1		52.4		0.0	0.1	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	19.1
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	350	1490	375	0	1680	125	50	25	75	150	25	200
Future Volume (veh/h)	350	1490	375	0	1680	125	50	25	75	150	25	200
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	0	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	380	1620	408	0	1826	136	54	27	82	163	27	217
Adj No. of Lanes	1	2	0	0	2	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	0	2	2	2	2	2	2	2	2
Cap, veh/h	370	2145	518	0	1783	131	60	58	175	163	25	203
Arrive On Green	0.17	0.76	0.76	0.00	1.00	1.00	0.14	0.14	0.14	0.14	0.14	0.14
Sat Flow, veh/h	1774	2828	683	0	3436	246	1131	407	1237	1279	178	1432
Grp Volume(v), veh/h	380	988	1040	0	956	1006	54	0	109	163	0	244
Grp Sat Flow(s),veh/h/ln	1774	1770	1742	0	1770	1819	1131	0	1644	1279	0	1610
Q Serve(g_s), s	21.0	36.7	43.0	0.0	64.0	64.0	0.0	0.0	7.3	9.7	0.0	17.0
Cycle Q Clear(g_c), s	21.0	36.7	43.0	0.0	64.0	64.0	17.0	0.0	7.3	17.0	0.0	17.0
Prop In Lane	1.00		0.39	0.00		0.14	1.00		0.75	1.00		0.89
Lane Grp Cap(c), veh/h	370	1342	1321	0	944	970	60	0	233	163	0	228
V/C Ratio(X)	1.03	0.74	0.79	0.00	1.01	1.04	0.90	0.00	0.47	1.00	0.00	1.07
Avail Cap(c_a), veh/h	370	1342	1321	0	944	970	60	0	233	163	0	228
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.19	0.19	0.19	0.00	0.17	0.17	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	42.5	7.9	8.7	0.0	0.0	0.0	60.0	0.0	47.3	56.9	0.0	51.5
Incr Delay (d2), s/veh	27.4	0.4	0.6	0.0	15.2	22.9	90.0	0.0	6.6	70.0	0.0	79.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.1	17.7	20.5	0.0	4.0	6.2	3.3	0.0	3.8	8.6	0.0	12.6
LnGrp Delay(d),s/veh	69.9	8.4	9.3	0.0	15.2	22.9	150.0	0.0	54.0	126.9	0.0	130.8
LnGrp LOS	F	A	A		F	F	F		D	F		F
Approach Vol, veh/h		2408			1962			163			407	
Approach Delay, s/veh		18.5			19.2			85.8			129.2	
Approach LOS		B			B			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6	7	8
Phs Duration (G+Y+Rc), s		23.0		97.0		23.0	27.0	70.0
Change Period (Y+Rc), s		6.0		6.0		6.0	6.0	6.0
Max Green Setting (Gmax), s		17.0		91.0		17.0	21.0	64.0
Max Q Clear Time (g_c+I1), s		19.0		45.0		19.0	23.0	66.0
Green Ext Time (p_c), s		0.0		44.1		0.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	30.1
HCM 2010 LOS	C

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	588	24	323	1228	54	191
v/c Ratio	0.24	0.02	0.46	0.41	0.36	0.47
Control Delay	7.1	3.3	4.5	2.8	49.1	16.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.1	3.3	4.5	2.8	49.1	16.4
Queue Length 50th (ft)	69	0	31	82	33	38
Queue Length 95th (ft)	115	10	58	123	70	92
Internal Link Dist (ft)	245			1006	416	
Turn Bay Length (ft)		100	140			180
Base Capacity (vph)	2442	1099	824	2966	513	577
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.02	0.39	0.41	0.11	0.33

Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1258	61	283	721	55	386
v/c Ratio	0.59	0.06	0.52	0.24	0.41	0.76
Control Delay	18.0	8.8	16.3	5.7	61.2	44.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.0	8.8	16.3	5.7	61.2	44.4
Queue Length 50th (ft)	310	11	105	116	41	251
Queue Length 95th (ft)	462	37	193	154	83	324
Internal Link Dist (ft)	245			1006	416	
Turn Bay Length (ft)		100	140			180
Base Capacity (vph)	2120	958	543	3044	427	507
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.06	0.52	0.24	0.13	0.76

Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	588	24	323	1228	54	191
v/c Ratio	0.25	0.02	0.46	0.42	0.34	0.45
Control Delay	7.9	3.7	2.8	0.9	43.3	16.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.9	3.7	2.8	0.9	43.3	16.7
Queue Length 50th (ft)	68	0	7	18	29	43
Queue Length 95th (ft)	120	11	23	29	63	92
Internal Link Dist (ft)	245			1006	416	
Turn Bay Length (ft)		100	140			180
Base Capacity (vph)	2327	1048	784	2914	570	544
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.02	0.41	0.42	0.09	0.35

Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1258	61	283	721	55	386
v/c Ratio	0.59	0.06	0.52	0.24	0.41	0.76
Control Delay	18.0	8.8	17.7	0.6	61.2	44.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.0	8.8	17.7	0.6	61.2	44.4
Queue Length 50th (ft)	310	11	48	5	41	251
Queue Length 95th (ft)	462	37	74	14	83	324
Internal Link Dist (ft)	245			1006	416	
Turn Bay Length (ft)		100	140			180
Base Capacity (vph)	2120	958	543	3044	427	507
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.06	0.52	0.24	0.13	0.76

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	10	696	23	29	1365	112	44	34	52
v/c Ratio	0.05	0.29	0.02	0.06	0.58	0.38	0.11	0.11	0.13
Control Delay	5.3	5.4	1.5	6.1	10.1	37.6	15.1	32.5	13.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.3	5.4	1.5	6.1	10.1	37.6	15.1	32.5	13.2
Queue Length 50th (ft)	2	61	1	6	219	61	6	18	5
Queue Length 95th (ft)	m6	83	3	16	274	113	34	44	35
Internal Link Dist (ft)		1006			1220		430		375
Turn Bay Length (ft)	75			70		65		65	
Base Capacity (vph)	189	2371	1068	465	2365	296	389	298	392
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.29	0.02	0.06	0.58	0.38	0.11	0.11	0.13

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	34	1591	78	75	926	39	59	62	25
v/c Ratio	0.08	0.57	0.06	0.39	0.33	0.24	0.25	0.40	0.12
Control Delay	1.9	3.3	0.2	9.3	3.3	52.5	22.0	57.4	29.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.9	3.3	0.2	9.3	3.3	52.5	22.0	57.4	29.1
Queue Length 50th (ft)	3	121	0	9	56	28	10	45	7
Queue Length 95th (ft)	m4	100	m1	17	60	64	51	92	34
Internal Link Dist (ft)		1006			1220		430		375
Turn Bay Length (ft)	75			70		65		65	
Base Capacity (vph)	439	2801	1269	194	2785	161	232	156	211
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.57	0.06	0.39	0.33	0.24	0.25	0.40	0.12

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	10	696	23	29	1365	112	44	34	52
v/c Ratio	0.05	0.29	0.02	0.06	0.58	0.53	0.15	0.16	0.18
Control Delay	4.2	3.5	0.3	3.2	4.7	26.8	9.9	17.7	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.2	3.5	0.3	3.2	4.7	26.8	9.9	17.7	9.2
Queue Length 50th (ft)	1	35	0	2	131	26	2	8	2
Queue Length 95th (ft)	m3	43	m1	m8	230	#64	22	25	23
Internal Link Dist (ft)		1006			1220		430		375
Turn Bay Length (ft)	75			70		65		65	
Base Capacity (vph)	201	2368	1075	482	2364	239	320	241	325
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.29	0.02	0.06	0.58	0.47	0.14	0.14	0.16

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	34	1591	78	75	926	39	59	62	25
v/c Ratio	0.07	0.54	0.06	0.36	0.32	0.22	0.30	0.35	0.14
Control Delay	2.1	2.6	0.6	7.7	0.9	28.3	16.1	31.0	18.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.1	2.6	0.6	7.7	0.9	28.3	16.1	31.0	18.3
Queue Length 50th (ft)	2	77	1	6	33	13	5	21	3
Queue Length 95th (ft)	m8	188	m10	27	20	38	34	53	23
Internal Link Dist (ft)		1006			1220		430		375
Turn Bay Length (ft)	75			70		65		65	
Base Capacity (vph)	476	2937	1327	208	2920	186	205	186	183
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.54	0.06	0.36	0.32	0.21	0.29	0.33	0.14

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	35	775	1464	102	38
v/c Ratio	0.13	0.29	0.62	0.41	0.15
Control Delay	5.3	4.5	6.8	52.4	15.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	5.3	4.5	6.8	52.4	15.4
Queue Length 50th (ft)	5	80	98	73	0
Queue Length 95th (ft)	13	100	110	130	33
Internal Link Dist (ft)		1220	237	608	
Turn Bay Length (ft)	90			90	
Base Capacity (vph)	261	2713	2345	250	256
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	42	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.13	0.29	0.62	0.41	0.15

Intersection Summary

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	30	1650	1096	118	52
v/c Ratio	0.08	0.62	0.48	0.42	0.18
Control Delay	5.5	6.8	4.3	50.8	13.4
Queue Delay	0.0	0.3	0.2	2.8	0.0
Total Delay	5.5	7.0	4.5	53.6	13.4
Queue Length 50th (ft)	4	139	64	84	0
Queue Length 95th (ft)	m14	314	103	144	36
Internal Link Dist (ft)		1220	237	608	
Turn Bay Length (ft)	90			90	
Base Capacity (vph)	364	2654	2300	280	294
Starvation Cap Reductn	0	0	439	0	0
Spillback Cap Reductn	0	356	0	86	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.08	0.72	0.59	0.61	0.18

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	35	775	1464	102	38
v/c Ratio	0.12	0.27	0.56	0.55	0.19
Control Delay	2.0	1.2	3.1	49.1	14.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	2.0	1.2	3.1	49.1	14.0
Queue Length 50th (ft)	2	21	61	56	0
Queue Length 95th (ft)	4	25	88	103	28
Internal Link Dist (ft)		1220	237	608	
Turn Bay Length (ft)	90			90	
Base Capacity (vph)	281	2866	2622	255	261
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	5	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.12	0.27	0.56	0.40	0.15

Intersection Summary

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	30	1650	1096	118	52
v/c Ratio	0.08	0.58	0.42	0.65	0.25
Control Delay	2.1	3.2	3.0	67.6	15.5
Queue Delay	0.0	0.0	0.4	0.9	0.0
Total Delay	2.1	3.3	3.4	68.5	15.5
Queue Length 50th (ft)	2	72	37	89	0
Queue Length 95th (ft)	m5	78	101	146	37
Internal Link Dist (ft)		1220	237	608	
Turn Bay Length (ft)	90			90	
Base Capacity (vph)	385	2849	2615	280	294
Starvation Cap Reductn	0	0	898	0	0
Spillback Cap Reductn	0	96	0	44	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.08	0.60	0.64	0.50	0.18

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	754	124	145	1378	88	107
v/c Ratio	0.39	0.14	0.25	0.54	0.27	0.28
Control Delay	13.9	1.8	7.9	8.9	44.8	9.9
Queue Delay	0.5	0.0	0.0	0.0	0.0	0.0
Total Delay	14.4	1.8	7.9	8.9	44.8	9.9
Queue Length 50th (ft)	120	0	31	231	59	0
Queue Length 95th (ft)	143	12	51	279	109	49
Internal Link Dist (ft)	237			1112	463	
Turn Bay Length (ft)		120	180		120	120
Base Capacity (vph)	1916	912	569	2536	324	377
Starvation Cap Reductn	701	0	0	0	0	0
Spillback Cap Reductn	0	0	0	57	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.14	0.25	0.56	0.27	0.28

Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1618	155	126	997	103	207
v/c Ratio	0.73	0.15	0.49	0.37	0.41	0.58
Control Delay	17.6	6.1	21.3	1.7	52.6	20.6
Queue Delay	0.3	0.5	0.0	0.0	0.0	0.0
Total Delay	17.9	6.7	21.3	1.7	52.6	20.6
Queue Length 50th (ft)	393	21	29	31	74	35
Queue Length 95th (ft)	712	38	75	35	131	114
Internal Link Dist (ft)	237			1112	463	
Turn Bay Length (ft)		120	180		120	120
Base Capacity (vph)	2211	1020	258	2683	250	359
Starvation Cap Reductn	143	567	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.34	0.49	0.37	0.41	0.58

Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	754	124	145	1378	88	107
v/c Ratio	0.36	0.12	0.26	0.51	0.51	0.42
Control Delay	8.0	1.3	1.8	2.7	47.9	13.0
Queue Delay	0.3	0.0	0.0	0.0	0.0	0.0
Total Delay	8.2	1.3	1.8	2.7	47.9	13.0
Queue Length 50th (ft)	86	0	5	26	48	0
Queue Length 95th (ft)	117	3	m8	32	91	46
Internal Link Dist (ft)	237			1112	463	
Turn Bay Length (ft)		120	180		120	120
Base Capacity (vph)	2110	993	559	2718	354	402
Starvation Cap Reductn	664	0	0	0	0	0
Spillback Cap Reductn	0	0	0	17	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.12	0.26	0.51	0.25	0.27

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1618	155	126	997	103	207
v/c Ratio	0.68	0.14	0.48	0.35	0.61	0.70
Control Delay	8.0	2.4	21.4	1.2	66.3	27.9
Queue Delay	0.8	0.5	0.0	0.0	0.0	0.0
Total Delay	8.8	3.0	21.4	1.2	66.3	27.9
Queue Length 50th (ft)	206	6	25	23	78	37
Queue Length 95th (ft)	293	40	69	27	131	114
Internal Link Dist (ft)	237			1112	463	
Turn Bay Length (ft)		120	180		120	120
Base Capacity (vph)	2393	1097	272	2845	250	359
Starvation Cap Reductn	426	634	0	0	0	0
Spillback Cap Reductn	0	0	0	8	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.33	0.46	0.35	0.41	0.58

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	283	722	245	641	136	326	707	120	630	359
v/c Ratio	0.77	0.70	0.77	0.68	0.24	0.79	0.71	0.66	0.84	0.65
Control Delay	48.7	23.6	50.7	28.9	2.6	48.0	27.4	53.3	39.9	13.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.7	23.6	50.7	28.9	2.6	48.0	27.4	53.3	39.9	13.1
Queue Length 50th (ft)	67	127	58	140	0	77	145	28	148	32
Queue Length 95th (ft)	#124	186	#112	196	19	#138	205	#65	#232	114
Internal Link Dist (ft)		1112		1210			1330		1218	
Turn Bay Length (ft)	150		220			220		155		260
Base Capacity (vph)	366	1036	320	943	560	411	991	183	754	556
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.70	0.77	0.68	0.24	0.79	0.71	0.66	0.84	0.65

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	391	994	245	603	92	141	875	136	620	332
v/c Ratio	0.68	0.78	0.71	0.57	0.16	0.55	0.85	0.68	0.64	0.49
Control Delay	52.8	47.2	66.3	34.0	0.6	62.1	46.8	72.9	41.8	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.8	47.2	66.3	34.0	0.6	62.1	46.8	72.9	41.8	6.3
Queue Length 50th (ft)	166	327	101	156	0	55	316	54	222	0
Queue Length 95th (ft)	219	401	#147	198	1	89	#402	#96	286	70
Internal Link Dist (ft)		1112		1210			1330		1218	
Turn Bay Length (ft)	150		220			220		155		260
Base Capacity (vph)	572	1277	343	1061	589	257	1025	200	973	676
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.78	0.71	0.57	0.16	0.55	0.85	0.68	0.64	0.49

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	283	722	245	641	136	326	707	120	630	359
v/c Ratio	0.76	0.65	0.73	0.61	0.23	0.76	0.72	0.48	0.79	0.63
Control Delay	42.4	20.1	48.9	27.0	5.6	50.0	32.4	46.6	40.9	13.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.4	20.1	48.9	27.0	5.6	50.0	32.4	46.6	40.9	13.5
Queue Length 50th (ft)	84	155	71	142	2	92	177	34	176	38
Queue Length 95th (ft)	#126	211	#121	185	36	#139	241	61	238	127
Internal Link Dist (ft)		1112		1210			1330		1218	
Turn Bay Length (ft)	150		220			220		155		260
Base Capacity (vph)	382	1109	344	1049	580	457	1018	267	829	582
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.65	0.71	0.61	0.23	0.71	0.69	0.45	0.76	0.62

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	391	994	245	603	92	141	875	136	620	332
v/c Ratio	0.68	0.74	0.76	0.55	0.15	0.59	0.89	0.67	0.65	0.50
Control Delay	42.2	25.3	71.1	32.8	2.8	64.8	50.9	71.8	42.5	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.2	25.3	71.1	32.8	2.8	64.8	50.9	71.8	42.5	6.4
Queue Length 50th (ft)	128	251	84	164	0	55	316	54	222	0
Queue Length 95th (ft)	189	354	#141	206	10	89	#402	#96	286	70
Internal Link Dist (ft)		1112		1210			1330		1218	
Turn Bay Length (ft)	150		220			220		155		260
Base Capacity (vph)	572	1337	343	1104	619	257	1025	206	976	677
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.74	0.71	0.55	0.15	0.55	0.85	0.66	0.64	0.49

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	36	530	1034	114	43	127
v/c Ratio	0.12	0.22	0.44	0.10	0.11	0.28
Control Delay	7.5	7.1	9.0	1.6	33.0	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.5	7.1	9.0	1.6	33.0	7.7
Queue Length 50th (ft)	8	66	155	1	23	0
Queue Length 95th (ft)	21	88	194	19	52	47
Internal Link Dist (ft)		1210	593		491	
Turn Bay Length (ft)	275			100	100	
Base Capacity (vph)	299	2359	2359	1091	404	459
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.22	0.44	0.10	0.11	0.28

Intersection Summary

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	96	1180	692	126	223	153
v/c Ratio	0.18	0.45	0.26	0.10	0.76	0.39
Control Delay	4.3	4.5	5.8	1.2	63.2	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.3	4.5	5.8	1.2	63.2	9.2
Queue Length 50th (ft)	15	114	78	0	166	0
Queue Length 95th (ft)	m23	140	128	18	238	54
Internal Link Dist (ft)		1210	701		491	
Turn Bay Length (ft)	275			100	100	100
Base Capacity (vph)	524	2623	2623	1206	501	558
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.45	0.26	0.10	0.45	0.27

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	36	530	1034	114	43	127
v/c Ratio	0.11	0.22	0.43	0.10	0.17	0.41
Control Delay	3.7	3.0	5.2	1.4	18.1	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.7	3.0	5.2	1.4	18.1	10.9
Queue Length 50th (ft)	1	13	58	0	10	6
Queue Length 95th (ft)	m5	34	104	13	29	39
Internal Link Dist (ft)		1210	593		491	
Turn Bay Length (ft)	275			100	100	
Base Capacity (vph)	341	2431	2431	1123	314	365
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.22	0.43	0.10	0.14	0.35

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	96	1180	692	126	223	153
v/c Ratio	0.22	0.54	0.32	0.12	0.63	0.35
Control Delay	3.9	4.1	6.5	1.8	29.5	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.9	4.1	6.5	1.8	29.5	6.2
Queue Length 50th (ft)	8	64	54	0	74	0
Queue Length 95th (ft)	m18	118	96	18	124	36
Internal Link Dist (ft)		1210	701		491	
Turn Bay Length (ft)	275			100	100	100
Base Capacity (vph)	446	2178	2178	1023	472	534
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.54	0.32	0.12	0.47	0.29

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

S Boulder Rd

Direction	EB	WB	All
Total Delay (hr)	15	21	36
Stops (#)	1824	3440	5264
Average Speed (mph)	21	23	22
Total Travel Time (hr)	36	60	96
Distance Traveled (mi)	740	1371	2111
Fuel Consumed (gal)	53	94	146
Fuel Economy (mpg)	14.0	14.6	14.4
Unserved Vehicles (#)	0	0	0
Vehicles in dilemma zone (#)	179	298	477
Performance Index	19.8	30.7	50.5

Network Totals

Number of Intersections	6
Total Delay (hr)	61
Stops (#)	7247
Average Speed (mph)	20
Total Travel Time (hr)	138
Distance Traveled (mi)	2710
Fuel Consumed (gal)	202
Fuel Economy (mpg)	13.4
Unserved Vehicles (#)	0
Vehicles in dilemma zone (#)	561
Performance Index	80.9

S Boulder Rd

Direction	EB	WB	All
Total Delay (hr)	37	16	53
Stops (#)	3784	1741	5525
Average Speed (mph)	19	23	20
Total Travel Time (hr)	78	46	124
Distance Traveled (mi)	1450	1033	2483
Fuel Consumed (gal)	111	64	175
Fuel Economy (mpg)	13.1	16.1	14.2
Unserved Vehicles (#)	0	0	0
Vehicles in dilemma zone (#)	360	179	539
Performance Index	47.2	20.9	68.0

Network Totals

Number of Intersections	6
Total Delay (hr)	90
Stops (#)	7883
Average Speed (mph)	17
Total Travel Time (hr)	180
Distance Traveled (mi)	3120
Fuel Consumed (gal)	245
Fuel Economy (mpg)	12.8
Unserved Vehicles (#)	0
Vehicles in dilemma zone (#)	599
Performance Index	112.4

S Boulder Rd

Direction	EB	WB	All
Total Delay (hr)	10	12	22
Stops (#)	1565	1759	3324
Average Speed (mph)	24	27	26
Total Travel Time (hr)	31	51	82
Distance Traveled (mi)	740	1371	2111
Fuel Consumed (gal)	48	74	122
Fuel Economy (mpg)	15.6	18.5	17.4
Unserved Vehicles (#)	0	0	0
Vehicles in dilemma zone (#)	150	209	359
Performance Index	14.6	16.6	31.2

Network Totals

Number of Intersections	6
Total Delay (hr)	47
Stops (#)	5312
Average Speed (mph)	22
Total Travel Time (hr)	124
Distance Traveled (mi)	2710
Fuel Consumed (gal)	177
Fuel Economy (mpg)	15.3
Unserved Vehicles (#)	0
Vehicles in dilemma zone (#)	434
Performance Index	61.5

S Boulder Rd

Direction	EB	WB	All
Total Delay (hr)	23	16	39
Stops (#)	3200	1900	5100
Average Speed (mph)	22	23	23
Total Travel Time (hr)	65	45	110
Distance Traveled (mi)	1450	1033	2483
Fuel Consumed (gal)	96	65	162
Fuel Economy (mpg)	15.0	15.9	15.4
Unserved Vehicles (#)	0	0	0
Vehicles in dilemma zone (#)	368	146	514
Performance Index	32.2	21.0	53.2

Network Totals

Number of Intersections	6
Total Delay (hr)	77
Stops (#)	7509
Average Speed (mph)	19
Total Travel Time (hr)	166
Distance Traveled (mi)	3120
Fuel Consumed (gal)	232
Fuel Economy (mpg)	13.4
Unserved Vehicles (#)	0
Vehicles in dilemma zone (#)	570
Performance Index	98.0

S Boulder Rd

Direction	EB	WB	All
Total Delay (hr)	17	21	38
Stops (#)	2579	2693	5272
Average Speed (mph)	21	23	22
Total Travel Time (hr)	44	62	106
Distance Traveled (mi)	933	1449	2382
Fuel Consumed (gal)	68	91	158
Fuel Economy (mpg)	13.8	16.0	15.1
Unserved Vehicles (#)	0	0	0
Vehicles in dilemma zone (#)	193	190	383
Performance Index	24.3	28.2	52.5

Network Totals

Number of Intersections	7
Total Delay (hr)	78
Stops (#)	7926
Average Speed (mph)	19
Total Travel Time (hr)	166
Distance Traveled (mi)	3084
Fuel Consumed (gal)	234
Fuel Economy (mpg)	13.2
Unserved Vehicles (#)	0
Vehicles in dilemma zone (#)	449
Performance Index	99.5

S Boulder Rd

Direction	EB	WB	All
Total Delay (hr)	52	40	92
Stops (#)	4720	3745	8465
Average Speed (mph)	17	18	18
Total Travel Time (hr)	101	84	185
Distance Traveled (mi)	1710	1525	3235
Fuel Consumed (gal)	139	116	254
Fuel Economy (mpg)	12.3	13.2	12.7
Unserved Vehicles (#)	0	0	0
Vehicles in dilemma zone (#)	408	336	744
Performance Index	64.8	50.8	115.6

Network Totals

Number of Intersections	7
Total Delay (hr)	159
Stops (#)	11944
Average Speed (mph)	15
Total Travel Time (hr)	276
Distance Traveled (mi)	4083
Fuel Consumed (gal)	362
Fuel Economy (mpg)	11.3
Unserved Vehicles (#)	5
Vehicles in dilemma zone (#)	824
Performance Index	192.6

S Boulder Rd

Direction	EB	WB	All
Total Delay (hr)	15	17	31
Stops (#)	2094	2143	4237
Average Speed (mph)	23	25	24
Total Travel Time (hr)	41	58	99
Distance Traveled (mi)	918	1451	2370
Fuel Consumed (gal)	61	84	145
Fuel Economy (mpg)	15.0	17.3	16.3
Unserved Vehicles (#)	0	0	0
Vehicles in dilemma zone (#)	170	202	372
Performance Index	20.3	22.9	43.3

Network Totals

Number of Intersections	7
Total Delay (hr)	74
Stops (#)	6983
Average Speed (mph)	19
Total Travel Time (hr)	163
Distance Traveled (mi)	3113
Fuel Consumed (gal)	225
Fuel Economy (mpg)	13.8
Unserved Vehicles (#)	0
Vehicles in dilemma zone (#)	437
Performance Index	93.2

S Boulder Rd

Direction	EB	WB	All
Total Delay (hr)	38	36	74
Stops (#)	4814	3877	8691
Average Speed (mph)	20	19	19
Total Travel Time (hr)	87	80	167
Distance Traveled (mi)	1703	1525	3228
Fuel Consumed (gal)	129	114	243
Fuel Economy (mpg)	13.2	13.4	13.3
Unserved Vehicles (#)	0	0	0
Vehicles in dilemma zone (#)	290	284	574
Performance Index	51.8	46.8	98.6

Network Totals

Number of Intersections	7
Total Delay (hr)	146
Stops (#)	12345
Average Speed (mph)	16
Total Travel Time (hr)	263
Distance Traveled (mi)	4107
Fuel Consumed (gal)	356
Fuel Economy (mpg)	11.5
Unserved Vehicles (#)	19
Vehicles in dilemma zone (#)	647
Performance Index	179.9

S Boulder Rd

Direction	EB	WB	All
Total Delay (hr)	29	29	58
Stops (#)	2988	3523	6511
Average Speed (mph)	19	21	20
Total Travel Time (hr)	62	74	136
Distance Traveled (mi)	1158	1559	2717
Fuel Consumed (gal)	88	108	195
Fuel Economy (mpg)	13.2	14.5	13.9
Unserved Vehicles (#)	0	0	0
Vehicles in dilemma zone (#)	364	440	804
Performance Index	36.9	39.2	76.1

Network Totals

Number of Intersections	7
Total Delay (hr)	107
Stops (#)	9528
Average Speed (mph)	17
Total Travel Time (hr)	208
Distance Traveled (mi)	3522
Fuel Consumed (gal)	284
Fuel Economy (mpg)	12.4
Unserved Vehicles (#)	0
Vehicles in dilemma zone (#)	884
Performance Index	133.6

S Boulder Rd

Direction	EB	WB	All
Total Delay (hr)	63	48	111
Stops (#)	5093	4238	9331
Average Speed (mph)	16	17	16
Total Travel Time (hr)	114	94	207
Distance Traveled (mi)	1769	1616	3385
Fuel Consumed (gal)	152	128	280
Fuel Economy (mpg)	11.6	12.6	12.1
Unserved Vehicles (#)	0	3	3
Vehicles in dilemma zone (#)	345	276	621
Performance Index	77.3	59.4	136.7

Network Totals

Number of Intersections	7
Total Delay (hr)	186
Stops (#)	12976
Average Speed (mph)	14
Total Travel Time (hr)	308
Distance Traveled (mi)	4268
Fuel Consumed (gal)	396
Fuel Economy (mpg)	10.8
Unserved Vehicles (#)	33
Vehicles in dilemma zone (#)	706
Performance Index	221.8

S Boulder Rd

Direction	EB	WB	All
Total Delay (hr)	23	22	45
Stops (#)	2876	2797	5673
Average Speed (mph)	20	24	22
Total Travel Time (hr)	56	66	122
Distance Traveled (mi)	1142	1559	2701
Fuel Consumed (gal)	82	96	179
Fuel Economy (mpg)	13.9	16.2	15.1
Unserved Vehicles (#)	0	0	0
Vehicles in dilemma zone (#)	281	291	572
Performance Index	31.3	29.5	60.8

Network Totals

Number of Intersections	7
Total Delay (hr)	98
Stops (#)	8776
Average Speed (mph)	18
Total Travel Time (hr)	199
Distance Traveled (mi)	3548
Fuel Consumed (gal)	273
Fuel Economy (mpg)	13.0
Unserved Vehicles (#)	0
Vehicles in dilemma zone (#)	649
Performance Index	122.2

S Boulder Rd

Direction	EB	WB	All
Total Delay (hr)	46	43	88
Stops (#)	5517	4269	9786
Average Speed (mph)	18	18	18
Total Travel Time (hr)	96	89	185
Distance Traveled (mi)	1761	1616	3377
Fuel Consumed (gal)	142	125	267
Fuel Economy (mpg)	12.4	12.9	12.6
Unserved Vehicles (#)	3	3	6
Vehicles in dilemma zone (#)	352	293	645
Performance Index	60.9	54.6	115.5

Network Totals

Number of Intersections	7
Total Delay (hr)	165
Stops (#)	13607
Average Speed (mph)	15
Total Travel Time (hr)	287
Distance Traveled (mi)	4291
Fuel Consumed (gal)	387
Fuel Economy (mpg)	11.1
Unserved Vehicles (#)	35
Vehicles in dilemma zone (#)	719
Performance Index	202.5

S Boulder Rd

Direction	EB	WB	All
Total Delay (hr)	45	44	90
Stops (#)	3665	4177	7842
Average Speed (mph)	16	18	17
Total Travel Time (hr)	84	92	176
Distance Traveled (mi)	1355	1667	3022
Fuel Consumed (gal)	112	128	240
Fuel Economy (mpg)	12.1	13.1	12.6
Unserved Vehicles (#)	0	9	9
Vehicles in dilemma zone (#)	407	496	903
Performance Index	55.5	56.1	111.6

Network Totals

Number of Intersections	7
Total Delay (hr)	162
Stops (#)	11307
Average Speed (mph)	14
Total Travel Time (hr)	275
Distance Traveled (mi)	3927
Fuel Consumed (gal)	354
Fuel Economy (mpg)	11.1
Unserved Vehicles (#)	57
Vehicles in dilemma zone (#)	995
Performance Index	193.8

S Boulder Rd

Direction	EB	WB	All
Total Delay (hr)	104	95	200
Stops (#)	5875	4966	10841
Average Speed (mph)	12	13	13
Total Travel Time (hr)	160	150	311
Distance Traveled (mi)	1960	1930	3890
Fuel Consumed (gal)	195	181	376
Fuel Economy (mpg)	10.0	10.7	10.3
Unserved Vehicles (#)	126	237	363
Vehicles in dilemma zone (#)	446	410	856
Performance Index	120.8	109.0	229.8

Network Totals

Number of Intersections	7
Total Delay (hr)	333
Stops (#)	14995
Average Speed (mph)	10
Total Travel Time (hr)	473
Distance Traveled (mi)	4896
Fuel Consumed (gal)	543
Fuel Economy (mpg)	9.0
Unserved Vehicles (#)	687
Vehicles in dilemma zone (#)	947
Performance Index	374.6

S Boulder Rd

Direction	EB	WB	All
Total Delay (hr)	32	34	66
Stops (#)	3986	3835	7821
Average Speed (mph)	19	20	20
Total Travel Time (hr)	70	81	152
Distance Traveled (mi)	1330	1667	2996
Fuel Consumed (gal)	104	117	221
Fuel Economy (mpg)	12.7	14.2	13.5
Unserved Vehicles (#)	9	4	13
Vehicles in dilemma zone (#)	318	336	654
Performance Index	43.3	44.4	87.7

Network Totals

Number of Intersections	7
Total Delay (hr)	143
Stops (#)	11399
Average Speed (mph)	16
Total Travel Time (hr)	256
Distance Traveled (mi)	3975
Fuel Consumed (gal)	342
Fuel Economy (mpg)	11.6
Unserved Vehicles (#)	88
Vehicles in dilemma zone (#)	744
Performance Index	174.3

S Boulder Rd

Direction	EB	WB	All
Total Delay (hr)	98	82	180
Stops (#)	16999	4802	21801
Average Speed (mph)	13	14	13
Total Travel Time (hr)	154	137	290
Distance Traveled (mi)	1947	1930	3877
Fuel Consumed (gal)	274	170	444
Fuel Economy (mpg)	7.1	11.4	8.7
Unserved Vehicles (#)	125	170	295
Vehicles in dilemma zone (#)	325	319	644
Performance Index	145.3	95.0	240.3

Network Totals

Number of Intersections	7
Total Delay (hr)	316
Stops (#)	26211
Average Speed (mph)	11
Total Travel Time (hr)	457
Distance Traveled (mi)	4934
Fuel Consumed (gal)	617
Fuel Economy (mpg)	8.0
Unserved Vehicles (#)	659
Vehicles in dilemma zone (#)	726
Performance Index	388.5

Scott Robinson

From: Scott Belonger <sbelonger@lorisandassociates.com>
Sent: Thursday, October 29, 2015 1:28 PM
To: Scott Robinson
Subject: RE: South Boulder Road Small Area Plan

Sounds great! Although I am interested in seeing the Main St intersection realigned, my greatest interest is an underpass at Via Appia/Cottonwood Park! I bike and walk this corridor many times per week. Although I have seen several possible locations mentioned as possibilities for an underpass, this location is BY FAR the most appropriate location for an underpass in this corridor. Once the new trail map / wayfinding system is implemented and the proposed North Drainage and SH 42 / Hecla underpass come on line, this is going to be an even more critical location for an underpass. I don't think people fully appreciate what a significant trail corridor this will be in the future. I am very glad to hear that this location is being closely considered for an underpass. I hope to find ways to get involved and further promote this project in the future. I think an underpass at Cottonwood Park is also an IDEAL candidate for funding through DRCOG or other sources. Thanks for the info. –scott

Scott Belonger, P.E.

Loris and Associates, Inc.

Ph: 720.974.5603

From: Scott Robinson [mailto:scottr@louisvilleco.gov]
Sent: Thursday, October 29, 2015 1:14 PM
To: Scott Belonger
Subject: RE: South Boulder Road Small Area Plan

Scott,

Council directed us to not explore realigning Main to meet up with Centennial, so that will not be discussed. We will be looking at geometric changes at most of the intersections to improve operations and the pedestrian experience. Right now we are focusing on an underpass at Via Appia/Cottonwood Park with the possibility of exploring other locations.

Thanks

Scott Robinson, AICP

Planner II

City of Louisville

303-335-4596

scottr@louisvilleco.gov

From: Scott Belonger [mailto:sbelonger@lorisandassociates.com]
Sent: Wednesday, October 28, 2015 9:04 PM
To: Scott Robinson
Subject: RE: South Boulder Road Small Area Plan

Thanks for the response. I know how everything seems to come together right before the meeting! If I can't make it, I will watch for the postings after.

I am especially interested in the location of possible future underpasses beneath South Boulder Road and reconfiguration of the Main Street / SBR intersection. Will these items be part of the discussion?

From: Scott Robinson [mailto:scottr@louisvilleco.gov]
Sent: Wednesday, October 28, 2015 5:34 PM
To: Scott Belong
Subject: RE: South Boulder Road Small Area Plan

Scott,

We are still working on the drawings, and probably will be right up to the meeting. We will, however, post them on the website and accept additional comments after the meeting. Or we will have hard copies available in City hall for review. I hope you'll give us your feedback even if you can't make the meeting. Please let me know if you have any more questions.

Thanks

Scott Robinson, AICP

Planner II

City of Louisville

303-335-4596

scottr@louisvilleco.gov

From: Scott Belonger [mailto:sbelonger@lorisandassociates.com]
Sent: Wednesday, October 28, 2015 11:10 AM
To: Scott Robinson
Subject: South Boulder Road Small Area Plan

Scott, Are any of the displays that will be used in next week's meeting available prior to the meeting. Not sure that I can make it but I would definitely like to see what options are being considered. If I can make it, I'd like to show up with some ideas. Please let me know. Thanks! -scott

Scott Belonger, P.E.

Associate Principal

~~~~~~~~~~~~~~~~~~~~~~~~~

L O R I S

Loris and Associates, Inc.

818 W. South Boulder Road, Suite 200

Louisville, CO 80027

Ph: 720.974.5603

Fax: 303.444.0611

http://www.lorisandassociates.com
~~~~~~~~~~~~~~~~~~~~~~~~~

Scott Robinson

From: Linda Abrams <lindadba@msn.com>
Sent: Sunday, November 22, 2015 2:56 PM
To: Scott Robinson
Subject: s boulder plan

I see nothing wrong with the King Soopers shopping area. Leave it alone.

The Alfalfa's area probably could use a few nice shops or dining options. I cannot figure out why a 3-4 story apartment building is being built there creating more traffic and more people whining about train horns!

Linda Abrams
415 Fairfield Ln

Memorandum

To: Scott Robbinson

From: Scott Belonger, Patsy McEntee, 697 Fireside Street

Date: 12/1/2015

Re: South Boulder Road Small Area Plan Transportation Improvements

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Thank you for this opportunity to provide comments regarding the South Boulder Road Small Area Plan. We are excited to live in a community that is willing to challenge themselves to create a new vision of what this community could be. The confidence and high expectations that have developed in our community in the recent years is truly energizing. We hope to further challenge our city planners, councilpersons, and residents to think big, **envision the ideal solutions** and pursue, develop and fund the **best plan possible**.

We have reviewed the information presented at the South Boulder Road Place- Making Workshop #3 on November 5, 2015. We are encouraged by what we see in the materials presented. We would like to offer some additional thoughts, primarily focused on the "Transportation Improvement Alternatives" display.

GENERAL DISPLAY PRESENTATION COMMENT

It would be helpful if the display would graphically differentiate between:

a. Existing facilities to remain in-place as part of the plan.

b. Existing facilities to be improved (sidewalks widened, roadway separation increased, intersections to be improved, etc.).

c. New facilities to be developed.

IMPROVEMENT PRIORITIES

Below is a list of recommended transportation listed in order of importance.

(1) Establish an east-west pedestrian focused corridor to be used as an alternative to South Boulder Road.

Need:

The need for this is two-fold. Firstly, this would provide a much more pleasant and safe user experience for users of the alternative corridor. Secondly, it would improve the vehicle capacity and function of the signalized intersections on South Boulder Road. Although

pedestrians are not currently a significant factor at the intersections, if pedestrian activity increases as part of this overall plan, heavy pedestrian volumes at the SBR intersections may reduce vehicle capacity.

Implementation:

This alternative corridor can be established relatively easily by utilizing portions of the existing and currently planned future trail system (the soon to be named Goodhue Trail & Lake to Lake Trail) located north of the SBR.

For this alternative corridor to be effective, it must provide a main-line trail alignment that is as **efficient and direct** as possible and be well connected to destinations along the route. To achieve this, the following improvements should be pursued. These are listed in order of significance to achieve the objective:

(a) Construct an underpass beneath the BNSF rail line at a location aligned/parallel with planned Hwy 42 underpass.

The currently planned "North Drainage Underpass" is approximately 1700 feet north of this location, requiring a total of 0.64 miles of out of direction travel if it is to serve this suggested alternative east/west corridor. This more than doubles the distance between Centennial Drive and Louisville Plaza, making it much less likely to be used as a pedestrian route between areas west and east of the BNSF. The North Drainage Underpass should be scaled back to focus on drainage only if needed to allow development of an **underpass at this location to effectively serve this alternate pedestrian corridor.** This underpass certainly represents a significant challenge and cost but is the single most critical aspect establishing an effective alternative pedestrian corridor.

The ideal crossing from a user connectivity standpoint would be to stay aligned with current trail alignments that occur along and/or aligned with the Davidson Highline Ditch. An underpass at this farther south location will allow the maximum number of users to access connections to the South (Downtown) and to the East (Waneka and King Soopers Center).

(b) Construct an underpass beneath South Boulder Road, east of Via Appia Way at Cottonwood Park.

The underpass shown for consideration at Via Appia should be pursued as a priority. This will provide a critical connection and improvement to the Goodhue / Lake to Lake trails.

(c) Provide a new connection between the existing trail and Village Square.

(d) Provide additional neighborhood connections along the existing undeveloped city-owned irrigation / drainage/utility ROW corridors to the north and west of the study area.

(e) Plan for a woonerf or other improved pedestrian connection through the Balfour development to Louisville Plaza.

If the Louisville Plaza is redeveloped, as shown in other displays in the Small Area Plan, a primary pedestrian access point oriented toward the north, through the Balfour development would greatly improve the overall connectivity and strength of the alternative east-west corridor.

(2) Provide improved north/south pedestrian connectivity between the Goodhue / Lake to Lake Trail and the SBR / Main Street Intersection.

Need:

The Goodhue / Lake to Lake Trail and Main Street are two significant destinations in close proximity, with poor quality pedestrian connection between them. Existing sidewalks are narrow (4 feet to 6 feet), in poor condition and overgrown with vegetation. This would also provide improved connectivity to the SBR / Hwy 42 intersection, which is currently 8' wide east of the railroad tracks, but 6 feet wide or less between Centennial Drive and the tracks.

Implementation:

A trail and/or improved sidewalk, with a minimum of 8 foot width and 5 foot separation from existing roadways should be developed between the existing Goodhue / Lake to Lake trails and the SBR / Main Street intersection. This could be done in any of three locations. The preferred location would be adjacent to the railroad tracks. However, technical challenges and property ownership issues may make this location prohibitive. The next best location would be on the west side of Centennial Drive, to line up with the existing crosswalk at the Centennial Drive / SBR intersection. The third option would be at the east side of Centennial Drive.

(3) Provide Dedicated Pedestrian Access to Louisville Plaza.

Need:

There is currently NO dedicated pedestrian access between the existing sidewalks along SBR and Hwy 42 and the Louisville Plaza. Any pedestrian wishing to access any of the businesses in the Louisville Plaza must enter the relatively narrow vehicular access drives until getting into the parking lot. It is assumed that this will be corrected if the area is redeveloped. However, the current configuration is so inadequate that an interim solution should be provided.

Implementation:

Curb ramps should be provided at multiple locations providing dedicated pedestrian access between the existing sidewalks and safe locations within the parking lot (away from vehicle access points).

(4) Provide Improved Transit Stops.

Need:

South Boulder Road is a significant transit route for both the DASH and Route 228. Route 228 will become a more important route as the BRT service to Denver comes on line soon. Existing transit stops on SBR are minimal at best and do not include any bike parking/storage facilities. Transit should become a more visible and celebrated element of the overall transportation system on SBR.

Implementation:

Improved transit stops should be developed and should incorporate high quality aesthetic treatments similar to other facilities within the City. Bike parking should be provided, as should weather protection for transit users. Artistic treatments are a civic enhancement that contributes to community, sense of place, and desire to use those facilities and landscapes. **Our treatment of transit stops should symbolize a level of respect for transit as a transportation mode and not appear to be an afterthought**, or bare minimum level of treatment required to provide basic access to those restricted to transit. A high-level transit treatment should be incorporated into the Cottonwood Park / Via Appia underpass design. This transit stop is heavily used and should be treated as a public amenity.

CONFIDENTIAL

LEGEND

Additional improvements

Potential new connection and/or improved connection

U Potential Underpass

South Boulder Road Small Area Plan

Additional Comments by
Scott Belonger & Patsy McEntee
697 Fireside St Louisville

Scott Robinson

From: Justine Vigil-Tapia <jvigilt@gmail.com>
Sent: Thursday, November 19, 2015 8:31 PM
To: Scott Robinson
Subject: Small Area Plan (South Boulder Road) Feedback

Hi Scott,
I favor Louisville Plaza #1 and Village Square #1. Louisville Plaza 1 looks like a nice balance of building to open/public space area.

Transportation is definitely a big concern. Can't really tell from the plan how walkable or easily accessible (or safe) it will be to get from west side of 42 to east side? I live in old town and mostly shop at King Soopers. I would love to walk or ride my bike safely to Kings.

Don't know what a solution would look like but coming out of Walgreens/Alfalfas onto South Boulder Road requires cars to come across the sidewalk and as we get more peds/bikes using the sidewalk it creates unsafe situations for all. The fiscal impact seems too great with the 3-story scenario (too many units, people).

Regards, Justine

Scott Robinson

From: Marianne Gibbs <marianne.gibbs@comcast.net>
Sent: Friday, November 20, 2015 12:36 PM
To: Scott Robinson
Subject: RE: South Boulder Road small area plan

Thank you for getting back! I'm glad to hear there was some conversation surrounding this point… And really appreciate your response.

An over/underpass from Old Town (whether it's at Main/LaFarge/Jefferson or Griffith across 96, then…toward that new farm area??? Have we exhausted the possibilities?…) …kind of makes or breaks the decision to take the car vs use the bicycle… for grocery and errands.

If any way possible, would love, love, love to improve walkability, bike-ability to tie the travel to/fro grocery shopping and other shopping (not to mention school and school programs) at South Boulder/96th to Old Town residence base….at same time tying in all new housing north of South Boulder Rd to Old Town events, restaurants and shopping without need for car….

Hmmmmmm, gotta be a way…. If not now, when?

Is there discussion on the City website outlining the un-surmountables? Or discussion on this?

Many thanks again,

~ Marianne

…improved cross walk….well, better than nothing, …right direction, but probably not sufficient for serious errand running via bikes… Are improved bike lanes in the works?…biking on Main Street sometimes scary w/ buses, car doors, etc… I'm thinking Europe, Scandinavia, Holland, incredible bike-ability, next to no need for cars, solves lots of parking problems, traffic, etc… also makes for great community interaction… still hoping!

From: Scott Robinson [mailto:scottr@louisvilleco.gov]
Sent: Friday, November 20, 2015 12:09 PM
To: 'Marianne Gibbs' <marianne.gibbs@comcast.net>
Subject: RE: South Boulder Road small area plan

Marianne,

Thank you for your comments, we will be sure to include them in the decision-making process. We have looked into an underpass or overpass at Main Street, but neither was feasible at this time with the land and utility constraints in the area. The transportation plan calls for improvements to the crosswalks to make getting across South Boulder Road and Highway 42 easier though. Let me know if you have any more questions.

Thanks

Scott Robinson, AICP

Planner II

City of Louisville

303-335-4596

scottr@louisvilleco.gov

From: Marianne Gibbs [mailto:marianne.gibbs@comcast.net]
Sent: Thursday, November 19, 2015 7:49 PM
To: Scott Robinson
Subject: South Boulder Road small area plan

Hi Scott,

Marianne Gibbs here, old town resident on La Farge.

I didn't see any suggested pedestrian under or over pass proposed or discussed where Main Street, from Old Town, meets South Boulder Road .

Has there been discussion regarding making local travel via bicycle or walk from Old Town area to Alfalfa's or King Sooper's safer? I would love to see a pedestrian/cycle only under or over pass across South Boulder Road. I did see somewhere one being proposed at Via Appia which is lovely, but would much prefer one, or see additional one tie old town near Main Street to grocery areas….

Apologies if this has been detailed already, I may have missed it on the City of Louisville website.

Thank you for all you do,

~ Marianne

Scott Robinson

From: Planning Commission
Sent: Wednesday, February 10, 2016 8:28 AM
To: Scott Robinson
Subject: FW: Adopt S. Boulder Rd Plan

Monica Garland
Senior Administrative Assistant
Planning & Building Safety Division
City of Louisville
Phone: 303.335.4592
Fax: 303.335.4588
monicag@louisvilleco.gov

From: Nick Simpson [mailto:nsimpsonco@msn.com]
Sent: Tuesday, February 09, 2016 10:15 AM
To: Planning Commission
Subject: Adopt S. Boulder Rd Plan

Members of Planning Commission, Please adopt the South Boulder Road Small Area Plan at this week's meeting.

Regarding the 'South Boulder Road Small Area Plan' up before the Louisville Planning Commission.

My Name: Nicholas Simpson
My Address: 884 W Chestnut Circle
Louisville, CO, 80027
Action items:

Scott Robinson

From: Planning Commission
Sent: Wednesday, February 10, 2016 8:28 AM
To: Scott Robinson
Subject: FW: planning commission

Monica Garland
Senior Administrative Assistant
Planning & Building Safety Division
City of Louisville
Phone: 303.335.4592
Fax: 303.335.4588
monicag@louisvilleco.gov

From: sandra aris [mailto:sandra.mary.aris@gmail.com]
Sent: Monday, February 08, 2016 7:54 PM
To: Planning Commission
Subject: planning commission

Members of Planning Commission, Please adopt the South Boulder Road Small Area Plan at tonight's meeting.

--
Warm Regards,

Sandra Aris
Cell: 310 908 8314
915 w chestnut cir
Louisville co 80027

Scott Robinson

From: Planning Commission
Sent: Wednesday, February 10, 2016 8:28 AM
To: Scott Robinson
Subject: FW: planning committee issue

Monica Garland
Senior Administrative Assistant
Planning & Building Safety Division
City of Louisville
Phone: 303.335.4592
Fax: 303.335.4588
monicag@louisvilleco.gov

From: djruffbroker@comcast.net [mailto:djruffbroker@comcast.net]
Sent: Monday, February 08, 2016 9:33 PM
To: Planning Commission
Subject: re: planning committee issue

To the Members of Louisville Planning Commission, - Please adopt the South Boulder Road Small Area Plan at your meeting tomorrow. I have been a citizen and property owner in Louisville since 1985. I am deeply concerned with the amount of growth this city has had in the last several years and hate to see Louisville lose its small town charm. I owe my home here and also have 2 rental properties in Hunter's Ridge which have been easy to rent out due to the awesome amenities of Louisville. I have noticed more and more traffic congestion and accidents and even more crime. I hope you take into consideration that Louisville is a unique awesome place to live and that if you continue to build and build it will lose that charm and be just like most other cities.

I have already purchased and paid for an acre lot on the Dived Ranch golf course in Ridgway CO which I will build on much quicker than planned (and quite easily with the proceeds of my 3 properties in Louisville) if Louisville loses more of its charming small town appeal. Your decision will not only affect the quality of lifestyle here for its residents but also the kind of people you will attract here. I encourage you to temper the growth and maintain the appeal that originally attracted people to this awesome city that I chose to live in after graduating CU business school in 1984. Thank you for your time and consideration. Regards, Donna Ruff
1875 Quail Ct.
Louisville, CO
and also the owner of 103 Pheasant Run and 175 Pheasant Run in Louisville

Scott Robinson

From: Planning Commission
Sent: Monday, February 08, 2016 3:37 PM
To: Scott Robinson
Subject: FW: Small Area Plan

Monica Garland
Senior Administrative Assistant
Planning & Building Safety Division
City of Louisville
Phone: 303.335.4592
Fax: 303.335.4588
monicag@louisvilleco.gov

-----Original Message-----
From: jo emery [mailto:joemery32@gmail.com]
Sent: Monday, February 08, 2016 1:35 PM
To: Planning Commission
Subject: Small Area Plan

Please adopt this plan at your meeting.
Roy and Jo Emery, 650 W. Aspen Way, Louisville.

Scott Robinson

From: Planning Commission
Sent: Wednesday, February 10, 2016 3:10 PM
To: Scott Robinson
Subject: FW: Small Area Plan

Monica Garland
Senior Administrative Assistant
Planning & Building Safety Division
City of Louisville
Phone: 303.335.4592
Fax: 303.335.4588
monicag@louisvilleco.gov

From: Mike Ross [mailto:2mikeross@gmail.com]
Sent: Wednesday, February 10, 2016 2:41 PM
To: Planning Commission
Cc: sherry sommer
Subject: Small Area Plan

Members of Planning Commission,

Please adopt the South Boulder Road Small Area Plan at tomorrow night's meeting.

Best Regards,
Mike & Natalie Ross

Mike Ross
888 S. Palisade Ct.
Louisville, CO 80027

Scott Robinson

From:	Planning Commission
Sent:	Wednesday, February 10, 2016 8:28 AM
To:	Scott Robinson
Subject:	FW: South Boulder Road small area plan - Feb 11 PC Meeting
Attachments:	South Boulder Road SAP_Petition_021116.pdf

Monica Garland
Senior Administrative Assistant
Planning & Building Safety Division
City of Louisville
Phone: 303.335.4592
Fax: 303.335.4588
monicag@louisvilleco.gov

From: James Williams [mailto:jamesmunroewilliams@gmail.com]
Sent: Monday, February 08, 2016 8:17 PM
To: Planning Commission
Subject: South Boulder Road small area plan - Feb 11 PC Meeting

Scott -

Attached is a petition requesting the proposed pedestrian underpass at South Boulder Road/Cottonwood Park to be included in the 1-5 year Schedule in the Recommended Public Improvements (as opposed to 6-10 year). The petition clearly states the reasoning behind this request and is signed by 27 Louisville residents. Additional signatures may be delivered prior to Thursday meeting.

For my personal comments:

Of the three underpasses included in the plan, the South Boulder Road/Cottonwood Park underpass is closest to downtown and provides the much needed benefit of safe pedestrian/bicycle crossing of South Boulder Road. The BNSF underpass, while certainly important, is not even within the South Boulder Road small area plan boundary. In fact, one could argue that the South Boulder Road/Cottonwood Park underpass should be the logical first underpass to be built, as it would allow Louisville connectivity that the other two underpasses would build-on.

Please confirm your receipt of this email and attachment, both of which should be read into public comments this Thursday at the Planning Commission meeting. As of right now, I will not be able to make the meeting, so I am sending in advance.

Appreciate your hard work on this important endeavor to shape the future of South Boulder Road small area with particular attention to the pedestrian/bicycle infrastructure.

Regards,

James Williams

1889 Garfield Avenue

RESOLUTION SUPPORTING THE SOUTH BOULDER ROAD PLANNING STUDY

The undersigned citizens of Louisville support the South Boulder Road Small Area Plan (the "Planning Study") being conducted and the desire to provide our input into the Planning Study and its impact on our neighborhood. THEREFORE,

WHEREAS, safety is the chief priority to the citizens of Louisville when a Planning Study is conducted,

WHEREAS, connectivity of pathways encourages active modes of transportation, use of parks and open space, and ease of access in Louisville,

WHEREAS, street grade crossing on South Boulder Road immediately east of Via Appia involves intersection between major automobile/bus, high density residential area, and active use trails and open space and posing hazards to pedestrians and cyclists,

WHEREAS, safe pedestrian and bicycle access between Cottonwood Park and Centennial Park open space through avoidance of street grade crossing of South Boulder Road is necessary,

NOW THEREFORE, **THE UNDERSIGNED SUPPORT THE SOUTH BOULDER SMALL AREA PLAN REPORT PROVIDED IT INCLUDES THE FOLLOWING TO BE INSTALLED IN THE NEXT 1-5 YEARS:**

1. A fifteen foot (15') wide, underground, pedestrian and bicycle concrete tunnel constructed under South Boulder Road immediately east of Via Appia that connects the north and south side of South Boulder Road via the Cottonwood Park – to – Centennial park greenway path. See Attachment 1.

ATTACHMENT 1

THE FOLLOWING ARE IN SUPPORT OF THIS RESOLUTION:

Name	Louisville Street Address
Eric J Davila	1903 Garfield Ave
Stephanie Navarez	1903 Garfield Ave
Robin Hayes	364 peerless St.
Craig Hayes	366 Peerless St
Mary Schmitt	348 Peerless St.
GEORGE GRAHAM	324 PEERLESS ST.
Paul Pauly	307 Peerless St.
[illegible]	1889 Garfield Ave.
[illegible]	1846 Garfield Ave
[illegible]	1846 Garfield Ave.
[illegible] W. Chance	2015 Strathmore St.
[illegible]	2062 Strathmore St.

THE FOLLOWING ARE IN SUPPORT OF THIS RESOLUTION:

Name	Louisville Street Address
[illegible]	1889 Garfield Ave
[illegible]	348 Peerless
[illegible]	1865 Garfield Ave.
Jeff A. [illegible]	1850 Garfield Ave.
Daniel [illegible]	1850 Garfield Ave
[illegible]	1808 Garfield Avenue
Jamie Rhodes	493 Fireside St.
[illegible]	509 FIRESIDE ST.
[illegible]	225 W South Boulder Rd
Rhonda [illegible]	690 Fireside St
Kathy Martella	638 Fireside St.
[illegible]	494 FIRESIDE ST.

THE FOLLOWING ARE IN SUPPORT OF THIS RESOLUTION:

Name	Louisville Street Address
Chris Esser	2016 Strathmore St
Ross Davis	1948 Strathmore ST
Charles Oliver	231 S Madison Ave
Andrew Nicholson	388 Peerless St
Barbara Nich	388 Peerless St. Louisville

Scott Robinson

From: Planning Commission
Sent: Thursday, February 11, 2016 9:38 AM
To: Scott Robinson
Subject: FW: South Boulder Road Small Area Plan

Monica Garland
Senior Administrative Assistant
Planning & Building Safety Division
City of Louisville
Phone: 303.335.4592
Fax: 303.335.4588
monicag@louisvilleco.gov

From: Doris Ostrander [mailto:dorishostrander@gmail.com]
Sent: Thursday, February 11, 2016 8:11 AM
To: Planning Commission
Subject: South Boulder Road Small Area Plan

Members of Planning Commission, please adopt the So. Bldr. Road Small Area Plan at tonight's meeting.

Doris Ostrander
598 Ridge View Dr.

Scott Robinson

From: Scott Belonger <sbelonger@lorisandassociates.com>
Sent: Thursday, February 11, 2016 1:59 PM
To: Planning Commission; Scott Robinson
Subject: South Boulder Road Small Area Plan Comments
Attachments: SOBORO SMP ~ SJB Comments.pdf

I have reviewed the latest version of South Boulder Road Small Area Plan and would like to reiterate comments that I have made previously that have not been incorporated into the plan. The numbered comments below relate to the numbered items in the attachment.

1. The current 4' sidewalk along Centennial Dr. between the trail and South Boulder Road should be widened to 10' to provide a trail/shared use path connection between the existing trail and South Boulder Road / Main Street.

2. A connection should be provided between the Village Shopping Center and the trail.

3. The proposed underpass beneath the BNSF RR should be located to be aligned with the existing trail near Fireside St. and the proposed underpass at SH 42.

4. A trail connection should be added to the existing public right of way as shown in the attachment. Although this is not shaded green in the attachment, it is all City of Louisville right of way and is an excellent opportunity for an additional trail to improve connectivity in this area. I realize that it slightly outside of the study area. However, the plan does include other new trails outside of the study area.

5. The plan shows an existing trail along the east side of the BNSF RR through Steel Ranch. There is no trail or sidewalk in this area so it should not be shown as an existing trail in the map.

Scott Belonger, P.E.

Associate Principal

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L O R I S

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THE PLAN

The trail improvement plan includes proposed new trails in and around the corridor, including expanded sidewalks along South Boulder Road. The plan also shows recommended locations for new or enhanced crosswalks and underpasses, including the two already in process under Hwy 42/96th Street and the BNSF railroad, plus a new one near South Boulder Road and Via Appia at Cottonwood Park.

Trails Improvement Plan

ADDITIONAL NEW TRAILS

(X) – KEYED NOTES.

City of Louisville
COLORADO • SINCE 1878

Planning Commission
Meeting Minutes
February 11, 2016
City Hall, Council Chambers
749 Main Street
6:30 PM

Call to Order: Pritchard called the meeting to order at 6:30 PM.

Roll Call was taken and the following members were present:

Commission Members Present:	Chris Pritchard, Chairman
	Cary Tengler, Vice Chairman
	Steve Brauneis
	Jeff Moline
	Tom Rice
	David Hsu
Commission Members Absent:	Ann O'Connell, Secretary
Staff Members Present:	Sean McCartney, Principal Planner
	Scott Robinson, Planner II

Approval of Agenda:
Moline moved and **Hsu** seconded a motion to approve the February 11, 2016 agenda. Motion passed by voice vote.

Approval of Minutes:
Brauneis moved and **Moline** seconded a motion to approve the January 14, 2016 minutes as prepared by staff. Motion passed by voice vote.

Public Comments: Items not on the Agenda
None heard.

Regular Business – Public Hearing Items

- **South Boulder Road Small Area Plan:** A request to review a draft copy of the South Boulder Road Small Area Plan.
  - Staff Member: Scott Robinson, Planner II

Emails entered into the record: **Tengler** moved and **Brauneis** seconded the motion to enter emails into the public record. Motion passed by unanimous voice vote.

Conflict of Interest and Disclosure:
None.

Public Notice Certification:

This is a legislative act and does not have the same public notice requirements as usual quasi-judicial applications. Staff posted signs along South Boulder Road and posted notice on City website. Agenda posted per regulations and email sent to email distribution list.

Staff Report of Facts and Issues:
Robinson presented from Power Point:

- Staff has worked on Small Area Plan since October 2013 and presents a draft plan for the PC to review.
- What is a Small Area Plan? The Comp Plan updated in 2013 is a city-wide policy document. What is built on the ground is controlled by zoning and design guidelines. To go from the Comp Plan to zoning and design guidelines, Staff uses the small area planning process. It takes the big ideas from the Comp Plan and translates them into one specific area, such as the South Boulder Road area. Out of this, Staff will create the zoning and design guidelines that will then create the built environment the community wants to see. The South Boulder Road study area includes both sides of South Boulder Road from Via Appia on the west to the city limit at Lafayette on the east, and along Highway 42/96th Street to the city limit at Paschal on the north.
- Three big questions in the Small Area Plan are:
    - What are desired land uses for the corridor?
    - What are the preferred physical character design guidelines for the corridor?
    - What are the public infrastructure priorities and public investment needed?

There are some public investment items called out in the plan, but for the most part, this sets design guidelines or parameters for design guidelines that will control private development. Staff will present some drawings and renderings, but these are to give the PC an idea of what these guidelines would produce. The City is not proposing to tear down any buildings or build any new buildings. Staff is putting the guidelines in place so that when and if areas develop or redevelop, they will be built with the character and design that the community wants to see.

- Project Schedule:
    - October 2014 – Kick-off Meeting (talked about general goals for the plan)
    - January 2015 – Walkability Audit and first Placemaking Workshop #1 (looked at transportation, walking, and biking issues)
    - February 2015 – Placemaking Workshop #2 (looked at different sites in the corridor and asked what people would or would not like to see on the sites)
    - November 2015 – Placemaking Workshop #3
        - Development scenarios
            - 1 story
            - 2 story
            - 3 story
        - Urban design elements
        - Roadway improvements

We took the outcome of the November 2015 meeting and all public comments received through the planning process (including the survey done in late 2014 and early 2015) and used it to create the preferred alternative which is the basis for the Draft Plan presented tonight. In general, the Plan has six sections:

- **Introduction**
- **Process**
- **Context**
- **Project Principles**
    1. Provide for safer and more convenient connections across South Boulder Road and Highway 42 for bikes and pedestrians.

2. Utilize policy and design to encourage desired uses to locate in the corridor.
3. Establish design regulations to ensure development closely reflects the community's vision for the corridor while accommodating creativity in design.
4. Mitigate impacts of trains and improve safety of railroad crossings.
5. Balance the regional traffic needs of South Boulder Road and Highway 42 with the community's desire for safety and accessibility.
6. Provide for community gathering spaces and public infrastructure to encourage visitors to spend time in the corridor.

- **The Plan**
  - Community Design Principles.
    - Go To and Stay at Places
      - Public spaces that encourage gathering and interaction
      - A range of retail and entertainment uses that encourage longer visits
      - Small parks and plazas that increase the appeal and experience of daily activities
    - Easy to get to, easy to get around
      - Safe grade separated trail connections to all quadrants
      - Properties connected with driveways and walks
      - A street network that offers balanced choices to move around
      - Opportunities to "park once and walk"
    - A Zipper not a barrier
      - Sidewalks and plazas facing onto South Boulder Road
      - Safe intersections that allow people to cross South Boulder Road and Highway 42
      - Traffic flow/speed that is not detrimental to businesses or people along the corridor
      - A continuous and connected high quality pedestrian experience
    - Development that Contributes
      - To be defined by the community
        - Greenspaces
        - Housing choices
        - New trail connections
        - Semi-public gathering spaces
  - Placemaking Concepts.
    - Transitional Street
    - Pedestrian Refuges
    - Views into the Community
    - Parking Rooms
  - Urban Design Plan. (current zoning land uses)
  - Street Improvements. Additional signal at Cannon and Kaylix on South Boulder Road. Staff had a transportation consultant look at it. There are benefits and drawbacks. The signal can work from a traffic perspective but will cause additional delay, and timing will be tight. If there is an accident, there could be a breakdown of these intersections and significant delays. On the other hand, it provides additional access to developments on either side. It will be easier and safer to make turns off South Boulder Road into developments. It will provide a parallel connection to Highway 42 so traffic can move from north to south without accessing Highway 42. Proposed Kaylix will connect to Baseline in the north and to the DELO project in the south. It will provide a safe pedestrian crossing with a new signal. There are two other signals planned that are included in the Highway 42 Gateway Plan adopted a few years ago. One is at Hecla and the other is at Cannon Circle on Highway 42. There are also new proposed public streets at the

new Coal Creek Station development and the extension of Kaylix through the Kestrel development, which includes the middle portion of Kaylix. The northern portion extends through the RV Storage currently there. The City has an easement through the Christopher Plaza development that would be turned into a full street. Currently, the road at Steel Street goes into the North Main Apartments as a right-in. Staff is proposing some modifications of the Main Street intersection to turn it into a right-in / right-out. Drivers can get from Steel Ranch to South Boulder Road without going out to Highway 42. There are dash lines which represent connections that may not be public streets but private streets or public easements through existing or new developments. They create an opportunity to move through the corridor easier to get to these developments.

- Trail Improvements. Staff suggests new trails and sidewalk improvements which include widening or improving the sidewalk along South Boulder Road and Highway 42 where there is room. In some places, there is no room, especially along the south side. Staff is proposing a new trail connection parallel to South Boulder Road. For people not comfortable walking or riding a bike along South Boulder Road, there will be a parallel connection to move east to west through the corridor without having to be on South Boulder Road. Staff is proposing three underpasses. Two are already planned; one on Highway 42 at the Kestrel/North End development north of Hecla and one under the railroad at Bullhead Gulch connecting Centennial Drive to Steel Ranch. A new third underpass is proposed at Via Appia and Cottonwood Park to create a better connection across South Boulder Road. Staff has looked at other places because the public mentioned better crossings of South Boulder Road. The only place one would work was at Main Street which involved the realignment of Main Street to line up with Centennial. City Council directed Staff to not pursue this any further. Without the Main Street realignment, there was no room to put in an underpass.
- Roadway Improvements. Staff is proposing to take out acceleration/deceleration lanes and make other geometric improvements. We are putting in pedestrian refuges in the center island to make it safer, easier, and more comfortable to cross South Boulder Road. The Santilli property located the far southeast portion of South Boulder Road is currently zoned commercial, and the plan has it remaining commercial. It is long, narrow, and separated from other developments in town, so it is not a great site for commercial development. I spoke with the Open Space Advisory Board (OSAB) last night and brought this item up. They said it does have potential for public land, whether as open space, other park space, or some utility use with drainage improvements. OSAB will consider putting it on their priority acquisition list. This South Boulder Road Plan says to consider this land for open space acquisition if and when it becomes available based on comments from OSAB last night.
- Building Heights. Three alternatives were 1 story, 2 story, and 3 story. The public said they don't like the idea of 3 story buildings along South Boulder Road and Highway 42. Staff is proposing 1 story buildings fronting the street with the option of going to 2 stories if they meet certain conditions such as not creating additional shadows on adjoining properties, not blocking views, meeting fiscal performance requirements, and additional benefits to the public realm and design benefits.
- Urban Design Elements. Staff presents a conceptual diagram of Village Shopping Center showing what redevelopment could look like under the proposed guidelines. Staff proposes a variety of building types and styles, active pedestrian plazas, 10-20 foot setbacks, parking between buildings, views into the development, wide sidewalks with landscaping, no consistent street wall, and a mix of hard and soft landscaping. Staff presents a conceptual diagram of

Louisville Plaza/King Soopers. Staff proposes a mix of pedestrian and auto-oriented design, varied 1-2 stories along the arterial, green spaces within the development, connections into the development, varied 2-3 stories within the development, a series of smaller building footprints, connections between developments, break up of larger parking lots, and creation of an internal network.

- **Implementation**
  - Draft and adopt design standards and guidelines
  - Timeline
  - Cost estimates to be given in ranges

Commission Questions of Staff:
Brauneis says we have looked at a number of the elements of this plan in the past. Can you clarify what Staff is looking for?
Robinson says we are looking for the PC to adopt a resolution recommending approval of the plan to City Council (CC). If there are changes or recommendations requested, the PC can give the direction to Staff who will come back at the March PC meeting with the changes so it can be adopted. It will then go to CC and additional public hearings. Anyone thinking they were not adequately heard tonight, or still have concerns, can come to the CC meetings.
Pritchard says Staff is also looking for additional direction regarding signalization of Cannon and South Boulder Road.
Moline asks about the cost estimates. I am weighing the challenge of approving a plan without cost estimates.
Robinson says Staff does not have them ready yet. If the PC is not comfortable approving without them, we will have them by the March meeting.
Moline says at one of the early public meetings, there was some cost analysis done on some of the alternatives.
Robinson says Staff did the fiscal analysis. This is about ranges of cost for actual public improvements. We are calling for an additional underpass and want to know generally how much will that cost. Also included will be street improvements, infrastructure improvements, and new trails and sidewalks.
Rice says on page 29, there is a plan impact analysis. Traffic impact is discussed. There is a matrix listed that shows the change in travel times with and without Kaylix. The information shows westbound traffic will be quicker with Kaylix signal than without.
Robinson says the signal timing going west, travel time actually goes down in the am. For the other directions, the overall travel time increases.
Hsu asks if any of the new streets are dependent on the traffic signal?
Robinson says no. Staff is recommending the streets with or without the Kaylix signal. The streets have benefits even if the signal is not installed.
Rice says the Main Street railroad crossing and the South Boulder Road configuration as it currently exists is pretty complex. The Steel Street entrance will move entering traffic from the north. How will that work?
Robinson says the reason it was designed as a right-in was because there was concern about cars coming out and cutting across South Boulder Road to make a left onto Main Street. Staff wanted to prevent that movement. Staff is now proposing putting in a raised median between the left turn lane and the west bound through lane and extending it all the way back to Steel Street. A driver would be physically prevented from cutting across to make the left turn. With this improvement, it will be safe to include that connection. It will be necessary to make the changes on Main Street so drivers can't make the weave movement across South Boulder Road.
Hsu asks about the traffic light at Kaylix. If the City does not install it now, are there impacts to deciding later?

Robinson says no. The signal timings are different. Our traffic engineer has recommended signal timing to optimize traffic without the signal. If the signal is installed, timings would be adjusted. There is nothing to prevent the signal to be installed in the future.
Rice asks about the impact analysis on page 29, listing development impact and fiscal impact. Regarding development impact, as I read it, it gives us a synopsis of what currently exists in terms of what has been built out. It says what is projected over the next 20 years based on what could be built given the zoning that exists now.
Robinson says yes, with the existing allowed uses and then assuming these design guidelines are adopted.
Rice says that existing development is 407 residential units but then it shows an additional 546 potential residential units. Where are these 546 units? Does this include Kestrel? A good portion has already been approved, correct?
Robinson says it includes Kestrel development, Coal Creek Station development, the Foundry development, the proposed North End Marketplace development, the Centre Court apartments, and a few currently zoned residential that are undeveloped.
Rice says generally, this summary says that net fiscal impact is positive. The only negative is in the area of capital projects fund of about $5 million. What is that?
Robinson says the way the model works is that for every new resident and employee projected, it assumes additional impact on capital facilities such as city buildings (City Hall, Rec Center, and Police building). It is streets, trails, parks, and open space. The model is a marginal cost model. It has incremental costs so if it projects enough new people to trigger a new park, it then adds the cost of the new park to the model. With the new residents and employees projected in the first table, it says we will need to make these capital improvements to keep our current level of service with our capital facilities. After we got the model adopted and we saw most developments end up with this capital deficit, it is supposed to be offset by the impact fees we charge. One of the things highlighted is we may need to update our impact fees. We will look at that in the next couple years and do a new impact fee study, and we may raise the impact fees. It should balance that out the capital deficit we see in proposed developments.
Rice says we are talking about capital impact city-wide. The capital costs of these improvements such as underpasses, are they included in any of this?
Robinson says not specifically. The model uses existing levels of service to project estimated capital costs. It doesn't have specific projects. Some of the improvements recommended here are to improve the level of service such as new trails and a new underpass. It would be considered enhanced level of service. Those are costs not necessarily derived from any additional development. They are costs from existing residents.
Moline asks what would that money be, and what are some of the things it might pay?
Robinson says the general fund mostly goes towards operational expenses such as staff salaries, daily running costs, utilities, and roads.

Public Comment:
Suzanne Brandler, 1609 Cottonwood Drive, #11, Louisville, CO
Looking at the traffic along South Boulder Road, does the police get to comment on this plan? Does the Fire Department get to comment and review it? I live close to South Boulder Road and I hear sirens and emergency vehicles. I want to make sure they get a chance to look at it.
Pritchard says the Police Department, the Fire Department, and basic staff such as Public Works are notified. We have not received anything from the Police Department on this matter. Have we seen a surge in traffic accidents along this corridor?
Robinson says no, I am aware of any.

John Leary, 1116 Lafarge Avenue, Louisville, CO
I want to talk about what City Council said about land uses in this area. I heard them say that they did not want additional residential. This plan has the Special Review Use (SRU) provision for residential at Village Square and part of North End along South Boulder Road. The SRU

process comments were from Jeff Lipton when he was Chairman of the PC regarding the first Safeway proposal. He criticized having SRU as a planning process. When SRU is mentioned, it's maybe we'll do this and maybe we won't at some time in the future. It gives no certainty to the public and it gives no certainty to anyone interested in development. They may withhold development if the promise of something may happen eventually. The main message from the public in this process was about connectivity across South Boulder Road. It may be impossible to do an underpass and I don't know how deeply it has been examined. There is another option that may not be visibly attractive but an overpass is a possibility. I don't think that can be dismissed as technically unfeasible. The #1 priority of the public is connectivity, especially residents who live north of South Boulder Road. Looking at the traffic estimates, they are actually underestimated because time is added to the existing situation. This is a 20 year plan and by 2035, there will be more traffic. When you add traffic, it is not linear. You get more delays when you add traffic. It would be good to get an idea of traffic levels for 2025. Regarding the current Highway 42 plan, there are some goals and principles about traffic. The goal is to move traffic through there as quickly as possible. The Highway 42 plan does not do that. There were trade-offs in terms of how it is constructed with lights and speeds that do not move cars through as quickly as possible. The financial analysis is lacking some detail and documentation so it is hard to look at. I appreciate the comments you brought up because if none of those capital projects are in there and that surplus is long gone. Doing the 20 year projection ignores the time value of money. It is only valid if your expenditures and your revenues match each year. If they don't, you need to have a discount rate which could change significantly. Regarding build-out projections, I am not sure they are consistent with market analysis for a small area plan process. It was a shallow analysis looking at doubling the office space in the next 20 years in that area. I think the best market analysis done was for the Urban Renewal Area and I don't think it projected that kind of demand for offices. I don't know if it is over the next 20 years or the next 10 years, but I don't think it is realistic. I don't know if the retail is realistic. It seems a little on the low side for a 20 year projection. I think we need to tie that back to the information done by market people. When I look at the drawings of the King Soopers area, I see the parking there today when two-thirds of the lot is packed out to the street in front of ARC and Hobby Lobby and King Soopers. If we put streets through there and more and more buildings, I don't think anyone is going to want to invest in a parking structure there. How realistic are these projections?

Alexandra Bradley, 1385 Caledonia Circle, Louisville, CO
I am really surprised to see the traffic light at Kaylix. I talked to the traffic consultant at the last public meeting and he said the light wasn't feasible. I thought it was a done deal. I have grave concerns about the traffic flow with that additional light. I want to bring up the small entrance change for Cottonwood Park being proposed. My understanding is that it will allow a spur road off Via Appia to get to the parking lot. It is a lovely idea but Cottonwood Park is a treasure park for our children because it is totally safe. It is fenced off and the parking lot is far away in terms of little kids running into it. There are mature trees where the little spur road would go. The road would be right next to the playground so we would lose that safe treasure. It is the best park in town to take kids if they bolt so I want the park to be protected. It doesn't help people coming off South Boulder Road to try to get into the park. It only helps people coming on Via Appia from the Rec Center. It would save 10 seconds since you'd only have to turn the corner. My biggest concern in town is school enrollment, and specifically Louisville Elementary School (LES). Glen Segrue, BVSD Project Manager, sent new 5 year projections today. His newest projections look at 653 students in 2018-2019, which is over capacity. LES is very crowded. What are the odds that we will get the exact number in each classroom? We are looking at portables and not enough space in the classrooms. The last time I checked with Jennifer Rocke, LES Principal, about classrooms, there was one more classroom available for growth. The kids are eating into massive shifts so they can fit into the cafeteria. If the numbers increase past that, or if it is decided that school cannot handle the capacity, we are looking at redrawing boundaries for the entire city. Growth in this corridor will not just impact LES but all the schools. In this plan, if it

allows any more possibility of more kids with more development, I urge that it be taken out. The community really expressed to CC and through the public means that we don't want any more density. If there is any slight inkling of it in this plan, I'd like it taken out. I love the conceptual idea of smaller stores and smaller parking lots, but many of us have to leave Louisville to shop in big box stores. The possibility of having big box stores such as Hobby Lobby or ARC leave and not be replaced might cause the City to lose good tax revenue. How can little stores pull in the same sales tax?

Moline says that his children went to Coal Creek Elementary when there were many portables, and they had a fine, really good experience. I don't know that portables necessarily mean a real decline in education here in Louisville.
Bradley says portables themselves are not necessarily a horrific thing. It is the whole size of the school. Having a school over 600 kids puts a strain on the whole entire system. It is the size of the hallways, the cafeteria size, and the poor art teacher who has 600 kids that come through her class currently. There have been national studies that the best size of an elementary school is around 400 kids. Below that or above that, you have impacts on test scores. A huge elementary school impacts the kids negatively. The staff and the infrastructure are affected.
Moline says in other parts of the county, when schools are not meeting those enrollments, they get closed and schools combine. I look at this issue and think that the school district should deal with this complexity. If the school district is saying that the capacity is something you feel is far in excess of what the program and what the building can support, it is a problem for the district to try and solve.
Bradley says it is the responsibility of the City to try and evaluate the impact to the community. If we know, as a city, that we have a problem with the schools in Louisville, that the current drawn boundaries do not put kids in the schools equally, and we know we are running into a problem for LES, the capacity should be readdressed by BVSD. They are already doing that. It is a big problem and the responsibility of BVSD, but I think there is some responsibility for the City itself. What the PC decides directly impacts the community whether BVSD acts or not. If BVSD acts and decides LES can no longer support the number of kids attending and we need to redraw the boundaries, it just impacted your community.
Moline says that BVSD says they can accommodate the size by ratcheting down open enrollment.
Bradley says open enrollment has been closed. There is a big argument in the community as to whether LES can accommodate 600 students. At 653 students, the defined capacity of the school is based on the number of physical classrooms. It does not address how many kids are flowing through the hallways.
Tengler says I am very sympathetic to what you suggest. I think that as much as we might like to provide that sort of guidance, we cannot tell a builder downtown what type of architectural design they can use. There are certain things that are out of the scope of what we are allowed to effectively voice our opinion on, or make any judgement on, in this PC.
Bradley says I think you have a lot of power and ability to voice your opinions and suggestions. BVSD can take them or leave them, but I think that as a city, we have an opportunity to request and ask. I am asking the PC to look at what the impact of increased development will be in this area. My son is a third grader and was at LES. He is no longer at LES because he could not take the noise and eat in the cafeteria. We had to withdraw him from the school which was devastating to me because we loved LES. It is a wonderful school and wonderful community.
Tengler says I agree, as a city we do, and as individuals we certainly have that opportunity. But for the PC to effectively put a condition on approval of something and suggest that BVSD needs to build a new school, it is out of our scope.

Randy Caranci, 441 Elk Trail, Lafayette, CO
I have voiced my opinion several times at different types of meetings regarding the redevelopment of Highway 42 which has yet to be funded. The impact on Highway 42 continues

to grow. I am not against development or seeing additional retail business to help support the sales taxes. I hear different conversations with different people and they seem to want to put a spin on Highway 42, which will not happen for a while. There is no projected date for funding. If you look at where Lafayette may bring in their ballfields and soccer fields on Highway 42, they will impact Highway 42 and everything north. It is already a nightmare at morning and evening work commute. Regarding the underpass at Hecla, is the City funding that? The Kestrel developer told me that they were paying 100% of that pedestrian underpass. I want to make sure that is on public record. They are not present tonight to respond.
Robinson says Kestrel is not paying for the underpass, but they are paying for the trail to the underpass. The County is going to provide some funding towards the Hecla underpass as part of a separate agreement we have had for several years. The underpass will require some City funding as well. Boulder County Housing Authority (BCHA) as part of the Kestrel development will build the trail on the west side of the underpass but I don't know the exact amount.
Caranci says the Kestrel developer then basically misled that group. I asked that same question at the public meeting. When somebody says "some" funding, I don't know how much that is. It might be a fraction amount. There are a lot of costs associated with the underpass. The Kestrel development is going to do really well. I am not a big proponent of public housing or BCHA receiving funds from the City of Louisville. They told us at a public meeting with citizens present that they will pay 100% of the underpass. This is my concern and I like to make it part of public record when I can.

Sherry Sommer, 910 S. Palisade Court, Louisville, CO
I want to say a big thank you to Alex Bradley for advocating for our children and our schools. We know there is a huge negative factor in Colorado that schools are woefully underfunded. I have had personal experience with stresses on my family due to crowding in schools. I know that BVSD may have certain guidelines or limits but I think we need to be proactive as a community to protect our children where we can with the tools we have. I respect that the PC may not have all the tools, but I urge you to use whatever tools you can. I have a question regarding the impact fees in the next couple of years. I wonder where the $5 million comes from regarding capital improvements since the impact fees seem to be lagging?
Robinson says every year, the City goes through a budgeting process. As a development comes in, the City looks at it and assesses priorities and allocates funding based on what they feel is important. The way the fiscal model works, it is a purely mathematical project. It is up to CC to decide if they will spend money to maintain the existing level of service.
Sommer says the CC could potentially raise taxes? I think it is important to evaluate the impact fees sooner rather than later.
Robinson says under the State Constitution, any increase in taxes has to go to a vote by the people. They just can't decide to raise taxes. They instituted the use tax a few years ago. If CC decides that is the direction they want to go, they can take something to the public.
Tengler asks for clarification regarding the $5 million deficit in the Capital Projects fund. Has Staff looked at this from the standpoint of the 20 year plan and how that impacted this?
Robinson says the capital is tied directly to when the development comes in and creates new demand on capital facilities. We don't know when it is going to happen. The model shows the residential coming in the first few years because currently, there is high demand for residential. Commercial is mostly spread out over the first 10 years of the development. The operational impacts are cumulative and happen every year. The capital is one time and tied to a specific development.

Cindy Bedell, 662 W Willow Street, Louisville, CO
I want to lend my support to what some other public comments have stated. I have been in attendance through much of the public process. I want to remind the PC that throughout the public process, the input has been loud and clear that the community does not support additional residential beyond what has already been approved in the planned area, especially

high density. I also want to remind you that CC directed Staff to not add more residential, especially high density residential above what was already approved.
Pritchard asks Robinson if Staff was directed by CC to do nothing regarding density issues?
Robinson says CC's direction to Staff was to not change the allowed uses. Staff has looked at where residential was already allowed and to maintain their current zoning allowance of density. We have not added any new residential. There are some places where medium or high density residential was previously allowed.
Moline asks how many additional units are there that were not already planned?
Robinson says approximately 100. There is the Seventh Day Adventist property located at Paschal and Highway 42 zoned residential. The RV storage in the GDP calls for residential. There are some areas that currently have residential on them, but they are underbuilt from what the zoning would allow.

Alexandra Bradley, 1385 Caledonia Circle, Louisville, CO
Glen Segrue's latest BVSD projection, Attachment A, shows an additional residential development potential of 183 units. I assume he got that from the Planning Department which could include Christopher Village which is not built to capacity.

John Nahodyl, 2333 Dogwood Circle, Louisville, CO
My question is directed towards Robinson and has to do with the realignment of North Main Street and Centennial. You stated that CC said we are supposed to drop that. Can you explain that a little more? Does it involve them at North Main? If that property does become available at some future date, would the City be interested in purchasing it to realign North Main Street with Centennial?
Robinson says at a CC meeting last year, it was discussed. The proposal would impact three properties along Main Street. All three property owners were at the meeting and expressed their opposition. They asked CC to remove it from the plan; CC directed Staff to not pursue it further.

Brauneis asks Robinson regarding the concern surrounding the new access to Cottonwood Park, is that one of those "squishy" lines on there?
Robinson says as mentioned in the plan, with the acquisition of the additional land at Cottonwood Park, we are proposing that the Parks Department undertake a public process of the master plan of the entire Cottonwood Park area. As part of that, we recommend they look at:

1. Shifting the existing entrance driveway further east which would help the operation of the Via Appia intersection.
2. Depending on the design of the park, provide additional access off of Via Appia.

We don't want to get into designing the Park at this stage. When and if it is redesigned and redeveloped, there could be benefits to having an additional access off of Via Appia. We are recommending a full robust public process to look at the future of the whole Cottonwood Park development.

Moline says there were great comments from the public that prompt a couple of questions. Regarding the Highway 42 Plan and my experience with that plan, I don't know that its primary purpose is trying to move traffic quicker through the corridor. Do you want to comment on that?
Robinson says there were some trade-offs when we went through that planning process. We (the community) decided some of the design and character elements would outweigh what would move the most traffic. If we are just looking at moving traffic, it would be turning it into two lanes in each direction. It would involve significant takings on both sides of the road. We said we want to create a sort-of front door for the community. There are some places where we are willing to make a trade-off so it might be a little slower going through. We are actually proposing dropping the speed limit from the present 40 mph to 35 mph. It would have additional community benefits and would make it easier for pedestrians to cross and more pleasant to bike or walk. Based on the projections in the plan, it actually does reduce travel time through the

corridor slightly. It should, in theory, help people move through the corridor, but its primary purpose was not to move as much traffic as fast as possible.

Moline says if we look at page 29, and the traffic impacts and minutes, I heard somebody say that those times are in excess of the travel times now. However, that is not my reading of that graphic.
Robinson says it shows how long on average it would take you to drive through the corridor during those peak hours. I think what John Leary mentioned is that it is based on existing traffic volume plus projected volume from development in the corridor. At this stage, we did not look at what the existing 2035 traffic volumes would be and then additional traffic. When we did this modeling, it was to compare the alternatives. We tried to get some sense of what the impacts would be from the one story, two story, and three story alternatives, so we used existing traffic. If you are interested, we can go back to our traffic consultant and have them use the 2035 numbers since we have numbers expected along South Boulder Road in 2035. I am not sure what the change would be because additional build out is already assumed in their model.
Moline says I think John raises good point. For the future draft of the plan, it might be interesting to see what is projected out into the future. If the numbers are available, we might get them and plug them into the plan. As a reminder, the Comp Plan told us that the road carries a lot of through traffic. We are buffeted by the winds of what is happening to the east.
Brauneis says regarding John's comment about once you hit a certain saturation level, then you are in the "muck". Where, if, when, and would that be?
Robinson says to a certain extent, any future congestion on the road is going to come no matter what we do in the corridor. It carries regional traffic.

Closed Public Hearing and discussion by Commission:
Pritchard reminds PC that Staff has a few items they want PC to look at and comment on such as the Santilli open space acquisition and the Cannon Circle/South Boulder Road stoplight.
Brauneis says starting at the macro level of the document, this is something that has been worked on heavily over the last 1.5 years. In a lot of ways, it reflects a lot of what people have expressed as a community. We are being pulled and stretched in different directions about what we really value as a community. I am excited to see it move forward. I expect there will be a different level of scrutiny at CC. While I am personally comfortable at this point in time, I expect there will be more questions to come in the process. As far as the two specific issues, on the potential for open space property acquisition, if and when it becomes available, it is a natural for open space. When you look at that piece of property, it doesn't offer huge commercial potential. I would leave it to the Open Space Advisory Board (OSAB) to evaluate it as time progresses. Regarding the additional signal at Cannon, I don't understand the dynamics surrounding it. Typically, I come out in favor of safety so if it makes sense at that spot, I'd want to hear more about it.
Hsu says I echo what Commission Brauneis said about the macroscopic view. Looking through this plan, it has a lot of principles and was easy to read. It is nice to see the ideas out there and it reflects the work Staff put into it. As far as the specific issues, with the traffic signal, I lean toward punting and deferring that decision because we can always add that later. I am ambivalent about that much like Staff is. As a driver, I'd like to get through more quickly. I don't like having a light every block because it's frustrating. I do see that without that light, it is hard to cross north and south of South Boulder Road. It may alleviate some of the traffic on Highway 42. Since we can always add it later, I lean toward deferring it and not putting in a traffic signal if we don't have to. As far as Open Space, I defer to OSAB and Parks. Personally, I like the idea of having more open space, especially since we are considering more development in the rest of the region. The property is far away from everything else. Lastly, we talked about getting more numbers on costs. I have a question for the PC. Do we consider this, because it sounds like more of a CC thing to consider? Does the PC generally consider costs as far as land use?

Brauneis says typically the PC hears those numbers so it is a missing part of the equation for all of us. My hunch is the cost numbers, especially given in ranges and knowing they are pushed out possibly 20 years, are what we are focused on in the plan. We probably differ on how uncomfortable we are without having those numbers at this point in time.
Hsu says then I'd like to see the costs at the next meeting and a breakdown of them.
Tengler says I too am impressed with the overall plan. I think Staff did a great job incorporating a lot of the public feedback that has happened over the last year and a half. There were a lot of very relevant and great points made in the public comments. I think John Leary's point was good and realize that the drawings are very speculative in showing what could happen. When I looked at the King Soopers proposed drawing, I thought "where do the cars go"? As much as I am in favor of more walkability and a safer environment, the King Soopers parking lot and the old Safeway parking lot are/were hazardous. They are tough to navigate as a pedestrian. I like the thought, but I question how feasible it is. Regarding the comments on the school enrollment, Alex, I wish we had better tools at our disposal. Maybe we build that in from the standpoint of passing whatever vote we put along to CC with the recommendation that they strongly consider it. It is not in our purview to make it a condition but we can certainly give some guidance to CC in terms of what we think. Again, I am sympathetic to your point of view and wish we had some stronger tools. As to the specific questions from Staff, my inclination is to turn the Santilli property into open space. It doesn't seem like a great spot for commercial stuck between the agriculture there now and the residential on the Lafayette side. Let's add it to the buffer we have. As to the traffic light at Cannon, my sense is that it will add a little bit of delay to the northbound traffic at certain points in the day, specifically at the evening rush hour. By and large, it is a safety issue and it seems to be a relatively minor inconvenience for anybody turning in there or making a right hand turn out of there. It will provide better access for future residents in that area. I am with Commissioner Hsu in terms of the financial analysis. I would like to see more "fine" prioritization rather than 1 to 5 or 6 to 10. There are bunch of things in 1 to 5, so is there a way we can characterize that in terms of fiscal impact as well as the priority within that? I realize it is a heavy ask at this stage. Is it feasible to do a 1, 2, and 3?
Robinson says yes, we can look at the top priorities. It always comes down to getting funding from CC. The dates and years are intended to be guides for when they go into the CIP requests. If there are things you want to see moved up, let us know. If you think there are things that are priorities, we can try to highlight those. We can look at breaking 1 to 5 into a finer grain.
Tengler says, specifically to the question I asked previously about where those big chunks of capital occur, is it feasible to also look and see where the big bumps would be based on the current prioritization?
Robinson says yes.
Rice says I want to express a concern I have about this plan, and then also reflect on some of the discussion we have had tonight. Echoing what others have said, overall I think it is an excellent plan and is very well done. I think the process we have gone through to develop this plan has been a really good one in terms of trying to get the community involved in the discussion as opposed to the Planning Department coming up with a proposal for all of this. I am impressed with that. First my concern is not having the economic issues fully on the table before us. One of the key components of this plan is the public improvements being suggested. We are not saying we are going to do these things. We are saying, if we can build a plan, these are the kinds of things we'd like to do. For example, and it has been stated by more than one person tonight, one of the key issues the public has expressed is the connectivity across South Boulder Road. To me, looming large is the ability to develop the underpass at Cottonwood Park. To me, if we are going to pass a plan down the line, we ought to know the dollars and cents associated with it. I myself would be in favor of deferring this discussion to approve the plan until we have those numbers. If that is not possible, I would say that CC is the next step in the line. We need to know in terms of planning what it is we are proposing and how much it will cost the community. We then need to know how that plays into the fiscal impact we see from development in this area. This plan does not add to the density and that is a very important

concept. We are not approving a plan that will add to density. As Robinson has said, this plan is based upon the existing ability of people to build on these properties. As I pointed out when I was asking questions, in large measure, the residential increase has already been approved through the planning process. We are not approving a plan that will add, in any significant way, to the density of what exists in this particular area. With regard to the school issue, I am at a loss. Every time the PC approves a development plan, we get feedback from BVSD. It is one of the key things we solicit. Time and again, when I see the proposals come through, BVSD says they can serve and it will have minimal impact. I don't know what else to say besides the fact that we have to defer to those people on their ability to decide how the schools could be operated. It is over my head to be able to tell them how to run the school district. I think it is important to know that we don't look past that and we don't ignore it. In fact, it is something that is given due consideration in every case. Lastly, it is also key to understand that this is not a development plan. We are not telling someone what to develop or when to develop it or how much to develop. We are simply trying to give an overall addition to the Comp Plan in terms of this particular area and how we would like to see it built out. With regard to the issue of the traffic signal, to me that is a feasibility issue. We will have to rely upon people who are expert in the area. The information we have now suggests that if you add that intersection being called Kaylix (to the north) but it Cannon (to the south), at peak time there is an 11 second difference in the morning and a 29 second difference in the afternoon. As I pointed out, in the westbound direction, it is actually faster. I found that hard to believe but apparently, the experts tell us it is faster if you put in the Kaylix light. In the evening, it is 14 seconds additional time. If those numbers are accurate, this is feasible and reasonable to me. We started this process a long time ago. Nobody wants traffic jams and we have to be careful about it. I think we are using due care. On the open space, I can only echo that it seems to be logical open space. If it is economically feasible to acquire the land, I would support that.

Moline says I don't have too much to add based on what my fellow commissioners have said. I thank the public for coming out and speaking on these issues. I have one minor thing. On page 12 of the plan, there are some maps. In some of the maps, they show significant pressure for development and some of those properties are open space. I think it is the value of the land and very little improvement on them. They show as very threatened. I think it would be important to get that corrected so the public understands it. Related to that, some of the maps are not to scale. When they are to scale, I would recommend against using verbal scales when they are on the web. At that point, people are zooming in and zooming out. A 1"= 400' doesn't mean as much as a graphic scale. I am someone who has lived and traveled in this corridor for 20 years, almost every day. This is one area of town that I think I know well. One thing that I asked the city to look at, and I would like to keep it on the table, is dealing with storm water on South Boulder Road. It is being conveyed in curbs in some portions of the corridor. I wonder if there is the potential of undergrounding it. One of the intersections I use almost every day is Centennial and South Boulder Road (next to Alfalfa's). Partly because of storm water issues, as you approach the intersection, you head down the hill that leads you into the intersection. It prevents the most optimal traffic flow in that intersection and it is worsened when you have ice and snow. I hope it can be looked at from a public works transportation perspective. I feel the plan's design guidelines and design policies are things that would be great enhancements for this corridor. It needs to make those connections. We have really good open space and park resources on the periphery of this corridor. I appreciate that the plan attempts to improve the trail connectivity of places between Cottonwood Park, Steel Ranch Parks, Hecla, Waneka, and Harney. In this part of town, those are great resources as people mentioned. By virtue of the plan, enhancing those connections to those areas makes it a better plan. I like the schematics about what is proposed at the King Soopers site. I like that kind of look for future redevelopment of that area. The new mall in Longmont (The Village at Twin Peaks) offers a model and reflects some of what we are proposing tonight. I think it works. I do have the concerns about the parking.

Pritchard says I am supportive of the process. We have come a long way and there are a few areas we need to tighten up such as the cost analysis. It would give us more clarity. When it

comes to traffic flow, we need to look at the 2035 data and see if we are making the right judgement calls. In regard to the signals, if it is warranted by CDOT, I will not argue with them.
Robinson says that South Boulder Road is a local road, so it is entirely up to the City. If we adjust timing, we would work with CDOT since Highway 42 is their road.
Pritchard says we also need to consider costs and make sure the development will help us pay for the additional lights if warranted. Regarding trail connectivity, who in this town is against that? Anything we can do to make these connections is beneficial. It needs to be incorporated into this plan. The issue with the school is an ongoing issue. I defer to BVSD because they are aware of what we are attempting to do. They say they can accommodate the student loads. As a city, we are aware of this. CC has complained to BVSD about this so it is an ongoing argument. Regarding open space, if the property comes up and we have the capacity to buy it, then great. If the property owner comes forward, I don't believe we should change the zoning but do as staff proposes and leave it. I would like to see the numbers and would feel more comfortable since we have gone this far. I think we should go the whole way and give something to CC that they can truly look at, and feel that CC has all the necessary information to move forward.
Brauneis asks if Staff will have the cost analysis numbers before presentation at CC?
Robinson says yes. We apologize that they were not ready tonight. We are working on them currently with Parks and Public Works. Staff should have them by the end of February. When we were doing tentative scheduling, we assumed two meetings with PC before CC presentation. We intend to have the numbers for the PC March meeting.
Rice says can we roll this over until March meeting to approve the plan? Will that change the schedule?
Robinson says yes.
Tengler asks if these traffic studies are beginning to incorporate the potential for driverless cars? If you believe the more aggressive estimates, you could start seeing them in as few of 5 years. Within 20 years, you will certainly see an impact.
Robinson says no. We have talked a little about it the design aspect. One of the advantages of this compartmentalized parking is that parking demand could decrease significantly because of automatic cars. It allows for the development of these parcels. We are not necessarily projecting or totally anticipating at this point. I can follow up with the traffic consultant. We want to keep the plan flexible so that changes or unforeseen changes can be accommodated.
Pritchard says my impression is that the PC would like to continue this matter until March. Other issues such as the "yellow" lines that are difficult to see can be corrected. I want a clean plan going to CC. I would like to continue this matter to the March meeting.

Motion made by **Tengler** to continue the South Boulder Road Small Area Plan, Series 2016, seconded by **Rice**. Motion passed by unanimous voice vote.

City of Louisville
COLORADO • SINCE 1878

Planning Commission

Meeting Minutes

March 10, 2016
City Hall, Council Chambers
749 Main Street
6:30 PM

DRAFT

Call to Order: **Pritchard** called the meeting to order at 6:30 PM.

Roll Call was taken and the following members were present:

Commission Members Present:	Chris Pritchard, Chairman Cary Tengler, Vice Chairman Ann O'Connell, Secretary Steve Brauneis Jeff Moline Tom Rice David Hsu
Commission Members Absent:	All Present
Staff Members Present:	Aaron DeJong, Director of Economic Development Scott Robinson, Planner II

Approval of Agenda:
Brauneis moved and **Tengler** seconded a motion to approve the March 10, 2016 agenda. Motion passed by voice vote.

Approval of Minutes:
Moline moved and **Brauneis** seconded to approve the February 11, 2016 minutes. Ann O'Connell abstains due to excused absence. Motion passed by voice vote.

Public Comments: Items not on the Agenda
None.

Regular Business:

- **South Boulder Road Small Area Plan: Resolution 5, Series 2016.** A request to review a draft copy of the South Boulder Road Small Area Plan. *Continued from February 11, 2016.*
  - Staff Member: Scott Robinson, Planner II

Robinson presents. This was originally heard at the February 11, 2016 meeting and continued to tonight to provide more information. Some of the maps have been adjusted to make them more readable. Some typos were pointed out and have been corrected. There were questions about traffic impact and what the traffic would be in comparison to the 2035 projected traffic. I

spoke with Curtis Rowe, our traffic consultant with Kimley Horn. When DRCOG does the 2035 does traffic projections, it is based on build out. The numbers they are projecting are very similar to what DRCOG was projecting; it is slightly higher. The traffic will be driven by the development in the community. There will be some cut-through traffic, and it will reach a point when it will stop increasing because there will be better alternatives such as Baseline, Highway 7, and Dillon Road to avoid this area. The build out numbers and the traffic projections in analysis are felt to be accurate for the 2035 projection. There was a question about storm water conveyance along South Boulder Road which is currently conveyed in the gutter. There are no underground storm pipes. The Public Works Department says they do not have this in their future plans. If they hear complaints about the amount of water, it will be discussed. It is not easy to tear up a street to install underground pipes.

Cost Estimates for the major infrastructure items and some other things in broad ranges will be rough estimates because they are designed yet. There are no accurate costs at this point. We are looking at some of these not being built for 5 or 10+ years. The cost estimates tables are located in the South Boulder Road Small Area Plan page 31.

There are four categories:
$ Less than $100,000
$$ Between $100,000 and $500,000
$$$ Between $500,000 and $1 million
$$$$ More than $1 million

Rice says you point out that you are using these categories, using dollar signs similar to Yelp. The last category is more than $1 million, which is $1 million to infinity. From what I have heard from people and their desires for the South Boulder Road corridor, the interconnectivity between the north and south, east and west, is key in making this improvement move people around. The underpasses are really important. Three of the principal underpasses, Highway 42, Bullhead Gulch, and Cottonwood Park are $$$$. What does an underpass cost?
Robinson says $1.5 million. The McCaslin Underpass cost $1.5 million.
Rice says hasn't Bullhead Gulch already been funded?
Robinson says partially. When Steel Ranch went in, they provided some funding. A large portion of funding will come from the storm water management enterprise fund because there is a storm water connection going through there.
Rice asks about Highway 42 underpass. Does that have a funding source?
Robinson says partially. We have an agreement with Boulder County that they will provide some funding.
Rice says I understand that the Cottonwood Park underpass has no funding at present.
Robinson says yes.
Rice says on the third page of the Cost Analysis, there is roadway improvements at Highway 42 (north and south) in accordance with the Gateway Plan. It has $$$$. What is the magnitude?
Robinson says the last time cost estimates were done for the full plan, it was in the $12-15 million range.
Rice says that is shown as a 1-5 year schedule. Will it be done in multiple phases?
Robinson says that project will be done in phases. We have federal money lined up. We have started work with CDOT on improvements at Short Street intersection. There is more money from the County to be used as well. I don't expect it to be done in five years, but we are starting this year. It will probably span 1-10 years.

Pritchard says I have concern about something brought up at the BRAD meeting about the elimination of the right hand turn lane going onto Main Street.

DRAFT

Robinson says Staff went back and looked at it. There is a discrepancy between what the drawings show and what the text describes. On page 24 of the South Boulder Road Small Area Plan, looking at the Main Street intersection sketch, we would keep the dedicated right turn lane and put in a pedestrian island (pork chop) to allow the right turn and bring pedestrians out. It is similar to McCaslin and Dillon. I would recommend modifying the language in the Main Street Improvements by Intersection from: Remove eastbound right-turn lane on South Boulder Road and improve geometrics of northbound Main Street right turn. Modify westbound South Boulder Road left-turn lane to create offset configuration and provide pedestrian refuge. To: Add pedestrian island at eastbound right-turn lane on South Boulder Road and improve geometrics of northbound Main Street right turn. Modify westbound South Boulder Road left-turn lane to create offset configuration and provide pedestrian refuge.

Hsu asks about possible traffic signal at Kaylix and Cannon. Is Staff still looking for input?
Robinson says, based on the discussion at the last meeting, the plan is to leave it in there as a possibility to be considered when development occurs. It is not in the plan recommending to "do it or not do it".
Pritchard says a light at Cannon and the existing light at Highway 42 would be tight. It could cause more problems that we might solve. I am comfortable with this document.

Motion made by **Hsu** to approve **South Boulder Road Small Area Plan**, **Resolution No. 5, Series 2016**: a resolution recommending approval of the South Boulder Road Small Area Plan, seconded by **Rice**. Roll call vote.

Name	Vote
Chris Pritchard	Yes
Cary Tengler	Yes
Ann O'Connell	Yes
Jeff Moline	Yes
Steve Brauneis	Yes
Tom Rice	Yes
David Hsu	Yes
Motion passed/failed:	Pass

Motion passes 7-0.

DRAFT

SOuth BOulder ROad

SMALL AREA PLAN | VIA APPIA TO CITY LIMITS

City Council

March 29, 2016

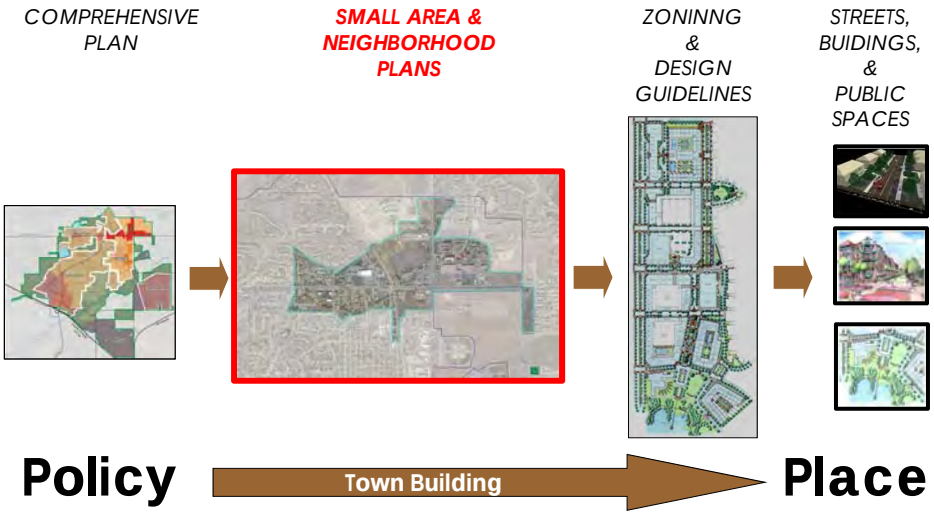
City of Louisville
COLORADO • SINCE 1878

What is a Small Area Plan?

SOuth BOulder ROad

What is a Small Area Plan?

1st Step to Implementing the Comprehensive Plan



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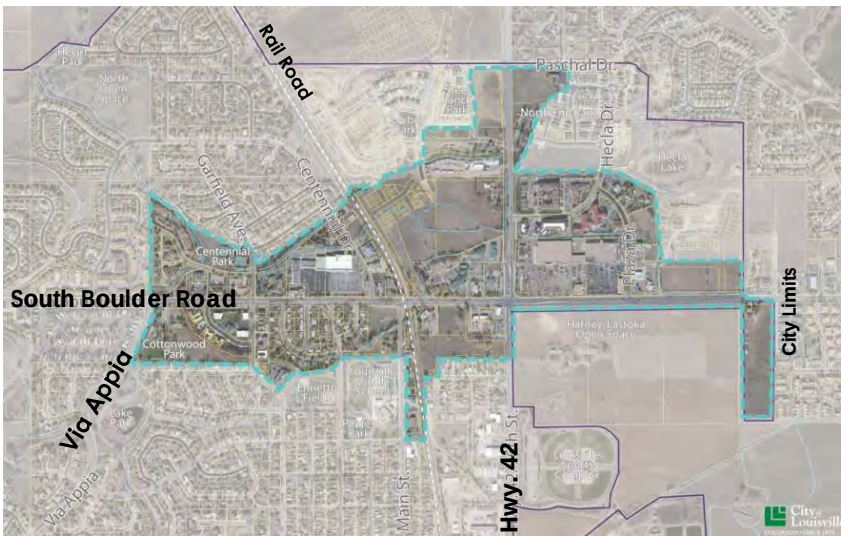
Study Area



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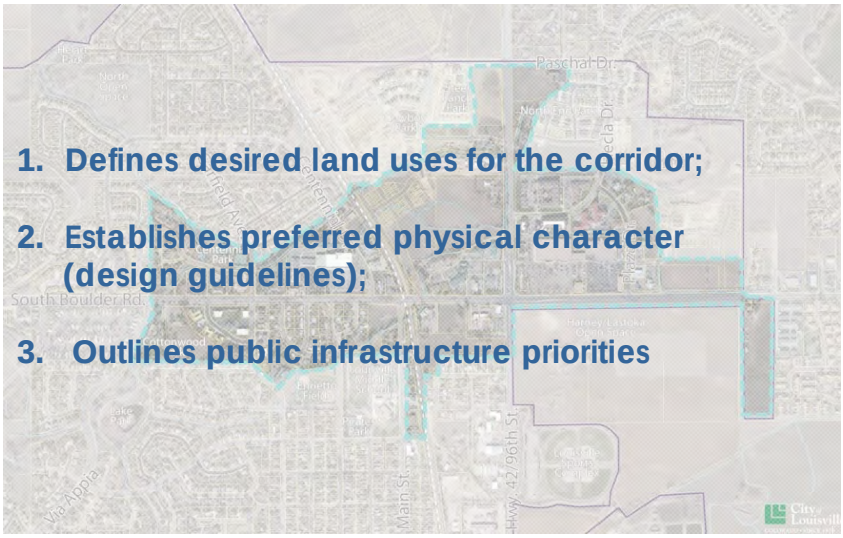
Study Area



1. Defines desired land uses for the corridor;
2. Establishes preferred physical character (design guidelines);
3. Outlines public infrastructure priorities

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Project Schedule

- October 2014 – Kick-off Meeting
- January 2015 – Walkability Audit/Placemaking Workshop #1
- February 2015 – Placemaking Workshop #2
- November 2015 – Placemaking Workshop #3

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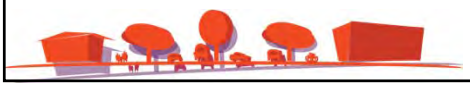
Workshop 3

- Development scenarios
  - 1 story
  - 2 story
  - 3 story
- Urban design elements
- Roadway improvements



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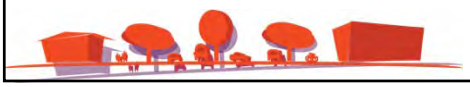
Plan Outline

- Introduction
- Process
- Context
- Principles
- The Plan
- Implementation



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Project Principles

1. Provide for safer and more convenient connections across South Boulder Road and Highway 42 for bikes and pedestrians.
2. Utilize policy and design to encourage desired uses to locate in the corridor.
3. Establish design regulations to ensure development closely reflects the community's vision for the corridor while accommodating creativity in design.
4. Mitigate impacts of trains and improve safety of railroad crossings.
5. Balance the regional traffic needs of South Boulder Road and Highway 42 with the community's desire for safety and accessibility.
6. Provide for community gathering spaces and public infrastructure to encourage visitors to spend time in the corridor.

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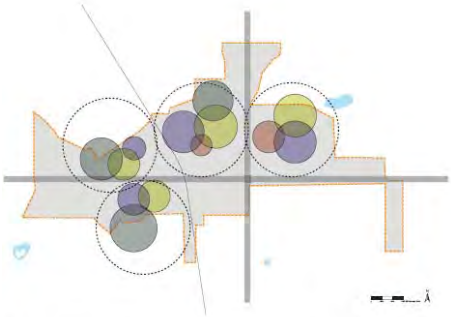
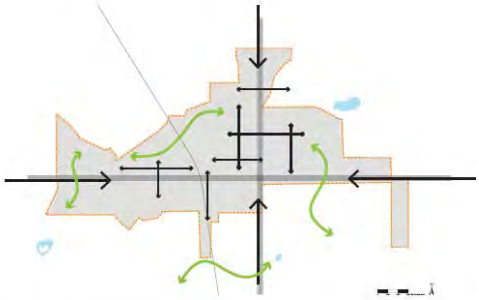
Community Design Principles





Go to and Stay at Places

Public spaces that encourage gathering and interaction

A range of retail and entertainment uses that encourage longer visits

Small parks and plazas that increase the appeal and experience of daily activities.

Easy to get to, easy to get around

Safe grade separated trail connections to all quadrants

Properties connected with driveways and walks

A street network that offers balanced choices to move around

Opportunities to "park once and walk"

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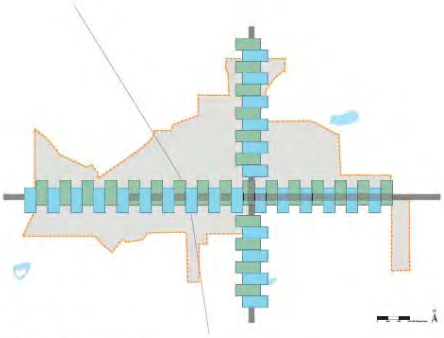
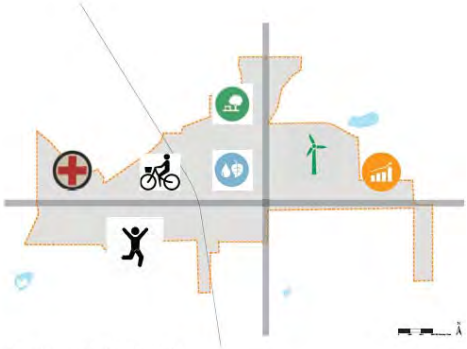
Community Design Principles





A Zipper, not a barrier

Sidewalks and plazas facing onto South Boulder Road

Safe intersections that allow people to cross South Boulder Road and 42

Traffic flow / speed that is not detrimental to businesses or people along the corridor

A continuous and connected high quality pedestrian experience

Development that Contributes

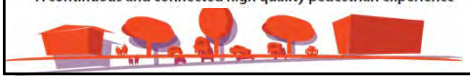
To be defined by the community

Greenspaces

Housing Choices

New trail connections

Semi-public gathering spaces



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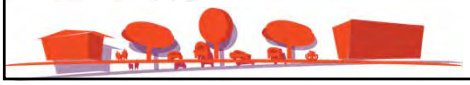
Placemaking Concepts

Transitional Streets

Pedestrian Refuges

Views Into the Community

Parking Rooms



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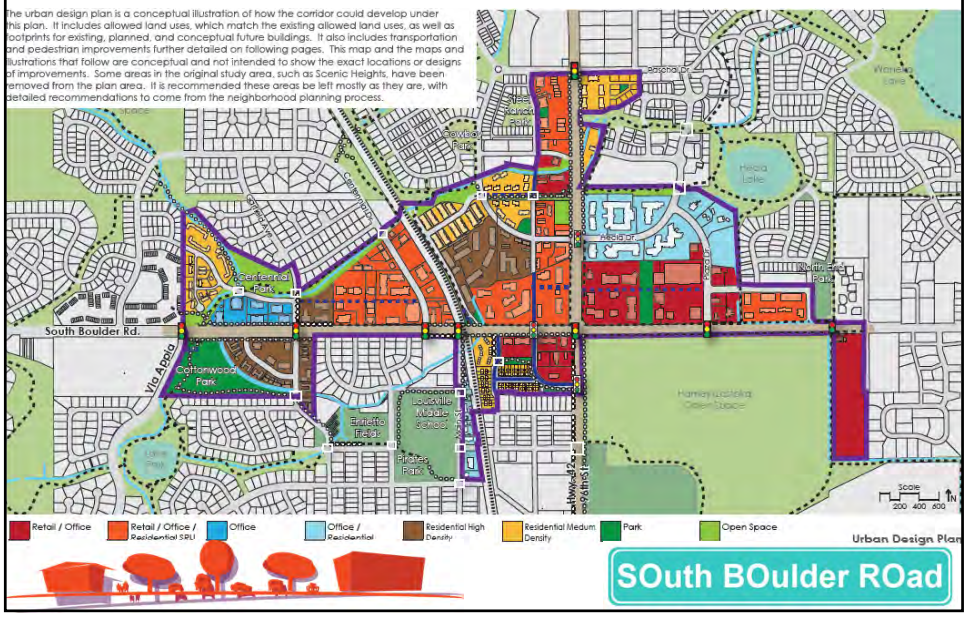
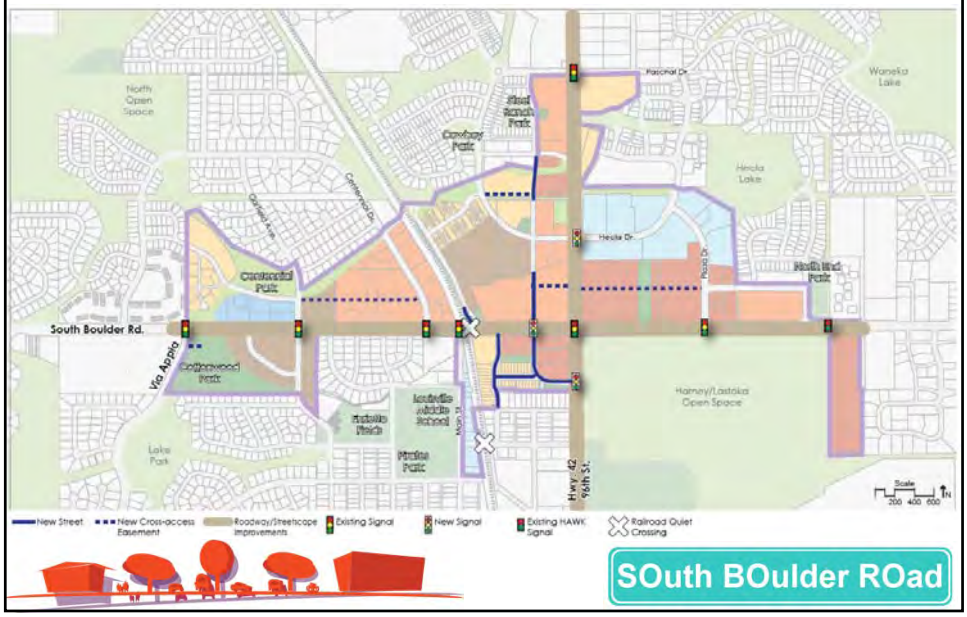
Urban Design Plan

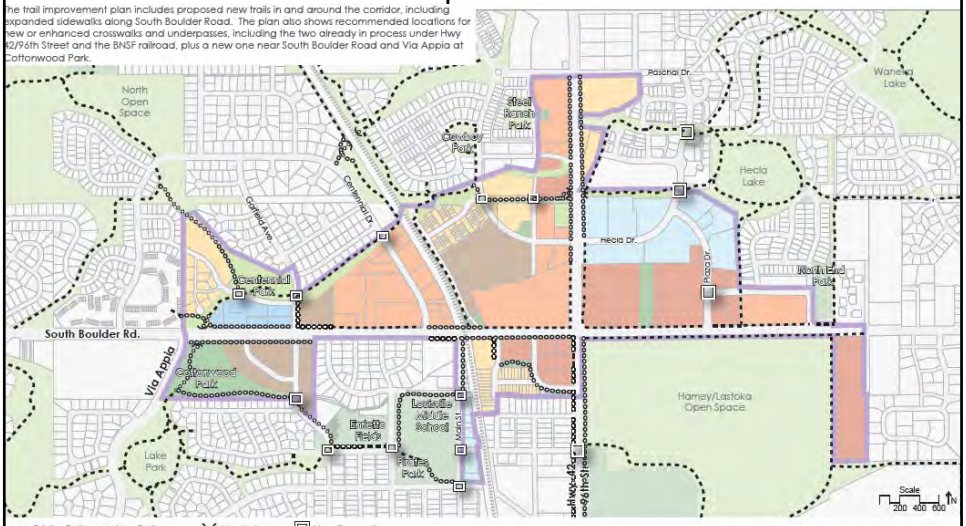


Street Improvements



Trail Improvements

The trail improvement plan includes proposed new trails in and around the corridor, including expanded sidewalks along South Boulder Road. The plan also shows recommended locations for new or enhanced crosswalks and underpasses, including the two already in process under Hwy 42/96th Street and the BNSF railroad, plus a new one near South Boulder Road and Via Appia at Cottonwood Park.



Trails Improvement Plan

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Roadway Improvements

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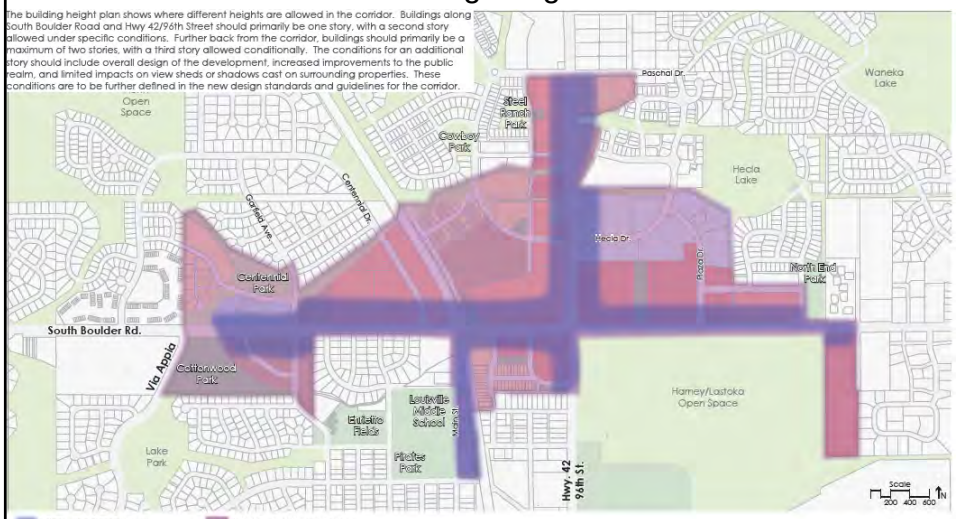
Building Heights



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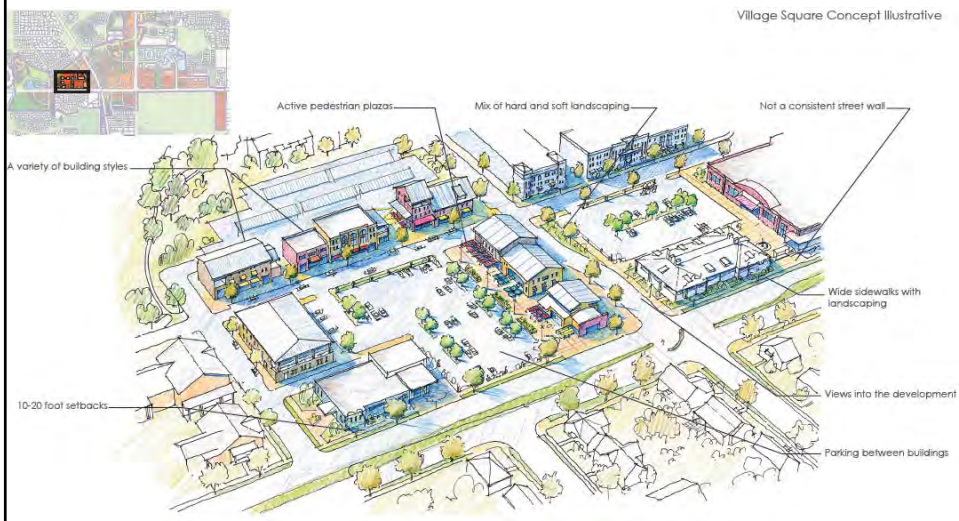
Urban Design Elements



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Urban Design Elements

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Fiscal Impact

Existing Development in Study Area		
Retail	352,729	Square feet
Office	178,608	Square feet
Residential	407	Units
Employees	1,682	People
Residents	569	People

Projected 20 year Increase over Existing		
Retail	26,931	Square feet
Office	374,298	Square feet
Residential	546	Units
Employees	1,658	People
Residents	724	People

20 Year Cumulative Fiscal Impact	
Revenue by Fund	
General Fund	$34,171,000
Urban Revitalization District Fund	$4,461,000
Open Space & Parks Fund	$6,117,000
Lottery Fund	$0
Historic Preservation Fund	$2,166,000
Capital Pojects Fund	$20,081,000
TOTAL REVENUE	$66,966,000
Expenditures by Fund	
General Fund	$28,303,000
Urban Revitalization District Fund	$0
Open Space & Parks Fund	$923,000
Lottery Fund	$0
Historic Preservation Fund	$0
Capital Projects Fund	$25,033,000
TOTAL EXPENDITURES	$54,259,000
Net Fiscal Result by Fund	
General Fund	$5,868,000
Urban Revitalization District Fund	$4,461,000
Open Space & Parks Fund	$5,193,000
Lottery Fund	$0
Historic Preservation Fund	$2,166,000
Capital Projects Fund	($4,952,000)
NET FISCAL IMPACT	$12,736,000

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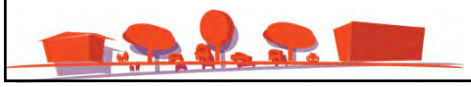
Implementation

- Draft and adopt design standards and guidelines
- Timeline
- Cost estimates given in ranges



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