

An aerial photograph of a city, likely Raleigh, North Carolina, showing a dense urban area with various buildings, including a prominent domed capitol building. The city is surrounded by rolling green hills under a clear sky. A large orange rectangular box is overlaid on the upper portion of the image, containing white text.

FRONT + MYRTLE COUPLET ALTERNATIVES ANALYSIS

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An aerial photograph of a city, likely Boise, Idaho, showing a dense urban area with various buildings, including a prominent domed capitol building. The city is surrounded by rolling hills and mountains under a clear sky. A large, solid orange banner is overlaid across the top portion of the image, containing the text 'EXECUTIVE SUMMARY' in white, bold, uppercase letters.

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

The Front + Myrtle Couplet Alternatives Analysis outlines a range of possible treatments and design interventions to modify two currently auto-oriented thoroughfares in Downtown Boise to better balance the interests of all travel modes, as well as economic development interests, along and across the Front and Myrtle corridors. *Sam Schwartz*, in partnership with Kittelson Associates and Leland Consulting Group, worked alongside the Capital City Development Corporation (CCDC), the City of Boise, the Idaho Transportation Department (ITD), Ada County Highway District (ACHD), and the Community Planning Association of Southwest Idaho (COMPASS) (collectively, the “project team”), to explore comprehensive and actionable recommendations to balance the many competing demands along the Front and Myrtle corridors and promote a calmer yet economically productive pair of streets that are better integrated into the growing Downtown Boise core. These recommendations were made in service of the project’s Vision Statement, shown on the right:

Vision Statement

The Front and Myrtle corridor should:

- 1 Function as a **safe** and **efficient multi-modal** transportation facility moving **people** (employees, customers, visitors and residents) and **goods to and through** Downtown Boise while allowing all of Downtown to function as a **seamless, integrated urban neighborhood**;
- 2 Acknowledge, complement, and enhance **surrounding land uses and activities** within the context of a **vibrant Central Business District**;
- 3 Promote and support **economic development** and **buildings facing and interacting with pedestrians** on Front Street and Myrtle Street;
- 4 **Reduce barriers** to **all modes** of cross traffic while **accommodating through traffic**;
- 5 Contribute to a **greener downtown** through **sustainable infrastructure** and widespread **street trees and vegetative elements**

Building on previous planning efforts by the City of Boise, and referencing the vision laid out in the recently completed Boise Transportation Action Plan (TAP) and the project team's Request for Proposals, the consultant team employed a transparent and inclusive process throughout this project, to guide the project team from defining the above high-level vision for the study all the way down to selecting preferred alternatives for the short- and long-term. The existing conditions analysis highlighted Front and Myrtle as essential transportation corridors, providing access for commuters and goods delivery into and through Downtown Boise along with direct connections to I-184 (the "Connector"). At the same time, the analysis also revealed that the current auto-centric configuration of Front and Myrtle limits other mobility options and functions as significant physical and psychological barriers for those walking and biking, and for all forms of cross traffic, potentially hampering economic development potential along the corridors and failing to provide a walkable and welcoming environment befitting of a growing downtown.

Recognizing the competing interests and priorities on Front and Myrtle, the consultant team placed particular emphasis on an integrated process that connected the stages of a typical corridor planning exercise (visioning, existing conditions analysis, alternatives development, alternative selection) with an interactive stakeholder engagement process. Through iterative workshops with the project

team, a series of design alternatives were developed and evaluated based on 12 different performance metrics. These metrics, developed through a workshop with the project team and related stakeholders, are wide-ranging; any one single design concept could not possibly result in maximum benefits across all of them. Balancing the many competing priorities along Front and Myrtle was accomplished by several discussions on the relative benefits of the metrics and how they supported the project's overall Vision Statement.

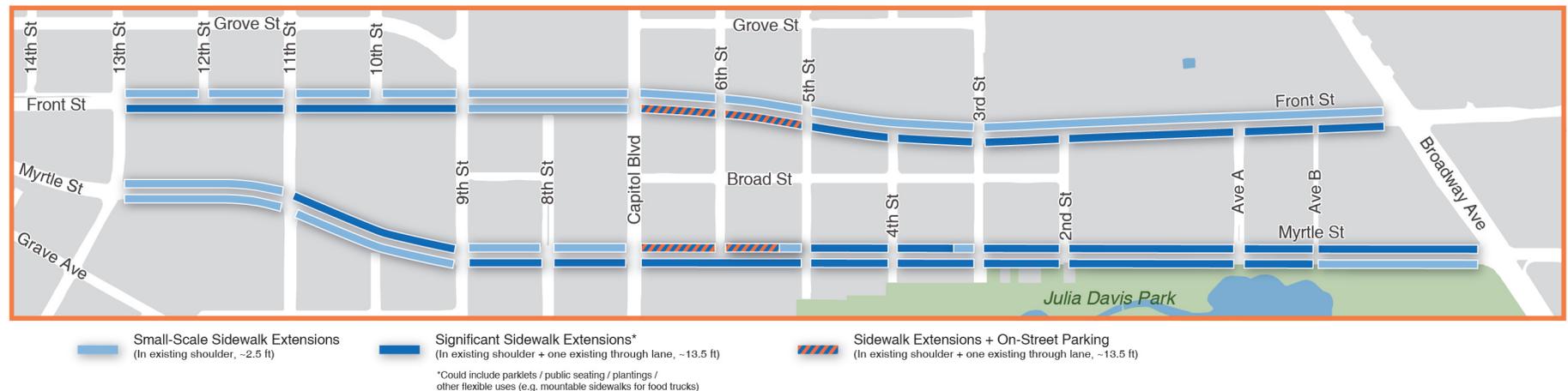
The resulting preferred alternative generally prioritizes strategies that reduce excess roadway capacity and vehicle speeds, aims to improve safety for all street users, and reduces north-south crossing distances. It also provides additional crossing opportunities in locations where existing or projected future pedestrian volumes demand them. These elements were balanced as to limit the negative impacts on traffic operations along the Front and Myrtle corridors as much as possible, and are supported by a rigorous and thorough vehicle traffic analysis that looks at conditions today and projected out into the future, both with and without the design elements in the preferred alternative. While traffic operations are projected to worsen along Front and Myrtle in any case (due to continued growth in Downtown Boise), the differences in traffic operational impacts between the future "no build" scenario and the preferred alternative designs are modest compared to the benefits provided.

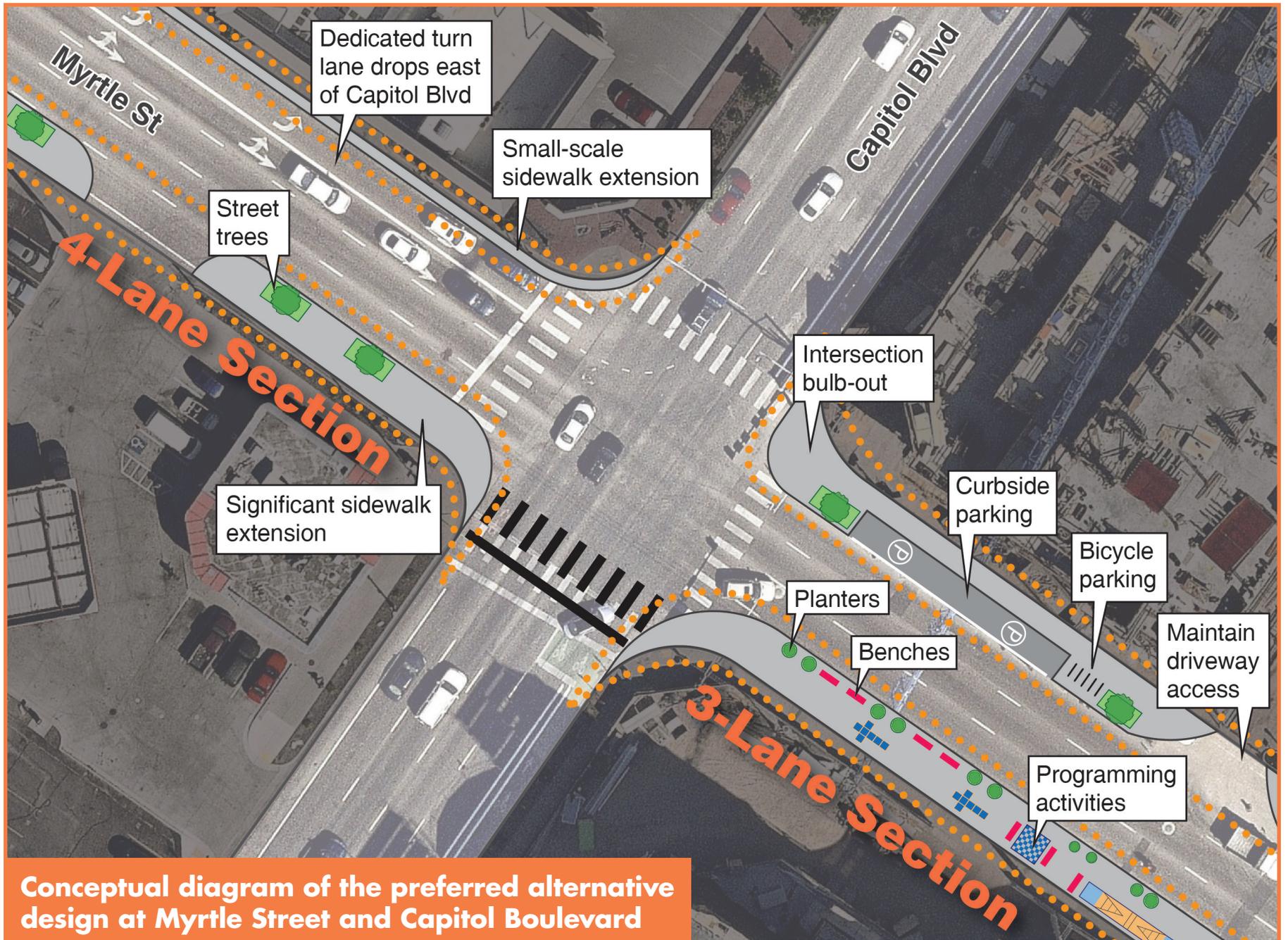
Key elements of the preferred alternative include:

- Selective lane reduction in parts of Front and Myrtle where projected impacts on traffic operations are relatively minimal
- Small-scale sidewalk extensions throughout both corridors through consolidation of excess width between curbs
- Larger-scale sidewalk extensions in select areas, which can be accomplished through a phased approach and applied contextually depending on need (e.g. with on-street curbside parking, programmable public spaces, plantings, public seating, etc)
- New signalized crossings and marked pedestrian crosswalks to improve north-south connectivity
- Selective retention or addition of vehicle turn lanes to further minimize negative impacts on traffic operations
- Continued investigation into the potential to decrease signal cycle lengths to decrease north-south wait time to cross Front and Myrtle (particularly towards the western half of Front St), in the context of ACHD's recently completed Downtown Boise signal timing plan, and in particular for the western portion of Front during PM peak hours

The benefits that can arise through implementation of these concepts can be significant when put in context of the Vision Statement and as measured through the accompanying performance metrics. Such changes can even be accomplished through minimal initial impacts if rolled out through a phased approach. In the short-term, it is recommended that inexpensive and potentially temporary solutions are explored to test the impact of proposed design elements and allow for additional engagement with the local community. In the long-term, capital construction of specific projects along Front and Myrtle can reinforce the permanent nature of these changes and create further balance among all travel modes along and across Front and Myrtle. The preferred alternative, if implemented, will help address connectivity needs, improve multi-modal mobility, enhance business opportunities, and still accommodate traffic flow to and from Downtown, all in service of the Vision Statement.

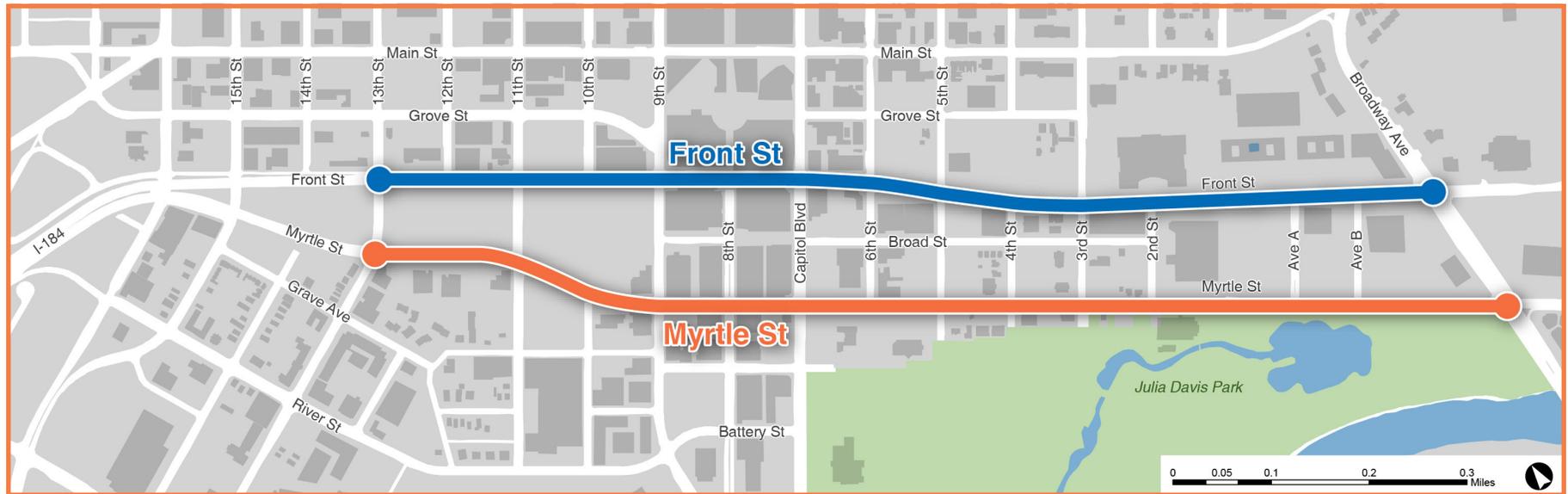
Preferred Alternative On-Street Design Elements





INTRODUCTION

PROJECT BACKGROUND + CONTEXT



Front and Myrtle streets (“Front and Myrtle”) constitute a one-way couplet of US Highway 20/26 that bisects Downtown Boise, east to west, for 1.25 miles between Park Avenue/Parkcenter Boulevard at Broadway Avenue and Interstate 184 at 13th Street. Each street is a one-way, five-lane facility with a posted speed limit of 35 mph and average daily traffic volumes of 25,000 to 37,000 vehicles. Front and Myrtle are highlighted in the map of Downtown Boise above.

The Front and Myrtle one-way couplet is an essential transportation corridor for the largest employment center, as well as the seat of government, in the state of Idaho. The couplet supports economic development in the Downtown Boise area, providing convenient and direct access to and from the I-184 Connector for commuters while also supporting freight movement for delivery of goods to Boise. The couplet serves as an important thoroughfare for employees traveling to

and from employment centers in Downtown such as St. Luke’s Hospital and Boise State University, and other employment destinations east of Broadway such as the Albertsons corporate headquarters.

However, the current auto-oriented configuration of Front and Myrtle limits other mobility options and serves as a de-facto barrier, acting more like a pair of high-speed thoroughfares than inviting downtown streets. As the Downtown core expands in terms of residential and commercial development, it has become clear to those living and working in Downtown Boise that Front and Myrtle are not in keeping with a walkable 21st century urban downtown that Boise aims to become. Urban central business districts that attract investment must offer amenities that cater to those on foot and bicycle, provide creative and connected quality public spaces, and support opportunities for retail and other real estate development.

Front and Myrtle in particular offer a rare opportunity. While significant efforts to improve frontages and streetscape along Front and Myrtle have already been undertaken by the Capital City Development Corporation (CCDC) and the City of Boise (the “City”), the convergence of development and demographic changes in Boise, combined with the city and region’s vision for a more balanced transportation system as articulated in planning documents such as the Boise Transportation Action Plan, provide a chance to examine and transform a pair of auto-oriented couplets into two urbanized complete streets that accommodate safer and more comfortable travel and access for all users to and through the Downtown Boise area.

As requested by CCDC, the City, Idaho Transportation Department (ITD), Ada County Highway District (ACHD), and Community Planning Association of Southwest Idaho (COMPASS) (collectively, the “project team”), the following report includes an analysis of existing transportation and land use conditions on the Front and Myrtle corridors. The results of the existing conditions analysis then inform the development and selection of a preferred design alternative that balances competing demands within the Front and Myrtle corridor, and promotes a more livable and potentially economically productive corridor that integrates and builds upon the growing Downtown core. The preferred alternative was developed with a robust traffic operations analysis that balances the many competing demands on the corridors and still generally preserves the current ability of vehicles to access and pass through Downtown Boise with relatively minimal delay at almost all hours of the day.



Myrtle St and 5th St, facing west

PROJECT PROCESS + TIMELINE

The consulting team employed a transparent process throughout the project in order to guide the project team from defining a high-level vision for the study all the way down to selecting preferred design alternatives for the short- and long-term. These steps are generally described in the diagram to the right.

The process began in October 2016 with a large-group workshop and field visit “walkshop” to establish a vision for the corridors and translate that vision into a set of performance measures. Next, the consulting team brainstormed a universe of potential design solutions, which were then evaluated and prioritized by the project team in a second workshop. The consulting team used this feedback to develop a set of three potential design solutions for Front and Myrtle, which were further reviewed by the project team in conjunction with technical analysis of potential impacts to the vehicle network. Through a third workshop with group exercises in which attendees were asked to evaluate design choices in context of the project’s vision and performance measures, the project team indicated its preferences on potential tradeoffs. The consulting team used this feedback to narrow down the options into a singular preferred alternative (in fact, a blend of several alternatives in order to best balance the competing demands on the corridors).

The preferred alternative is presented in Chapter 5 of this report, following chapters on existing conditions, performance metrics, and the development and evaluation of alternatives (Chapters 2 through 4, respectively).



EXISTING CONDITIONS



KICKOFF WORKSHOP



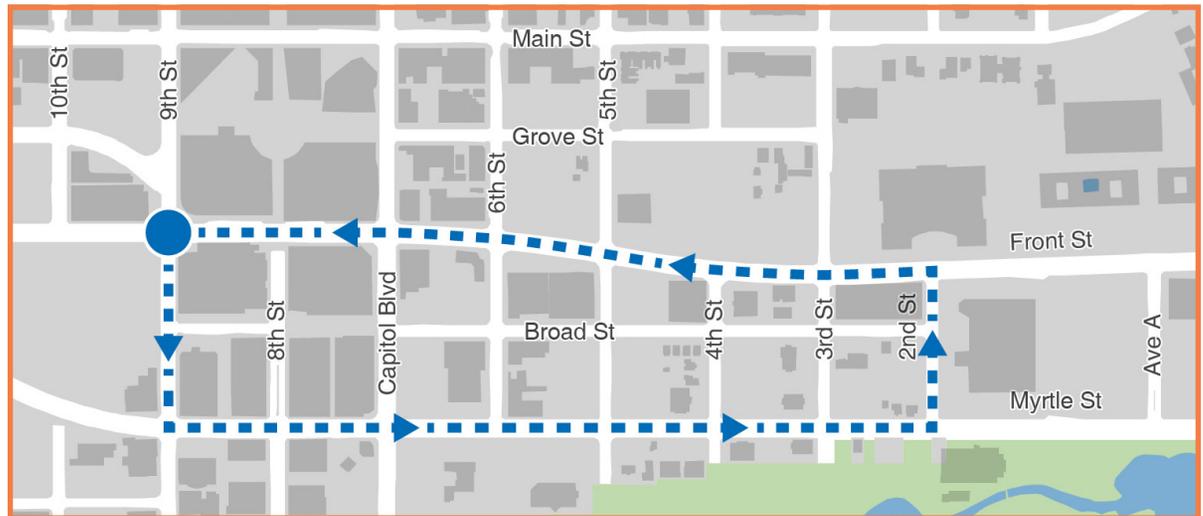
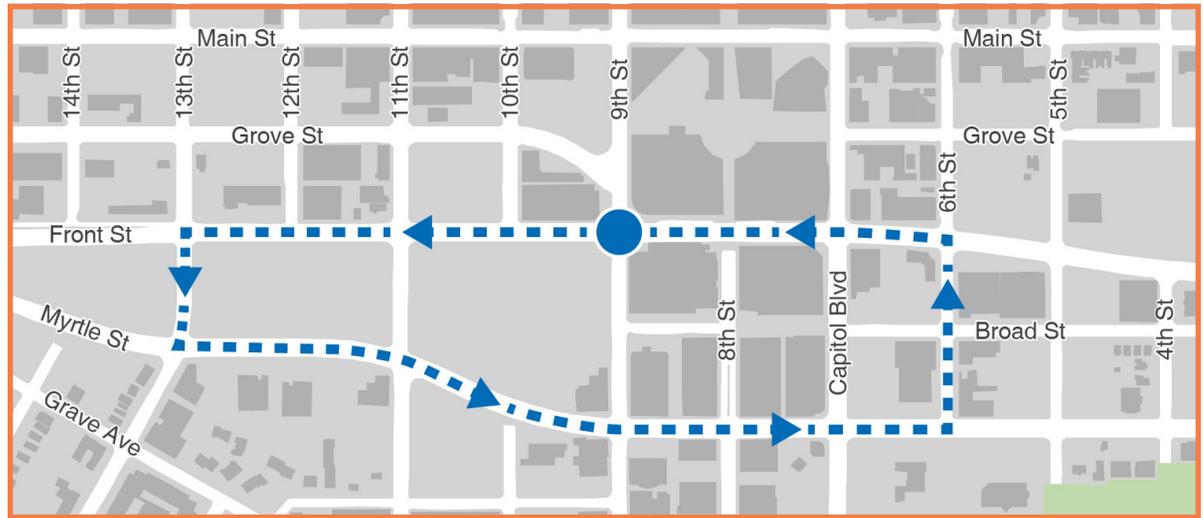
This section documents and summarizes the key findings and results from the October 2016 2-day kickoff visit on Boise's Front + Myrtle Couplet Alternatives Analysis project. The visit included a walking tour of the two corridors under consideration and a structured visioning session. Attendees included representatives from Capital City Development Corporation, the City of Boise, Ada County Highway District, the Idaho Transportation Department, the Community Planning Association of Southwest Idaho, and other invited stakeholders.

Findings from the kickoff visit were used to inform an existing conditions analysis of the two corridors, documenting and assessing how well Front and Myrtle works for a range of users. The results of the existing conditions analysis informed the subsequent development of alternative design scenarios and performance metrics, and established a baseline against which the proposed preferred alternative was measured and evaluated.

Walkshop

In order to get a sense of existing conditions on Front and Myrtle, the first step identified was a walking tour of most of the lengths of both study corridors. Participants were invited to join one or both “walkshop” sessions. Participants were provided with handouts asking them to identify issues they saw as ripe for improvement or as examples of elements that could be replicated in other parts of the two corridors. By walking the corridors, members of the project team and invited stakeholders were able to experience them with a non-motorized view, which was intended to help inform existing issues and potential improvements from a pedestrian perspective.

Map of Routes



Photos from Walkshop



13th Street between Front Street and Myrtle Street



Front Street and 12th Street



Front Street and 9th Street

General Walkshop Findings

What Needs Improvement

- Narrow sidewalks, often with no buffer, adjacent to perceived fast moving traffic
- Long distances between marked pedestrian crossings and signalized intersections
- Double right or double left turn lanes create dangerous conditions for crossing pedestrians
- Excessively large curb radii
- Surface parking lots are adjacent to streets while buildings are not
- 2.5 ft shoulders are insufficient for safe bicycle travel
- Superfluous curb cuts that do not lead to driveways
- High traffic volumes create noise pollution

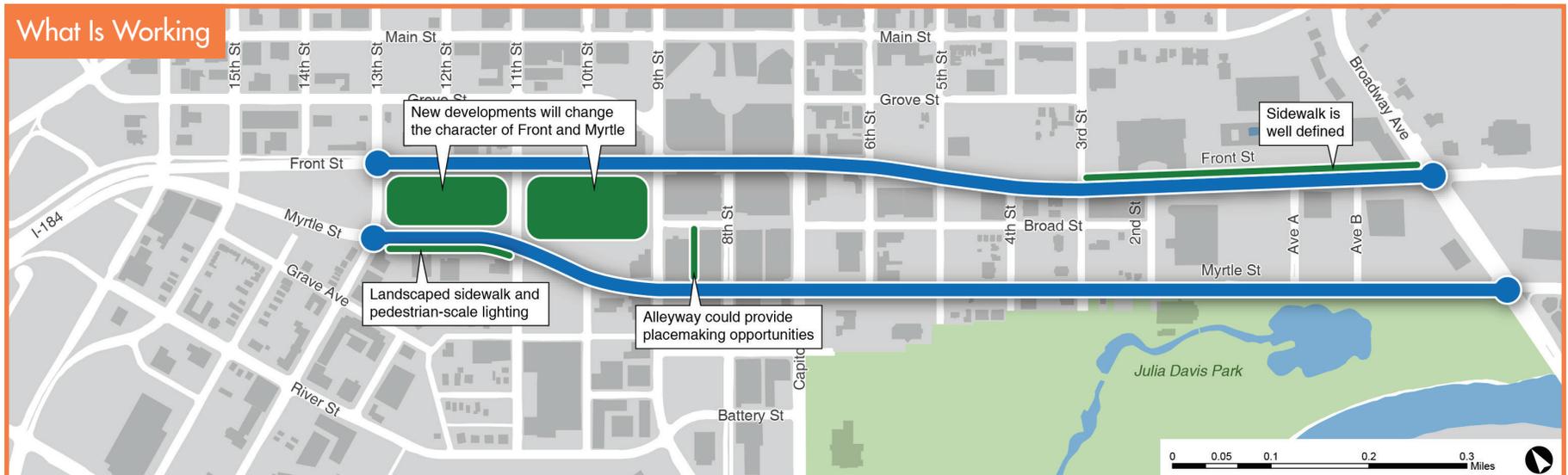
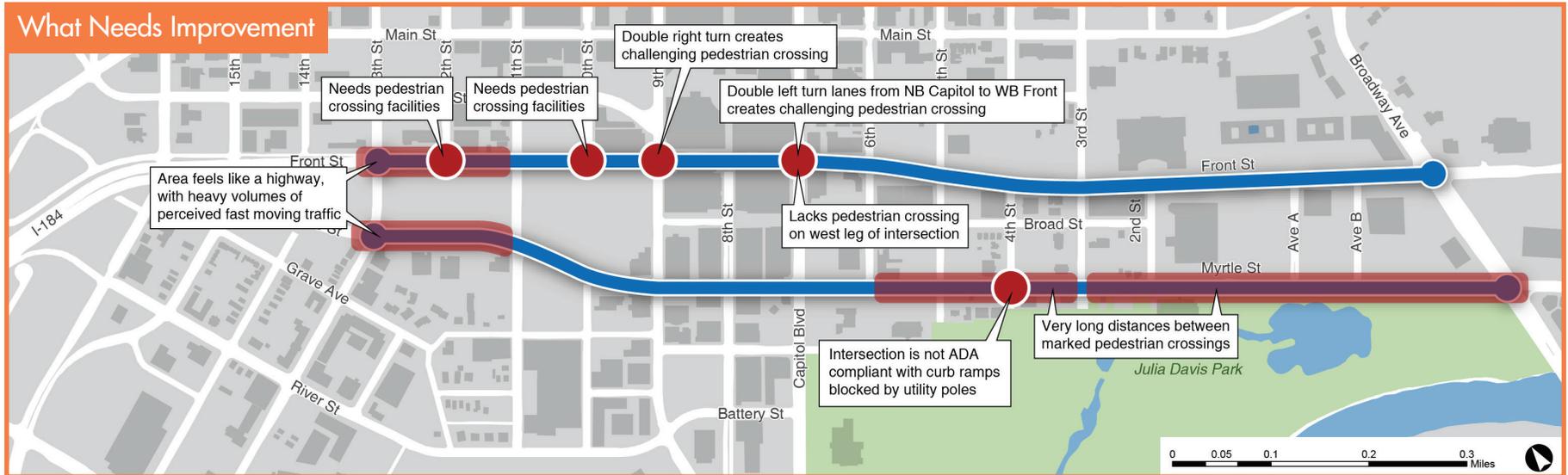
What Needs Improvement

- Some street segments feature wide sidewalks with landscaped physical buffers
- New developments will result in higher pedestrian volumes and justify new intersection crossing treatments
- New developments can potentially form attractive storefronts adjacent to streets
- Excess roadway capacity may create opportunities for corner bulb outs and/or on-street parking



Myrtle Street and 2nd Street looking east during the walkshop

Location Specific Walkshop Findings



Context Zones

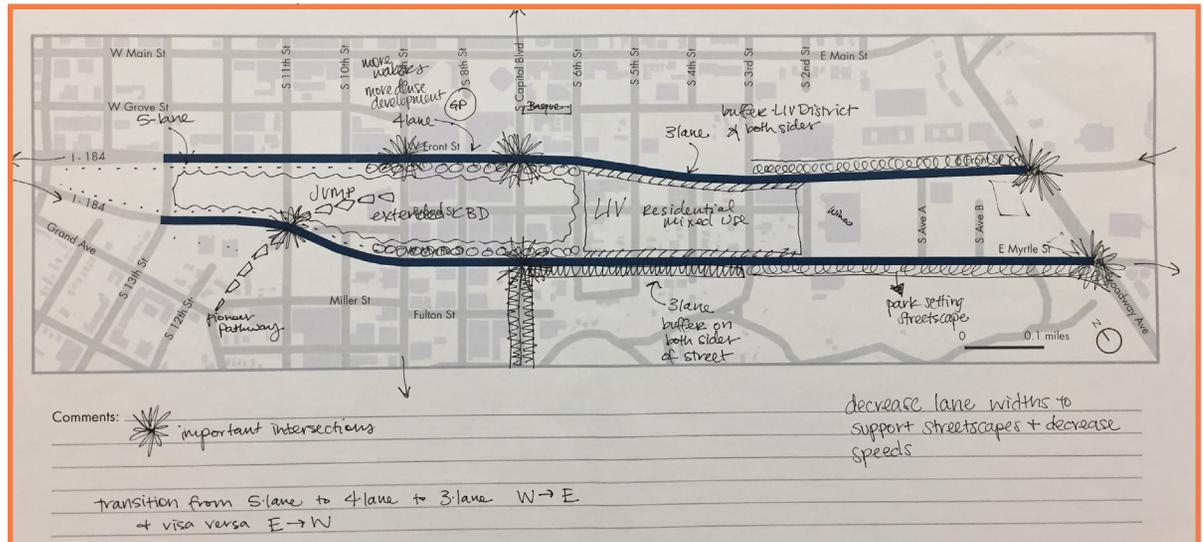
This exercise prompted participants to mark up a map of the study corridors to indicate specific issues that might demand certain design solutions. While some solutions may certainly be appropriate throughout the length of both Front and Myrtle, others may be context dependent. Through follow-up discussion at the vision session along with further consultation with the project team, it was determined that three “context zones” could be considered for Front and Myrtle. Furthermore, the third or easternmost zone was divided to recognize differences between Front and Myrtle east of 5th Street.

FRONT + MYRTLE VISION SESSION - CONTEXT ZONES

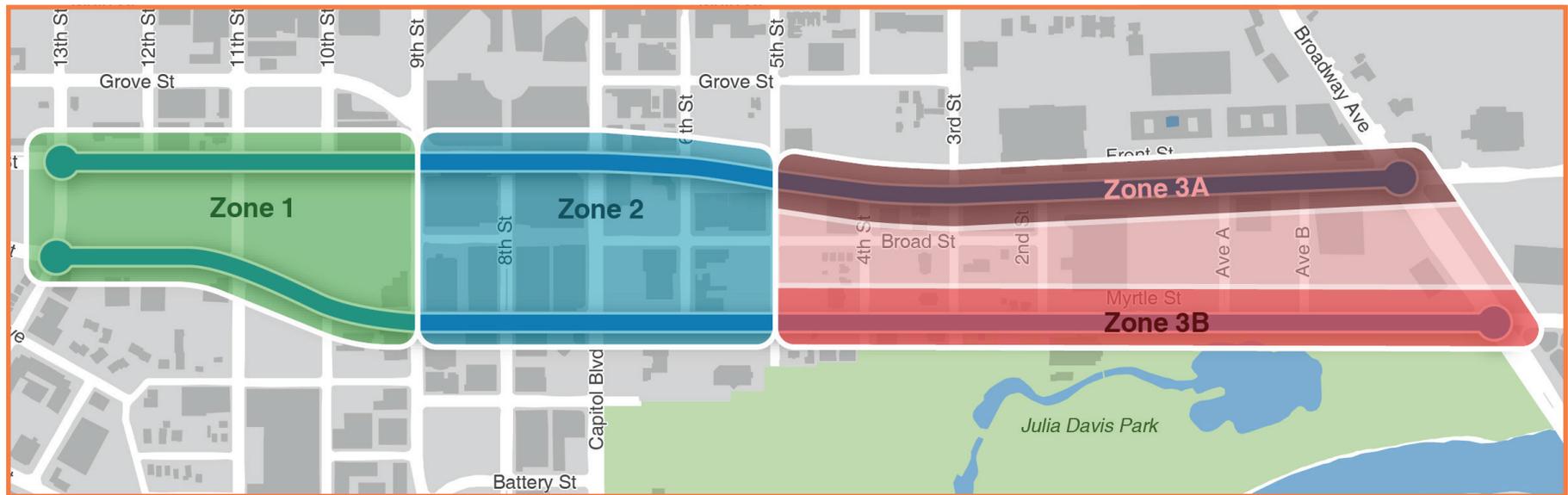
Different parts of Front + Myrtle have different contexts across the study area. Help us identify areas that share a common character, and describe the type(s) of design solutions that might be appropriate. Please be specific and use the reverse side if necessary.



Sample Responses



Context Zone Summary Map - Key Issues



Zone 1

- Lack of marked pedestrian crossings (superblocks)
- Transition from highway to Downtown Boise
- New large-scale developments
- Perceived high traffic speeds
- Relatively higher traffic volumes

Zone 2

- Downtown core
- Mixture of land uses
- Existing intersections require improvements
- Highest pedestrian and bicycle volumes

Zone 3

- Long distances between signalized intersections and lack of marked pedestrian crossings
- Myrtle St adjacent to Julia Davis Park
- Need for additional streetscape elements
- Perceived high traffic speeds



Myrtle Street and 2nd Street, facing east

Zone 1 Description

Zone 1 is characterized by new large scale developments and superblocks, and is the transition area from I-184 to Downtown Boise. Because of the area's transitional nature and its proximity to the highway, there are relatively higher volumes of traffic and perceived higher traffic speeds. The superblock development sites lack pedestrian safety elements at intersections such as marked crosswalks and crossing signals.





Front Street and 12th Street facing west towards I-184



Front Street and 9th Street facing east



Myrtle Street and 13th Street facing west towards I-184

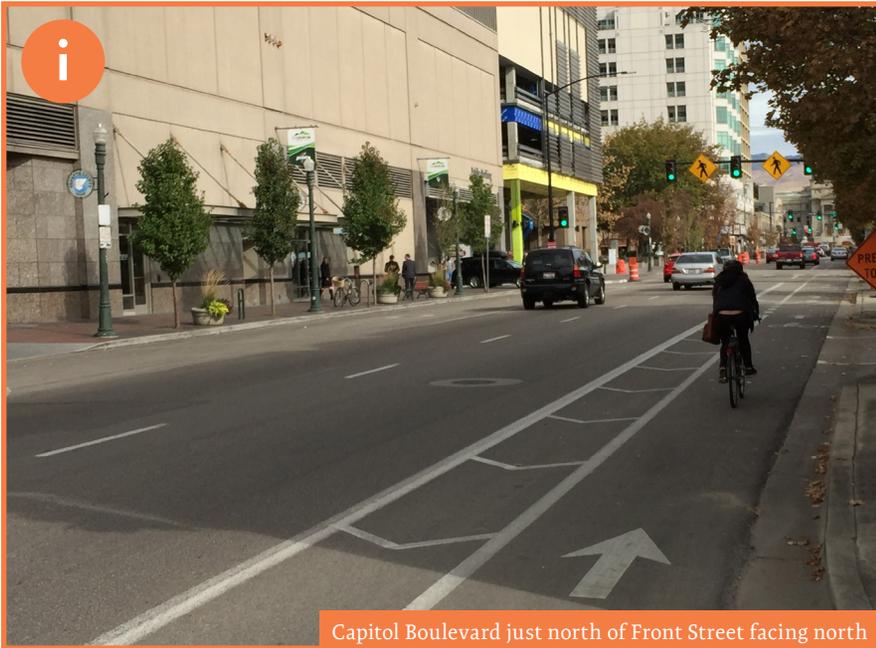


Myrtle Street and 11th Street facing east

Zone 2 Description

Zone 2 is located within the Downtown core of Boise, characterized by a mixture of land uses and denser development. Many existing intersections in the Downtown core require enhancements to accommodate increasing volumes of pedestrians and bicyclists, as well as to provide a safe and comfortable urban environment.

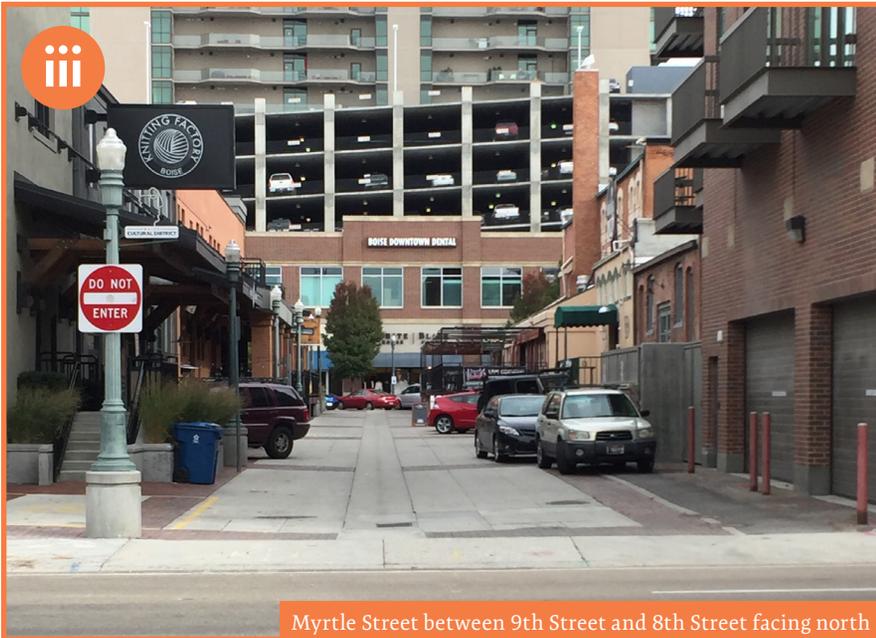




Capitol Boulevard just north of Front Street facing north



Front Street and 6th Street facing west



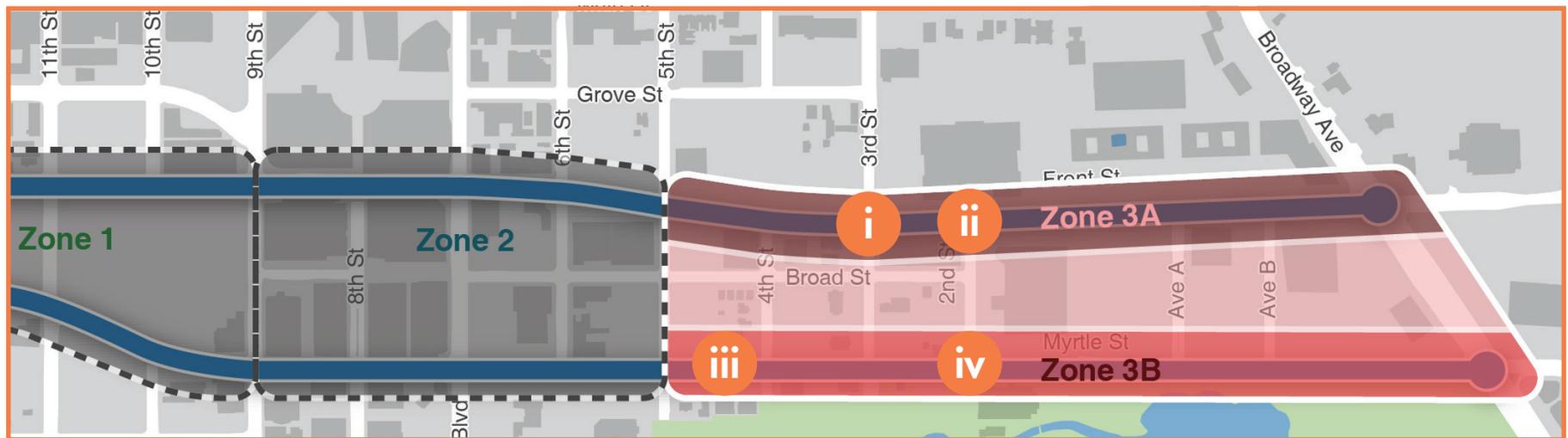
Myrtle Street between 9th Street and 8th Street facing north



Myrtle Street and 8th Street facing north

Zone 3 Description

Zone 3 is characterized by long distances between signalized intersections and a lack of marked pedestrian crossings. Five lane configurations and relatively lower traffic volumes lead to a perception of high traffic speeds and pedestrian safety concerns. Zone 3A consists of more diverse land uses and streetscape elements compared to Zone 3B, which features long stretches between signals and sits adjacent to Julia Davis Park.





DATA COLLECTION AND ANALYSIS APPROACH

A mix of existing transportation and land use data along with new data collected in Fall 2016 by the project team was used to develop the maps, figures, and analysis in this existing conditions analysis. Where possible, the project team relied upon data already collected and generously made available by the Idaho Transportation Department, the Ada County Highway District, and COMPASS. Such data includes daily traffic volume counts, turning movement counts, pedestrian counts, crash data, and others.

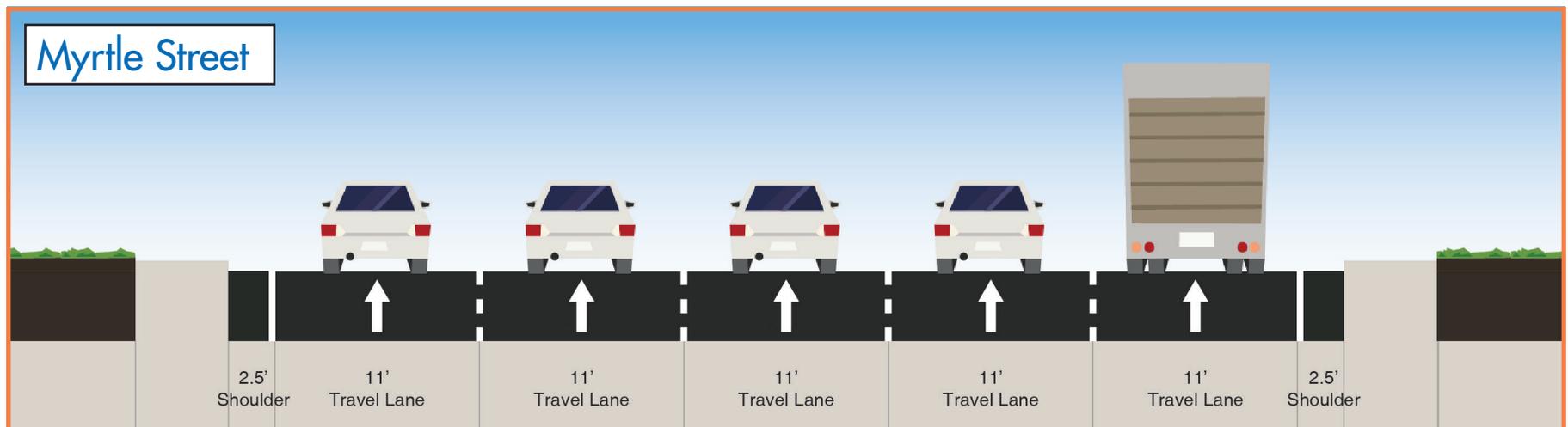
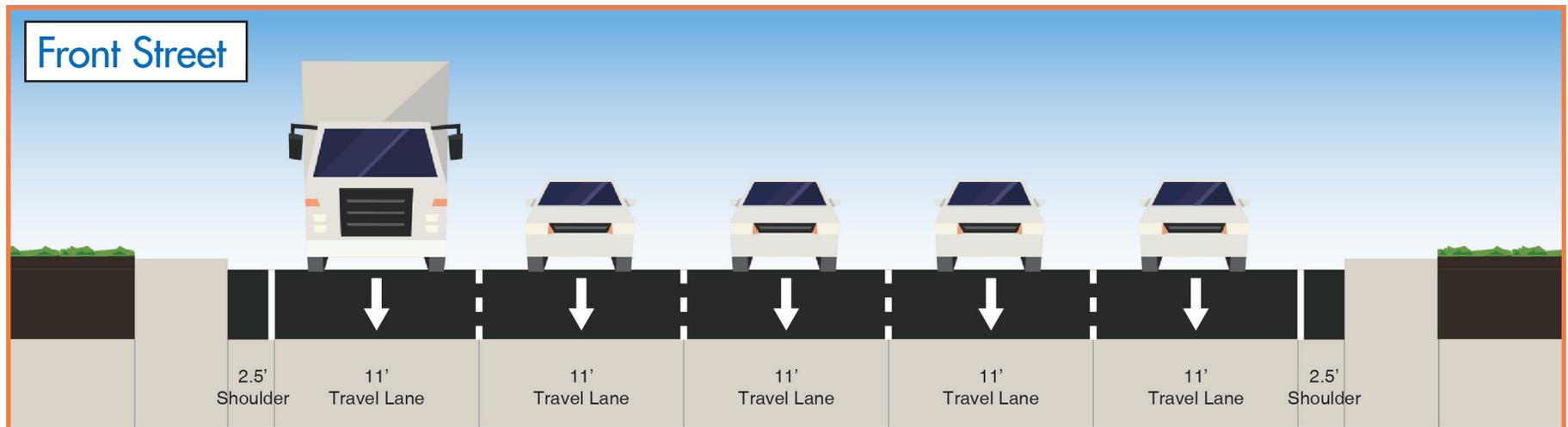
Additional data collected in late 2016 by the project team includes travel time data, additional turning movement counts, vehicle classifications, and others. A full accounting of transportation data and their sources is included in Appendix B. Land use data was primarily provided by COMPASS, and manipulated for presentation in GIS software. Supplemental data including information on new developments proposed and already under construction was gathered from a variety of sources, including COMPASS, Boise city staff, BoiseDev.com, individual developer websites and local news articles.

A mix of technical analysis and stakeholder input was applied to review the existing conditions data sources and develop maps, figures, and key conclusions. Traffic related data was analyzed using Synchro 9, a traffic software program, in order to represent conditions related to traffic congestion, vehicle delay, and volume-to-capacity ratios. Conclusions related to other transportation elements are based on data analysis along with comments received from the October 2016 vision session and subsequent conversations with the client team to date. In addition, certain information in this report was adapted from the City of Boise's 2016 Public Space Public Life report related to conditions in Downtown Boise - these are noted as such when they appear.

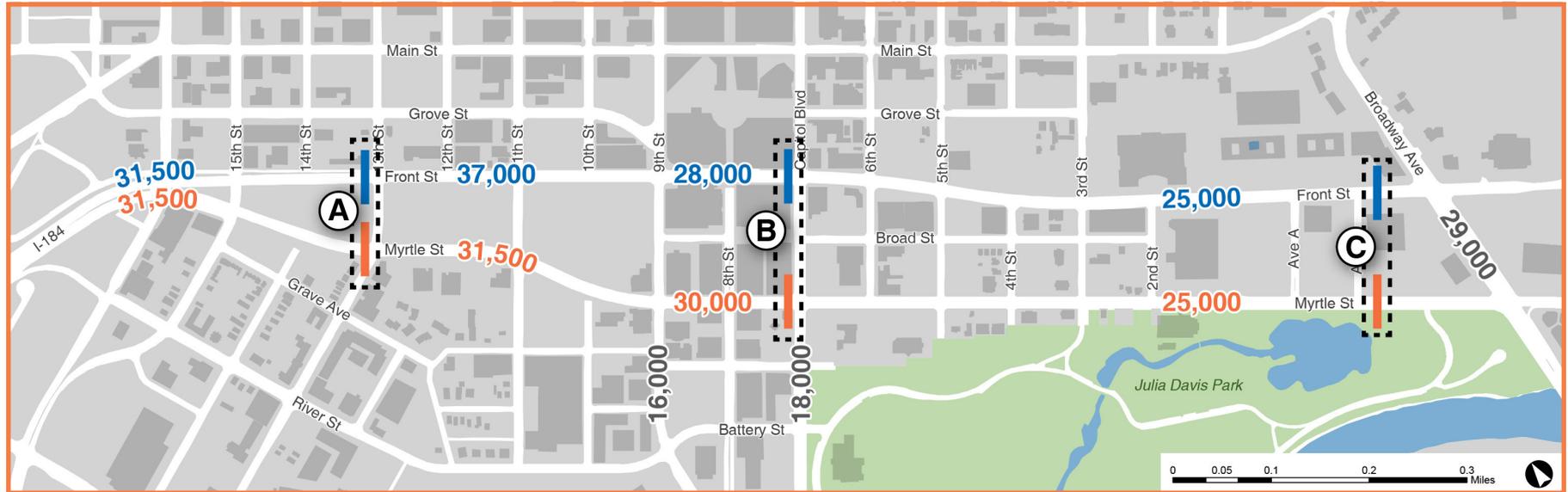
VEHICLE OPERATIONS

Street Configurations

Front and Myrtle feature consistent and fairly identical cross sections, with five vehicle travel lanes and narrow shoulders adjacent to north and south curbs. Front Street traffic moves westbound and Myrtle Street traffic moves eastbound.



Vehicle Volumes



Daily traffic volumes are generally highest on the western portion of both corridors and decrease further east. This trend most likely relates to use of the Connector: vehicles use Front as an approach to the highway westbound and access Front at different points, adding to cumulative volume. Similarly for those that exit the highway onto Myrtle, some vehicles gradually turn off for their destination.

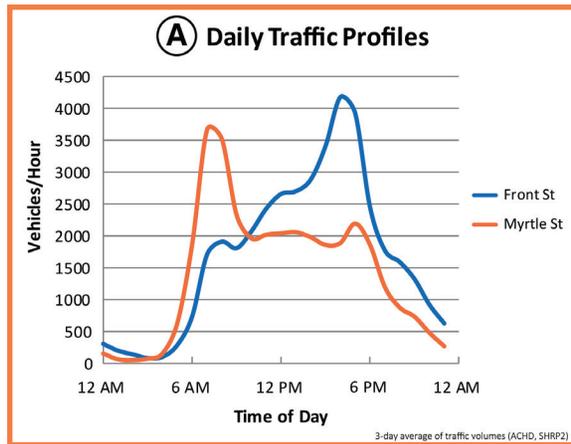
The chart to the right indicates the percentage of heavy vehicles at three locations: 13th Street, Capitol Boulevard, and just west of Broadway Avenue. Heavy vehicle percentages are relatively consistent at all locations and also similar between Front and Myrtle. Relative to overall traffic the percentages of heavy vehicles are low at half of one percent, or less (or just over one percent if Class 5 delivery trucks are included).

- XXX** Daily Traffic Volumes on Front St and WB I-184
- XXX** Daily Traffic Volumes on Myrtle St and EB I-184
- XXX** Daily Traffic Volumes on North/South Streets

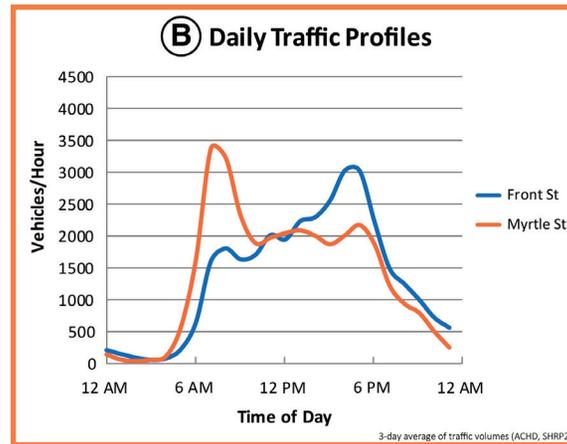
HEAVY VEHICLES PERCENTAGES OF DAILY TRAFFIC						
	A		B		C	
	Class 6-13	Class 5-13	Class 6-13	Class 5-13	Class 6-13	Class 5-13
Front St	0.4%	1.1%	0.5%	1.1%	0.4%	1.2%
Myrtle St	0.4%	1.1%	0.4%	1.1%	0.4%	1.1%

Vehicle class 6-13 includes 3-axle, single-unit truck to multi-trailer truck
Vehicle class 5-13 adds delivery/mail/pick-up trucks

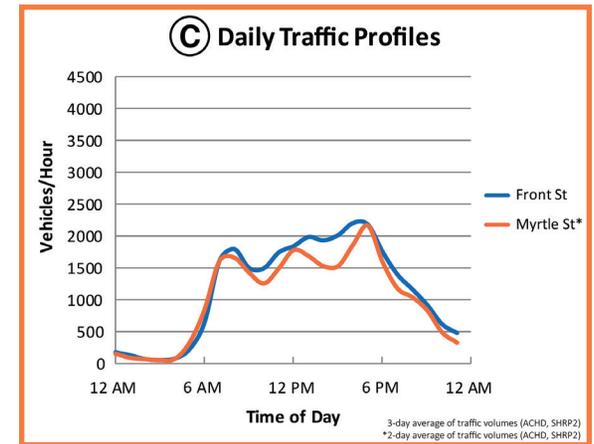
Vehicle Volume Hourly Profiles by Location



At 13th Street, where Front and Myrtle meet the Connector, volumes exhibit the most “peaking” based on time of day due to commuters entering Downtown in the morning (to Myrtle Street) and leaving in the afternoon (via Front Street). While both streets see spikes during their respective peak hours, Front sees more than double the amount of vehicles in the afternoon peak hour compared with the morning peak hour.

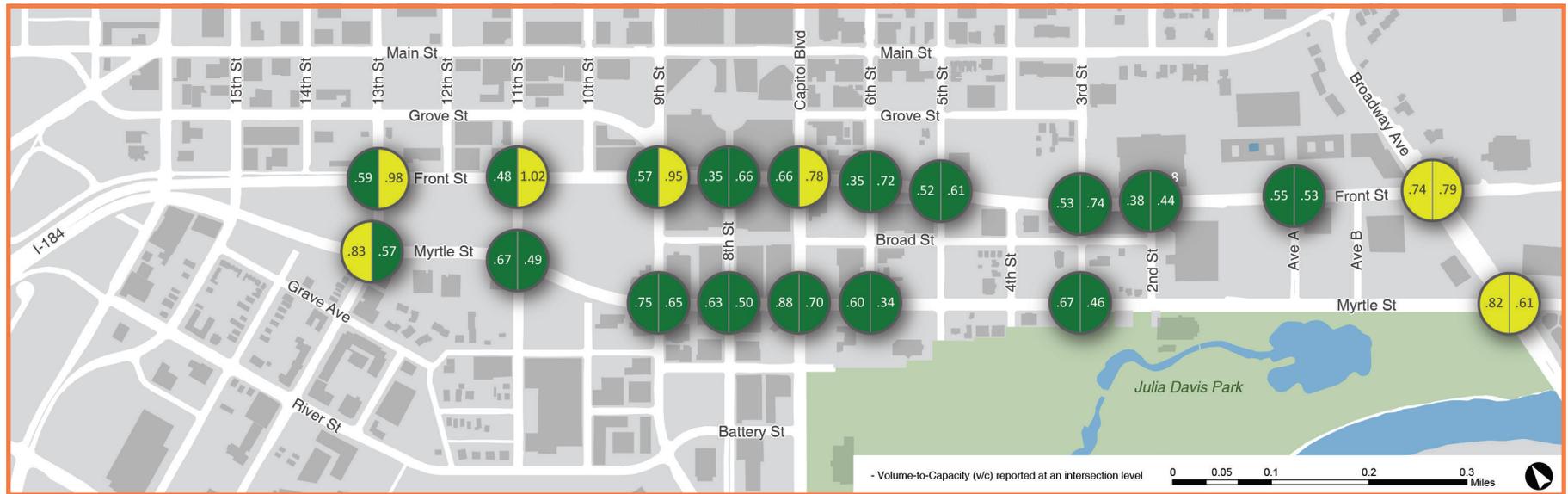


At Capitol Boulevard, the morning peak hour on Myrtle Street is almost as high as at 13th Street. On Front, however, the difference between morning and afternoon peak volumes is not quite as extreme.



Just west of Broadway Avenue, both Front and Myrtle exhibit significantly less variation in hourly volumes during all hours of the day. On both streets, hourly volumes gradually rise on the average weekday with highest values occurring around 5pm.

Level of Service and Volume-to-Capacity: Existing Conditions



Most intersections along Front and Myrtle operate in excellent condition for a majority of the day, providing vehicular levels of service of “A” or “B” meaning that there is excess capacity on much of the street network. Other than the intersection of Myrtle Street and Broadway Avenue, no intersection in the study area performs worse than a level of service “E” during the morning, midday, or afternoon peak hour. In short, for through traffic on Front and Myrtle, current conditions are favorable for vehicular movement.

Intersection Level of Service (LOS)

- LOS A-B (0-20 seconds delay)
- LOS C-D (> 20-55 seconds delay)
- LOS E-F (> 55 seconds delay)



Lane Utilization

Location <small>- Front St analyzed during weekday PM peak hour - Myrtle St analyzed during the weekday AM peak hour</small>	Peak Hour Lane Utilization				
	Left	Left Middle	Middle	Right Middle	Right
Front St between 12th St and 13th St	2%	32%	28%	28%	10%
Front St between 9th St and 8th St	17%	25%	25%	22%	10%
Front St between Capitol Blvd and 6th St	16%	24%	24%	26%	11%
Front St between 6th St and 5th St	21%	23%	23%	23%	10%
Myrtle St between 9th St and 11th St	11%	21%	23%	26%	20%
Myrtle St between Avenue B and Broadway Ave	10%	25%	23%	25%	16%

The chart above shows peak hour utilizations for each of the five travel lanes along Front and Myrtle during their respective peak times (weekday afternoon for Front Street and weekday morning for Myrtle Street). Although there are five lanes on each segment, an average of approximately 75 percent of the traffic present on these segments uses three of the available five lanes (e.g. the middle three lanes). Overall, the lane utilization at these study segments favors three to four of the five lanes available, depending on location. The low lane utilization of the far inside/outside lanes indicates these lanes may not be warranted at certain locations along each of the corridors. This could be especially true on eastern sections of the corridors, where overall traffic volumes are lower.

*Values may not sum to 100% due to rounding

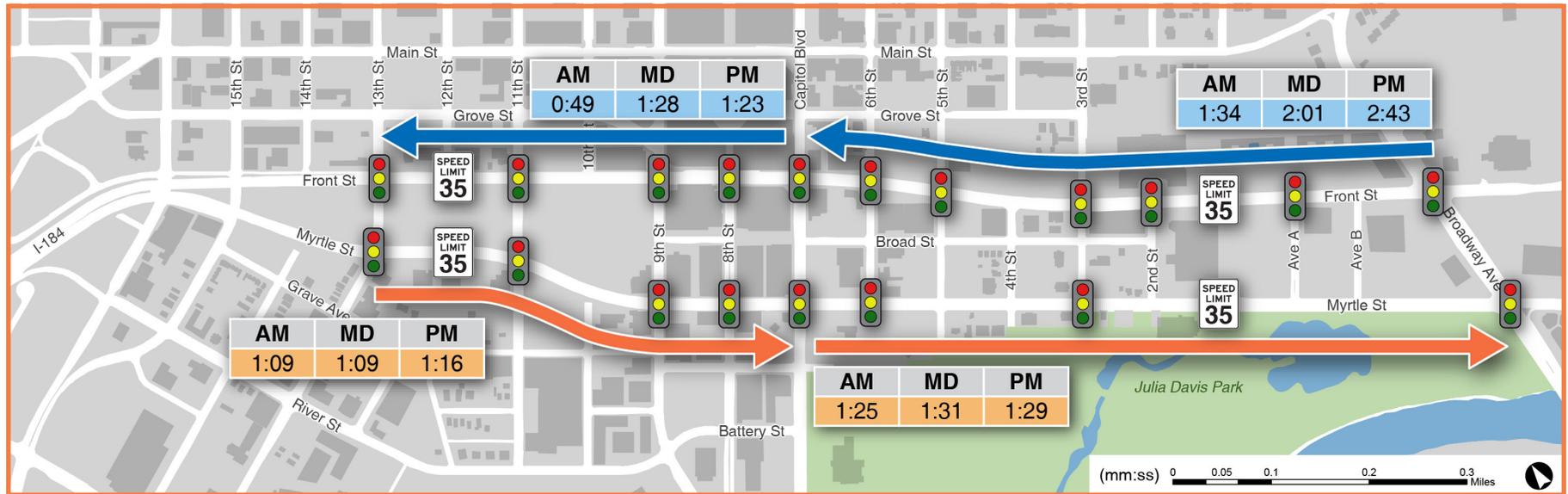
Signal Timing + Cycle Lengths

The signal timing and associated progression speed for vehicles traveling on Front and Myrtle was based on the posted speed limit of 35 miles per hour throughout the data analysis portion of this study. As of September 2017, ACHD updated the signal timings for the Downtown signal system. ACHD’s effort reduced the signal progression speed from the posted speed limit (35 miles per hour) to 30 miles per hour along the Front and Myrtle corridor. Signal timing and progression speed presents a tool which can send messages to drivers to reduce their speed for better reliability in travel time with fewer starts and stops, all else equal. Nonetheless, the traffic data analysis in this report, completed during early and mid-2017, reflects the prevailing signal timing plans in place at that time. Additional information on the signal timing update is provided later in this report.

The table to the right shows intersection level signal cycle lengths at a few intervals along the Front and Myrtle corridors. On the western section of Front Street, cycle lengths are increased to 140 seconds during the afternoon peak hour to accommodate the significant volume of traffic that uses Front Street to access the Connector. Similarly, Myrtle Street’s morning cycle length is higher than at other times across the entire corridor. The intersections with Broadway Avenue feature long cycle lengths throughout the day due to high traffic volumes to be processed at these intersections.

SIGNAL CYCLE LENGTHS COMPARISON			
Location	AM	MD	PM
<i>Signal Cycle Lengths Pre-ACHD Signal Timing Update</i>			
Front St (6th St - Avenue A)	85	65	65
Myrtle St (13th St - Avenue A)	85	65	65
Front St (13th St - Capitol Blvd)	85	65	130
Front St/Myrtle St (Broadway Ave)	120	130	140
<i>Signal Cycle Lengths Post-ACHD Signal Timing Update</i>			
Front St (5th St - Avenue A)	90	65	70
Myrtle St (13th St - Avenue A)	90	65	70
Front St (13th St - 6th St)	90	65	140
Front St/Myrtle St (Broadway Ave)	120	130	140

Vehicle Travel Times

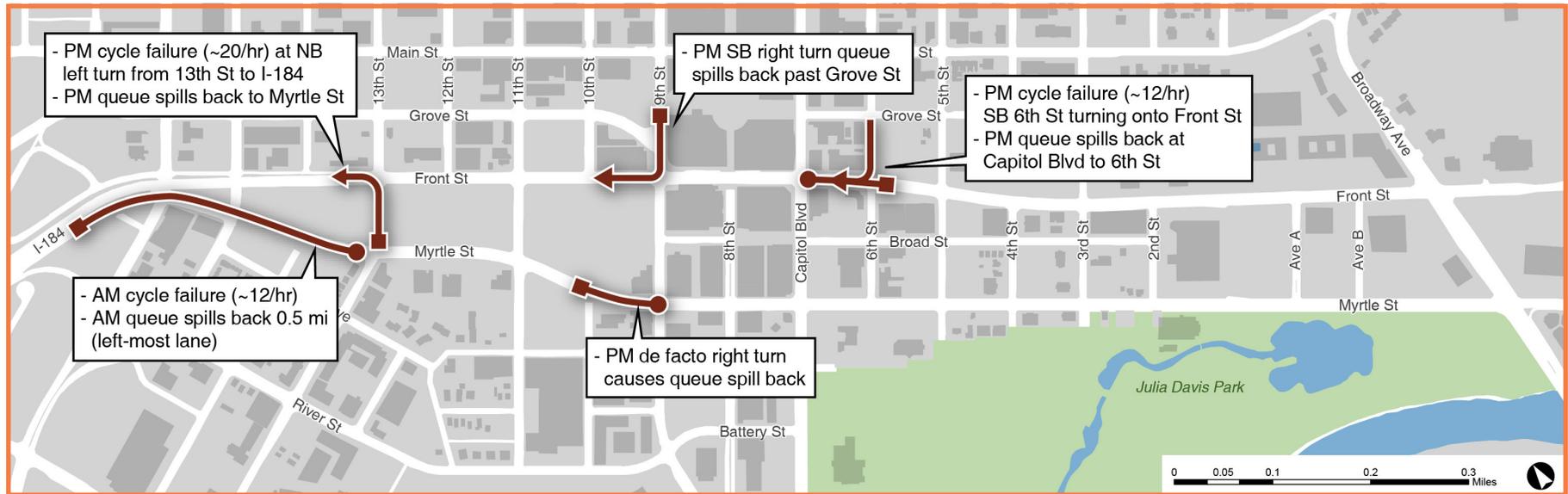


Travel times across both Front and Myrtle were measured using Bluetooth technology. The figure above breaks up travel times east and west of Capitol Boulevard, and the table to the right aggregates these findings. On Front Street, there is a significant difference in travel time between morning and midday/afternoon hours. The high volumes of vehicles using Front Street to access the Connector result in moderate congestion and an overall travel time that is over 70% higher in the afternoon peak compared with the morning peak. Myrtle Street sees far less variation in travel time, however, with only moderate differences throughout the day. In fact, the shortest travel times measured also occurred when traffic volumes are highest, during the morning peak hour.

Data Source	Method	AM Trips	MD Trips	PM Trips
BlueMAC	Bluetooth	1,659	2,931	1,911

TOTAL TRAVEL TIMES			
	AM	MD	PM
Front	2:23	3:29	4:06
Myrtle	2:34	2:40	2:45

Traffic Observations



Overall, vehicular traffic moves rather predictably and freely on both Front and Myrtle for a vast majority of the day. However, specific intersections or street segments where backups and queues do occur are indicated in the figure above. In some cases, cycle failures occur and traffic is unable to be processed through an intersection and must wait for the next green phase. Front Street generally sees these issues occur during the afternoon peak when volumes are highest and motorists are attempting to access the Connector. These issues are most pronounced from 6th Street and to the west as shown above.

Myrtle Street sees comparably fewer queues that spill back to adjacent streets or intersections. The most obvious issue is on the Connector itself, where queues in the morning peak spill back from the 13th Street intersection onto the freeway. However, the lengthy queues are not surprising, given the high volume of freeway traffic traveling at 60 miles per hour arriving at an at-grade signalized intersection that marks the entrance into Downtown Boise's urban grid.

Long distances between
signalized intersections

Excess capacity during
a majority of the day



Heaviest congestion occurs on Front Street during PM peak, especially in middle lanes

Queueing and spillback at signalized intersections in Downtown Core

Other ITD Facilities

Other streets under Idaho Transportation Department jurisdiction were reviewed to determine treatment in downtown or urban areas. Two examples are noted below where speed limits are reduced to 25 miles per hour, a level generally considered suitable for urban environments where (relatively) dense land uses and on-street commercial attractors may induce more pedestrian activity. Neither of these examples are analogous to Front and Myrtle, but are instead offered to provide context for the potential for lower speeds (either via lower posted speed limits, different signal progression speeds, and/or street design tactics to encourage defensive driving).

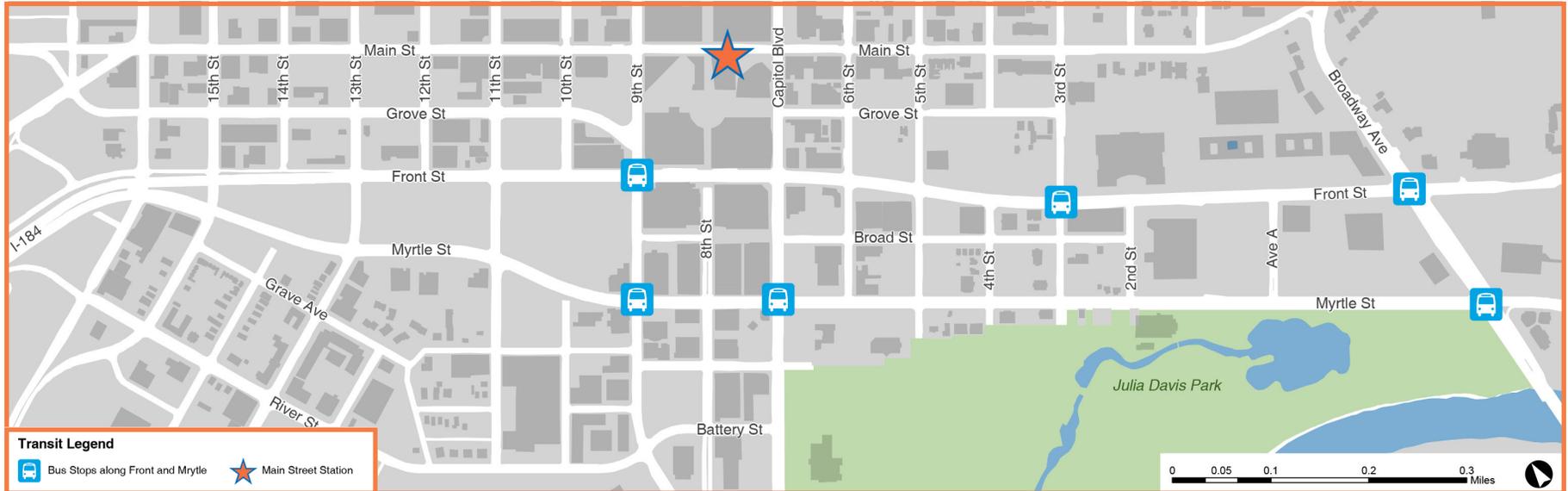


U.S. Highway 26 travels through Downtown Idaho Falls (as Yellowstone Avenue) and passes by a mix of low-to moderate density businesses, office parks, and commercial spaces. While Downtown Idaho Falls is not quite as active as Downtown Boise, the city is nonetheless a major population center in eastern Idaho. ITD posts speed limits of 25mph throughout most the length of U.S. 26's path through the Downtown.



The I-84 Business loop located in Caldwell is a one-way couplet like Front and Myrtle. The couplet consists of Cleveland Boulevard (shown above) and Blaine St. Both streets are signed for 25 mph in Downtown Caldwell. Cleveland and Blaine do not spill out from or connect directly to a limited access highway, and Caldwell has significantly less density and cross street traffic than Front and Myrtle. However, the application of a 25 mph speed limit is notable.

Transit Conditions

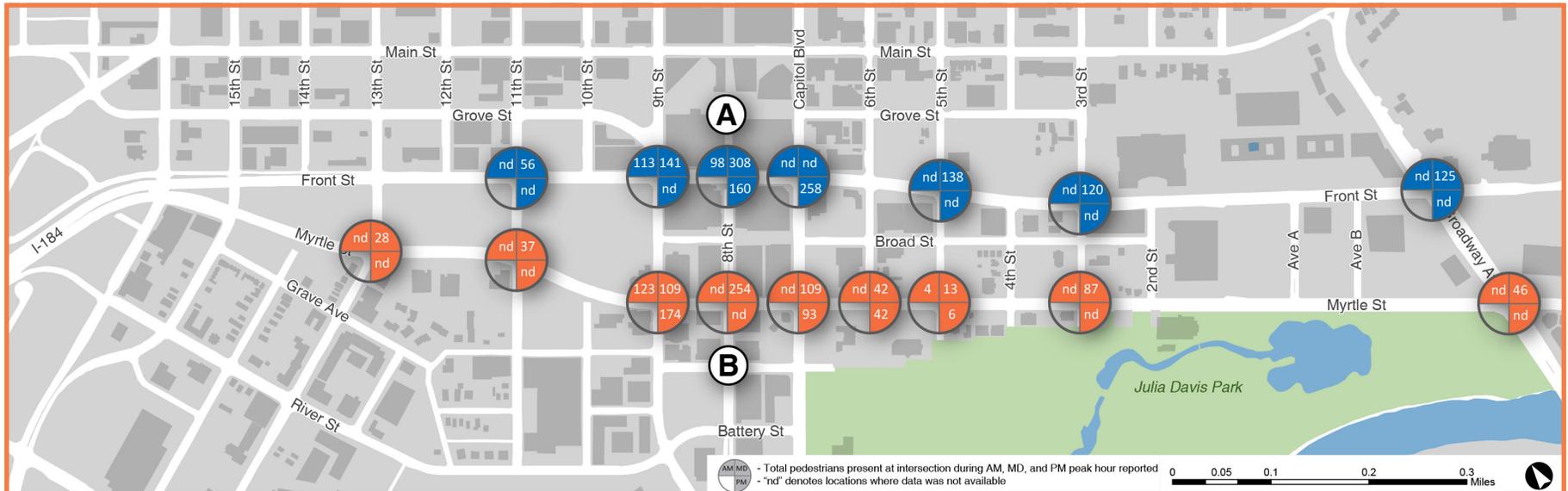


ValleyRide currently provides limited public transit service on Front and Myrtle. However, Boise's new Main Street Station (8th Street/Main Street) is located a few blocks to the north of the corridors, which provides access to many bus routes. Currently, Route #45 (BSU Express) operates seven round-trips during the day and has stops on Front Street at 3rd Street and 9th Street. Additionally, Route #1 (Parkcenter), which runs every 20 minutes during peak times and every 40 minutes during the midday, and Route #3 (Vista), which runs every 30 minutes during peak times and every 60 minutes during the midday, have stops on 9th Street and Capitol Boulevard at Myrtle Street. Route #2 (Broadway) provides hourly service and has stops on Broadway Avenue at both Myrtle and Front. No other transit stops are provided on Front and Myrtle.

With the current transit service fairly limited – in terms of both number of stops and frequency of service – there is little precluding or harming the transit experience on these corridors. However, to the extent that future transit service expands in conjunction with a growing and expanding Downtown core and shifting transportation preferences, it will be important to consider needs of transit users in addition to needs of motorists, freight vehicles, pedestrians and bicyclists. Consideration for adequate space for comfortable shelters and waiting areas, along with general traffic calming to enhance the pedestrian environment, could make the transit experience more appealing on the Front and Myrtle corridors.

PEDESTRIAN CONDITIONS

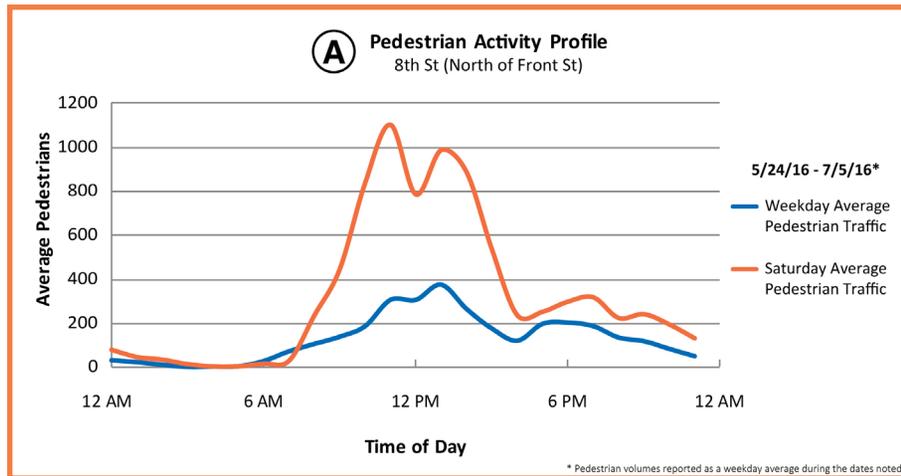
Pedestrian Volumes



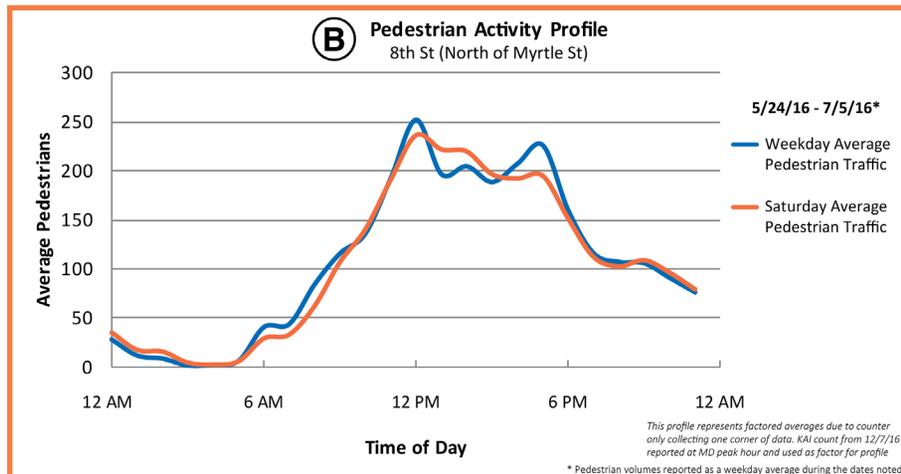
The figure above summarizes hourly pedestrian volumes during morning, midday, and afternoon peak hours. While the raw volumes themselves are not necessarily indicative of any particular issue, the differences in volumes seen at different intersections provide context to areas with relatively high or low pedestrian demand. Most significantly, volumes are highest in the heart of the Downtown Core, which includes intersections at 9th Street, 8th Street, and Capitol Boulevard. The peak hour for pedestrian activity on both corridors

occurs between 12:00 and 1:00 pm on 8th Street. For areas east and west of the Downtown Core, volumes tend to drop off. This is to be expected as land uses in these outer locations do not generate similarly high pedestrian volumes. However, this is likely to change as the development landscape continues its growth outward from the core.

Pedestrian Volume Hourly Profiles

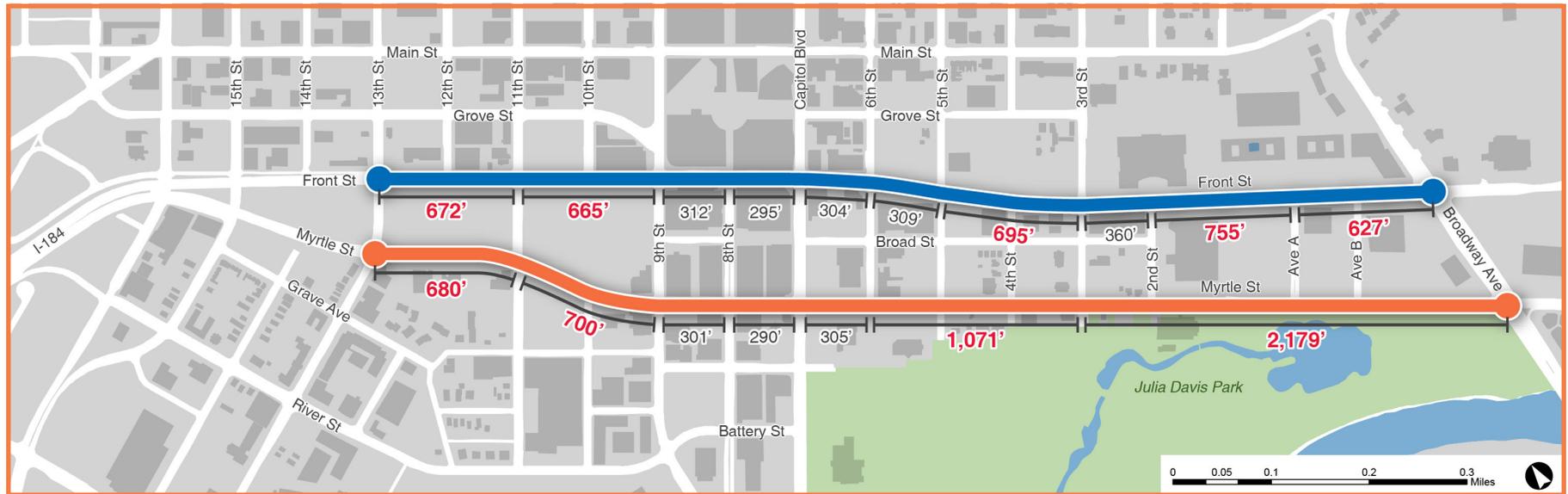


Front Street and 8th Street sees the highest volumes of pedestrians of any intersection along Front and Myrtle by a wide margin. Weekdays during midday see volumes of over 400 pedestrians per hour. On Saturdays the volumes are far higher, most likely due to visitors to Downtown Boise’s restaurants and retail attractions on 8th Street and vicinity, generally north of Front Street. Average hourly pedestrian volumes exceed 1,000 people per hour in late morning during the busiest times. There is also a moderate peak in pedestrian volumes on Saturday evenings, almost matching the highest levels seen on weekdays.



The second busiest intersection for pedestrians in the study area is located at Myrtle Street and 8th Street. On weekdays and on Saturdays, pedestrian volumes here peak during the midday period and remain relatively high until the early evening, with over 200 pedestrians crossing per hour. It is notable that pedestrian volumes on weekdays and on Saturdays are virtually identical.

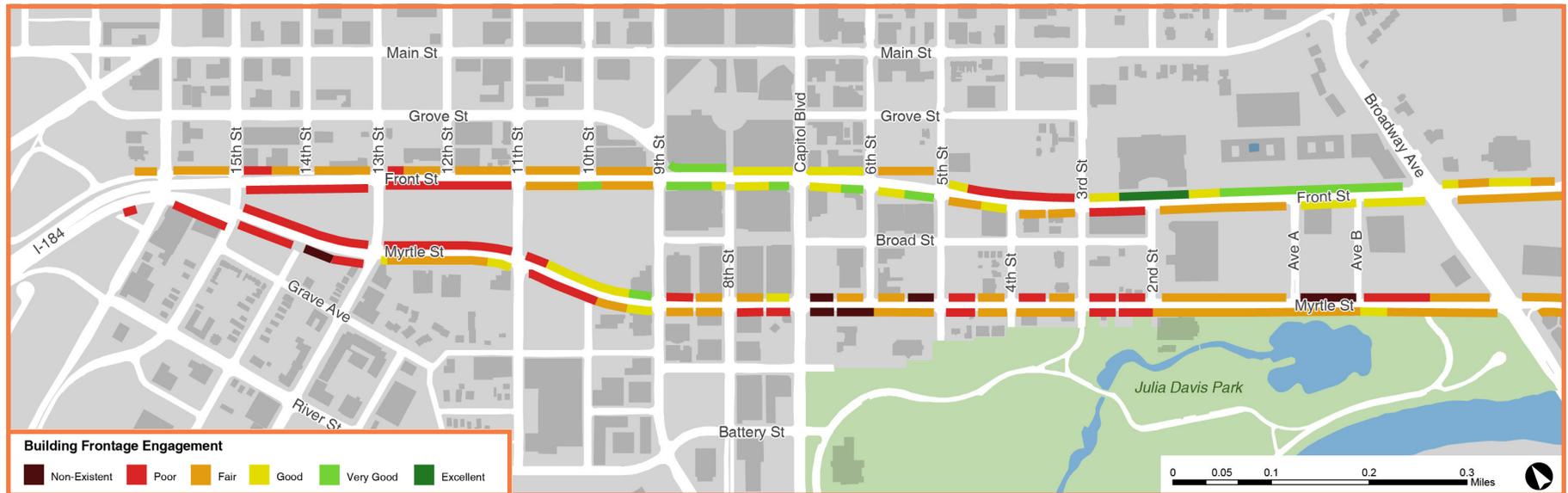
Distances Between Signalized Crossings



Numerous blocks along both corridors, particularly on Myrtle Street, feature distances over 400 ft between signalized crossings with marked crosswalks. For pedestrians walking east and west along Front and Myrtle, these long distances create challenges for comfortable walking and could potentially induce jaywalking. The reasons for these distances vary: on the west end of the corridor, two superblocks (13th Street to 11th Street, and 11th Street to 9th Street) create breaks in the street grid. Both superblocks are development sites and consideration for increased numbers of future pedestrians may necessitate reintroducing distances of 300 to 400 ft between marked crossings that are more typical for Downtown Boise.

The east end of the corridor features very long distances on Myrtle Street: there is only one signalized crossing opportunity (at 3rd Street) between 6th Street and Broadway Avenue (over half a mile). Many streets in this interval are minor, with low traffic volumes, and all terminate at Myrtle Street without extending further south due to the presence of Julia Davis Park. While the vehicle network may not demand traffic signals at these intersections, a lack of signalized crossing opportunities at this end of Myrtle Street makes access between the park and new developments on the north side of Myrtle Street difficult for pedestrians. The eastern end of Front Street sees similarly long distances between signalized crossings although there are additional opportunities provided at 5th Street, 2nd Street, and Avenue A.

Street Level Engagement



The figure above summarizes a virtual “walk audit” of most frontages along Front and Myrtle, characterizing the overall level of engagement with the street, particularly from a pedestrian standpoint. Using September 2016 Google Streetview imagery, each frontage segment was rated based on a combination of orientation and proximity of building entrances, sidewalk quality and condition, streetscaping/ plantings, surface parking obstructions, signage, window placement, etc. to arrive at a holistic score of pedestrian engagement.

Ratings are generally highest along Front Street adjacent to the Downtown Core (between 9th Street and 5th Street) with a lone “excellent” rating given for the Ada County Courthouse building east

of 3rd Street. Pedestrians are generally disengaged from Front and Myrtle on all segments west of 9th Street, partially due to vacant and inaccessible superblocks here as sites are developed. There are only a few streetscape elements or active entrances along the north side of Front Street and south side of Myrtle Street in these areas.

While current conditions along Myrtle Street seldom rise above “fair,” some sites shown as “non-existent” are likely to improve as new development projects come online. Throughout the corridor, there appears to be more investment in pedestrian-friendly amenities (inviting entrances, signage, and active windows) along frontages facing north-south streets, as opposed to Front and Myrtle themselves.

Pedestrian Crossing Conditions



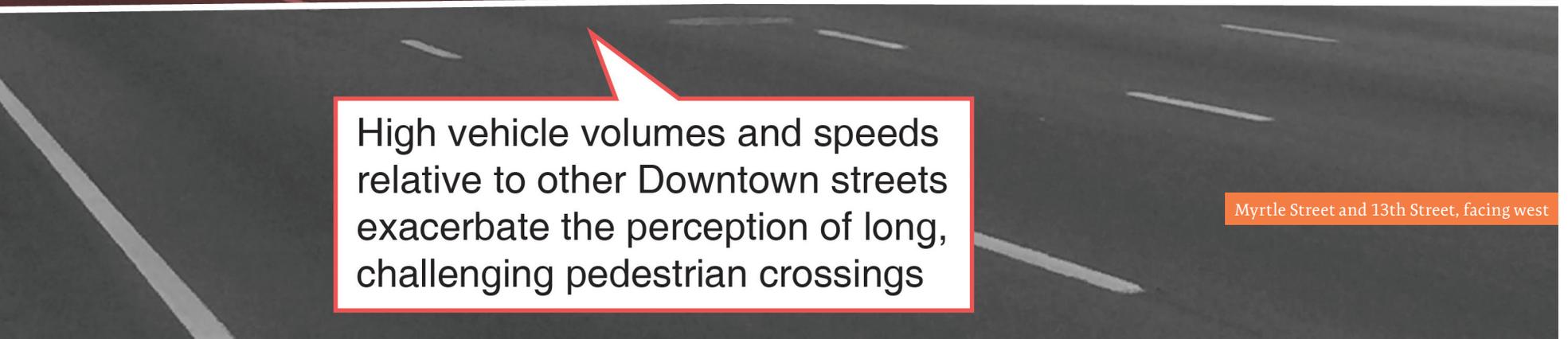
In 2016, the City of Boise engaged in an exercise to rate a majority of intersections in the Downtown Core as “friendly” or “unfriendly” with “good” or “poor” infrastructure. As shown in the figure above, many intersections along Front and Myrtle are rated in the middle (yellow) category. Infrastructure is generally rated as “good” – this indicates the presence of crosswalk markings, pedestrian signal heads and, in most cases, ADA compliant curb ramps. However, the City rated the crossings as “unfriendly” to pedestrians for all intersections along Front and Myrtle. This subjective measure was based on the City noting that despite acceptable infrastructure, these crossings “can

still be intimidating and uncomfortable due to high vehicular traffic [volumes].” In fact, Front and Myrtle were two of three streets (the other being State St) that were specifically called out as “present[ing] obstacles to pedestrian traffic.”

The above figure was directly adapted from the City of Boise’s report “Downtown Boise 2016: A Public Spaces and Public Life Study.”



Long crossing distances compared with other streets in Downtown Boise



High vehicle volumes and speeds relative to other Downtown streets exacerbate the perception of long, challenging pedestrian crossings

Blank building wall with
poor sidewalk engagement

Property frontage
occupied by parking lot

Relatively narrow sidewalk
immediately adjacent
to fast-moving traffic

Pedestrian Analysis: Quantitative vs. Qualitative Evaluations

Unlike traditional vehicular traffic analysis, certain elements of a pedestrian’s experience walking on a given street are not always quantifiable. Similarly, the pedestrian experience is not as easily boiled down to a simple “good” or “not good” dichotomy: various elements of the walking experience fall on a wide and often subjective spectrum of criteria.

Cumulatively, these elements may (but not always) be collectively negative enough to influence pedestrians to take longer routes to their destinations and/or abandon their plans to walk along or across a given corridor entirely. Such decisions are usually made subliminally and are difficult to measure, but if the walking environment is sufficiently poor there can be actual effects felt through opportunity costs of lost economic development, a lack of “sense of place” that

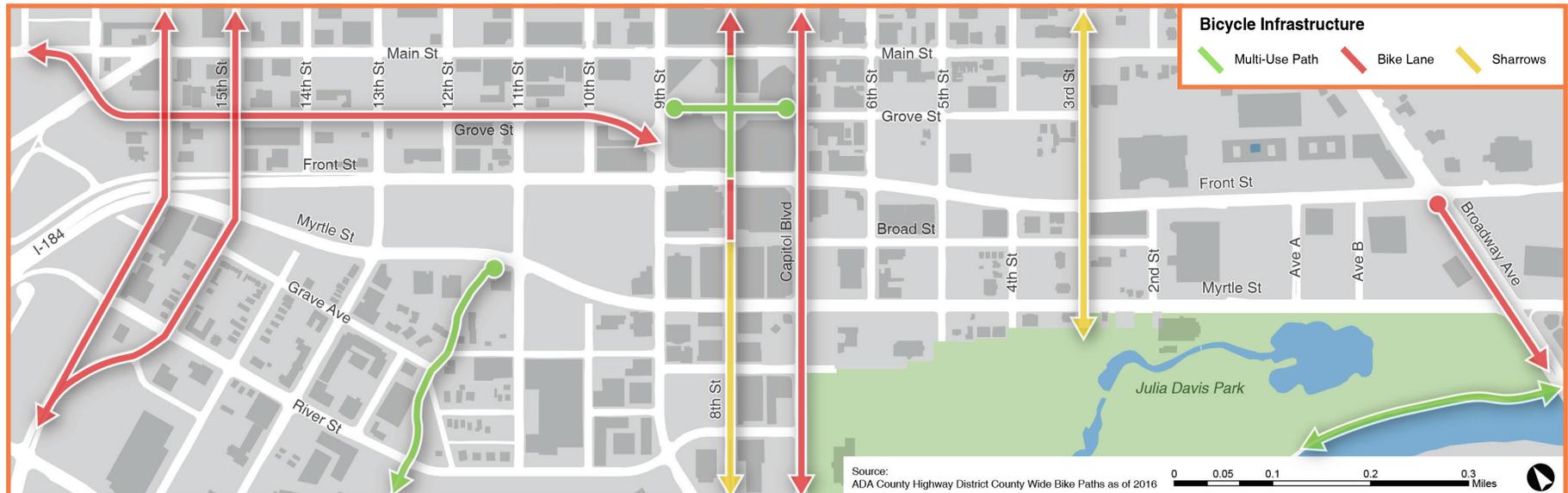
detracts from a healthy and vibrant public realm, and a vicious cycle of disinvestment and neglect. Conversely, the benefits of a walkable and vibrant pedestrian environment may not be directly measurable by any one given improvement but by a group of investments that increase property values and collectively promote street-level activity and investment.

The table below summarizes some of the types of information evaluated in the analysis of Front and Myrtle, and how that information can be used to derive specific conclusions along with a more subjective understanding of the pedestrian environment.

Element	Quantitative	Qualitative
Pedestrian volumes	Hourly volumes of people seen at a given intersection or location	How do these volumes relate to other nearby locations? What volume of pedestrians (or certain demographic groups) might be missing due to an uninviting crossing or environment?
Crossing distances	How many feet is the crossing from curb to curb? How many vehicle travel lanes must be crossed? Is the minimum time provided for pedestrians moving at 3.5 ft per second (or less)?	Are the number of travel lanes to cross much higher than other streets in the area? Are traffic speeds higher than what is typically considered comfortable in a walkable environment (25mph or less)? Are drivers more or less likely to yield to pedestrians than elsewhere?
Distances between marked crossings	What is the distance between marked, signaled pedestrian crossings?	Are any distances abnormally long compared with adjacent corridors? Does a blank street wall and/or lack of tree cover exaggerate the distance while walking?

BICYCLE CONDITIONS

Bicycle Infrastructure



The figure above illustrates existing bicycle infrastructure in Downtown Boise around Front and Myrtle. Conspicuously lacking in this area are east/west connections in the center and eastern portions of Downtown: this includes no dedicated facilities provided for bicyclists on Front Street or Myrtle Street. While a section of the Boise River Greenbelt provides an excellent east-west connection to the south, access to certain destinations in Downtown is constrained by a lack of other facilities. A spur of the Greenbelt (the Pioneer Pathway) currently terminates just west of 11th Street at Myrtle Street, and plans are under development to create a comfortable connection further north and east towards the Downtown Core. Front and Myrtle themselves currently have no marked bicycle

facilities but both streets feature a pair of 2.5 foot shoulders. While these areas are not wide enough for comfortable bicycling for all ages and ability levels, they can be used as de-facto bicycle lanes by confident riders. Using this 5' of right of way – potentially in conjunction with additional street width that could be gained by narrowing some existing vehicle travel lanes – could provide a means toward installing marked bicycle facilities on Front and Myrtle with minimal impact on vehicle operations. Additional east/west facilities in Downtown Boise would support the City's already high percentage of bicycle commuters (2.3% for Boise commutes compared with only 0.6% of commutes by the entire US population)

Bicycle Level of Traffic Stress (LTS)



A bicyclist's experience on a street is determined by more than just the presence or absence of a bicycle lane. The Level of Traffic Stress (or LTS) methodology was developed by bicycle planners to quantify a rider's experience on a simple 1 to 4 scale using factors such as vehicle speeds, vehicle volumes, presence of and treatments to address turning conflicts, presence of curb cuts, and others. An LTS of 4 is considered the highest level of traffic stress, and thus considered the "worst" score.

As of today, with no marked bicycle facilities, speed limits of 35 mph, and 5 lanes of moving traffic, both Front and Myrtle are graded as LTS 4 throughout their entire lengths. It is worth noting, however, that based on the LTS methodology and scoring system, an upgrade to a standard "Class II" marked but unprotected bicycle lane on either corridor would not be enough to reduce stress levels significantly. Only with a combination of other traffic calming treatment(s) - e.g. lower speed limits or physical separation for bicyclists from moving traffic - could the rating decrease to an LTS 1 or LTS 2. Scores at the low end (i.e. low stress) of the range are needed to induce significant bicycle travel by riders of all ages and abilities.



Excess road capacity and high prevailing vehicle speeds create an uncomfortable environment for on-street bicycling

Narrow shoulders on Front and Myrtle function as de facto bicycle lane with poor LTS score

CRASHES + SAFETY

Crash Density



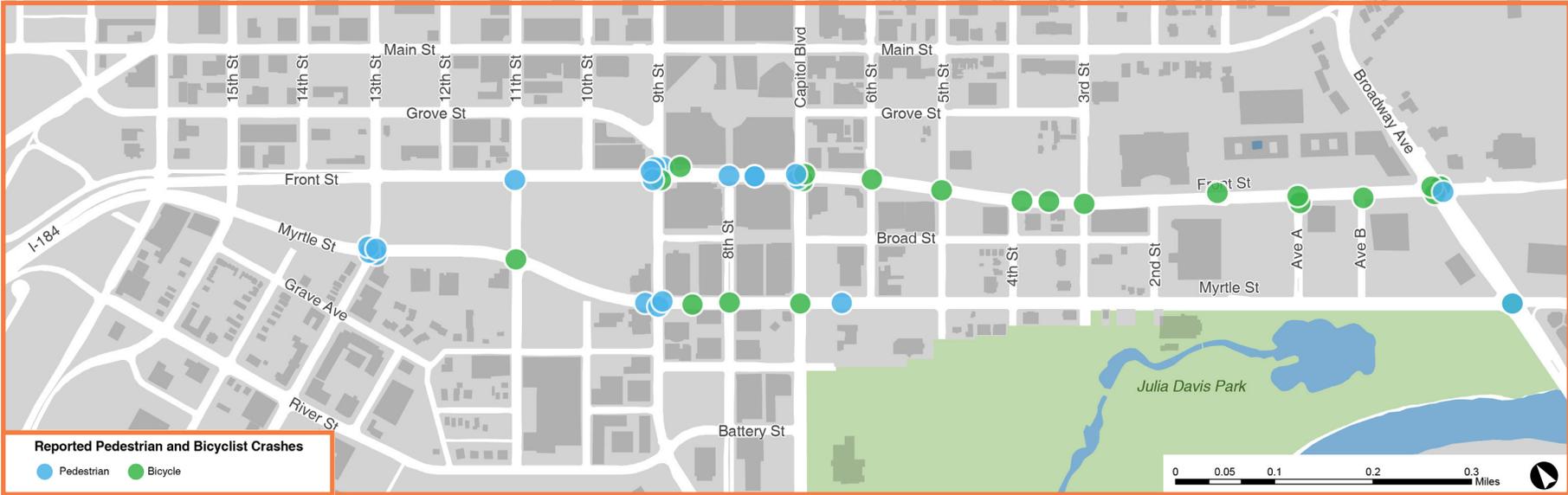
The above figure illustrates the incidences of crashes over the last five years at intersections and midblock locations along Front and Myrtle. Additional details on this data, including intersection and segment level detail and a description of the data source are provided in Appendix B.

Not surprisingly, intersections with higher traffic volumes generally see higher absolute numbers of crashes: this means that major streets that cross Front and Myrtle, such as Capitol Boulevard, 9th Street, and Broadway Avenue, also have the highest numbers of crashes. While reducing absolute numbers of crashes is always of utmost importance, the crash rate – or number of crashes normalized based on relative

traffic volumes – can provide a picture of the likelihood that a crash will occur at a given location.

The intersection of Myrtle Street and Capitol Boulevard has both the highest absolute number of crashes (78 over 5 years) along with the highest rate calculated (1.01 crashes per million entering vehicles). Intersection specific crashes also occur in relatively high numbers at Myrtle Street and 13th Street, where the Connector meets the Downtown street grid, and at Front Street and 9th Street, where relatively high numbers of turning movements lead to a high percentage (36%) of incidents categorized as “turning” crashes.

Reported Pedestrian/Bicyclist Crashes

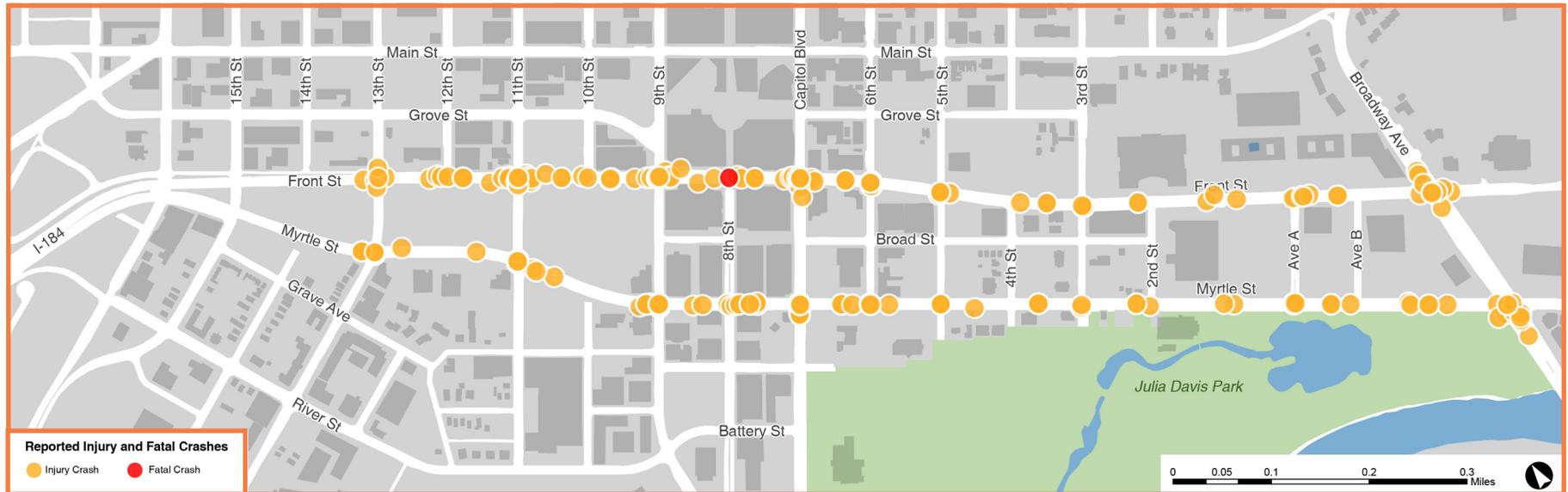


The above figure isolates crash locations that involved pedestrians or bicyclists. Of the 815 crashes analyzed, 22 were marked as involving pedestrians and 23 were marked as involving bicyclists. Thus, only about 5% of all crashes involved a pedestrian or bicyclist, but due to the vulnerability of these street users it is important to understand if there are any trends in the data that might help focus attention on important ground-level safety improvements.

The concentration of crashes involving vulnerable street users is only somewhat similar to what is shown in the overall crash map on the prior page. Locations at Capitol Boulevard and westward experience a

lion’s share of the pedestrian crashes. Intersections in the Downtown Core (9th Street to 6th Street) account for most of these (15 of 22 pedestrian crashes overall). With pedestrian volumes generally highest in the Downtown Core, this trend is to be expected. An outlier occurs at 13th Street and Myrtle Street: although pedestrian activity is far lower here than in Core areas, there were a relatively high number of pedestrian crashes at this location. Bicycle crashes, on the other hand, are much more evenly distributed across the corridors, especially on Front Street.

Reported Injury/Fatal Crashes



Crash data was also analyzed by severity type. Of the 815 total crashes, around 40%, or 321 crashes, were described as injury-inducing to one or more persons. As shown above, injury crashes occur across Front and Myrtle occur in roughly the same spatial distribution as overall crashes do. Intersections with major north-south streets in the Downtown Core, along with 13th Street on the west side and Broadway Avenue on the east, see the highest number of injury-related crashes. One exception here is the intersection of Front Street and 13th Street.

Despite its rank in the middle of intersections for overall crashes, its ranking on injury-inducing crashes is comparatively high. This could be due to a higher vehicle speed environment approaching the Connector, which exacerbates the potential for a crash to result in an injury. Only 1 crash resulted in a fatality: a pedestrian struck in the heart of the Downtown Core at Front Street and 8th Street.

Safety Related Concerns from Stakeholders

In addition to an analysis of crash locations, other safety related concerns were identified during discussions with project stakeholders. These issues are partially borne out in the data analysis but also relate to perceptions of the corridor, which are especially apparent for pedestrians and bicyclists. Several key concerns that relate to safety are identified in the list below. A comprehensive summary of these findings, including location-specific information for three “context zones” (west, center, and east portions of Front and Myrtle) are further detailed in Appendix A.

- Narrow sidewalks, often with no buffer, are adjacent to fast moving traffic
- 35 mph speed limit (with perceived higher actual speeds) harm the pedestrian environment and may exacerbate the severity of crashes
- Double right or double left turn lanes can create dangerous conditions for crossing pedestrians
- Excessively large curb radii encourage high-speed vehicle turns
- 2.5 ft shoulders are insufficient for safe bicycle travel

ECONOMICS + LAND USE

Surrounding Land Use

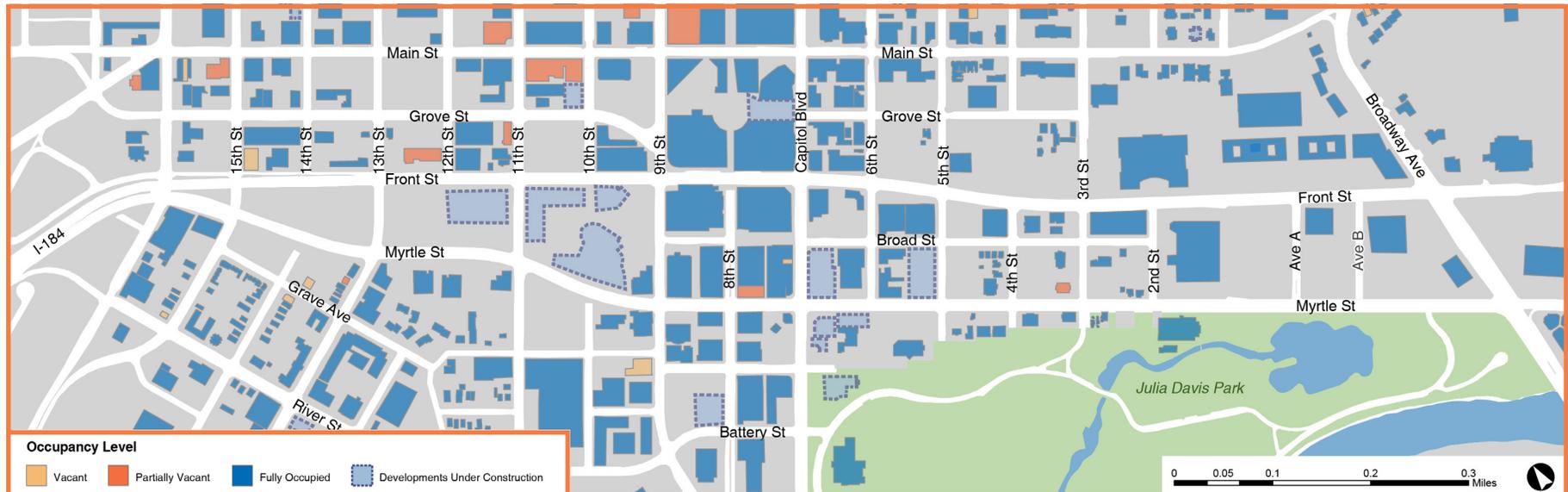


The Front + Myrtle corridors lie just south of the economic and civic heart of Downtown Boise. As such, the surrounding land has historically been developed for primarily commercial and public uses. Retail and office space remains the largest single land use (excluding roads and rights-of-way), with 43 percent of all land devoted to that category (164 acres). With nearly four million square feet of floor area, commercial uses also account for the vast majority of Front and Myrtle's building space. Just over one-third of land is used for government (26 acres) and parks/open space (106 acres).

More recently, multifamily residential development has accelerated, accounting now for about 30 parcel acres and 900 housing units. Vacant and underutilized land is shrinking proportionally, but still accounts for 33 parcel acres in the form of surface parking and 14 acres as vacant land zoned for development.

The increase in residential developments within Downtown Boise suggest improvements in multi-modal accessibility and public life experiences may be warranted to support future development opportunities.

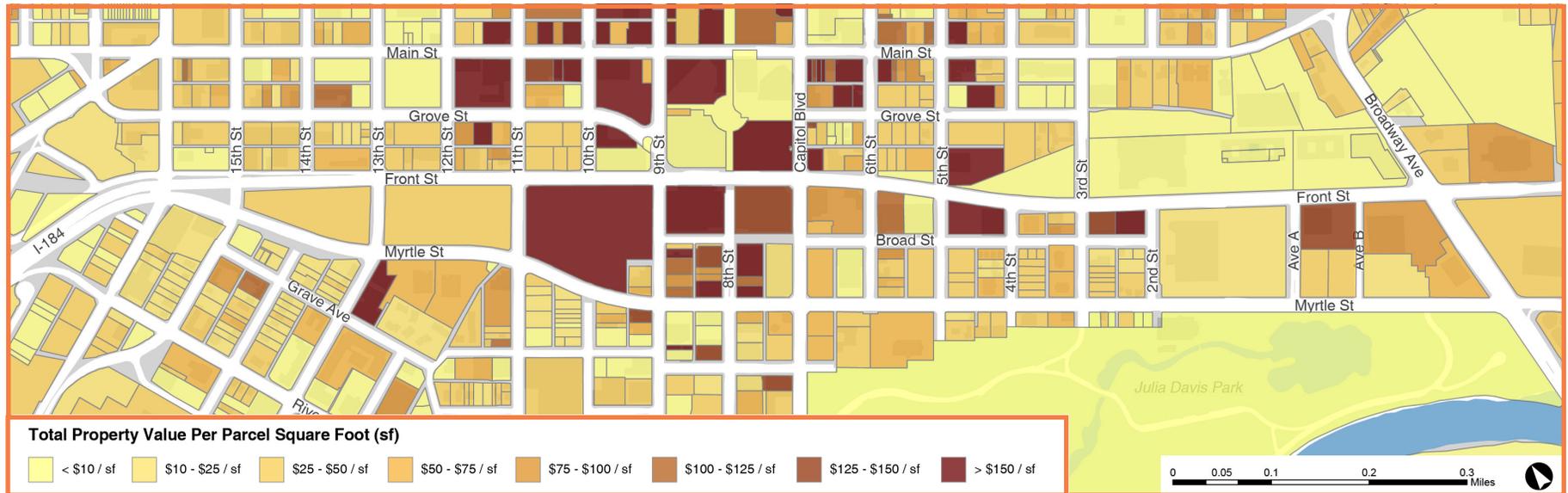
Vacancy/Occupancy



The figure above shows building footprints, shaded to represent building occupancy. Partially vacant buildings are dark orange, while fully vacant buildings are shown in light orange. With a generally robust economy across the Boise metro and especially Downtown, vacancy rates for residential, retail and office uses are generally quite low. Somewhat surprisingly, and despite the observable differences in pedestrian street quality, there seems to be little relation between couplet frontage and building occupancy, with Main Street and Idaho Street vacancies found roughly as frequently as those along Front and Myrtle.

Buildings under construction are considerably more prevalent along, and even in the interior of, the couplet. Many of these redevelopment sites were, until recently, home to either underutilized land or perennially vacant leasable space. It is likely that these redevelopment sites are evidence of development pressures emanating from higher density areas north of Front and Myrtle, made possible in part by lower land prices rather than because of any specific desirable conditions along Front and Myrtle. Again, this is supported by the qualitative observation that developments on the corridors tend to engage more (in terms of entrance orientation and walkable amenities) with north-south “side” streets rather than Front and Myrtle themselves.

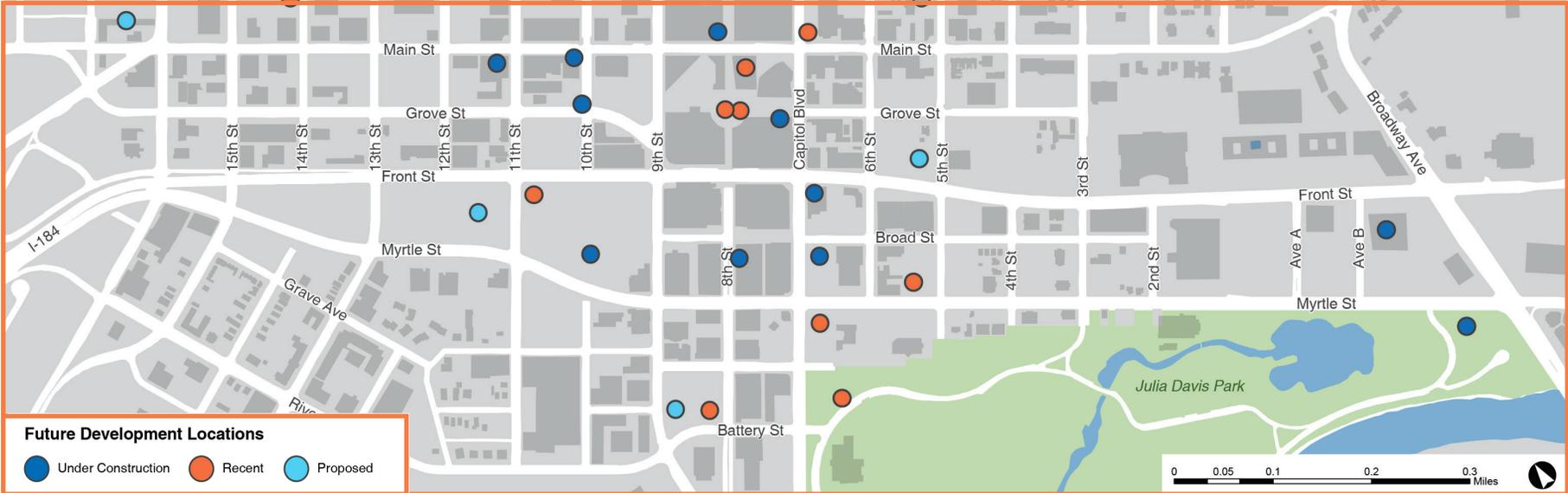
Property Values



Value density is illustrated here by total property value (land + improvements) per square foot of parcel area. Values for individual condominiums are summed and shown for the overall footprint of the condo property. In central Boise, these values are driven largely by proximity to Downtown's economic core – approximately one to two blocks north of Front Street, roughly between 9th Street and Capitol Boulevard. The highest values are found at the 8th Street & Main Street and Tower Plaza mixed use condo projects, both in excess of \$2,000 per parcel square foot.

Within the study area itself, there are 440 tax lots (excluding individual condos) with at least some value and land area recorded by the Assessor. Of these, just 15 percent exceed \$100 of total value per land square foot (with just 6 percent above \$200). High value density is more common along the stretch of Main Street between 12th Street and 6th Street. High values along Front and Myrtle are more common along Front, where much high-value development has recently occurred. While Myrtle is adjacent to some high value parcels (especially Simplot HQ, JUMP and 8th Street), these projects and others tend to orient their main entrance features and street amenities away from heavy traffic on Myrtle Street to focus inward and/or on more the more pedestrian-friendly north-south streets.

Development Pipeline



This figure shows 25 major developments that are either proposed, currently under construction, or very recently completed. The combined estimated value of these projects totals nearly \$600 million. The JUMP and Simplot Headquarters projects – under construction on the same block between Front and Myrtle – alone account for \$200 million in project value. Even with the \$90 million JUMP project scored as essentially complete, fully \$222 million in development is actively under construction. Projects designated as strictly multifamily residential account for \$39 million in planned and recent activity, with another \$237 million listed as mixed use with major residential components. Hotels made up \$42 million in recent activity (Marriott

Residence Inn and Inn at 500 Capitol, both along Myrtle) and the proposed Carley Hotel on Front Street will add another \$30 million.

Pipeline development activity is conspicuously light west of 11th Street and east of 5th Street, despite underutilized parcels outside that central zone, especially along Front and Myrtle. This generally supports a story of development pressures gradually moving southward along a central swath from a high value zone in the Downtown Core. Pedestrian unfriendly frontages combined with greater separation from central Downtown appear to be a “double-whammy” currently inhibiting development along these outer stretches of Front and Myrtle.



JUMP development is one of several major investments reflecting a changing landscape on the Front and Myrtle corridors

JUMP's primary pedestrian entrance at Front Street and 10th Street may require a marked pedestrian crossing and/or new traffic signal

STAKEHOLDER INTERVIEWS

The consulting team interviewed three stakeholders (as recommended by the client team) who are all related to or actively participating in the real estate and development scene in Downtown Boise. The intention was to gain a better understanding of development and economic trends that aren't perfectly obvious from reviewing land use GIS data. The following information is presented anonymously, and grouped into what emerged as common response, opinions that differed, and a few general ideas introduced for Front and Myrtle during the interviews.

Consensus Take-Aways

- Front and Myrtle's primary role as a major east-west facility to move traffic can't be overlooked, especially with the rise of Meridian as key destination in the west metro area, and strong residential growth in southeast Boise.
- That said, north-south access through Downtown Boise is very poor for pedestrians and bicyclists due to a lack of perceived safe crossings, high vehicle speeds, and sheer lane counts (5 lanes) along Front and Myrtle.
- Those pedestrian and bicycle deficiencies undercut the potential value of green space, riverfront, and campus-related amenities for Downtown employees and (increasingly) residents.
- North-south pedestrian access must be improved and made safer, but selectively and strategically: slowing or calming traffic somewhat is probably part of the solution, but be careful not to make Front and Myrtle too inconvenient for crosstown commuters.

- A focus on moving auto traffic on Front and Myrtle has led to more buildings turning their primary faces towards the north-south streets, where possible, and reducing pedestrian engagement along the corridors (fewer main entrances, fewer active windows, less signage, less lighting/streetscaping/plantings).
- While development within and fronting Front and Myrtle has been very strong of late, the location value appears tied to proximity to the Downtown core (emanating from 8th Street and Main Street), and almost in spite of the character of Front and Myrtle.
- There was general consensus that areas of surface parking in and along the corridors represented some of the most likely and natural opportunity sites for continued redevelopment and densification going forward.

Particular Points of Difference

Stakeholder opinions were understandably influenced by the location of their key holdings.

- Those with key properties closer to the Downtown Core questioned the wisdom of spreading development (and related public infrastructure investment) too far south and west – potentially diluting the healthy “center of gravity” already established north of Front and Myrtle.
- Others were more optimistic about following lower land prices to the south and west in search of blight-reducing redevelopment opportunities, and with that an expansion of the sphere of influence of Downtown Boise.

Specific Design Ideas Emerging From One or More Stakeholders:

- Look at adding a signalized crossing on the north side of the new Simplot headquarters, to reestablish the street grid at 10th Street across Front Street. Development plans call for an attractive entrance on the south side of Front Street here, and will likely be a natural draw for pedestrian visitors.
- Consider a “road diet” for the eastern portion of Front and Myrtle, between 5th Street and Broadway Avenue
- Consider shortening signal cycle for pedestrian crossings at 8th Street on Front Street. Current waits are excessively long.
- Avoid solutions involving bridges and tunnels.
- The viability of closing one lane on each of Front and Myrtle is supported by the fact that the corridors have functioned reasonably well recently with nearly constant lane closures due to construction.

Front Street and 13th Street, facing west



KEY FINDINGS FROM EXISTING CONDITIONS

The five areas below represent key findings for Front and Myrtle garnered from the existing conditions analysis.

Vehicle circulation and average travel times across the corridors are generally at acceptable levels.



With the exception of some delay at peak travel times in peak directions, driving along Front and Myrtle is almost always trouble-free. Congestion is infrequent and vehicle Levels of Service are usually 'C' or better at the intersection level. The streets are designed above all else for vehicle throughput.

Along both corridors, conditions for pedestrians range from mediocre to poor.



Front and Myrtle feature segments with long distances between signalized crossing opportunities. Crossing Front and Myrtle at any location is a long distance (60') and can feel intimidating for those on foot, especially in comparison to other narrower streets in Downtown Boise's urban grid. While sidewalks are generally available along both corridors, they are adjacent to fast moving traffic including vehicle moving lanes immediately adjacent to the curb.

Vehicular traffic peaks and delays increase during the morning peak period on Myrtle and during the afternoon peak period on Front.



As a result of motorists commuting into Downtown Boise during the morning and leaving in the afternoon, traffic from I-184 (the "Connector") feeds Myrtle Street in the morning and results in increased congestion, especially at intersections on the west side of the corridor. A similar situation occurs for westbound travel on Front in the afternoon.

Evolving land uses and accelerated development are happening around – and increasingly on – Front + Myrtle.



While development hasn't necessarily stalled because of the current configuration of Front and Myrtle, there has been a focus historically for buildings to face inward or towards north and south cross streets, rather than these corridors. North and south connectivity must also be improved to fully integrate the core of Downtown Boise with Front and Myrtle, and beyond.

The current configurations on Front and Myrtle create an imbalance between vehicular mobility and mobility for other users such as pedestrians, bicyclists and transit riders.



Front and Myrtle are currently designed very well to move vehicles, and the traffic analysis clearly shows that this is the case. However, this vehicular mobility comes at the cost of comfortable mobility for non-motorized users such as pedestrians and bicyclists. The corridors as currently configured present a significant opportunity to shift this balance and better accommodate all travel modes, without significantly affecting Front and Myrtle's role as key regional traffic arteries.



Front Street and 11th Street, facing east

FUTURE CONDITIONS + GROWTH RATE ASSUMPTIONS

As part of the consulting team's existing conditions analysis and data gathering, estimations of potential future growth in traffic volumes were made to support projections associated with the subsequent alternatives development phase of the project. Vehicular volumes along Front and Myrtle, while relatively steady over the last 20 years, may increase in the future as a result of Downtown Boise's continued development. In particular, several large-scale developments along Front and Myrtle will certainly generate an increase in volumes.

The consulting team proposed three options in estimating potential volumes in a horizon year of 2040. The first was to apply a blanket growth rate to existing 2016 volumes. The second was to use specific trip generation estimates on new known developments in Downtown Boise. The third proposed method was a hybrid of these two, applying a smaller background growth rate which is then supplemented with potential trips added to the network due to development.

The third option was deemed most appropriate and the findings were discussed with the project team during the second project workshop. This option results in, generally, a 1% annual growth rate in volumes for the corridors between 2016 and 2040. It is important to note that this estimate is certainly variable and subject to change depending on continued shifts in travel behavior, the further proliferation of shared mobility services and/or autonomous vehicles, and a development landscape in Downtown Boise that may slow down or speed up even further in the intermediate to long-term future. Additional information on the growth rate assumptions is available in Appendix C.

DEFINING THE VISION



The results of the existing conditions analysis highlighted the importance of Front and Myrtle as a major thoroughfare bringing crosstown traffic and goods into and through Downtown Boise. However, the prioritization of traffic movements on Front and Myrtle has also created significant challenges for north-south crossing movements, increasing safety concerns, and generally poor pedestrian experiences along the two corridors.

The current acceleration of development activities in Downtown Boise provide an ideal opportunity to enhance multi-modal accessibility for all street users with improvements in the public realm and the pedestrian walking experiences.

The following chapter discusses the subsequent development of the Vision Statement, which drew upon the findings and results of the existing conditions analysis, and serves as guiding principles in the creation of the performance metrics used in the evaluation of different preferred design alternative scenarios.

An aerial photograph of a city, likely Boise, Idaho, showing a dense urban area with various buildings and green spaces. In the background, there are rolling hills under a clear sky. A large, semi-transparent orange rectangle is overlaid on the upper portion of the image, containing white text.

VISION STATEMENT + PERFORMANCE METRIC

VISION SESSION

Members of the project team, along with stakeholders invited to the October 2016 walkshop, assembled at Boise City Hall to engage in a structured conversation. The meeting was designed to set a vision for the project and inform the team's ideas for an evaluation of potential design alternatives for Front and Myrtle. Findings from the vision exercise are presented below.

Vision Exercise

Participants were provided with a simple but open-ended prompt: they were asked to describe the way they envision the study corridors to be in 10 years. This exercise was intentionally vague in order to gather a range of responses, ranging from specific physical interventions to perceptions of the overall character of the corridors. Over 80 submissions were provided and a follow-up discussion identified a variety of ideas, along with a few common themes.

Exercise Prompt

Front + Myrtle will be _____ in 10 years.

FRONT + MYRTLE VISION SESSION

Sample Responses

Front + Myrtle will be safe to ride, walk and drive in 10 years.

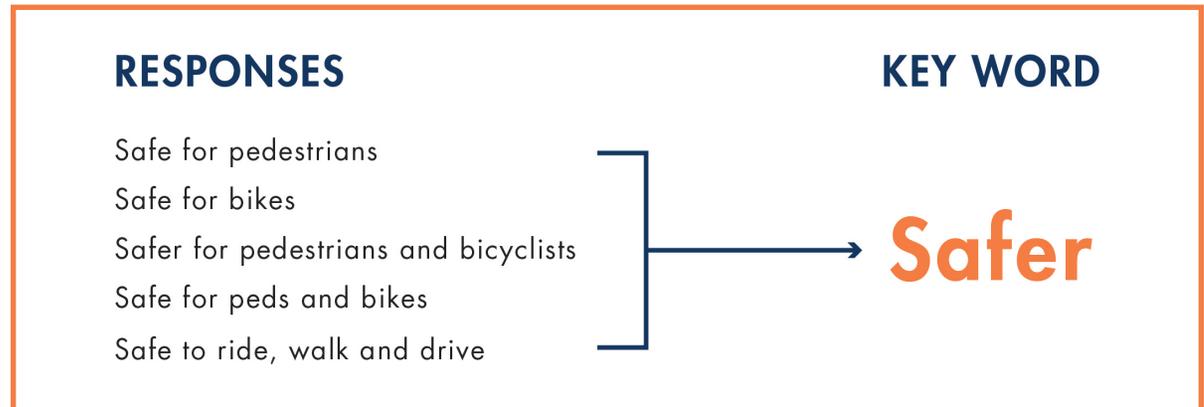
FRONT + MYRTLE VISION SESSION

Front + Myrtle will be safe for pedestrians in 10 years.

FRONT + MYRTLE VISION SESSION

Response Collection

All responses were catalogued and then categorized into like themes in order to provide a holistic picture of the types of responses received. The example below shows how different responses along a “safety” theme were combined to represent one word or phrase to fill in the blank portion of the exercise prompt. All key themes were then rated by their frequency and a “word cloud” was developed to represent the types of ideas provided.



Vision Exercise Summary - Response Frequencies



Note: Size of words and phrases are proportional to their respective frequency as summarized from the Vision Exercise responses

VISION STATEMENT

The Front and Myrtle corridor should:

- 1 Function as a **safe** and **efficient multi-modal** transportation facility moving **people** (employees, customers, visitors and residents) and **goods to and through** Downtown Boise while allowing all of Downtown to function as a **seamless, integrated urban neighborhood**;
- 2 Acknowledge, complement, and enhance **surrounding land uses and activities** within the context of a **vibrant Central Business District**;
- 3 Promote and support **economic development** and **buildings facing and interacting with pedestrians** on Front Street and Myrtle Street;
- 4 **Reduce barriers** to **all modes** of cross traffic while **accommodating through traffic**;
- 5 Contribute to a **greener downtown** through **sustainable infrastructure** and widespread **street trees and vegetative elements**

The Vision Statement for the project was developed through conversations with the project team, the larger stakeholder group during an October 2016 workshop, and was significantly informed by the project goals as articulated in CCDC's request for proposals. While the vision for Front and Myrtle is aggressive and encompasses many elements, it is important to note the need to balance the competing elements of the Vision Statement, and tradeoffs among these elements were made in the development of alternatives and evaluation over a range of related performance metrics.

Vision Statement Reference Points

A variety of elements from the project’s Vision Statement are referenced in city, county, regional, and statewide documents:

City of Boise

- 3 “Mobility investments should drive economic development, energize commercial districts, and produce quality neighborhoods that retain value through time.” **a**
- 4 “With careful design and planning, pedestrian and cycling infrastructure can safely and efficiently move large numbers of people and relieve the need to build more expensive roadways.” **a**
- 5 “The focus for these areas is on creating safer, greener residential streets by providing sidewalks and calming traffic so that they provide a better environment for residents.” **a**

Ada County Highway District

- 2 “Provide safe and accessible bicycle facilities that link local and community destinations (downtowns, schools, parks, neighborhood centers) and pathway systems.” **b**
- 4 “The Ada County Highway District’s Traffic Department is responsible for planning, designing and managing efficient traffic flow and traffic safety throughout Ada County.” **c**
- 5 “A multi-modal transportation system which includes bicycling as a practical alternative to automobile use, leads to reduced traffic congestion, air pollution and consumption of non-renewable fuels.” **b**

Blueprint Boise

- 1 “Provide a continuous network of sidewalks, bicycle, and pedestrian paths, and roadways to connect different areas of neighborhoods.” **d**
- 2 “Additional efforts should continue to focus on Downtown, which is recognized as a unique area of the community whose long-term health and viability are critical to the economic success of the community and region.” **d**
- 3 “The city should strive to maintain its current position and continue to identify opportunities to strengthen the economic base of the community.” **d**

Idaho Transportation Department

- 1 “Develop and maintain a transportation system that is safe, effective, reliable, and accessible for residents and visitors as they use all modes to travel anywhere—from within their neighborhoods and communities to throughout the state.” **e**
- 3 “Support economic vitality that enables a high standard of living, facilitates the retention and growth of Idaho businesses.” **e**
- 4 “Reduction in travel times for commuting, commerce, recreation, and tourism” **f**

a= Boise Transportation Action Plan (2016)

b= The Roadways to Bikeways Plan Executive Summary (2009)

c= ACHD Website : About ACHD’s Traffic Department

d= Blueprint Boise: Boise’s Comprehensive Plan (2011)

e= Idaho Statewide Bicycle and Pedestrian Study (2014)

f= ITD Quick Facts (2015)

PERFORMANCE METRICS



Alternative treatments for Front and Myrtle were evaluated based on the measures below. These categories and evaluation guidelines were developed using feedback from stakeholders in October 2016, along with continued iteration with the project team. All measures have been developed and are intended to address one or more elements of the project’s Vision Statement for Front and Myrtle. It is important to note, however, that each metric will not necessarily be completely satisfied within every alternative. A discussion of the tradeoffs considered in the alternatives development and preferred alternative selection process follows in subsequent sections of this report.

Safety + Traffic Calming

1



Bring average speeds down to an appropriate level for an urban CBD environment

For example...

Are proposed design elements expected to result in a reduction in vehicle speeds?

2



Reduce crash and/or KSI (killed or severely injured) rates or absolute numbers

Are proposed design elements expected to result in a reduction in traffic crashes (based on crash modification factors where available, and the proposed reduction in number of conflict points)

Multi-modal Accommodation

3



Maintain LOS E or better during peak hours and LOS D during off-peak hours at critical intersections

For example...

How many critical intersections (as identified by ITD) operate at given Intersection LOS thresholds in the future conditions network?

4



Avoid an increase in average travel times along the corridor of 2 minutes or more (i.e. approximately 10% of average commute times)

What is the projected increase in travel time for the average commuter due to changes on Front and Myrtle streets?

5



Reduce crossing distance and delay where current or anticipated demands exist

How many intersections have their pedestrian crossing distances reduced where there is a demonstrable current or future need?

Multi-modal Accommodation - Continued

6



Crosswalks provided where current or anticipated future pedestrian demand exists

For example...

How many new and relatively safe and comfortable pedestrian crossings are provided where there is a demonstrable current or future need?

7



Number of high-quality bike parking areas created where current or anticipated future demand exists

How much high-quality bike parking capacity is or could be provided where current or future demand is expected?

Economic Development + Downtown Integration

8



Changes in retail sales and/or property values

For example...

Are proposed design elements expected to result in increased retail sales or property values?

9



Maintain the reliability of goods movement and delivery options

Are proposed design elements expected to result in traffic delay/travel time impacts on trucks, reduced truck access to loading areas, or restriction of key truck turning movements?

10



Availability of on-street parking to support storefront retail

Do proposed design elements provide new on-street parking in areas specifically identified as in need to support existing or projected future street-facing retail?

Sustainability + Public Life

11



Number of trees and/or vegetative elements

For example...

How many trees and/or what square footage of vegetated areas are proposed?

12

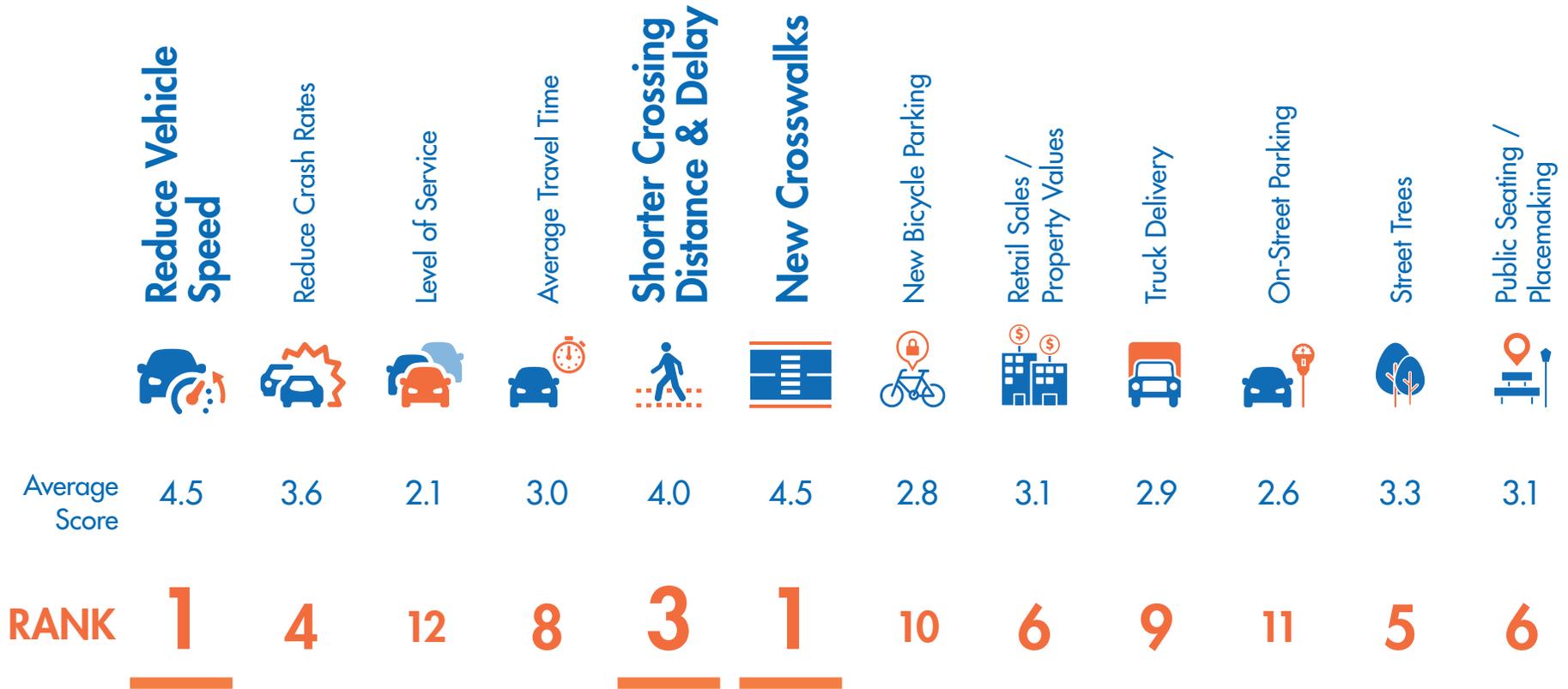


Number of high-quality public seating or public spaces opportunities

How many new seating opportunities and/or what square footage of new or enhanced public space is proposed?

PERFORMANCE METRICS WEIGHTINGS

While the 12 performance metrics are generally supportive of one another, it would be impossible for any single conceptual design for the Front and Myrtle corridors to simultaneously achieve maximum benefits across all of them. The project team engaged in an exercise to prioritize the various metrics by rating their importance on a simple 1 to 5 scale where 1 = least important and 5 = most important. Results of the exercise are shown below, and indicate that strategies to calm traffic through speed reduction and provide improved facilities for walking were deemed most critical among the metrics. Meanwhile, accommodations to maintain vehicular levels of service and provide on-street vehicle and bicycle parking along the corridors were rated as least important.



Additional Considerations on Performance Metrics

Evaluating Metrics

Some metrics are inherently more difficult to evaluate on potential alternative designs than others. For example, some can be easily evaluated through simple quantifiable information (e.g. number of new signalized crossings proposed) or through the consulting team's technical analysis (e.g. anticipated vehicular level of service impacts). Others, like the potential impact of certain design changes on safety outcomes like crash rates and crash severities, require a more nuanced approach.

Various research is available – some new, and much outdated – that estimates the impact of certain design changes on crash rates. Such research often points to Crash Modification Factors (CMFs) or Crash Reduction Factors (CRFs) of specific design changes. Through research of a publicly available CMF clearinghouse (www.cmfclearinghouse.org), no specific studies were found that directly correspond to the current layout of Front and Myrtle in terms of potential impacts of removing lanes from 5-lane, one-way, urban streets. And while certain design alternatives considered selective lane width reductions (from 11' to 10.5'), the ultimate preferred alternative presented in Chapter 5 of this report does not recommend changes from 11' lane configurations at this time. However, the consulting team has prepared a short whitepaper on lane width considerations that can and should be reviewed at a later date when a re-striping and/or more comprehensive street reconstruction occurs. Information related to research on lane widths in urban locations is provided in Appendix D.

Balancing Metrics

The results from the performance metrics weighting exercise showed a preference from the project team to prioritize strategies that would calm traffic through speed reduction and improve the walking and crossing experiences for pedestrians. While other operational metrics such as Level of Service, travel time, and on-street parking were not rated as such high priorities, the consultant team aimed to strike a balance between achieving the goals of the Vision Statement while maintaining acceptable levels of traffic operations along Front and Myrtle.

In particular, there is a balance that must be struck between signal cycle lengths (e.g. the total amount of time dedicated to green phases for Front and Myrtle and for cross streets) and maintaining acceptable traffic operations along Front and Myrtle. More specifically, reducing overall signal cycle lengths would decrease pedestrian and vehicle delay to cross Front and Myrtle, and thus could fare well across several metrics related to the Project Vision. However, doing so would, all else equal, create negative operational impacts on traffic on Front and Myrtle, through more backups and congestion. These impacts would be exacerbated when combined with any potential travel lane reductions on Front and Myrtle to shorten crossing distances and calm traffic, which itself would also satisfy several performance metrics.

Examining and balancing such tradeoffs requires a nuanced approach in evaluating alternatives. Exercises and conversations with the project team in prioritizing the various performance metrics helped the consultant team determine what to prioritize more, from a relative perspective, as alternatives were developed. Unfortunately, the reality on any street is that all improvements cannot be made exclusively in a vacuum. Through a clear and open process, the consultant team attempted to balance the many competing priorities on Front and Myrtle while remaining true to the Vision Statement and project goals as outlined by the project team in its request for proposals and throughout the project.

ECONOMIC DEVELOPMENT METRIC CONSIDERATIONS

Positive Relationship Between Walkability / Traffic Calming and Economic Development

Neighborhood Preferences

Publication: [Assessing Benefits of Neighborhood Walkability to Single-Family Property Values, A Spatial Hedonic Study in Austin, Texas \(2015\)](#)

- The study found that the highest premiums for walkability are in the “most walkable” neighborhoods: A 1 percent increase in walkability yielded a \$1,329 increase in property values; a 1 percent increase in sidewalk density generated a \$785 increase in property values.
- Homes in neighborhoods that are defined as at least “somewhat walkable” and “very walkable” also experienced premium increases, although correspondingly less.
- Findings show that investing in pedestrian infrastructure and promoting commercial development in the most walkable neighborhoods will yield the greatest dividends for cities through increased property revenue.

Publication: [Sonoran Institute Survey \(2013\)](#)

- Across Colorado, Idaho, Wyoming and Montana, 58 percent of respondents preferred a neighborhood with a mix of destinations within an easy walk versus a neighborhood where driving is the only way to reach businesses.

Publication: [Transportation for America Survey \(2014\)](#)

- Survey shows that 80 percent of 18- to 34-year-olds want to live in walkable neighborhoods.

Property Values

Publication: [Healthy and Complete Communities: The Walkability Assessment](#)

- A higher Walk Score can increase a property’s value anywhere from \$4,000 to \$34,000 for a residential property or from 9% to 54% per square foot for a commercial property, depending on the level of change in walkability.

Publication: [Walking the Walk, How Walkability Raises Home Values in U.S. Cities](#)

- Walk Score was positively and significantly correlated with housing values in 13 of the 15 metropolitan areas included in this study.
- If a house’s Walk Score were increased from a Walk Score of 54 (the average houses sampled in Charlotte) to a Walk Score of 71, it would add about \$34,000 (or about 12 percent) to its value, holding all other features of the house constant.

Publication: [Walk This Way: The Economic Promise of Walkable Places in Metropolitan Washington, D.C.](#)

- Places with higher walkability perform better commercially. A place with good walkability, on average, commands \$8.88/sq. ft. per year more in office rents and \$6.92/sq. ft. per year higher retail rents, and generates 80 percent more in retail sales as compared to a location with fair walkability, holding household income levels constant.

- Places with higher walkability have higher housing values. For example, a place with good walkability, on average, commands \$301.76 per month more in residential rents and has for-sale residential property values of \$81.54/sq. ft. more relative to a location with fair walkability, holding household income levels constant.

Publication: APTA 5-City Study (2013)

- Walkability to transit hubs improved resilience to the housing market downturn with 40% better value-retention.

Publication: Moody's Real Capital Analytics Walkscore Database (2015)

- Post-recession commercial values have risen fastest in highly walkable CBDs, followed by walkable suburbs, with car-dependent suburbs lagging well behind.

Publication: Sonoran Institute (2013)

- Even during the recession, a study of five markets across the Rocky Mountain West revealed that home buyers paid an average of 12.5 percent more for homes in neighborhoods with higher walk scores.

Retail and Fiscal Benefits

Publication: Transportation Research Board Study (2013)

- Study found that shoppers arriving on foot or bike spent 8.5% to 25% more than shoppers arriving by car.

Publication: Sonoran Institute (2012)

- A 2012 nine-city study across the Rocky Mountain west found that 2-3 story mixed-use downtowns generated 263 – 400 percent more county property tax per acre than single-use commercial development.

Luring Employers and Employees

Publication: How do you attract the best workers? Set up shop in a walkable downtown

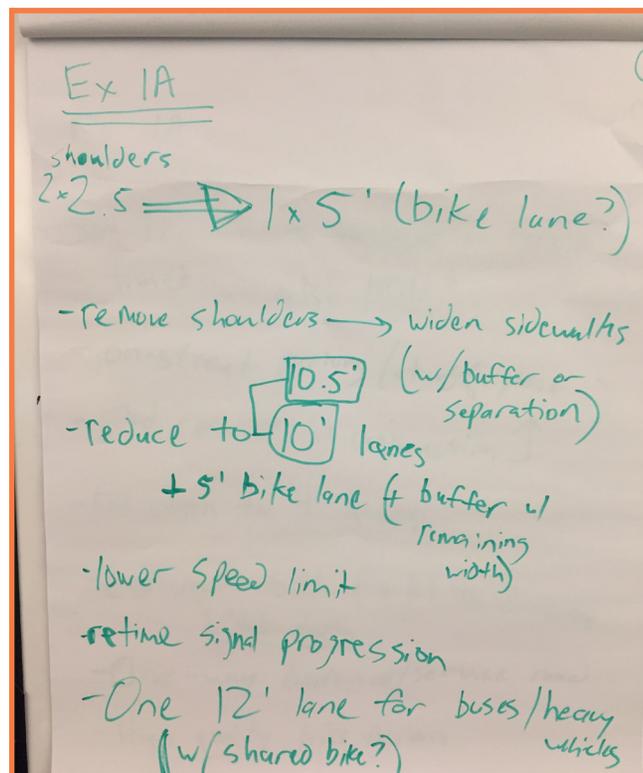
- Salt Lake City officials have made walkability a major theme in urban planning, with policies ranging from creating more bike lanes and pedestrian corridors and fostering in-fill to high-density rezones around light-rail corridors.
- A Utah company mentioned in the study, Provo-based InsideSales.com, recently opened new offices at 56 E. Broadway in Salt Lake City – for reasons that echo the national trends.

An aerial photograph of a city, likely Boise, Idaho, showing a dense urban area with various buildings and green spaces. In the background, there are rolling hills with a mix of green and brown vegetation, suggesting a semi-arid climate. The lighting is bright, indicating a clear day.

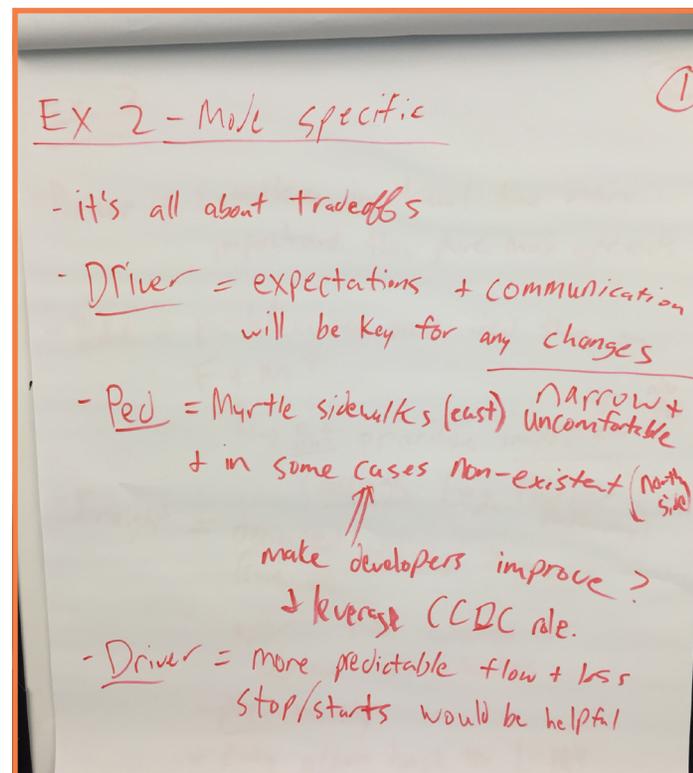
ALTERNATIVES DEVELOPMENT + SELECTION

DEVELOPMENT OF ALTERNATIVES

The first step in developing potential design alternatives in service of the project's vision was to brainstorm a "long list" of possible treatments. The consulting team solicited input from the project team through a few facilitated exercises at an in-person workshop in January 2017. The conversations were structured to be mostly open-ended: first, the group was asked to provide ideas with essentially no restrictions. These ideas were requested at both a general level (e.g. design options that could be implemented throughout the corridors) and at a location specific level (e.g. for ideas that lent themselves more to specific locations such as intersections or block segments). Next, the conversation shifted so workshop attendees could place themselves in the headspace of a hypothetical user traveling by a certain mode. These included drivers, pedestrians, and bicyclists, along with those who would be concerned about goods movement and economic development.



Alternatives brainstorm materials from project team workshop



Alternatives brainstorm materials from project team workshop

The consulting team reviewed the responses and documented conversation from this workshop to build up a “long list” of potential elements, using professional judgement on combining like ideas into tangible design solutions. While building this list, it became clear that design alternatives mostly fell clearly within one of two categories: some are “capacity related” and are linked to the amount of space in the right-of-way dedicated to vehicle traffic. Such alternatives will impact vehicle operations by changing how the space between the curblines is allocated. Design decisions on what -if anything - is proposed for any space reclaimed from vehicular traffic is also included in “capacity related” alternatives options.

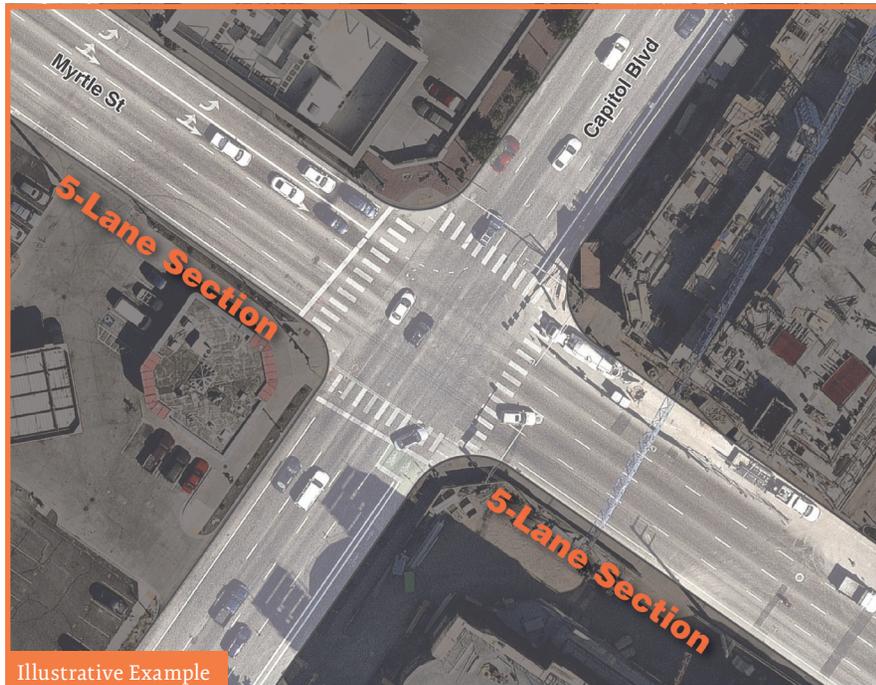
Others elements, on the other hand, are more “standalone” and can be applied regardless of what happens between the curbs. These include streetscape improvements on and around sidewalks, crossing improvements, corridor management and operations changes (e.g. speed limits and/or signal progression speeds), and land use and economic development strategies. The consulting team identified a series of these “standalone” elements that are not mutually exclusive and which were evaluated separately from those that impact capacity.

Moving from this “long list” of alternatives, the consulting team bundled certain design elements to create a series of alternatives structured around different levels of intervention and associated impacts on capacity on Front and Myrtle. In conjunction, the menu of “standalone” elements was pared down to cover the options that best fit with the vision for the project as put forth by the project team and related stakeholders. A third workshop was conducted with the project team in March 2017 to review these more discrete packages of alternatives, during which potential impacts to vehicle operations today and by 2040 were discussed.

Three categories of alternatives related to capacity were reviewed: the first with keeping 5 lanes as is today to serve vehicular traffic, the second with mostly 4-lane cross-sections, and the third with mostly 3-lane cross-sections across the Front and Myrtle corridors. For instances where a current vehicular travel lane was removed, several options for use of that space was presented and evaluated based on how the change serviced the project’s vision and related to the associated performance metrics. The following pages illustrate some of the configurations and design elements included for evaluation.

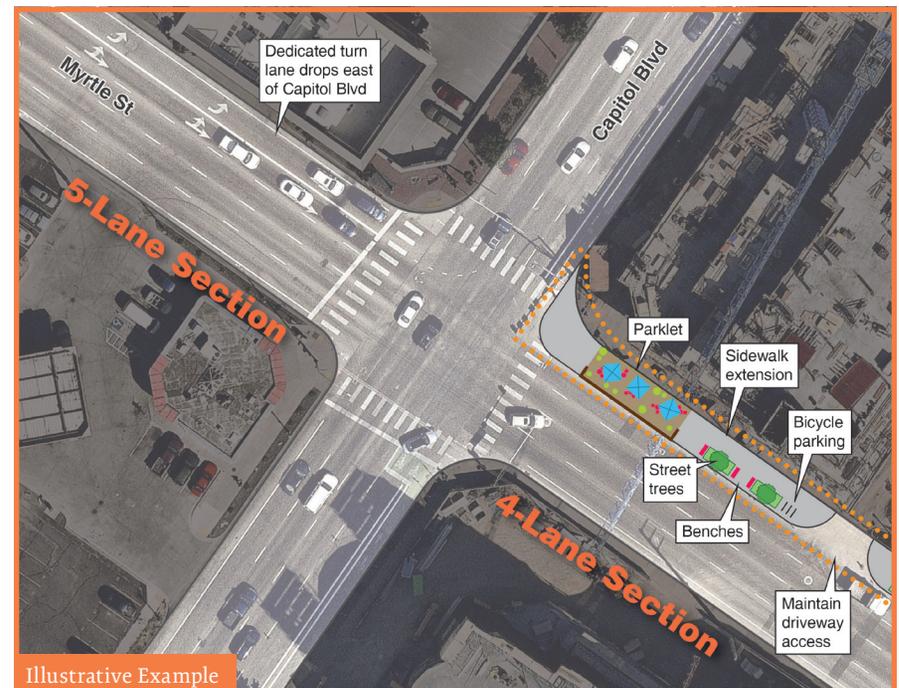
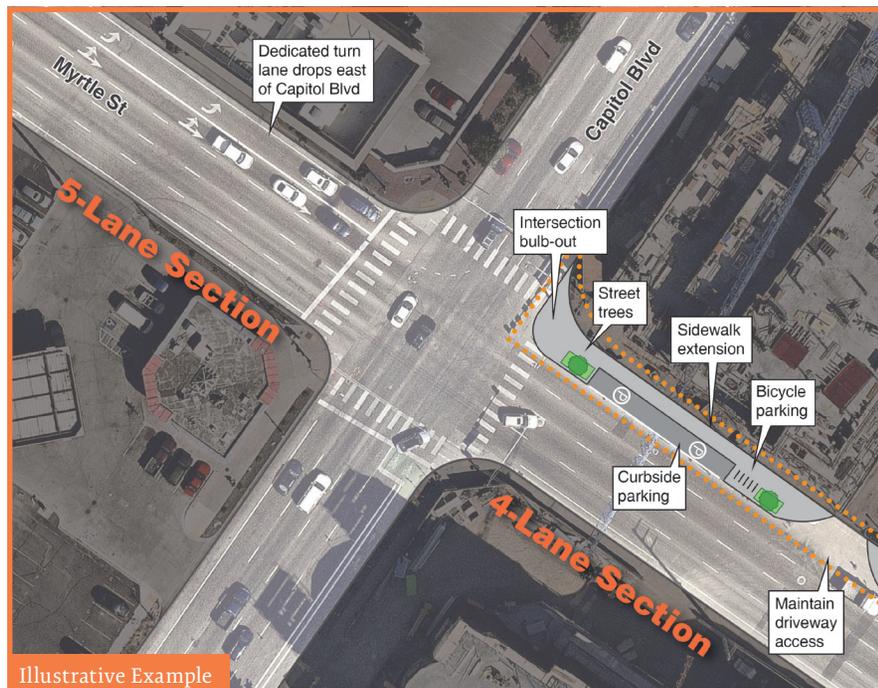
Alternative 1 - No Lane Removal

- Limited changes to existing roadway geometry, with no vehicle travel lanes removed
- Potential to consolidate each 2.5' shoulder (5') with 1.5' gained from interior lane reduction (3 lanes x 0.5') into a 6.5' programmable space
- Potential to reduce interior lanes to 10.5' in width with exterior lanes remaining at 11' in width
- Sidewalk extensions using existing gutter and/or shoulder space can allow additional streetscape improvements such as pedestrian-scaled lighting, planters, street seats and trees



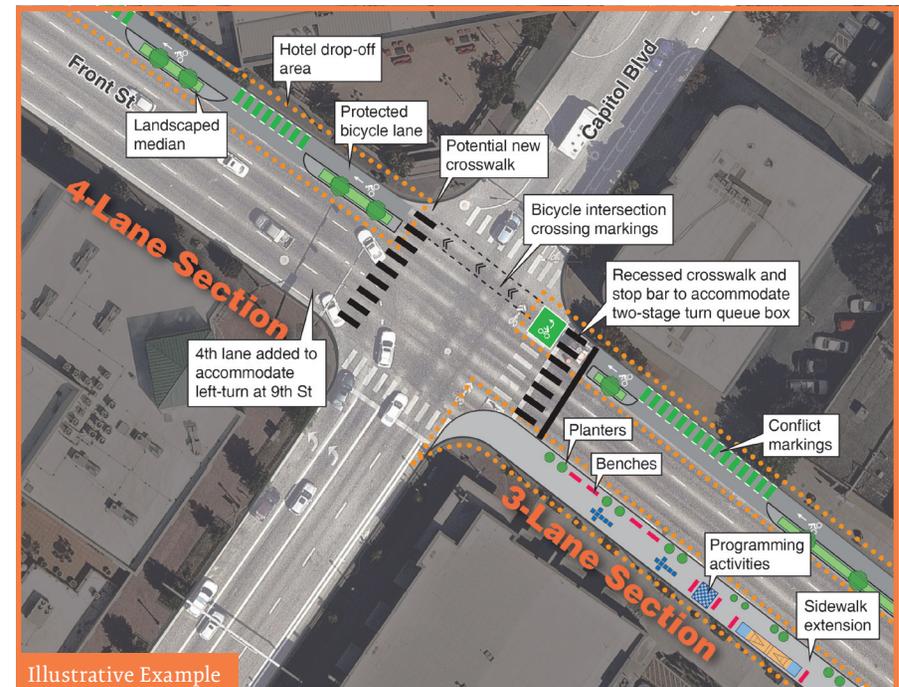
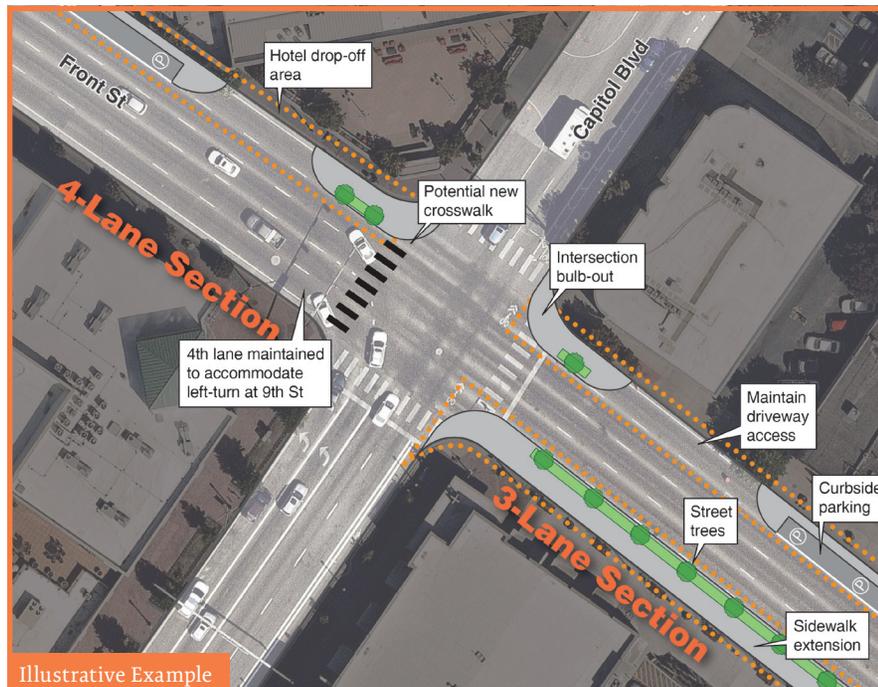
Alternative 2 - Mostly 4 Lanes

- In various sections of Front and Myrtle, one of the curbside vehicle travel lanes is eliminated to allow for up to additional 15' of programmable space
- Lane reductions would be applied at specific sections of Front and Myrtle where minimal impacts to vehicle travel time and LOS are anticipated
- Curbside parking to stimulate Downtown economic development
- Sidewalk extensions can include streetscape improvements such as parklets, benches, street trees, and additional bicycle parking where demand is anticipated



Alternative 3 - Mostly 3 Lanes

- Mostly 3-lane configurations throughout the Front and Myrtle corridor, with some locations only reduced to four lanes based on anticipated operational impacts
- A reduction of two travel lanes would allow for up to 30' of additional programmable space
- Curbside parking to stimulate Downtown economic development
- Sidewalk extensions allow various streetscape improvements such as programmable spaces, benches, planters, street trees, and bicycle facilities



EVALUATING THE ALTERNATIVES



The consulting team provided evaluations for all capacity-related alternatives across the range of performance measures and solicited feedback on the scoring from the project team at the March 2017 alternatives workshop. Estimated impacts on traffic operations were also provided as part of this review. See Appendix E for the materials discussed, which include the consulting team’s scoring of the various alternative bundles across the range of performance metrics.

Based on a robust discussion with the project team, it was determined that a combination of the various alternative bundles would provide the most benefit in aggregate across the range of performance metrics. The evaluation generally centered on balancing the negative impacts on travel time and intersection operations resulting from removing roadway capacity with the related benefits that would accrue from doing so. These benefits include creating shorter crossing distances for pedestrians, and narrowing the distance and reducing the number of travel lanes between the curblines to implicitly encourage slower driving speeds and create a more welcoming downtown urban environment for those not travelling by car.

The project team also indicated its preferences for how any space between the curbs that might be reclaimed could be used. Preferences generally leaned toward streetscape enhancements including street trees and opportunities for public amenities. In areas closer to the middle of the corridors in the heart of Downtown, curbside on-street parking was also recommended. Bicycle facilities were generally not favored by the project team, as parallel facilities along Main and Idaho are currently under consideration.

An aerial photograph of a city, likely Boise, Idaho, showing a dense urban area with various buildings, including a prominent domed capitol building. The city is surrounded by rolling, green hills under a clear sky. A large orange rectangular box is overlaid on the left side of the image, containing the text 'PREFERRED ALTERNATIVE' in white, bold, sans-serif capital letters.

PREFERRED ALTERNATIVE

OVERVIEW



The preferred alternative design includes a selected mix of 5, 4, and 3 lane cross-sections in order to balance benefits across a multitude of performance metrics while minimizing negative impacts on vehicle operations. The following section outlines the preferred alternative in terms of its basic geometric design, on-street design elements on various blocks where roadway capacity has changed, other “standalone” design elements including new crosswalks and signals, and the overall impacts anticipated on the vehicle network.

Particular elements of the preferred alternative for Front and Myrtle are further described below:

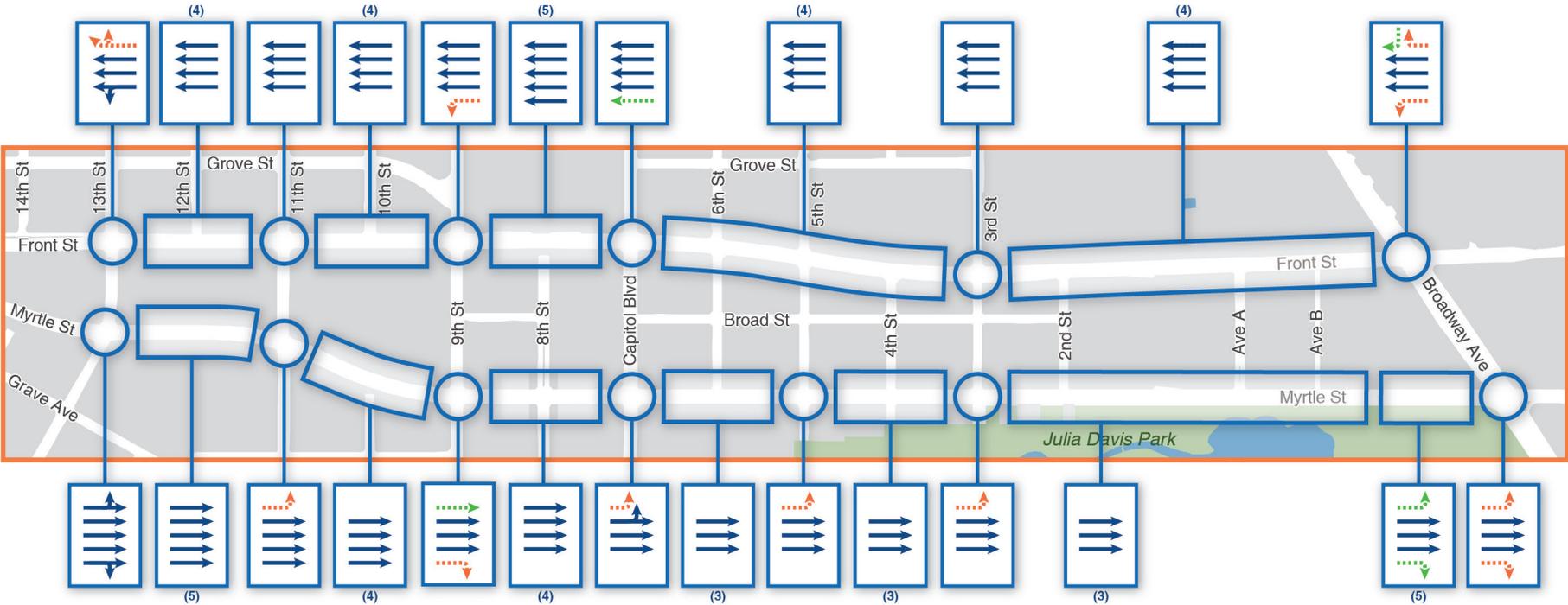
Front Street

On Front Street, a reduction of one vehicle travel lane is envisioned between Broadway Ave and Capitol Blvd. Between Capitol Blvd and 9th Street, the existing configuration with 5 lanes is preserved in order to accommodate the relatively heavy traffic volumes seen in the heart of Downtown Boise. The left lane on Front Street is designated as left-turn only at 9th Street, after which a 4-lane configuration is preserved westbound to 13th Street and the entrance to the Connector. Where a vehicle travel lane is removed, most areas are dedicated to sidewalk extensions with streetscaping and street tree interventions. On-street parking is provided in the Downtown core between 5th Street and Capitol Blvd. Additional interventions include new signalized crossings at 10th Street and 12th Street, along with marking of new crosswalk legs where currently missing at the west legs of the intersections of Avenue A, 2nd Street, and Capitol Blvd.

Myrtle Street

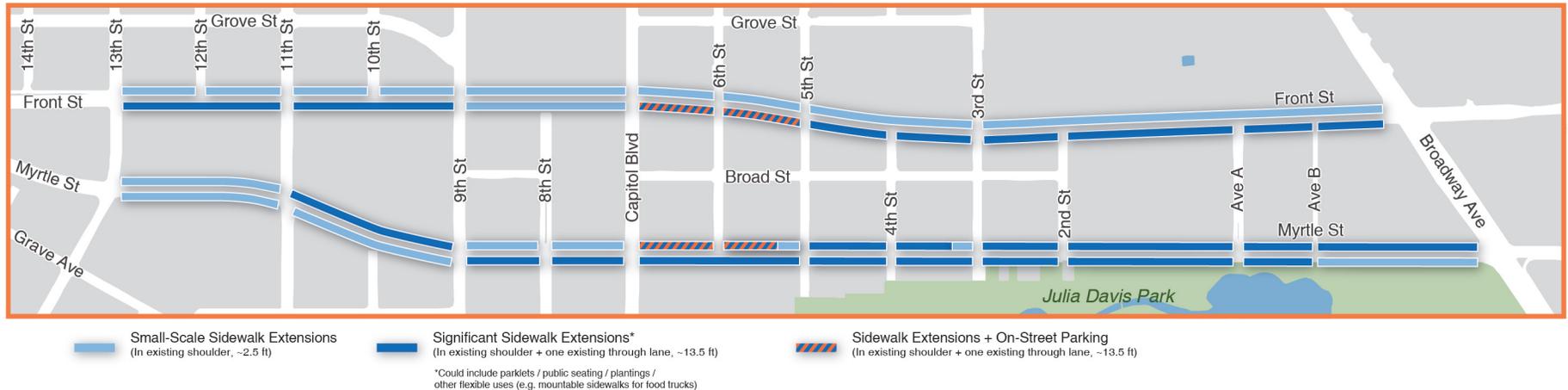
On Myrtle Street, the existing 5-lane configuration is preserved between 13th Street and 11th Street, at which point a left-turn only lane is developed to create a 4-lane section to the east of 11th Street. This 4-lane configuration is preserved through Capitol Blvd, after which Myrtle Street is converted into a 3-lane section as far east as Broadway Ave, with two dedicated left-turn lanes introduced at 5th Street and 3rd Street to accommodate turning volumes (subject to potential 5th Street two-way conversion). Just prior to Broadway Ave, dedicated left-turn and right-turn only lanes are introduced to allow for northbound and southbound turns, respectively, from Myrtle Street to Broadway Avenue. Like Front Street, most areas of reclaimed vehicle travel lane space are allocated to sidewalk extensions that can include parklets, public seating, planters or street trees. The north side of Myrtle Street between Capitol Blvd and 5th Street is used for some on-street curbside parking. New signals and marked crosswalks are also suggested at 5th Street and Avenue A.

Lane Configurations



The above diagram provides a conceptual look at the various lane configurations including dedicated turn lanes and lane drops as envisioned in the preferred alternative. Arrows in green indicate lane additions and those in red indicate lane drops.

On-Street Design Elements



In sections of Front and Myrtle where no lane reduction is recommended, there is an opportunity to implement small-scale sidewalk extensions in the existing 2.5 feet shoulder on either side of the street. These locations are illustrated in light blue above.

In sections of Front and Myrtle where lane conversions are recommended, there are opportunities to create significant sidewalk extensions in the existing shoulder and through lane (~13.5 feet) on either side of the street, where appropriate. These locations are illustrated in dark blue above.

In sections of Front and Myrtle where existing retail businesses are located and where future economic development is anticipated, on-street parking is recommended and can be combined with either small-scale or significant sidewalk extensions on the other side of the street.

Based on the project team's feedback, limited on-street parking is provided only in the Downtown Core as there is ample off-street parking in today's development environment. Additional on-street parking could be provided in the shadow of proposed "significant" sidewalk extensions in the long-term, if applicable.

Adopting a phased implementation approach, the proposed street design elements would be implemented using temporary materials during the short-term. Where temporary sidewalk extensions are recommended, through a flexible and strategic approach, on-street curbside parking could be provided in locations where demand can be reasonably expected. While parallel parking may induce "friction" with through-vehicle traffic, it is expected that parking turnover will be fairly low and that this impact would be immaterial in the context of multi-lane roadways such as Front and Myrtle.

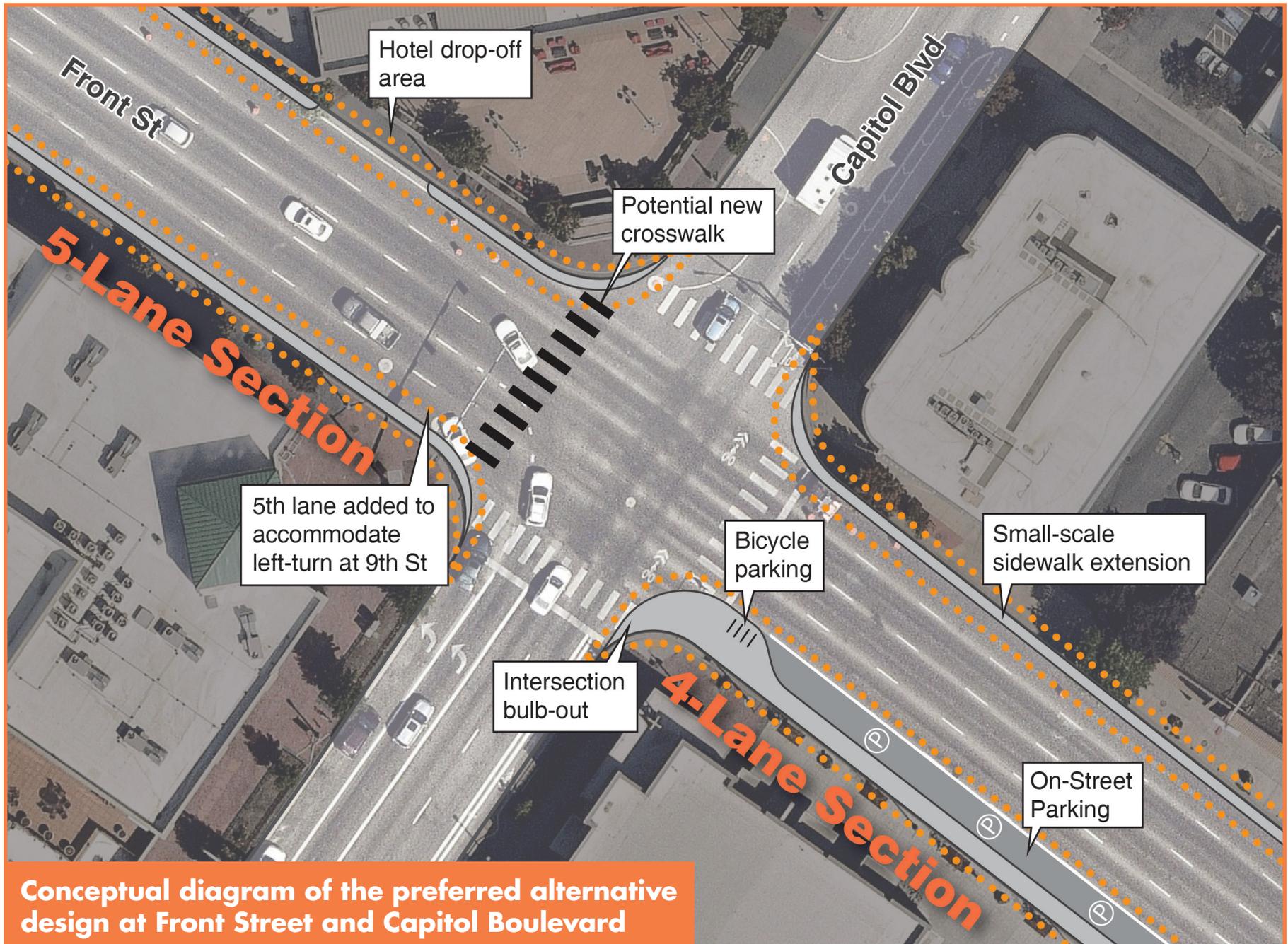
New Signalized Intersections + Marked Pedestrian Crosswalks



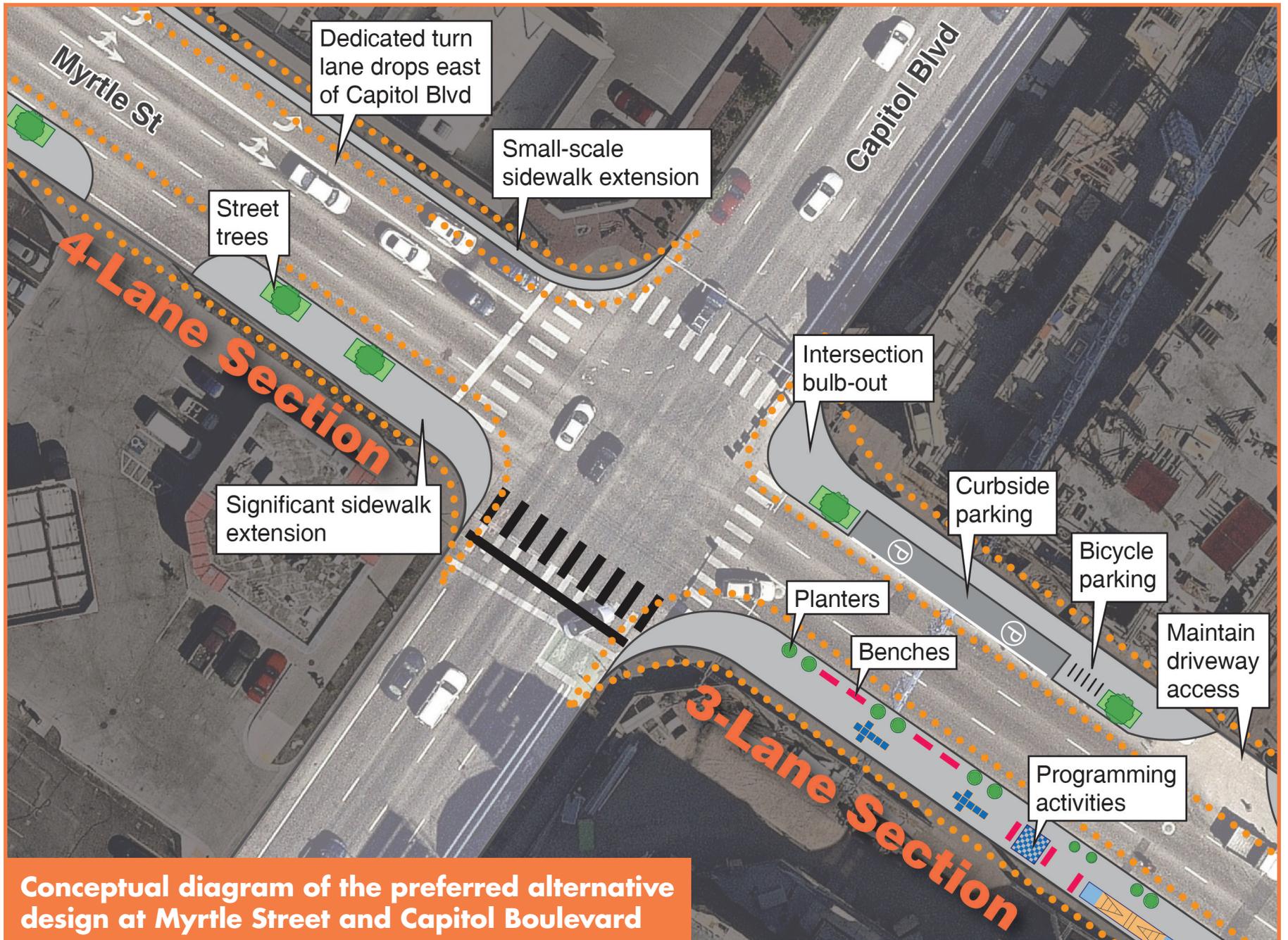
This diagram illustrates proposals for 4 new signalized intersections along Front and Myrtle based on anticipated future crossing demand and goals related to the Project Vision of providing more pedestrian crossing opportunities. In addition, new marked crosswalk legs are recommended at 3 signalized intersections that currently are missing a west leg crossing. Such improvements should be examined in more detail in order to minimize conflicts between turning vehicles and pedestrians, especially at Capitol Blvd and Front Street. This leg may require a leading pedestrian interval, flashing yellow left-turn arrows, or separate pedestrian crossing and vehicle turning signal phases.

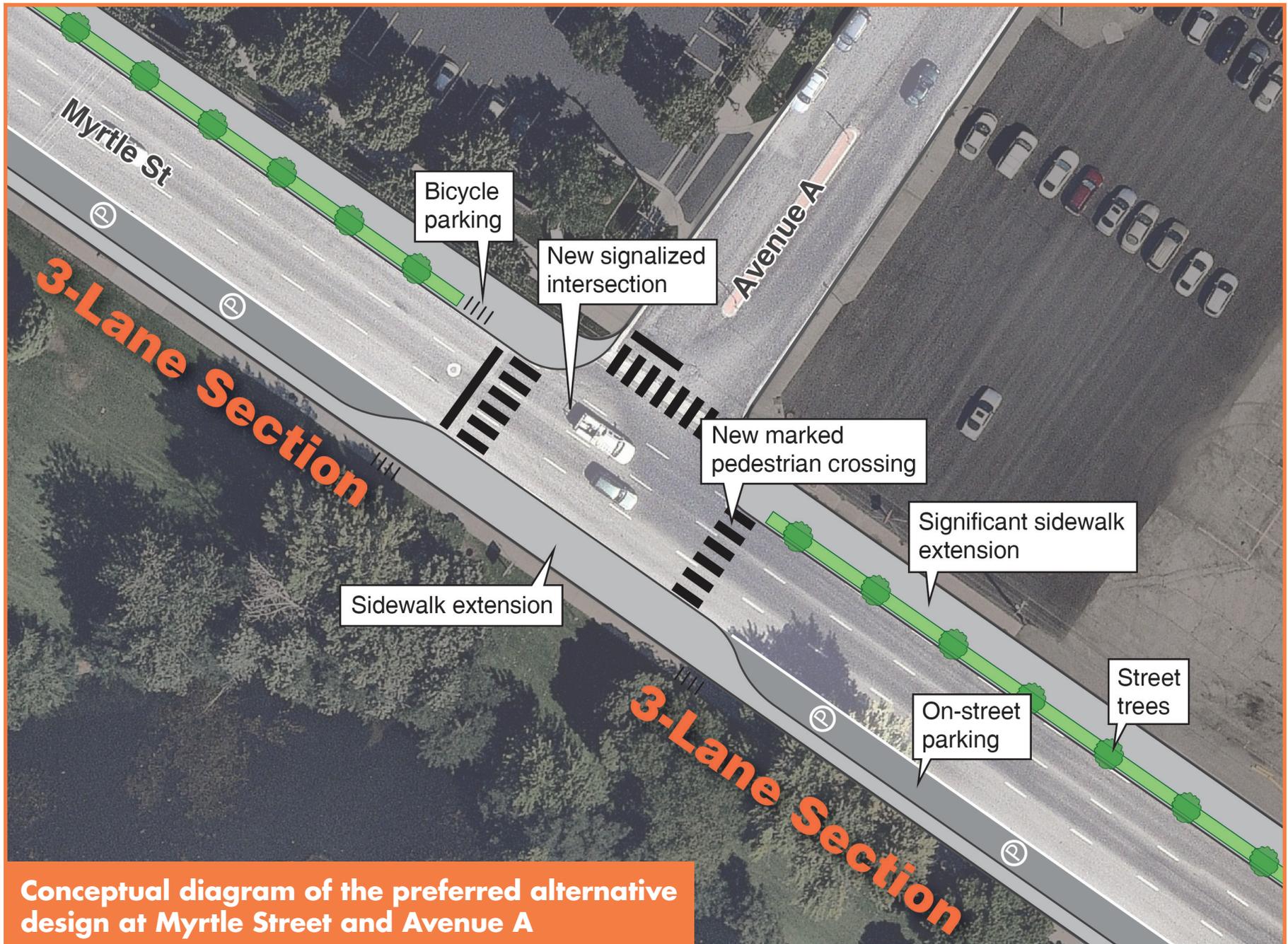
Preferred Alternative Conceptual Diagrams

The following three diagrams conceptually illustrate the preferred alternative. Collectively, they portray the universe of design options recommended in the preferred alternative based on the project team's scoring of various alternative bundles during the third project workshop. The diagrams illustrate treatments with 5-lane, 4-lane, and 3-lane cross sections, and also show various treatments for reclaimed travel lanes adjacent to both north and south curbs.



Conceptual diagram of the preferred alternative design at Front Street and Capitol Boulevard



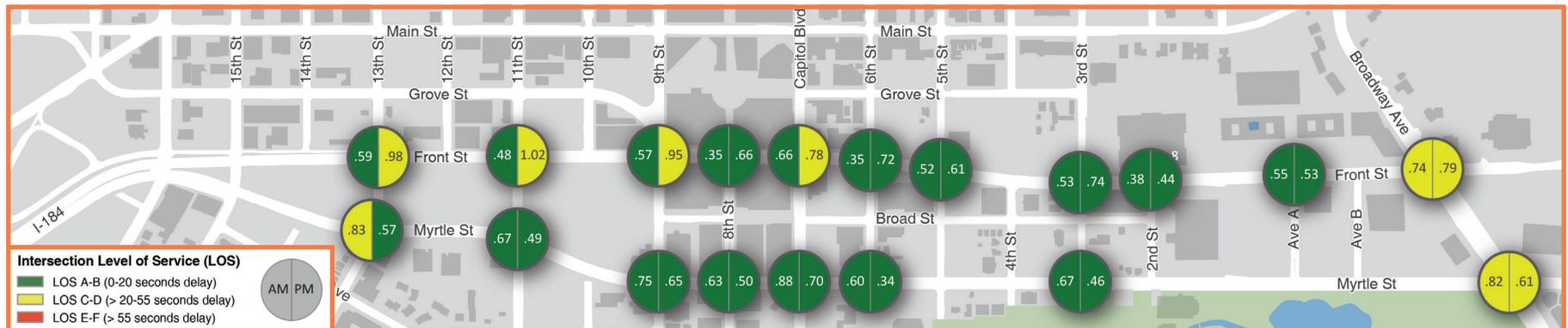


TRAFFIC ANALYSIS SUMMARY

Level of Service and Volume-to-Capacity Comparison [Today]

The figures below illustrate level of service and volume-to-capacity ratios between existing conditions and the preferred alternative as modeled in traffic analysis software. Should the preferred alternative be implemented, the analysis shows that relatively few intersections would fare worse than they do today. Additional information is provided in Appendix F.

Existing Conditions - Today

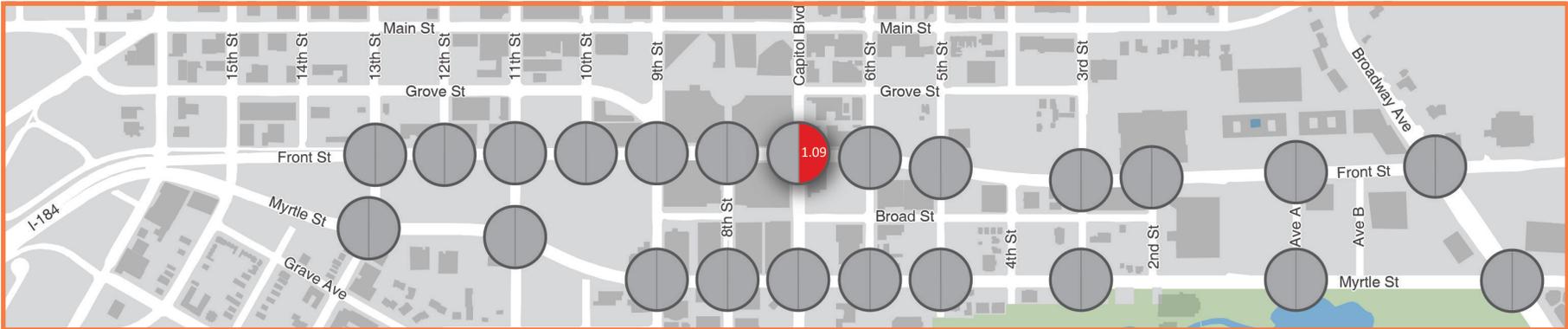


Preferred Alternative - Today



The figures below isolates significant differences between vehicle operations today in the current 5-lane configuration and potential operations if the preferred alternative is implemented. Only 1 intersection in the PM peak (Front and Capitol) is projected to degrade to LOS E or F in the preferred alternative from an LOS of D or better in existing conditions. As a result, implementing the preferred alternative today would likely not create any materially poor performance at any other intersection at all times of the day.

Comparison Between Existing Conditions (Today) and the Preferred Alternative (Today)



Travel Time Comparison

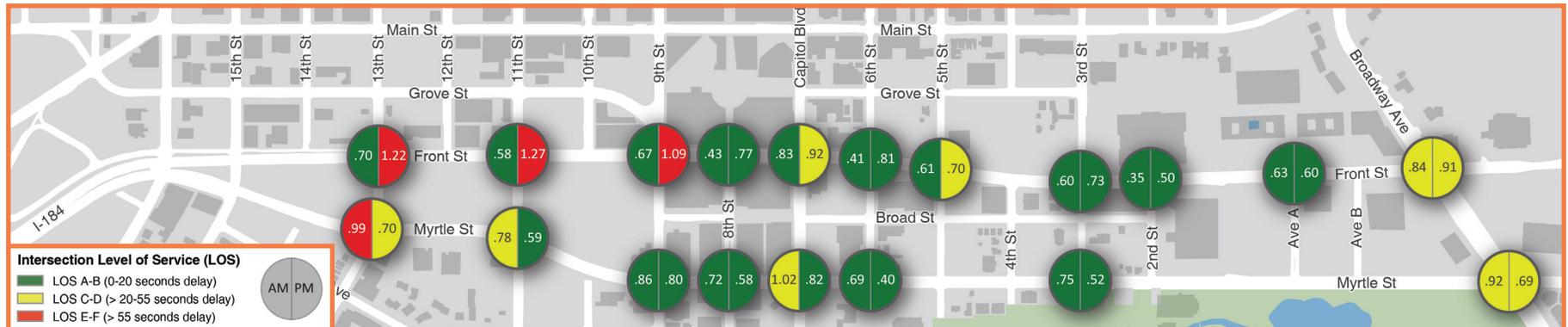
TABLE 3: AS OF TODAY		
	Current, 5-Lanes	Current, Pref. Alt.
FRONT		
AM	3:16	3:45
PM	3:45	6:21
MYRTLE		
AM	3:36	4:18
PM	3:07	3:18

Projected travel times highlighted in red indicate relatively significant potential increases of more than 2 minutes, which exceeds the threshold set forth in Performance Metric 4. It is important to recognize the need to balance the impacts over various performance metrics. For additional discussion, see page 79.

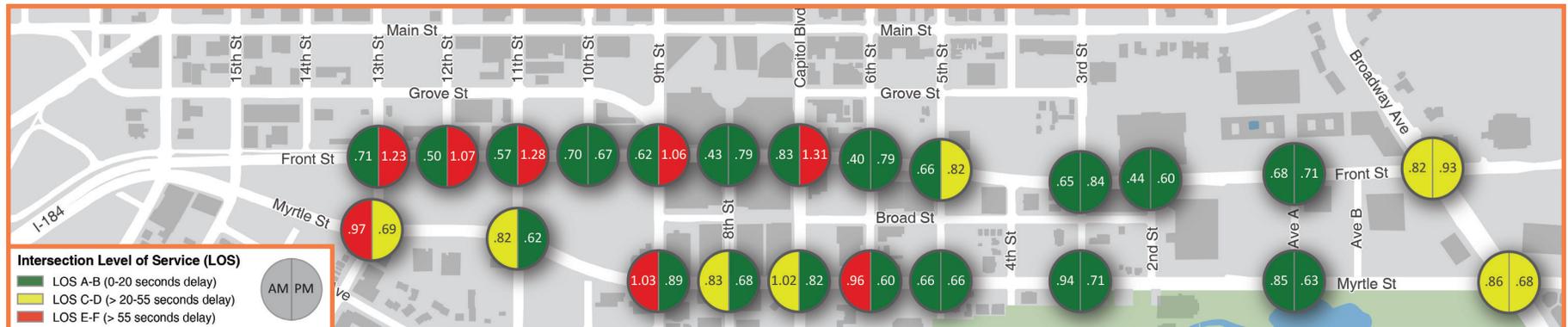
Level of Service and Volume-to-Capacity Comparison [2040]

By 2040, the traffic analysis shows that in both the “no-build” 5-lane configuration and in the preferred alternative, operational conditions will worsen compared to today.

No-Build - 2040



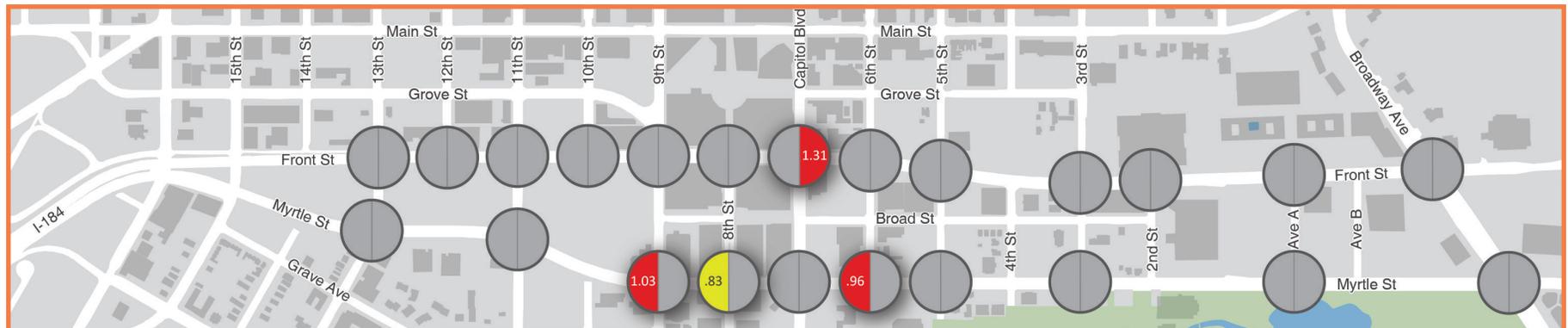
Preferred Alternative - 2040



In the 2040 projection, only 2 intersections in the AM peak and 1 intersection in the PM peak are anticipated to degrade to LOS E or F in the preferred alternative when they do not do so in a 5-lane configuration. Additionally, 1 intersection in the AM peak may degrade to LOS C or D in the preferred alternative from an LOS of A or B in the no-build 5-lane configuration.

It is notable that in both 2040 scenarios, many intersections are projected to significantly worsen by 2040 due to a projected 1% background growth rate. See Appendix F for further details.

Comparison Between No-Build (2040) and the Preferred Alternative (2040)



Travel Time Comparison

TABLE 4: PROJECTED IN 2040		
	2040, 5-Lanes	2040, Pref. Alt.
FRONT		
AM	4:03	3:41
PM	7:34	12:59
MYRTLE		
AM	4:36	7:41
PM	3:13	3:57

Projected travel times highlighted in red indicate relatively significant potential increases of more than 2 minutes, which exceeds the threshold set forth in Performance Metric 4. It is important to recognize the need to balance the impacts over various performance metrics. For additional discussion, see page 79.

An aerial photograph of a city, likely Boise, Idaho, showing a dense urban area with various buildings and green spaces. In the background, there are rolling hills with a mix of green and brown vegetation, suggesting a semi-arid climate. The lighting is bright, indicating a clear day.

ADDITIONAL CONSIDERATIONS + NEXT STEPS

IMPACTS OF SIGNAL TIMING ON FRONT + MYRTLE

ACHD Update to Downtown Signal Timing

Signal timing is an important component of the operational performance of moving people efficiently and safely on and across Front and Myrtle in Downtown Boise. The Ada County Highway District (ACHD) completed a Signal Retiming Study in September 2017 at 113 traffic signals in Downtown Boise, including the Front and Myrtle corridors. While the analysis in this report was run before the consultant team had the opportunity to incorporate new signal timing into its traffic software model, the team reviewed the report in September 2017.

The goals of the new timing plan, as articulated by ACHD, were focused almost exclusively on optimizing vehicular traffic flow. These goals are transcribed below:

- Optimize signal timing for one-way to two-way street conversions
- Reduce travel speeds of vehicles to improve safety for other travel modes
- Maintain progression along Front and Myrtle, 9th Street, and Capitol Boulevard
- Minimize queuing, especially on 13th Street

Specifically on Front and Myrtle, the new signal timing plan resulted in the following changes:

- Progression speed along Front and Myrtle lowered from 35 mph to 30 mph
- Signal cycle lengths increased by 5 to 10 seconds during all three peak time periods. At most intersections, this additional time was allocated to through movements on Front and Myrtle

Review of the new signal timing plan indicate the following operational results:

- Potential for improved pedestrian safety outcomes resulting from slower vehicle speeds
- Anticipated average of 1% reduction in total vehicular delay
- Anticipated average vehicle travel time increase of 4 percent due to reductions in speeds

Overall, ACHD's new signal timings focus on improving vehicular traffic flow in and through Downtown Boise while decreasing vehicle travel speeds. Efforts to improve multi-modal accessibility - in particular the north-south connections into Downtown Boise - were not prioritized.

Signal Timing Impact on Front + Myrtle Alternatives Analysis

Review of ACHD’s Signal Retiming Study highlights the inherent competing priorities along the Front and Myrtle corridors. While wait times for pedestrians (and vehicles) to cross Front and Myrtle are long, especially during peak times, the consultant team ultimately prioritized lowering traffic speeds, reducing crossing distances, and calming traffic through lane reductions, and safety and streetscape improvements in the preferred alternative. In order to address the long wait times for pedestrians and vehicles crossing Front and Myrtle, additional analysis of the signal timing is needed. This requires a separate analysis and is listed as a next step.

Following release of ACHD’s updated timing plan, the consultant team also explored the potential impacts of shorter signal cycles along Front and Myrtle under current conditions. Using the intersection of Front Street and 9th Street as a test case, the team sampled cycle lengths during the PM peak that are shorter than the 140 second cycle in ACHD’s September 2017 plan. Results of this sensitivity test are found in the table below.

The testing clearly shows the inherent tradeoffs between shortening the signal cycle length and operational impacts on traffic on Front Street during the PM peak. It also illustrates that anything that takes time away from Front does improve vehicle LOS for the side street (9th Street, in this case), and shows how delay is inherently at odds between east-west and north-south vehicle movements. Reducing cycle lengths also would improve north-south pedestrian mobility by reducing waiting time to cross Front Street.

Weekday PM Peak Hour Operations Under Different Cycle Lengths (140, 120, 100, 90, 80, 70)

9TH STREET / FRONT STREET			
Cycle Length (seconds)	Intersection LOS (seconds)	WB Through V/C & LOS/Delay (seconds)	Side Street V/C & LOS/Delay (seconds)
140	C (22.6)	0.78 (B / 16.1)	0.74 (D / 40.1)
120	C (25.6)	0.85 (C / 21.2)	0.63 (D / 37.5)
100	C (30.1)	0.97 (C / 31.5)	0.53 (C / 25.6)
90	D (43.0)	1.07 (D / 50.9)	0.48 (C / 20.4)
80	F (104.0)	1.24 (F / 134.9)	0.42 (B / 14.9)
70	F (163.4)	1.43 (F / 219.4)	0.39 (A / 2.1)

Recommended Next Steps for Signal Timing Analysis

Based on this simple sensitivity analysis, some shortening of the new PM cycle lengths of 140 seconds at various intersections on Front Street may still result in acceptable LOS results. However, ACHD's retiming study - which very clearly prioritizes vehicular movement without much outright consideration for mobility for non-motorized modes of travel - was completed at a network-wide level across Downtown Boise. The impacts of reducing cycle timing along Front and Myrtle would need to be evaluated similarly at a network level that is beyond the scope of this Front + Myrtle Alternatives Analysis. Revisiting the signal timing plan for Downtown Boise would be worthwhile, but should be done so in the context of the goals articulated for Front and Myrtle in this report.

As a result, the consulting team recommends a network-wide evaluation of lower cycle lengths along Front Street in the PM peak hours, given that the results of this test show that there may be flexibility with the extra-long PM cycle lengths of 140 seconds under current conditions. No "fatal flaws" appear in this sensitivity analysis that would render anything lower than 140 seconds as a non-starter; in fact even a dramatically reduced cycle length of 90 or 100 seconds may not degrade LOS on Front Street to an unacceptable "E" or "F" level. Such an evaluation should be completed with all affected parties involved so that multi-modal tradeoffs can be discussed in the context of the entire Downtown signal system, and not just in this study at a few isolated intersections. Revisiting the cycle length issue should also be done in the context of other elements of the preferred alternative, such as lane reconfiguration, to determine combined impacts on traffic operations along Front and Myrtle.

OTHER CONSIDERATIONS IN PREFERRED ALTERNATIVE SELECTION

As described previously in this report, the consultant team developed a process for this project that, with the participation of key stakeholders, would be transparent and ensure that the final recommendations put forth represent the vision of those stakeholders. Front and Myrtle were treated as “blank slates” – there were no preconceived ideas – rather, project goals, evaluation criteria, and design alternatives were developed through open-ended workshops, and different ideas were evaluated using the criteria that the core stakeholders on the project team had themselves established. Following the completion of this process and the development of a preferred alternative, the project team reviewed various additional considerations for design alternatives. The table on the following pages lists these suggestions, along with their relative merits given the project’s Vision Statement and the 8-month process followed to develop the preferred alternative.

Additional Considerations

Relative Value based on Project Vision

Elevated / below-ground (grade-separated) pedestrian crossings

While crossings that are not at-grade would eliminate vehicle-pedestrian conflicts (improving safety if people utilize them), they would create new barriers for pedestrians: both physical, through grade changes, and psychological, through inconvenient diversions and - in the case of tunnels - potentially unpleasant conditions. Elevated or below-ground pedestrian crossings would also work against other goals of the study, such as increasing street-level activity and public life in support of economic development and placemaking, and supporting surrounding land uses and activities that bring Front and Myrtle's character in line with Boise's expanding, vibrant Downtown. Bridges and tunnels would also be significantly more expensive than street design and traffic signal changes.

On-site parking for development

While requiring on-site parking may be prudent for suburban development where nearly all trips are made by car, it is much less so in Downtown Boise, where drivers usually “park once” and a large share of trips are made by other modes, such as on foot or bike. Also, provision of on-site parking is rarely the highest and best use or the most efficient way to provide parking where land values are so high and provision of parking on individual parcels is generally inefficient. Most significantly, the provision of on-site parking would be antithetical to the aims of the Front and Myrtle effort. It could potentially attract more car trips, resulting in worsening congestion, while detracting from walkable, vibrant streets. Additionally, it would make everything else Downtown—from a sandwich to an apartment—more expensive due to the additional cost of providing on-site parking that gets passed down from developers to residents and visitors. Limiting the amount of valuable Downtown land dedicated to automobile storage will also provide greater benefit to the Boise region in a future in which parking demand is significantly reduced by increased use of shared mobility services and autonomous vehicles.

Development that incorporates parking and elevated pedestrian crossings into the design to benefit users and complement development

(see responses to comments on elevated/below-ground pedestrian crossings and provision of on-site parking above)

Additional Considerations

Relative Value based on Project Vision

Off peak parking with lane reopened during peak traffic periods

As part of the Preferred Alternative, on-street parking has been recommended along the Front and Myrtle corridor at locations that would complement existing adjacent land uses and have the least impact on traffic operations. Off peak-hour parking regulations can be considered to facilitate traffic operations during peak hours, however any "convertible" off-peak parking and peak hour travel lanes would then be unable to support raised sidewalk extensions around intersections, which would come at a cost to pedestrian comfort.

Sidewalk expansion by utilizing the existing shoulders to shift the curb out

This suggestion is already included as part of the Preferred Alternative: sidewalk extensions of less than 5 feet (by utilizing the existing shoulder) have been proposed throughout the entire Front and Myrtle corridor. In the limited locations where lane reductions were found to provide significant benefit (e.g. increased safety; reduced crossing distances; and expanded public space) vs. cost (in terms of motor vehicle delays), more significant sidewalk extensions were also recommended. Such extensions have a more material impact on reducing pedestrian crossing distances and times, and would provide additional benefit in reducing top traffic speeds that result from excess road capacity.

Widening of sidewalks to accommodate both bicycles and pedestrians (example of Indianapolis, sidewalk is clearly marked for where bicycles operate and where pedestrians walk)

As part of the Preferred Alternative, significant sidewalk extensions were recommended at locations along the Front and Myrtle corridors where appropriate. Widened sidewalks would facilitate flexible programming and design to accommodate existing and future needs of Downtown Boise. Bike lanes or paths could be included within the widened sidewalks (similar to Indianapolis' Cultural Trail, which is referenced here), however continuous bike lanes along Front and Myrtle streets were not identified by the project stakeholders as a high priority as part of this project's process.

Several sections of the road have sidewalks immediately adjacent to the roadway with a vegetated setback strip between the sidewalk and the property use. Swapping these uses would create a buffered sidewalk, incorporating the existing shoulder would allow for wider sidewalks and/or other amenities as well

The Boise Downtown Design Standards and Guidelines already require wider sidewalks that include buffer zones at the back of curb. CCDC regularly installs these either through its own Capital Improvement Plan or by partnering with developers. Neither the City of Boise nor CCDC can install such public improvements outside the right-of-way (on private property) without an easement, so such improvements often cannot occur until a property redevelops.

Additional Considerations	Relative Value based on Project Vision
<p>Evaluating access to Front and Myrtle to improve traffic flow such that the loss of a lane would be less impactful to through traffic</p>	<p>It is possible that reduced direct vehicle access to Front and Myrtle would result in fewer conflict points with pedestrians and bicyclists and less frontage occupied by surface parking, all of which would support this project's goals. Additional consideration could be given to consolidating vehicular access points onto Front and Myrtle where appropriate. However, direct access should still be maintained in locations that are being impacted by new development patterns and accompanying traffic, so as not to unduly burden existing intersections. CCDC did approach several property owners about closing superfluous driveway cuts on Front and Myrtle, with limited success. The authority to manage access and close unauthorized driveways onto Front and Myrtle lies with Idaho Transportation Department.</p>
<p>Improving local streets to reduce congestion and improve flow for the overall network, which will improve flow and reduce delay for all modes of travel</p>	<p>As determined by this project's traffic analysis, the local (e.g. numbered) streets are generally not the drivers of overall congestion along the Front and Myrtle corridor. The congestion that occurs on the side streets are most acute during the 140-second PM peak period signal cycles that are seen at certain intersections along Front Street.</p>
<p>Grade separating intersections, moving vehicles below ground (e.g., cut-and-cover tunnels) along Front and/or Myrtle or passing selected cross streets under or over Front and Myrtle to improved overall traffic flow by separating traffic</p>	<p>While moving vehicular traffic underground is a bold proposal, the intent of this study was to provide actionable recommendations for the City of Boise that address issues identified today along the Front and Myrtle corridor. Grade separation of vehicle traffic would be prohibitively expensive relative to the benefits, and would work counter to the project's Vision Statement and many of its goals, e.g. supporting a vibrant, integrated urban downtown district, but could nevertheless be explored in a future study.</p>
<p>Evaluating the feasibility of adding a 4th lane onto I-184 westbound at Front and 13th Street</p>	<p>This proposal was discussed internally by the consulting team following comments at one project workshop. As modeled in the team's traffic analysis, the travel time and queue reduction benefits (purely as modeled) were fairly limited, and the potential operational feasibility of a quick merge just upstream on the Connector from 4 lanes back down to 3 had not been studied, and was outside the scope of the Front + Myrtle Alternatives Analysis. As a result, the consulting team did not include this element as part of the preferred alternative. However, the potential to add a fourth receiving lane onto the Connector should be further studied for feasibility from a geometric and safety standpoint, and to more closely model potential traffic impacts.</p>

IMPLEMENTATION AND PHASING

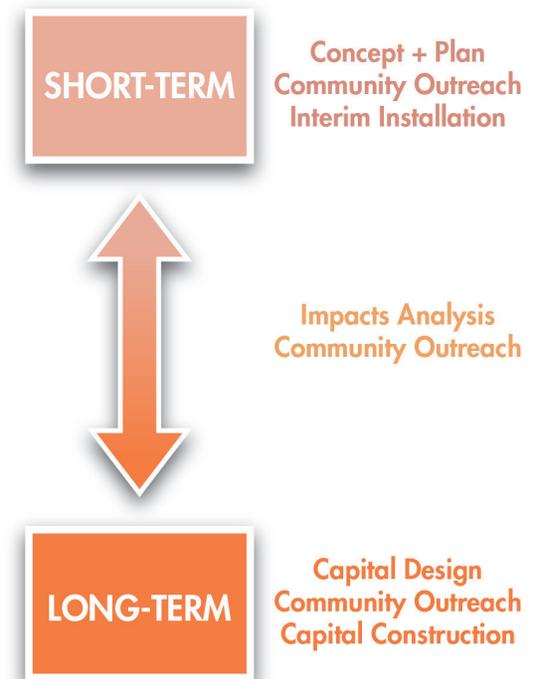
The conventional project development process generally requires steady and often sizable funding sources, and can require navigation of complex approval and regulatory processes. Some projects may take a number of years to proceed from planning to capital construction. While many of these lengthy and complicated processes are designed to assess and evaluate the potential impacts of a project, small-scale, interim changes can quickly deliver results to communities while allowing cities to examine the impacts of their intended project in real time. The consultant team proposes to incrementally redesign Front and Myrtle through a phased implementation approach detailed below:

Short-Term

In the short-term, elements of the preferred alternative can be implemented relatively quickly using low-cost, interim materials such as lane marking paint, textured epoxy gravel, planters or other attractive barriers, flexible bollards, and moveable furniture. On-street parking can be placed strategically and flexibly, and adjusted based on observed demand as needed. While the duration and permanence of the short-term implementation phase would vary by location and type of intervention, the impact and effectiveness of these near-term projects can be closely monitored during the implementation period, and design or associated programmatic elements can be adjusted and enhanced over time in response to community feedback and observed results.

Long-Term

In the long-term, the preferred alternative would build upon the improvements implemented during the short-term implementation phase, and would involve permanent capital reconstruction efforts that are higher-cost and would likely require the sustained coordination of multiple City, County, and State agencies, as well as ongoing support from the public and the business and civic community. Various elements of capital construction of the preferred alternative could themselves be phased by splitting them up into discrete capital projects based on community engagement and what ITD, the City of Boise, and other stakeholders see as most beneficial.



THE BENEFITS OF THE PREFERRED ALTERNATIVE

The project's Vision Statement (shown to the right) aims to promote a more livable and economically productive corridor along Front and Myrtle that integrates and builds upon the growing Downtown core. A range of elements are included in the preferred alternative that, if implemented, will result in significant benefits to safety, traffic calming, multi-modal accommodation, economic development, sustainability, and public life metrics. Such benefits have been demonstrated through similar strategies nationwide in downtown areas that are being redesigned for people who live, work, and play within them.

These benefits are summarized on the next page, and are related back to the project's Vision Statement. Additional information on how the metrics were evaluated across alternative options can be found in Appendix E.

Vision Statement

The Front and Myrtle corridor should:

- 1 Function as a **safe** and **efficient multi-modal** transportation facility moving **people** (employees, customers, visitors and residents) and **goods to and through** Downtown Boise while allowing all of Downtown to function as a **seamless, integrated urban neighborhood**;
- 2 Acknowledge, complement, and enhance **surrounding land uses and activities** within the context of a **vibrant Central Business District**;
- 3 Promote and support **economic development** and **buildings facing and interacting with pedestrians** on Front Street and Myrtle Street;
- 4 **Reduce barriers to all modes** of cross traffic while **accommodating through traffic**;
- 5 Contribute to a **greener downtown** through **sustainable infrastructure** and widespread **street trees and vegetative elements**

Preferred Alternative Component	Potential Benefits	Vision Statement Elements
Selective lane reduction	Reduced vehicle speeds and reduced crash severities; shorter pedestrian crossing distances; traffic calming to benefit street-facing retail and property values; opportunities for large-scale sidewalk extensions (see below) or targeted on-street curbside parking	1 2 3 4 5
Small-scale sidewalk extensions	Improved walking environment through wider sidewalks and/or buffers from moving traffic such as planters, street seats, or small street trees	1 2 3 4 5
Larger-scale sidewalk extensions	Opportunities for more active programming through a phased approach; can feature parklets, public seating, street trees, planters or other flexible uses (e.g. mountable sidewalks for selective loading locations, targeted locations for bicycle parking, or designated spaces for food trucks)	1 2 3 4 5
New signalized crossings	Decreased distances between safer north-south crossing opportunities; vehicle speed reduction between signals; contributes to “filling in” Downtown grid to encourage street-facing retail and increased property values	1 2 3 4 5
New marked pedestrian crosswalks	Additional safer crossing opportunities, especially at locations with relatively high pedestrian volumes (e.g. Front and Capitol)	1 2 3 4 5
Selective retention or addition of vehicle turn lanes	Limits the negative impacts on traffic operations (e.g. vehicle delay and travel times); enhances existing vehicular mobility	1 2 3 4 5
Further investigation into shorter signal cycles	Reduced north-south crossing delays for pedestrians and vehicles; potential vehicle speed reduction along Front + Myrtle especially during non-peak, uncongested hours	1 2 3 4 5

BALANCING PRIORITIES AND CONCLUSION

In a city like Boise that is fast-growing and has prioritized a multi-modal, walkable downtown – but where personal automobile travel still represents a bulk of all trips – there is a balance that must be struck when redesigning streets. Maintaining an acceptable level of convenience for drivers today is important; laying the foundation to provide comfortable multi-modal mobility choices in the long-term is just as much so. The overarching results from this study of Front and Myrtle show that these two streets in Downtown Boise already provide excellent and generally unfettered mobility for those driving, but create both real and perceived barriers for those crossing (in any travel mode) and certainly for those walking or biking along them. These issues will only become magnified as Boise grows and development pressure accelerates, bringing more people and more vehicles to Front and Myrtle.

The preferred alternative presented in this report aims to balance the many priorities that emerged from several project team and stakeholder workshops, and is backed up by a sound technical analysis of existing and projected traffic operations. It strikes a balance between setting the stage for what could be significant improvements to the public realm, all while retaining acceptable traffic operations at almost all times of day.

The changes recommended in the preferred alternative were the result of an inclusive, transparent process that engaged key stakeholders to lay out a vision for Front and Myrtle, examined existing conditions through the lens of multiple travel modes, developed a wide-ranging menu of alternatives, and prioritized them into a package that satisfied as many elements of the Vision Statement as possible without resulting in materially negative impacts.

Ultimately, the recommendations will meet many of the goals of the Vision Statement to promote a more livable and economically productive corridor along Front and Myrtle that integrates and builds upon the growing Downtown core. And as the analysis shows, even without any interventions, traffic operations are bound to worsen according to today's projections just by nature of growth Downtown. This could likely change, of course, as Boise reckons with the wholesale change in mobility that is coming to our cities as a result of technological advances, shared rides, and autonomous vehicles, which could dramatically reduce vehicle-miles traveled (VMT) and improve network efficiency within the next several decades.

Recognizing the competing demands along Front and Myrtle, the consultant team recommended street redesigns and capacity reductions only at locations that would have the least impact on traffic operations. While it is anticipated and acknowledged in this report that there will be some adverse impacts, when compared to the potentially sizable benefits of developing a vibrant, dynamic, and welcoming downtown that is accessible to all modes of travel, these impacts are on the whole reasonable.

This report aims to provide first steps towards resetting the current imbalance between vehicular mobility along Front and Myrtle and mobility for other travel modes, north-south travel, and public life. Moving these recommendations forward will require some compromise on all sides, and will require continued conversation and acknowledgment of the relative benefits and drawbacks of the recommendations in light of this project's Vision Statement.

APPENDICES



APPENDIX A

VISION SESSION SUMMARY

The background of the entire page is a composite image. The top half shows a vast, arid landscape with rolling hills and valleys, bathed in the warm, golden light of late afternoon or early morning. The bottom half shows a dense urban skyline with various high-rise buildings and structures, also captured from an elevated perspective under similar lighting. A semi-transparent teal rectangular box is overlaid on the middle of the image, containing the main title and subtitle in a bold, orange, sans-serif font.

FRONT + MYRTLE COUPLET ALTERNATIVES ANALYSIS:

VISION SESSION SUMMARY

SUMMARY CONTENTS

This package serves as documentation and a summary of key findings and results from an October 2016 2-day kickoff visit on Boise's Front + Myrtle Couplet Alternatives Analysis project. The visit included a walking tour of the two corridors under consideration and a structured visioning session. Attendees included representatives from Capital City Development Corporation, the City of Boise, Ada County Highway District, the Idaho Transportation Department, the Community Planning Association of Southwest Idaho, and other invited stakeholders. Findings from the kickoff visit will be used to inform an existing conditions analysis of the two corridors and the ways in which various conceptual design alternatives will be evaluated.

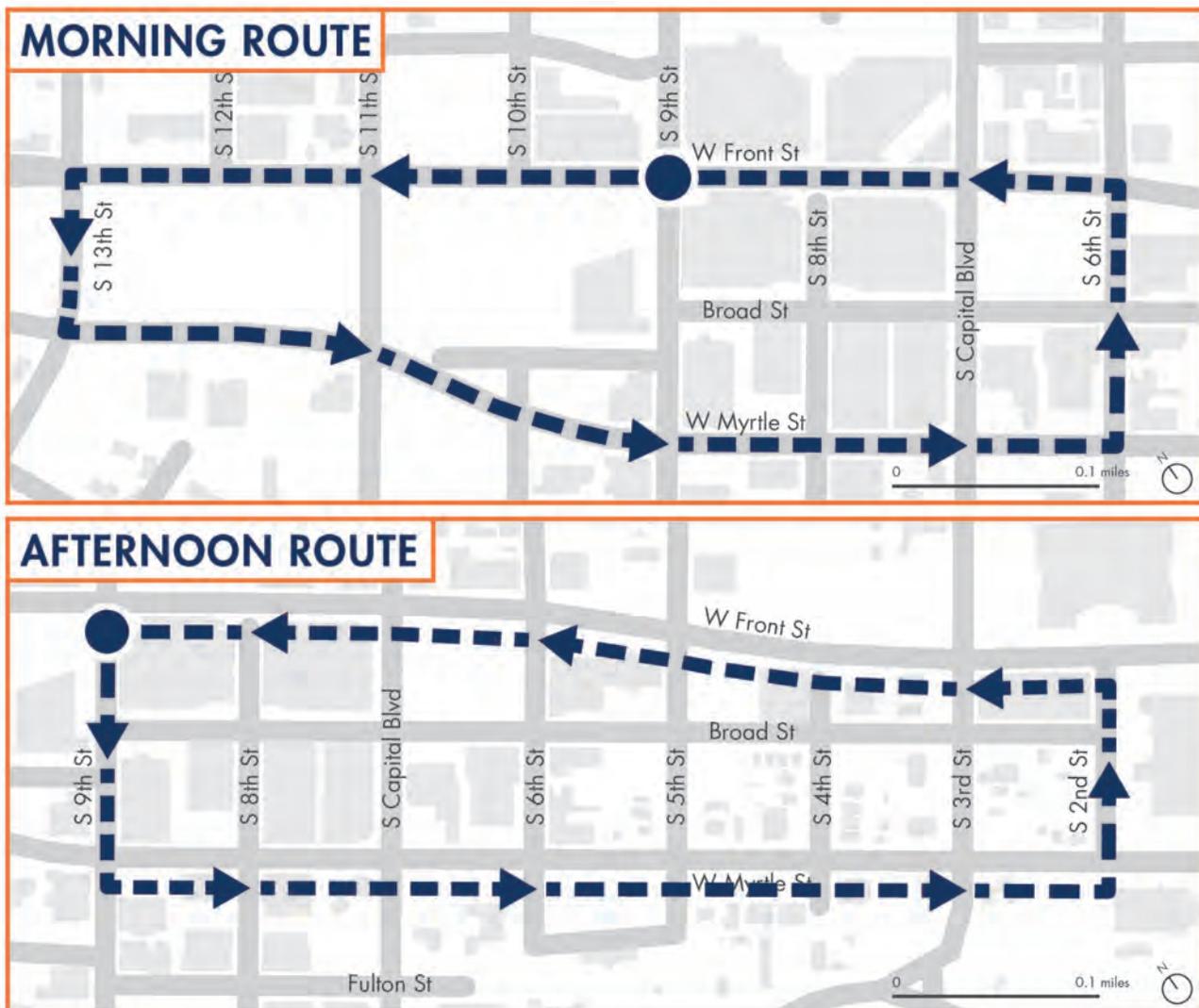
WALKSHOP

Introduction

In order to get a sense of existing conditions on Front and Myrtle, the first step identified was a walking tour of most of the lengths of both study corridors. Participants were invited to join one or both “walkshop” sessions. In the morning, the group walked west from 9th St to 13th St along Front St, south to Myrtle St, east as far as 6th St, and then west along Front St back to 9th St. The afternoon session focused on the eastern portion of the study corridors, with a route east on Myrtle St to 2nd St, north to Front St, and west back to 9th St. Participants were

provided with handouts asking them to identify issues they saw as ripe for improvement or as examples of elements that could be replicated in other parts of the two corridors. By walking the corridors, members of the project team and invited stakeholders were able to experience them with a non-motorized view, which was intended to help inform existing issues and potential improvements from a pedestrian perspective.

Map of Routes



Photos from Walkshop



13th St between Front St and Myrtle St, at western edge of study area near Pioneer Crossing site

Front St and 9th St, discussing the potential for a curb extension



Front St and 12th St, adjacent to retail cluster and nearby new development sites

General Walkshop Findings

What Needs Improvement

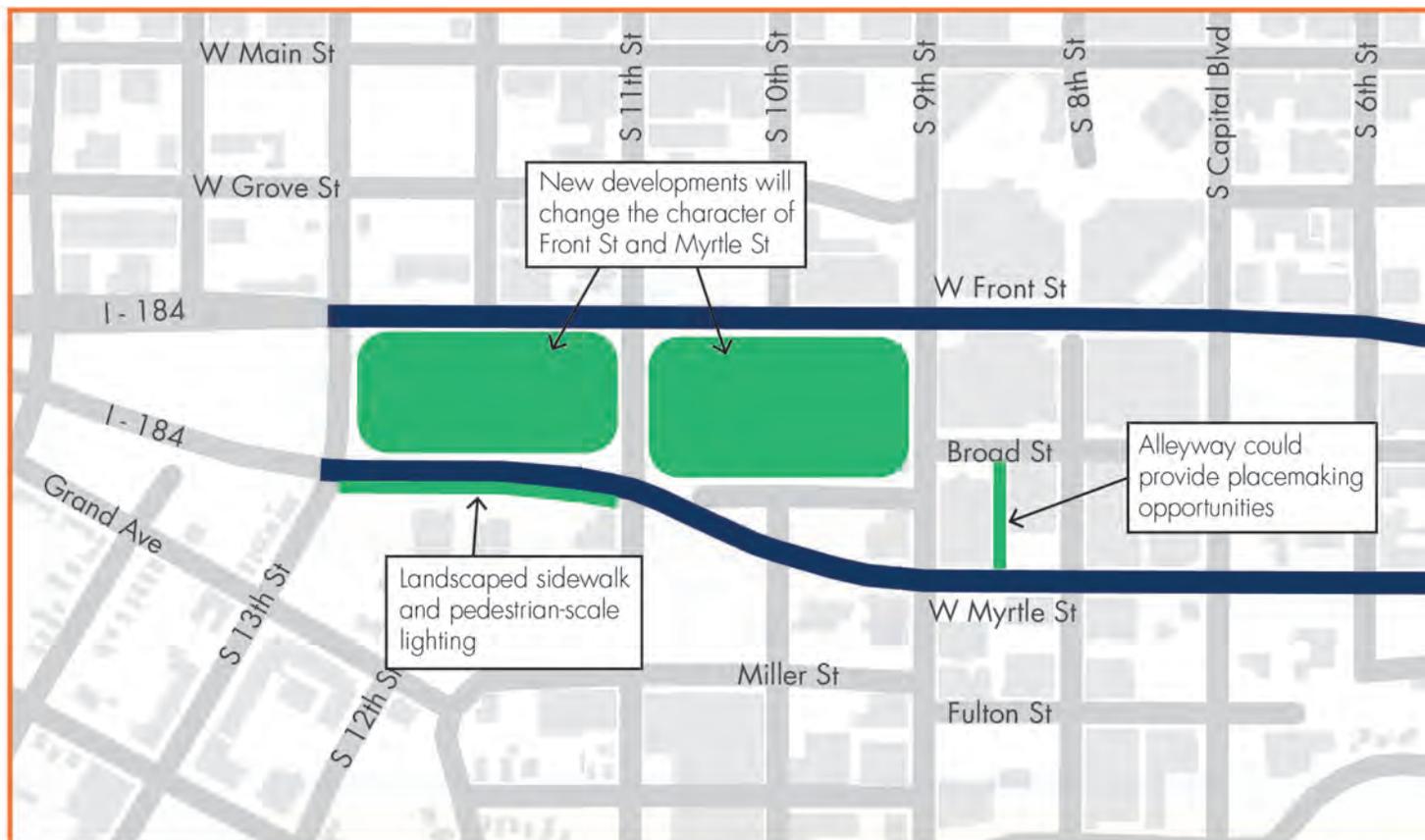
- Narrow sidewalks, often with no buffer, adjacent to perceived fast moving traffic
- Long distances between marked pedestrian crossings and signalized intersections
- Double right or double left turn lanes create dangerous conditions for crossing pedestrians
- Excessively large curb radii
- Surface parking lots are adjacent to streets while buildings are not
- 2.5 ft shoulders are insufficient for safe bicycle travel
- Superfluous curb cuts that do not lead to driveways
- High traffic volumes create noise pollution

What Is Working Well

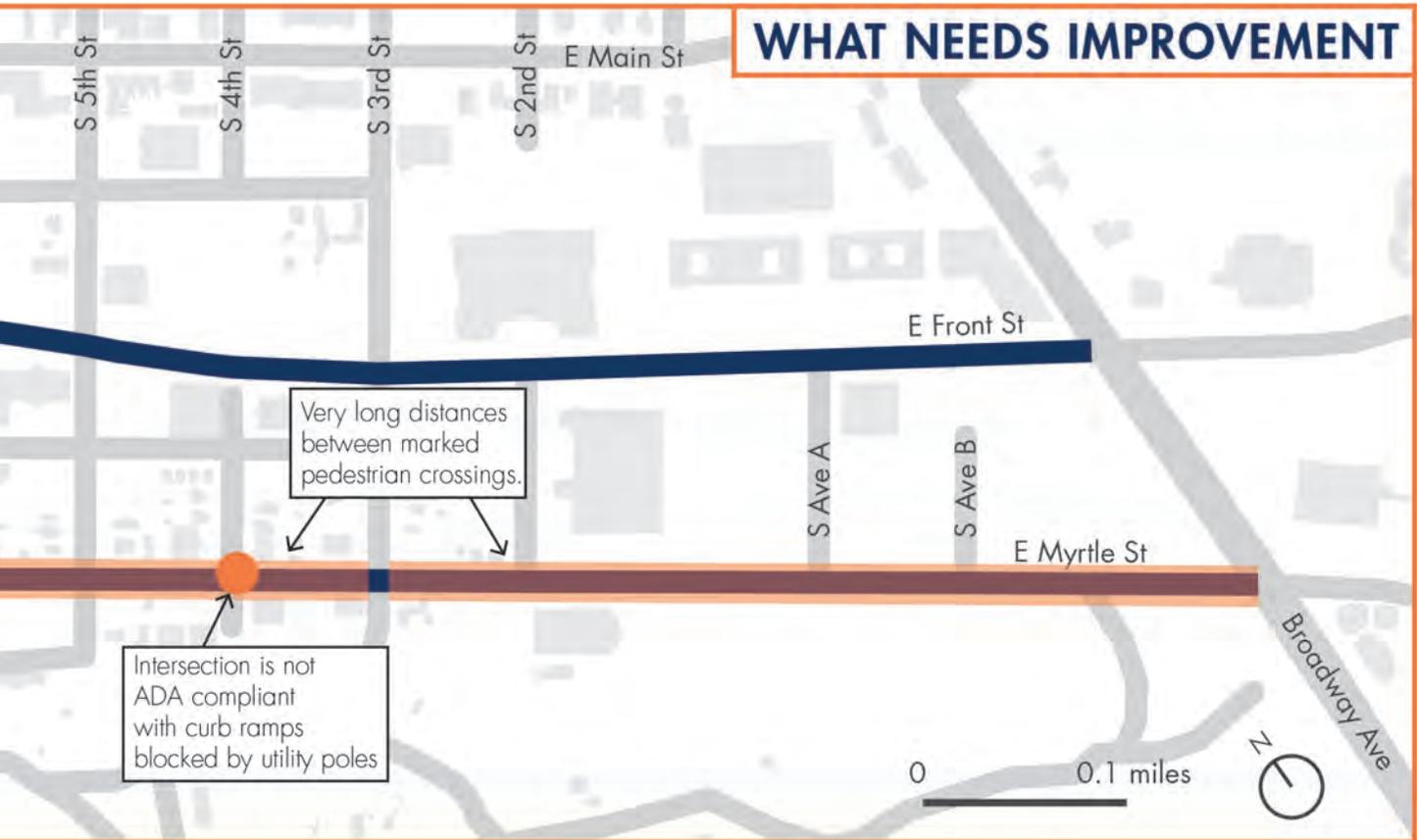
- Some street segments feature wide sidewalks with landscaped physical buffers
- New developments will result in higher pedestrian volumes and justify new intersection crossing treatments
- New developments can potentially form attractive storefronts adjacent to streets
- Excess roadway capacity may create opportunities for corner bulb outs and/or on-street parking



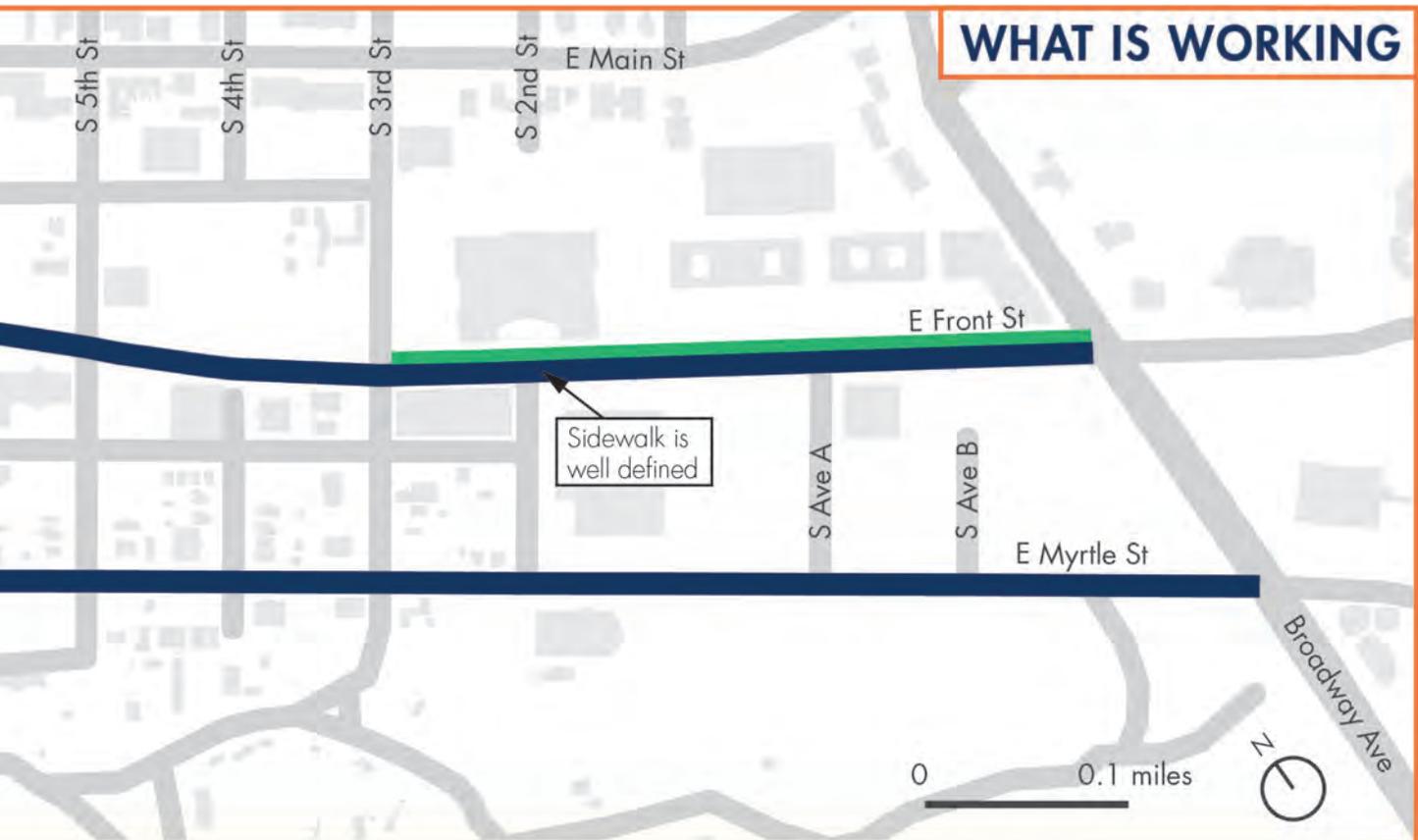
Location Specific Walkshop Findings



WHAT NEEDS IMPROVEMENT



WHAT IS WORKING



VISION SESSION

Introduction

Members of the project team, along with stakeholders invited to the workshop, assembled at Boise City Hall the following day to engage in a structured conversation. The meeting was designed to set a vision for the project and inform the team's ideas for an evaluation of potential design alternatives for Front and

Myrtle. After a brief presentation on best practices in street design, participants engaged in three exercises on grand-scale visioning, potential performance measures, and specific aspects of the two corridors. Each exercise was followed by a lively group discussion. Findings from these exercises are presented below.

Vision Exercise

Participants were provided with a simple but open-ended prompt: they were asked to describe the way they envision the study corridors to be in 10 years. This exercise was intentionally vague in order to gather a range of responses, ranging from specific physical interventions

to perceptions of the overall character of the corridors. Over 80 submissions were provided and a follow-up discussion identified a variety of ideas, along with a few common themes.

Front + Myrtle will be _____ in 10 years.

FRONT + MYRTLE VISION SESSION

Sample Responses

Front + Myrtle will be safe to ride, walk and drive in 10 years.

FRONT + MYRTLE VISION SESSION

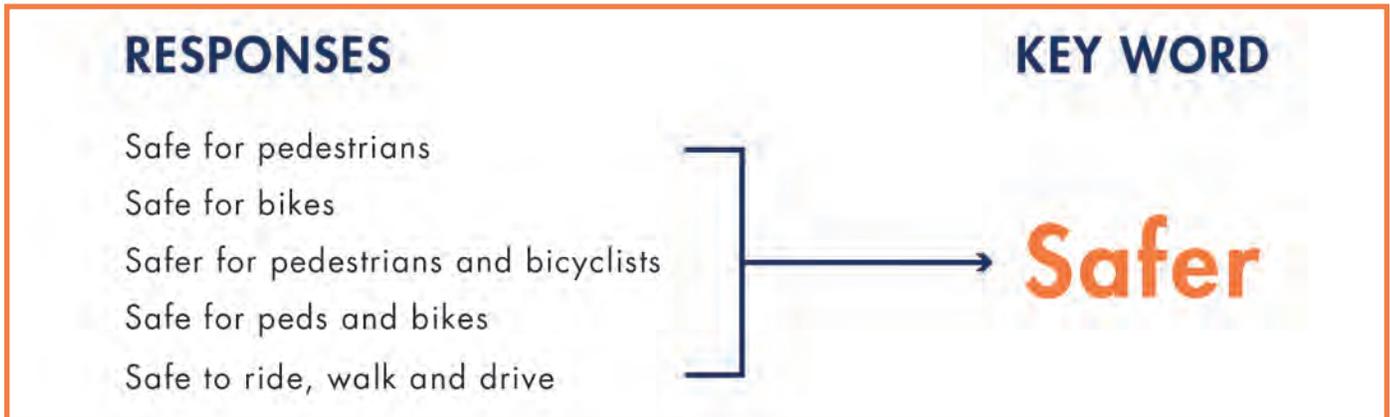
Front + Myrtle will be safe for pedestrians in 10 years.

FRONT + MYRTLE VISION SESSION

Response Collection

All responses were catalogued in spreadsheet form following the meeting, and then categorized into like themes in order to provide a holistic picture of the types of responses received. The example below shows how different responses along a “safety” theme were combined to

represent one word or phrase to fill in the blank portion of the exercise prompt. All key themes were then rated by their frequency and a “word cloud” was developed to represent the types of ideas provided.



Vision Exercise Summary - Response Frequencies



Note: Size of words and phrases are proportional to their respective frequency as summarized from the Vision Exercise responses.

Vision as Introduced in RFP

The Request for Proposals for this project had already identified a clear vision that the project team believes is important when thinking about future outcomes for the study corridors. It is presented unedited below, with key words and phrases highlighted:

The Front and Myrtle corridor should:

- Function as a **safe** and **efficient multimodal** transportation facility moving **people** (employees, customers, visitors and residents) and **goods to and through** Downtown Boise while allowing all of Downtown to function as a **seamless, integrated urban neighborhood**;
- Acknowledge, complement, and enhance **surrounding land uses and activities** within the context of a **vibrant Central Business District**;
- Promote and support **economic development** and **buildings facing and interacting with pedestrians** on Front St and Myrtle St;
- **Reduce barriers** to **all modes** of cross traffic while **accommodating through traffic**

Updated Vision

The feedback from the vision session exercise was reviewed in order to see how the project team and stakeholder suggestions linked up with original project vision statement above. Of the common themes emerging from the exercise, only the concept of a “greener” or more sustainable Front and Myrtle stood out

as missing from the original vision statement. All other elements were generally brought up in some form. As a result, an updated vision is proposed below. It retains all portions of the original version and is supplemented with one additional bullet point:

The Front and Myrtle corridor should:

- Function as a **safe** and **efficient multimodal** transportation facility moving **people** (employees, customers, visitors and residents) and **goods to and through** Downtown Boise while allowing all of Downtown to function as a **seamless, integrated urban neighborhood**;
- Acknowledge, complement, and enhance **surrounding land uses and activities** within the context of a **vibrant Central Business District**;
- Promote and support **economic development** and **buildings facing and interacting with pedestrians** on Front St and Myrtle St;
- **Reduce barriers** to **all modes** of cross traffic while **accommodating through traffic**
- + Contribute to a **greener downtown** through **sustainable infrastructure** and widespread **street trees and vegetative elements**

Performance Measures

For the second exercise, participants were asked to suggest what types of measurements could be used to determine whether a potential design alternative would bring Front and Myrtle closer to the overall vision for the corridors. This exercise was intended to begin the process of brainstorming and closing in on a

set of performance or success measures which will be used in the alternatives analysis phase of the project. Below, a sample form is shown along with a few representative responses. 80 submissions were provided in this exercise and a follow-up discussion helped identify common themes.

FRONT + MYRTLE VISION SESSION

Help us define and rank potential measures of success in order of your preference.

Make sure these measures link up to overarching goals identified in the first exercise.

1. Potential measure: _____
How do we evaluate? _____

Why is it important? _____

Sample Responses

1. Potential measure: More public transportation modes
How do we evaluate? Visual, studies/sampling
Why is it important? Allows for additional travelers without adding to congestion
2. Potential measure: Improved safety
How do we evaluate? Traffic accident counts by location
Why is it important? Unsafe roads are less desirable.
3. Potential measure: Improved vitality.
How do we evaluate? Additional Measure development/growth
Why is it important? adds to the vibrancy of the entire downtown.

Context Zones

The final group exercise prompted participants to mark up a map of the study corridors to indicate specific issues that might demand certain design solutions. While some solutions may certainly be appropriate throughout the length of both Front and Myrtle, others may be context dependent. Through follow-up discussion at the vision session along with

further consultation with the project team, it was determined that three “context zones” could be considered for Front and Myrtle. Furthermore, the third or easternmost zone was divided to recognize differences between Front and Myrtle east of 5th St.

FRONT + MYRTLE VISION SESSION - CONTEXT ZONES

Different parts of Front + Myrtle have different contexts across the study area. Help us identify areas that share a common character, and describe the type(s) of design solutions that might be appropriate. Please be specific and use the reverse side if necessary.

Comments: _____

Sample Responses

Comments: *important intersections*

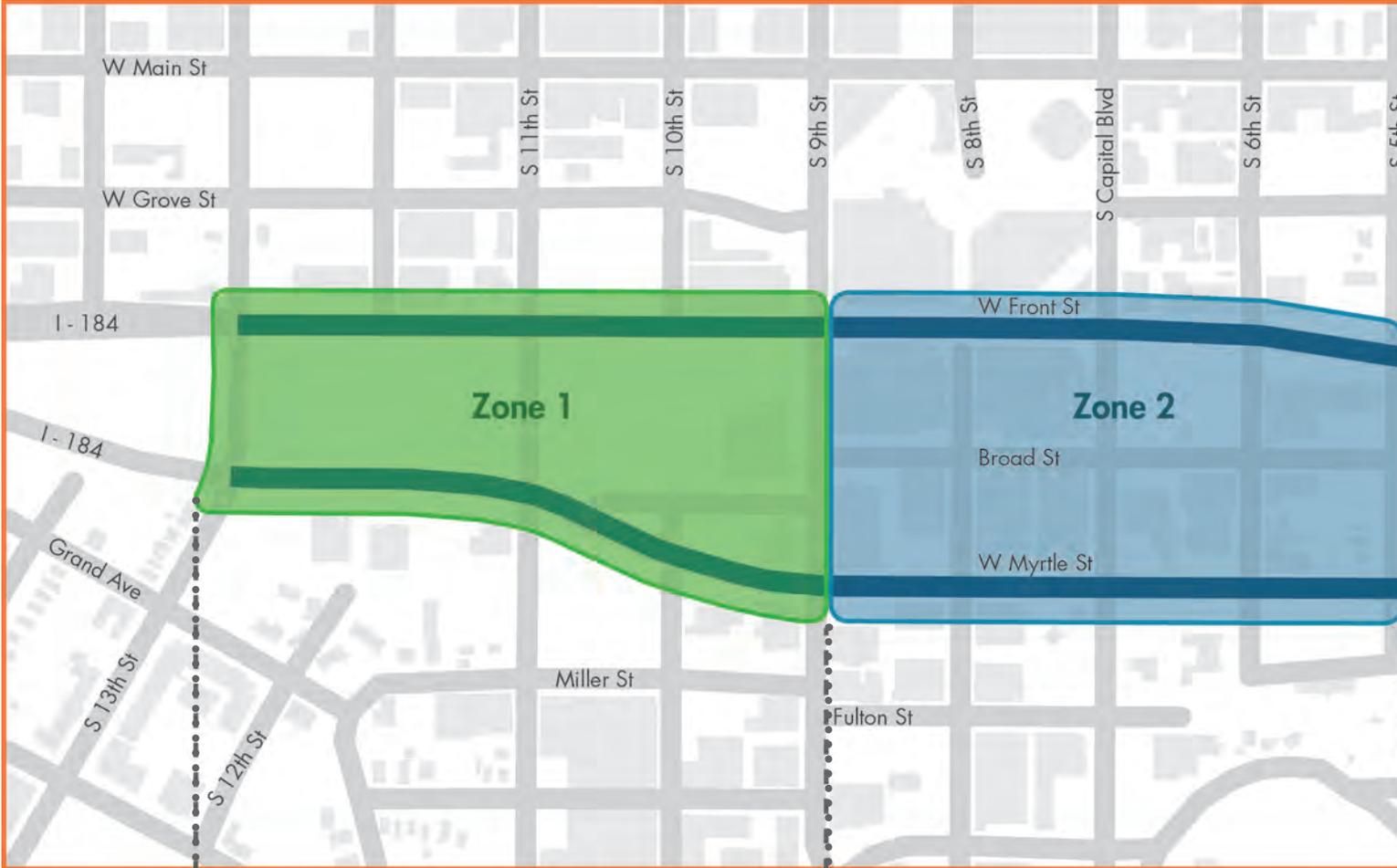
decrease lane widths to support streetscapes + decrease speeds

*transition from 5-lane to 4-lane to 3-lane W → E
+ visa versa E → W*

Selected Context Zone Comments

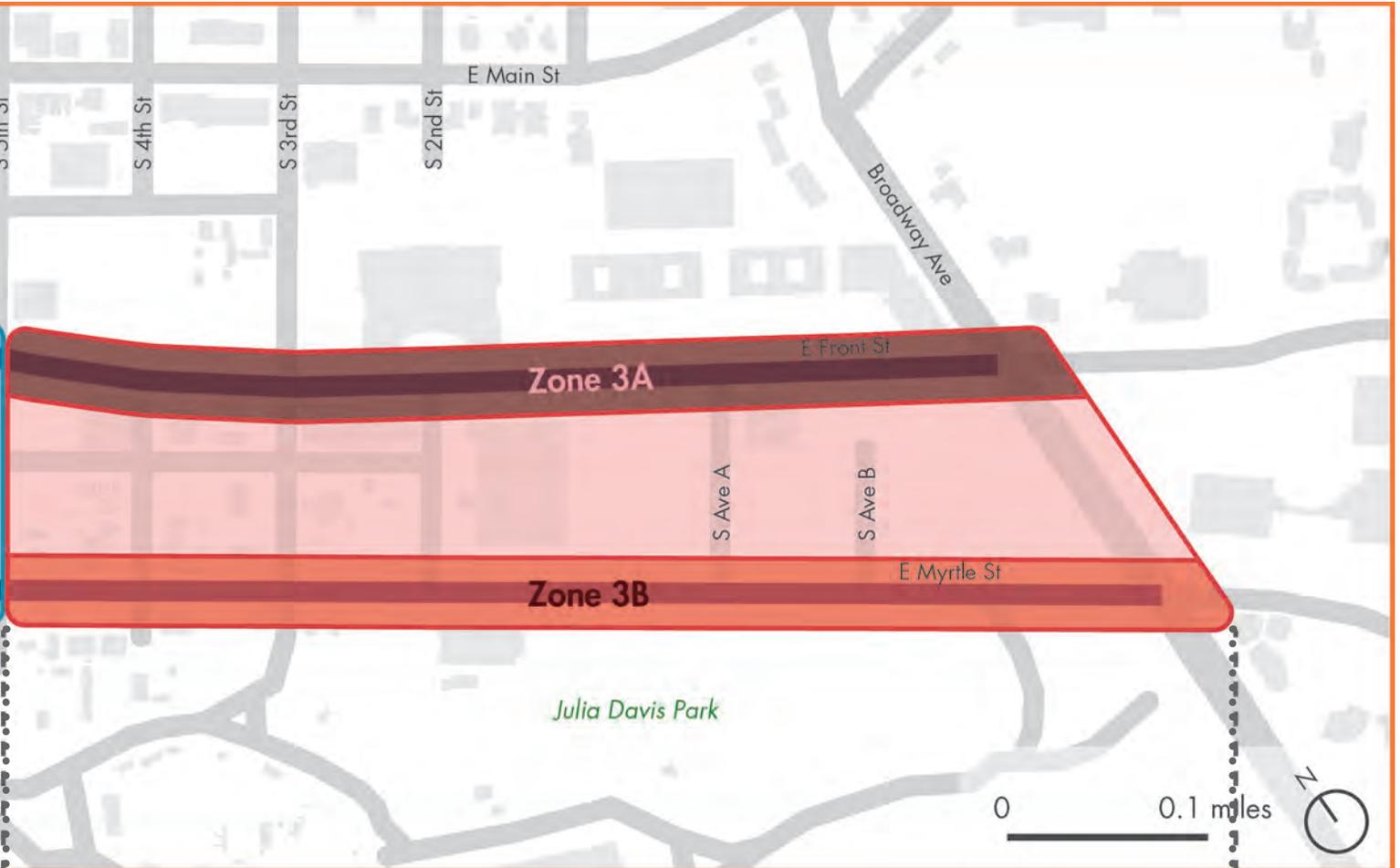
Context Zones	Issues	Potential Improvements
Zone 1	<ul style="list-style-type: none">• High traffic volumes and perceived speeds• Traffic entering/exiting freeway• Pioneer Crossing development east of 11th St• JUMP and Simplot development between 9th St and 11th St• 9th St, 8th St, and Capitol Blvd between Front St and Myrtle St are major pedestrian and bicycle corridors and may need more robust crossings	<ul style="list-style-type: none">• Add pedestrian crossing at 11th St (JUMP development)• Alert drivers to major changes in land use• Improve Pioneer path connection• Add new signal at 10th St and Front St• Improve north/south pedestrian and bicycle connection• Add pedestrian/bicycle crossing on 8th St from Main St to Fulton St• Lower speed limit to 25 mph
Zone 2	<ul style="list-style-type: none">• Future growth in housing and commercial land uses; excess capacity towards the east.• Additional marked crossings may be needed• Potential for improved sidewalks with new developments	<ul style="list-style-type: none">• Lower speed limit to 25 mph
Zone 3A	<ul style="list-style-type: none">• Vehicle lanes are too wide• Lack of attractive streetscape elements• Not enough marked pedestrian crossings	<ul style="list-style-type: none">• Reduce roadway configuration to 4 lanes• Lower speed limit to 25 mph• Add on-street parking• Bicycle lanes with physical buffer (potentially parking protected)• Convert travel lane into parking, green spaces, pedestrian buffers or protected bike lanes
Zone 3B	<ul style="list-style-type: none">• New developments• Long distances between traffic signals• Perceived speeding traffic• Not enough pedestrian-friendly areas• Lack pedestrian crossings	<ul style="list-style-type: none">• Convert travel lane to on-street parking• Reinforce character of Julia Davis Park• Myrtle St and 5th St to become key future crossing• Refuge island on Myrtle St and 3rd St• Add more marked pedestrian crossings• Reduce Myrtle St to 3 or 4 travel lanes• Additional streetscape elements

Context Zone Summary Map - Key Issues



- Lack of marked pedestrian crossings (superblocks)
- Transition from highway to Downtown Boise
- New large-scale developments
- Perceived high traffic speeds
- Relatively higher traffic volumes

- Downtown core
- Mixture of land uses
- Existing intersections require improvements
- Highest pedestrian and bicycle volumes



- Long distances between signalized intersections and lack of marked pedestrian crossings
- Myrtle St adjacent to Julia Davis Park
- Need for additional streetscape elements
- Perceived high traffic speeds

Zone 1 - Description



Zone 1 is characterized by new large scale developments and superblocks, and is the transition area from I-184 to Downtown Boise. Because of the area's transitional nature and its proximity to the highway, there are relatively higher volumes of traffic and perceived higher traffic speeds. The superblock development sites lack pedestrian safety elements at intersections such as marked crosswalks and crossing signals.



Front St and 13th St facing west towards I-184



Front St and 9th St facing east



Myrtle St and 13th St facing west towards I-184

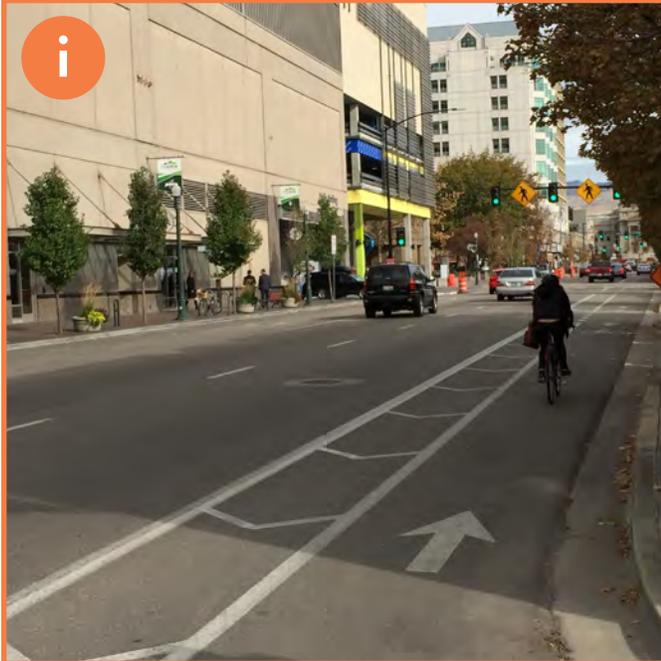


Myrtle St and 11th St facing east

Zone 2 - Description



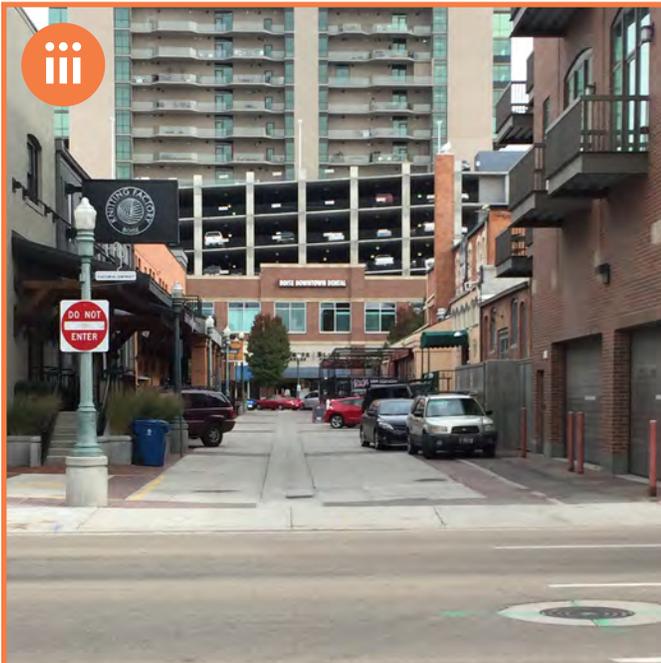
Zone 2 is located within the downtown core of Boise, characterized by a mixture of land uses and denser development. Many existing intersections in the downtown core require enhancements to accommodate increasing volumes of pedestrians and bicyclists, as well as to provide a safe and comfortable urban environment.



Capitol Blvd just north of Front St facing north



Front St and 6th St facing west

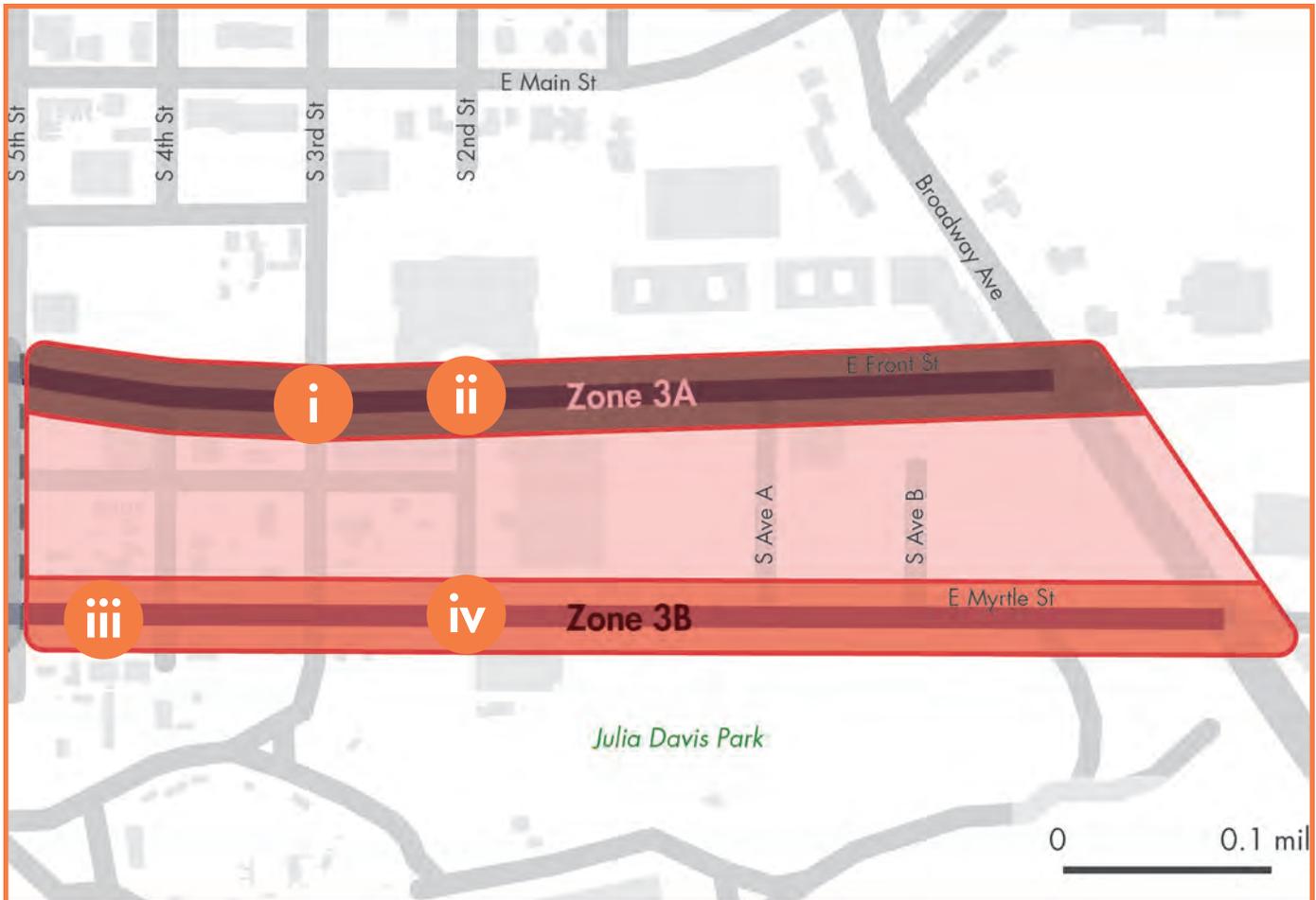


Myrtle St between 9th St and 8th St facing north

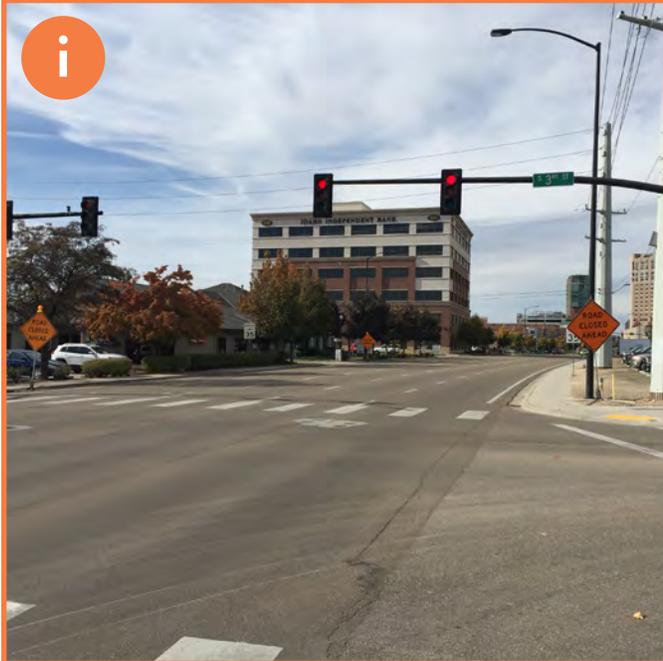


Myrtle St and 8th St facing north

Zone 3A / 3B - Description



Zone 3 is characterized by long distances between signalized intersections and a lack of marked pedestrian crossings. Five lane configurations and relatively lower traffic volumes lead to a perception of high traffic speeds and pedestrian safety concerns. Zone 3A consists of more diverse land uses and streetscape elements compared to Zone 3B, which features long stretches between signals and sits adjacent to Julia Davis Park.



Front St and 3rd St facing west



Front St and 2nd St facing east



Myrtle St between 5th St and 4th St facing east



Myrtle St and 2nd St facing east

APPENDIX B

EXISTING CONDITIONS TRAFFIC ANALYSIS



KITTELSON & ASSOCIATES, INC.

TRANSPORTATION ENGINEERING / PLANNING

101 S Capitol Boulevard, Suite 301, Boise, ID 83702 P 208.338.2683 F 208.338.2685

MEMORANDUM

Date: January 12, 2017

Project #:
20407

To: Ben Rosenblatt, AICP
Sam Schwartz Engineers

From: Jamie Markosian, EIT; Andy Daleiden, PE; and, Nick Foster, AICP

Project: Front and Myrtle Couplet Alternatives Analysis

Subject: Task 1 - Existing Traffic Conditions

This memorandum summarizes the existing traffic conditions on the Front and Myrtle corridors in downtown Boise, Idaho and is formatted in accordance with the Task 1 report outline. Contained within this memorandum are the following sections, summarizing the existing conditions along the corridor;

- Vehicle Operations;
- Pedestrian Conditions;
- Bicycle Conditions;
- Transit Conditions; and,
- Crashes and Safety

The data supporting these sections and the existing conditions analysis come from the Idaho Transportation Department (ITD), the Ada County Highway District (ACHD), the Community Planning Association of Southwest Idaho (COMPASS), the City of Boise, Idaho, and from data collected in the field during the fall and winter of 2016. Table 1 summarizes this data.

Table 1 Existing Conditions Data Summary

Front/Myrtle Couplet Existing Conditions Data Summary				
	Data Type	Agency / Vendor	Source	Date(s)
Vehicle Operations Data	Turning movement counts (TMC)	ACHD	ACHD turning movement count database	2012 - Present
	TMC + Classification	L2	L2 traffic count worksheets	11/15/2016
	TMC + Classification	L2	L2 traffic count worksheets	12/13/2016
	Travel Time	ACHD	ACHD travel time runs using floating car method (13 runs)	11/1/2106
	Travel Time	COMPASS	COMPASS travel time runs using floating car method (unknown number of runs)	Nov. 2016
	Travel Time	DigiWest/Quality Counts	BlueMAC Bluetooth data recorders	10/19/2016 - 10/28/2016
	Vehicle Class Count/Daily Traffic Count	COMPASS	COMPASS supplied SHRP2 data collection	11/3/2015
	Daily Tube Counts	ACHD	ACHD Tube Counts	2012 - Present
	AADT	ITD	IPLAN ArcGIS web application	2015
ATR counts	ITD	ITD downtown ATR data	2006 - Present	
Pedestrian Data	Pedestrian Counts	COMPASS	Pedestrian Bluetooth reader	12/2/2015 - 1/3/2016 & 5/23/2016 - 7/4/2016
	Pedestrian Counts	KAI	Manual counts of pedestrians at 8th/Myrtle & Broadway/Front & Broadway/Myrtle	12/7/2016 & 12/13/2016
	Pedestrian Counts	L2	Pedestrian counts pulled from L2 traffic count worksheets	11/15/2016 & 12/13/2016
Bicycle Data	Bicycle Counts	L2	Bicycle counts pulled from L2 traffic count worksheets	11/15/2016 & 12/13/2016
Transit Data	Route service maps	Valley Regional Transit	Valleyride transit route maps and schedules	Fall 2016
Crashes and Safety Data	Raw Crash data	ITD	Raw, reported crashes from ITD database on Front St and Myrtle St	2011 - 2015

EXISTING TRAFFIC CONDITIONS

The Front and Myrtle corridor is a one-way couplet that serves as a main east-west thoroughfare in downtown Boise. These two roadways are classified as principal arterials (National Highway System) with a posted speed of 35 miles per hour and connect Interstate 184 (referred to as the Connector) to the west and Park Center Boulevard/Broadway Avenue to the east. The two roadways have four to five travel lanes and carry average annual daily traffic (AADT) volumes ranging from approximately 25,000 to 37,000 vehicles per day. Interstate 184 experiences peaking in the eastbound direction (into downtown Boise) during the weekday a.m. peak hour and the westbound direction (out of downtown Boise) during the weekday p.m. peak hour, which translates into the same directional peaking on Front Street (westbound during weekday p.m. peak) and Myrtle Street (eastbound during weekday a.m. peak). The signal timing and associated progression speed for vehicles traveling east and west on the Front and Myrtle corridor is based on the posted speed limit of 35 miles per hour. Currently, ACHD is in the process of updating the signal timings for the downtown signal system, specifically, looking into reducing the Front and Myrtle corridor signal progression speed from the posted speed limit (35 miles per hour) to 30 miles per hour.

VEHICLE OPERATIONS

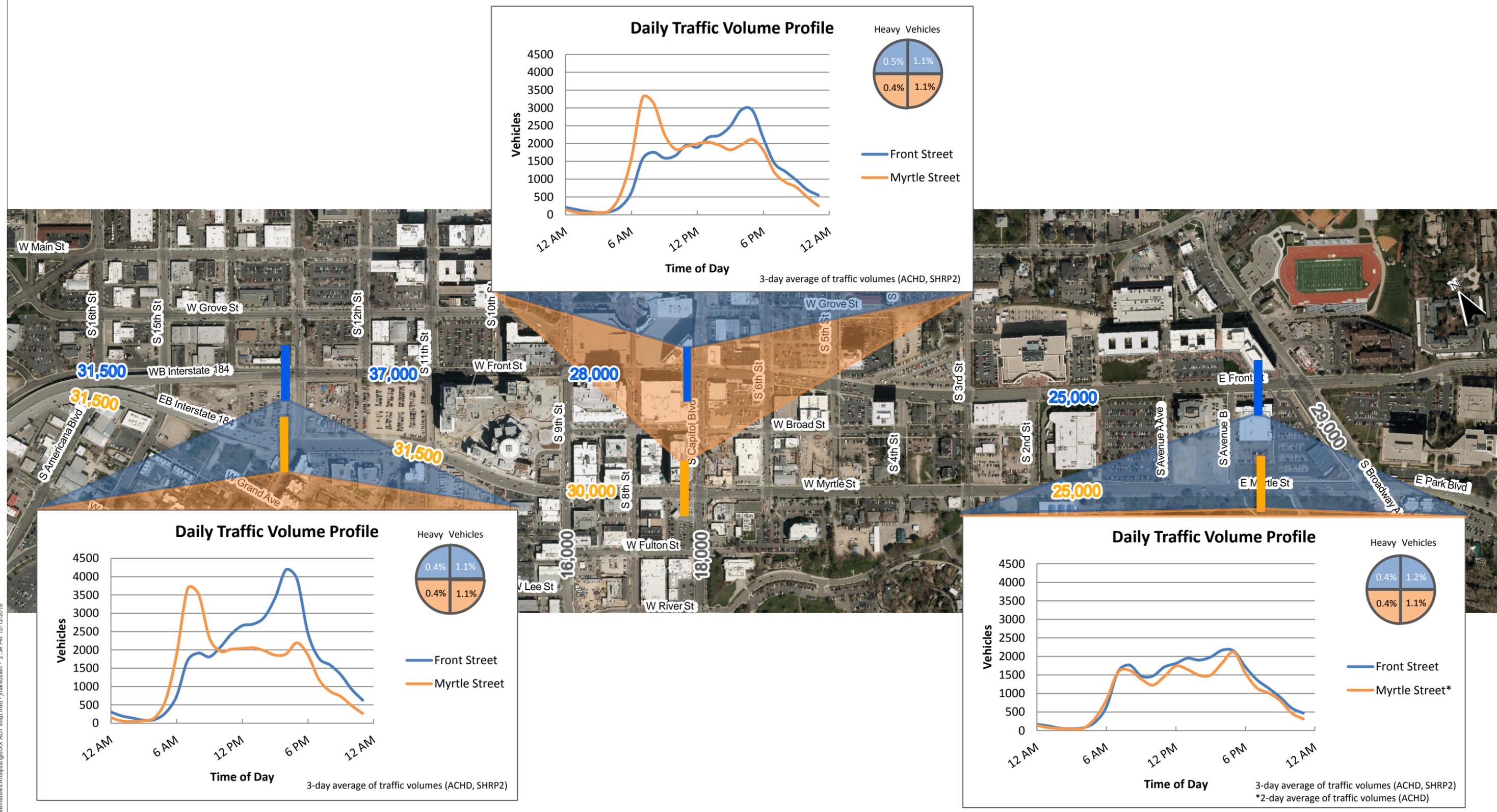
Existing vehicle operations along the Front and Myrtle corridor were analyzed based on the most recent traffic data available. A comprehensive summary of daily traffic volumes along the corridor is illustrated in Figure 1. During the weekday a.m. peak hour, Myrtle Street experiences a higher concentration of traffic in the eastbound direction between 13th Street and Capitol Boulevard as commuters travel from the Connector to access downtown and east Boise. During the weekday p.m. peak hour, Front Street experiences higher concentrations of traffic in the westbound direction between Capitol Boulevard and 13th Street as commuter travel to the Connector to leave downtown. The eastern portion of the corridor experiences fairly balanced traffic flows throughout the day. Heavy vehicle volumes (e.g. Federal Highway Administration (FHWA) vehicle class five and above) are minimal along the corridor ranging between 0.4% and 1.2%.

Intersection Operations

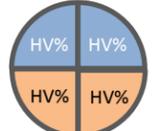
Turning movement counts were taken from the ACHD traffic database and supplemented with additional counts in November 2016 during the weekday a.m. (7:30 to 8:30), midday (12:00 to 1:00), and p.m. (4:30 to 5:30) peak hours, respectively. These new counts were added to the ACHD Synchro networks for each time period to replace data that was over five years old. An operational analysis was performed using Synchro 9 during the three peak hours and intersection level of service (LOS) and volume-to-capacity ratios were reported from the 2000 Highway Capacity Manual (Reference1). Figure 2 shows the intersection operations at the signalized intersections on Front Street and Myrtle Street.

Overall, the corridor functions quite well with all through movements on Front Street and Myrtle Street maintaining a level of service (LOS) of C or better during the weekday a.m., midday, and p.m. peak hours, respectively, except for the Broadway Avenue/Myrtle Street intersection which experiences LOS F during the weekday a.m. peak hour. The two corridors are generally operating under capacity with the most constrained environment from a capacity standpoint occurring between Capitol Boulevard and 13th Street. As shown in Figure 2, there are a handful of locations where vehicle queues spill back to adjacent streets or traffic signals, such as:

- One location is the eastbound approach at the Interstate 184 (Myrtle Street)/13th Street intersection, which spills back approximately 0.5 mile during the weekday a.m. peak hour. The lengthy queues are not surprising, given that high volume of freeway traffic traveling at 60 miles per hour comes into an at-grade signalized intersection.
- A second location is at the Capitol Boulevard/Front Street intersection. This intersection experiences heavy peaking characteristics during the weekday p.m. peak hour, which, when combined with balancing cross-street traffic and pedestrian activity during the weekday p.m. peak hour, results in cycle failures and queue spill back up to two blocks (approximately 0.1 mile). Given the characteristics and patterns of traffic in the downtown setting, it is not unusual to see this type of cycle failure in the downtown environment.



xxx – Daily Traffic Volumes on Front Street
 xxx – Daily Traffic Volumes on Myrtle Street
 xxx – Daily Traffic Volumes on North/South Arterials

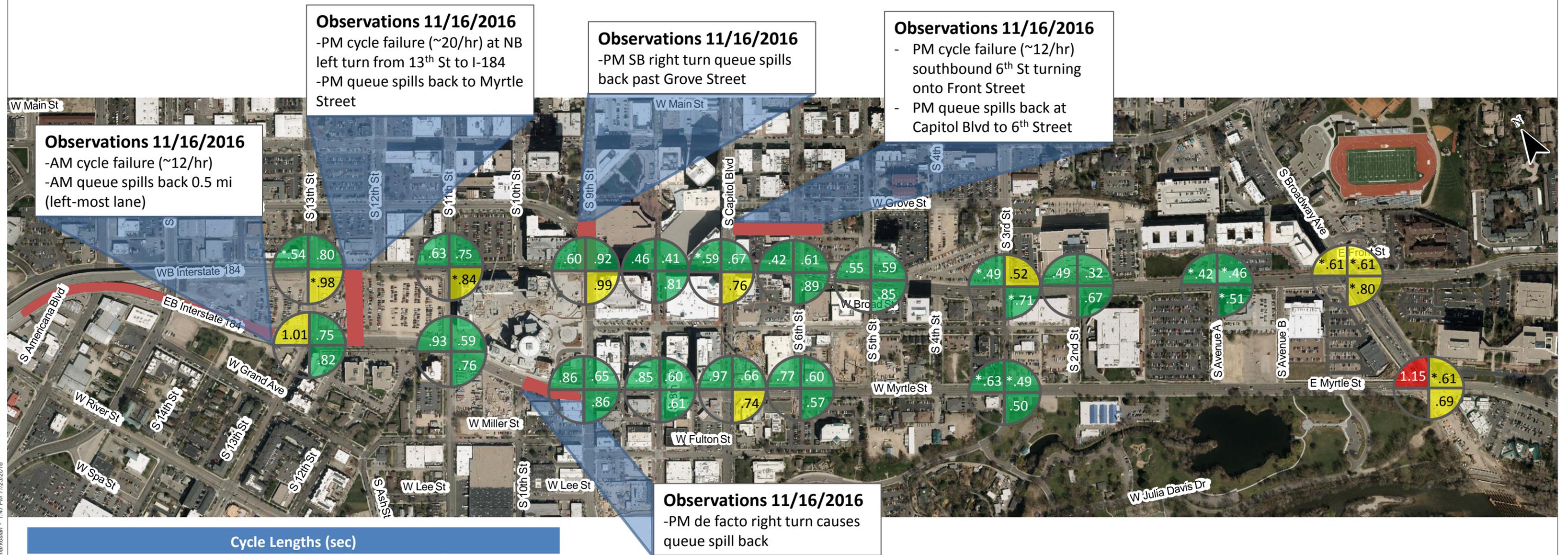


- Top half of circle represents Heavy Vehicle percentage on Front Street for vehicle class 6-13/5-13
- Bottom half of circle represents Heavy Vehicle percentage on Myrtle Street for vehicle class 6-13/5-13
- Vehicle class 6-13 includes 3-axle, single-unit truck to multi-trailer truck. Class 5-13 adds delivery/mail/pick-up trucks

**Average Annual Daily Traffic (2015)
 Front Street and Myrtle Street
 Boise, Idaho**

Figure 1

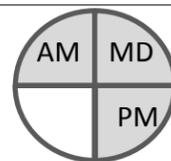
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Cycle Lengths (sec)			
Location	AM	Midday	PM
Front (6 th – Avenue A)	85	65	65
Myrtle (13 th – Avenue A)	85	65	65
Front (13 th – Capitol)	85	65	130
Front/Myrtle (Broadway Avenue)	120	130	140

Intersection Level of Service (LOS)

- LOS A-B (0-20 seconds delay)
- LOS C-D (> 20-55 seconds delay)
- LOS E-F (> 55 seconds delay)



- Volume-to-Capacity (v/c) reported for through movements on Front St/Myrtle St
 - * Denotes locations where through movement is not the critical movement

**Existing Traffic Operations at Signalized Intersections
 Weekday AM, Midday, and PM Peak Hours
 Boise, Idaho**

Figure
2

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Lane Utilization

A lane utilization assessment was performed at key segments along the Front and Myrtle corridor (e.g. 9th Street/Myrtle Street and Broadway Avenue/ Myrtle Street during the a.m. peak and, 13th Street/Front Street during the p.m. peak hour) in December 2016. This assessment revealed a lane-by-lane utilization during the respective peak hour at each studied segment. Table 2 shows the lane-by-lane utilizations for these key segments during the respective peak hours. Although there are five lanes on each segment, an average of approximately 75 percent of the traffic present on these segments uses three of the available five lanes (e.g. the middle three lanes).

Table 2 Peak Hour Lane Utilization

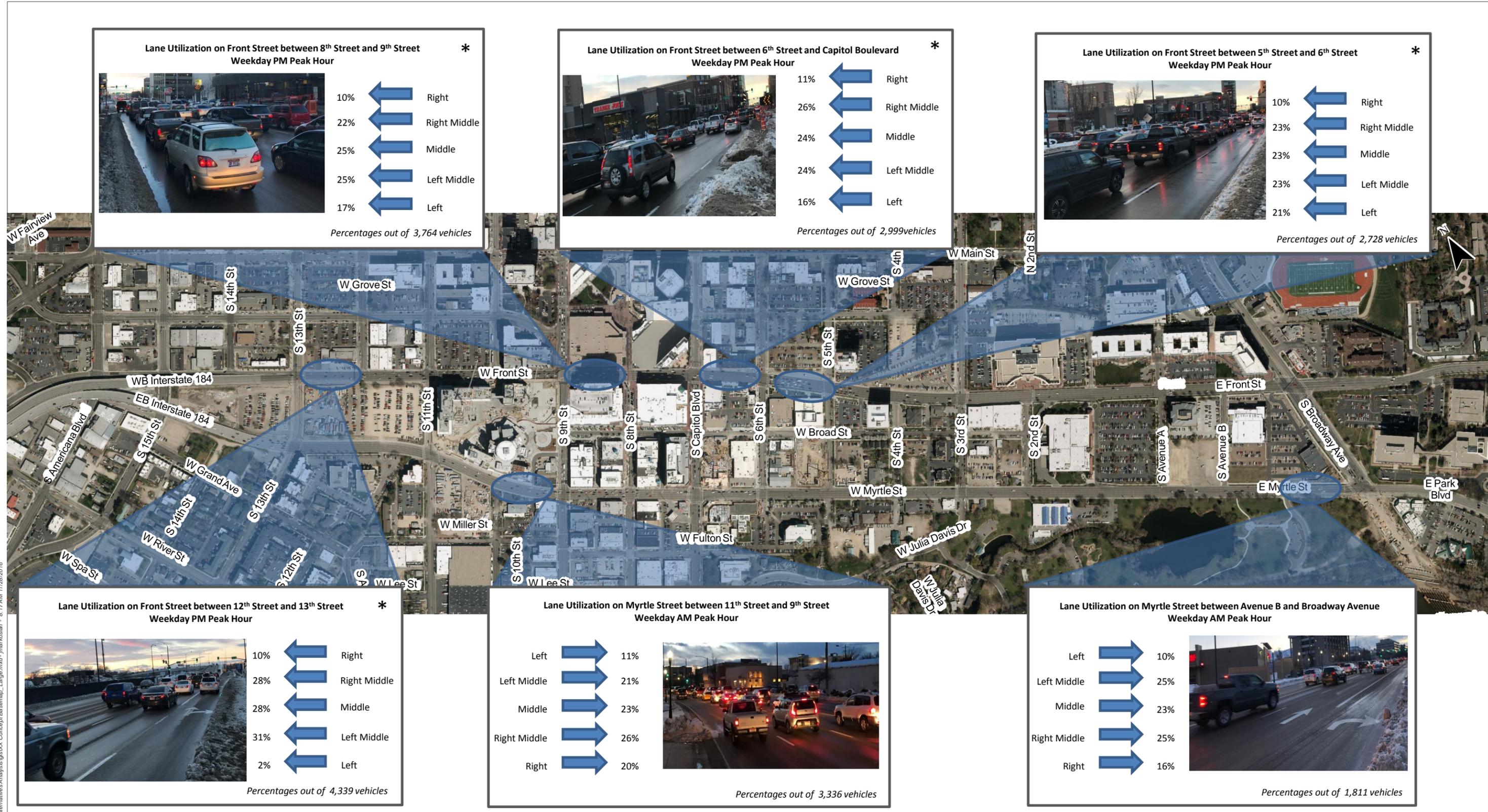
Location ^{1,2}	Peak Hour Lane Utilization				
	Left	Left Middle	Middle	Right Middle	Right
Front Street between 12 th Street and 13 th Street	2%	32%	28%	28%	10%
Front Street between 9 th Street and 8 th Street	17%	25%	25%	22%	10%
Front Street between Capitol Boulevard and 6 th Street	16%	24%	24%	26%	11%
Front Street between 6 th Street and 5 th Street	21%	23%	23%	23%	10%
Myrtle Street between 9 th Street and 11 th Street	11%	21%	23%	26%	20%
Myrtle Street between Avenue B and Broadway Avenue	10%	25%	23%	25%	16%

¹Front Street analyzed during weekday p.m. peak hour

²Myrtle Street analyzed during the weekday a.m. peak hour

The traffic stream along Front Street and Myrtle Street at the locations in Table 2 demonstrate grouping in the middle three lanes, showing a heavy presence of through traffic and illustrating the commuter behavior of the vehicles entering and exiting downtown. Figure 3 illustrates the lane utilization along the segments listed above. The segments on Front Street between 5th Street and 9th Street experience fairly constant use in four of the five lanes with the most limited use occurring in the right lane. Based on the lane utilizations along Myrtle Street, specifically the east end, there are potential opportunities to drop one to two lanes due to the lower traffic volumes on this section and the more balanced distribution of traffic.

Overall, the lane utilization at these study segments favors three to four of the five lanes available. This could lead to opportunities, corridor-wide, for exploring lane removal given the lower lane usage on the outer lanes and the under capacity conditions for the most part on the two roadways. The heaviest traffic volumes occur along the western part of the corridor (e.g. Front Street between 5th Street and 13th Street and Myrtle Street between 13th Street and Capitol Boulevard) may not warrant lane removals, but the east end of the corridor could potentially accommodate changes to the roadway cross-section in order to serve a larger range of transportation modes.



* Front Street experienced a single lane closure for photos taken between 5th Street and 9th Street. To be updated upon lane reopening. Lane Utilization reported based on all lanes open.

Lane Utilization at Key Segments Along Front Street and Myrtle Street Boise, Idaho

Figure 3

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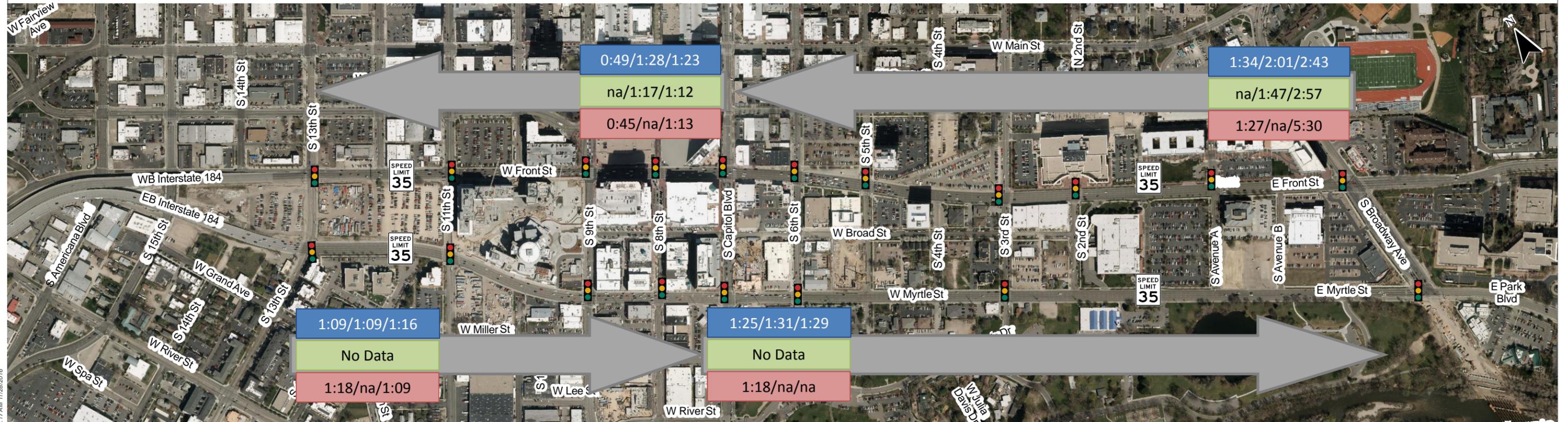
Travel Times

To assess travel times on the corridor, travel time data was collected from ACHD (2016), COMPASS (2016), and BlueMAC Bluetooth data recorders (10-day period in November 2016). Figure 4 shows the average travel time from each source during the weekday a.m., midday, and p.m. peak hours, respectively. Based on the average travel times along the corridor, vehicles experience longer travel times due to the directional peaking present during the weekday a.m. peak hour in the eastbound direction and during the weekday p.m. peak hour in the westbound direction. The eastern part of Myrtle Street maintains almost constant travel times during all three peak hours, showing the relatively balanced traffic flow on the eastern part of the corridor, while the eastern part of Front Street experiences increasingly longer travel times from weekday a.m. to weekday p.m. peak hours as commuters begin to exit downtown.

PEDESTRIAN CONDITIONS

Pedestrian activity along Front Street and Myrtle Street mainly serves pedestrians using the various north-south corridors to access destinations for food, entertainment, or shopping, thereby crossing Front Street or Myrtle Street to access these various destinations. Additionally, the area to the south of Myrtle Street offers pedestrians additional destinations, such as parks, museums, library, Boise State University, and the Boise greenbelt. Corridor observations in November 2016 showed minimal pedestrian activity along Front Street or Myrtle Street, rather pedestrian activity was focused to crossing these streets. Figure 5 illustrates the pedestrian activity at key intersections along the corridor and daily pedestrian activity profiles at 8th Street/Front Street, 8th Street/Myrtle Street, and 5th Street/Myrtle Street intersections. Most significantly, 8th Street/Front Street and 8th Street/Myrtle Street intersections experience the highest amount of pedestrian activity along the corridor. The peak hour for pedestrian activity occurs between 12:00 and 1:00 p.m.

Cycle lengths along the corridor vary from 65 to 140 seconds, and contribute to pedestrian wait times when crossing Front Street or Myrtle Street. The 85 second cycle length during the a.m. peak hour creates pedestrian wait times reaching 60 seconds when crossing Myrtle Street in the western part of the corridor, while 65 second cycle lengths during the midday peak hour offer more reasonable pedestrian wait times. Specifically, the 130 second cycle length during the p.m. peak hour on the west end of the corridor on Front Street causes pedestrian wait times of up to 100 seconds at 8th Street/Front Street to cross Front Street.

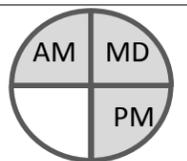
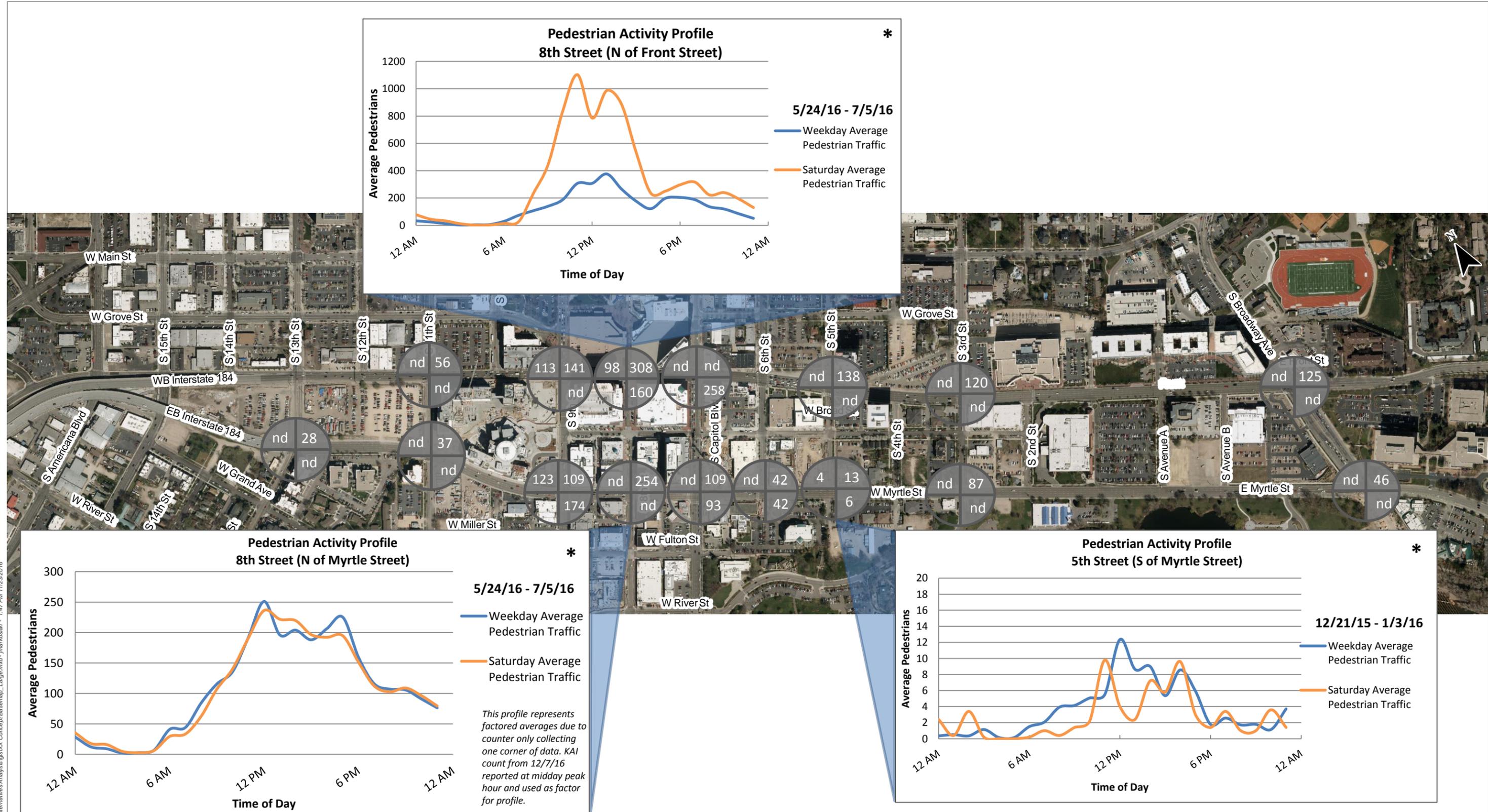


Data Source	Method	AM Trips	MD Trips	PM Trips
BlueMAC	Bluetooth	1659	2931	1911
ACHD	Floating Car	-	13	13
COMPASS	Floating Car	Unknown	Unknown	Unknown

- xx/yy/zz = AM Travel Time/Midday Travel Time/PM Travel Time (mm:ss)

Average Travel Time on Front Street and Myrtle Street between 13th Street and Broadway Avenue Boise, Idaho

Figure 4



- Total pedestrians present at intersection during AM, Midday, and PM peak hour reported
- * Pedestrian volumes reported as a weekday average during dates noted
- "nd" Denotes locations where there was no data available

Average Pedestrian Activity Weekday AM, Midday, and PM Peak Hours Boise, Idaho

Figure 5

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BICYCLE CONDITIONS

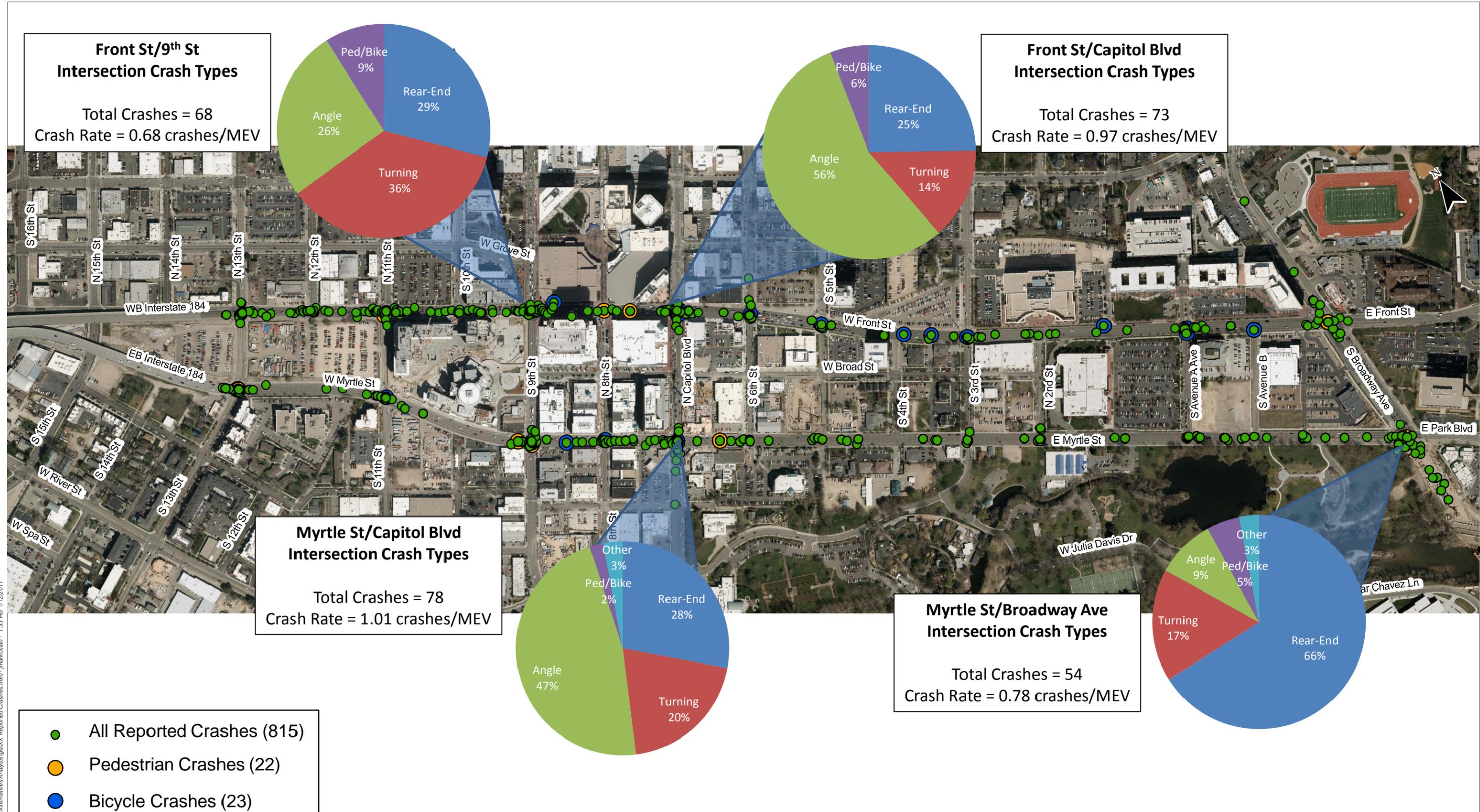
Front Street and Myrtle Street experience minimal bicyclist activity on the two roadways based on field observations and traffic data collected at the key intersections. Additionally, there is very limited data available for bicyclists along the corridor. There are no dedicated bike lanes on Front Street and Myrtle Street, so bicyclists are forced to use the narrow shoulder or sidewalk. The main bicycle routes are located on the north-south corridors (e.g. Capitol Boulevard, 10th Street, and 11th Street), as well as several parallel streets (e.g. Grove Street, River Street) and the nearby multiuse paths (Boise River Greenbelt and Pioneer Pathway).

TRANSIT CONDITIONS

ValleyRide currently provides limited public transit service on Front Street and Myrtle Street. However, the Main Street Station (8th Street/Main Street) is located a few blocks to the north of the corridor, which provides access to all of the bus routes. Currently, Route #45 (BSU Express) operates seven round-trips during the day and has stops on Front Street at 3rd Street and 9th Street. Additionally, Route #1 (Parkcenter), which runs every 20 minutes during peak times and every 40 minutes during the midday and Route #3 (Vista), which runs every 30 minutes during peak times and every 60 minutes during the midday, have stops on 9th Street and Capitol Boulevard at Myrtle Street. Route #2 (Broadway) provides hourly service and has stops on Broadway Avenue at Myrtle Street and Front Street. No other transit stops are provided on Front Street and Myrtle Street.

CRASHES AND SAFETY

The most recent five years (2011 to 2015) of crash data was provided at the study intersections and for Front Street and Myrtle Street by ITD. Figure 6 summarizes the reported crashes from the analysis period and the high crash locations along the Front and Myrtle corridor. There were 815 total reported crashes, of which there were 23 bicycle crashes and 22 pedestrian crashes. There were 493 property damage (PDO) crashes, 321 injury crashes, and a single fatal crash during the analysis period. Table 3 shows a summary of the crashes occurring in intersections along the corridor.



- All instances may not show due to map extents and similar geocoding of crashes.
 - "MEV" = Million Entering Vehicles

Reported Crashes and High Crash Intersections (2011 - 2015) Boise, Idaho

Figure 6

Table 3 Front/Myrtle Couplet Intersection Crash Summary

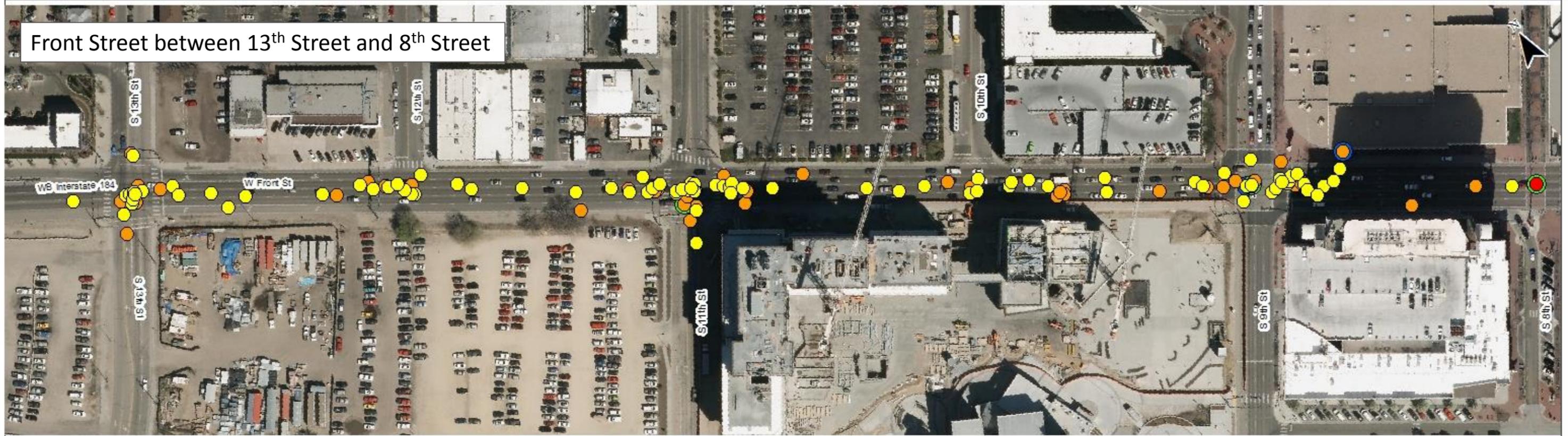
Study Area Intersection Crash Summary 2011-2015					
Intersection ¹	PDO	Injury	Fatal	Total	Crashes per MEV
Front St/13 th St	19	10	0	29	0.30
Front St/12 th St ²	7	3	0	10	0.13
Front St/11 th St	24	21	0	45	0.56
Front St/10 th St	6	1	0	7	0.10
Front St/9 th St	36	32	0	68	0.68
Front St/8 th St	6	6	1	13	0.18
Front St/Capitol Blvd	43	30	0	73	0.97
Front St/6 th St	10	11	0	21	0.34
Front St/5 th St	11	4	0	15	0.29
Front St/4 th St ²	1	0	0	1	0.02
Front St/3 rd St	9	4	0	13	0.27
Front St/2 nd St	2	1	0	3	0.07
Front St/Avenue A	11	6	0	17	0.36
Front St/Avenue B ²	1	0	0	1	0.03
Front St/Broadway Ave	14	21	0	35	0.50
Myrtle St/13 th St	32	20	0	52	0.64
Myrtle St/11 th St	11	9	0	20	0.32
Myrtle St/9 th St	31	13	0	44	0.60
Myrtle St/8 th St	9	8	0	17	0.28
Myrtle St/Capitol Blvd	47	31	0	78	1.01
Myrtle St/6 th St	4	4	0	8	0.14
Myrtle St/5 th St ²	9	3	0	12	0.25
Myrtle St/4 th St ²	1	0	0	1	0.02
Myrtle St/3 rd St	8	5	0	13	0.24
Myrtle St/2 nd St ²	6	1	0	7	0.22
Myrtle St/Avenue A ²	1	3	0	4	0.13
Myrtle St/Avenue B ²	2	0	0	2	0.06
Myrtle St/Broadway Ave	29	25	0	54	0.78

¹This table represents crashes occurring at the intersections only, there were 152 crashes reported outside of the intersections along the Front/Myrtle corridor

²Unsignalized intersection

Figure 7 and Figure 8 show the crash severity along Front Street and Myrtle Street, respectively. Figure 9 shows the pedestrian and bicyclist crashes that occurred along the corridor. The majority of the pedestrian and bicyclist related crashes took place in the intersection. There were several instances that were driveway/alley related and two instances that took place at a non-junction.

Front Street between 13th Street and 8th Street



Front Street between 8th Street and Broadway Avenue



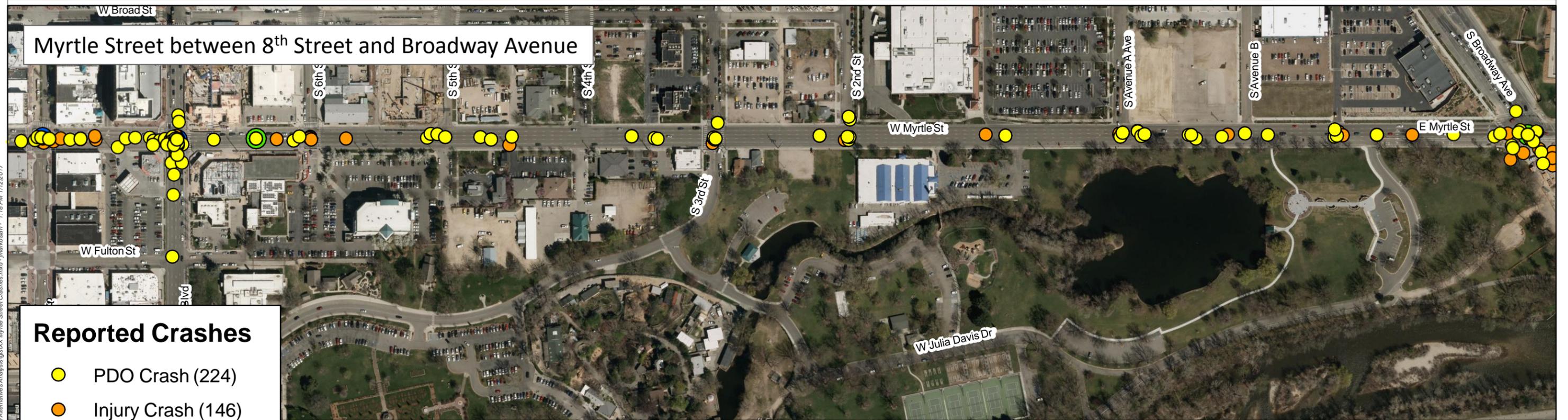
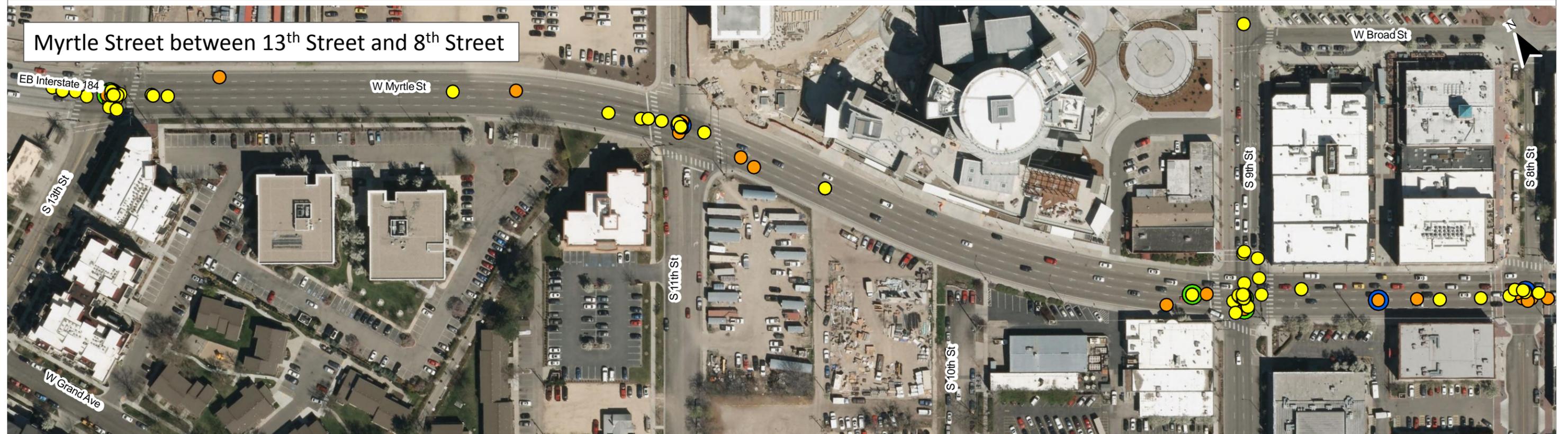
Reported Crashes

- PDO Crash (269)
- Injury Crash (175)
- Fatal Crash (1)
- Pedestrian Crash (13)
- Bicycle Crash (16)

Reported Crashes (2011-2015)
on Front Street
Boise, Idaho

Figure
7

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Reported Crashes

- PDO Crash (224)
- Injury Crash (146)
- Pedestrian Crash (9)
- Bicycle Crash (7)

**Reported Crashes (2011-2015)
on Myrtle Street
Boise, Idaho**

Figure
8

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Reported Crashes

- Pedestrian Crash (22)
- Bicycle Crash (23)

- 32 of 45 crashes occur in the intersection
- 9 of 45 crashes occur in driveway/alleyway
- 4 of 45 crashes do not occur at a junction
- All instances may not show due to map extents and similar georeferencing.

**Reported Pedestrian and Bicycle Crashes
On Front Street and Myrtle Street
Boise, Idaho**

Figure
9

H:\proj\120407 - Front_Myrtle Alternatives Analysis\gsx\Ped&Bike Crashes.mxd - jmakosin - 1:00 PM 1/12/2017

The Capitol Boulevard/Myrtle Street intersection experienced the highest number of crashes with 78 during the analysis period. Further, this intersection had the highest crash rate with 1.01 crashes per million entering vehicles (MEVs). Angle crashes are particularly common at Capitol Boulevard/Myrtle Street and Capitol Boulevard/Front Street intersections. The angle crashes are likely due to a moderate number of red light running incidents (20% of crashes) reported at these locations. Due to the one-way configuration of these streets and number of traffic signals, it is expected that the most common crash type would be a rear-end collision, which is the case at the Broadway Avenue/Myrtle Street intersection, comprising two-thirds of the crashes at this intersection. The 9th Street/Front Street intersection experiences approximately 36% turning crashes. This location serves two major turning movements throughout the day; westbound left turn from Front Street to 9th Street during the weekday a.m. peak hour and southbound right turn from 9th Street onto Front Street during the weekday p.m. peak hour. Due to these respective movements being so large, the turning crash type is more prevalent.

On the west end of the Front and Myrtle corridor, between Capitol Boulevard and 13th Street, there were approximately 327 and 226 reported crashes on Front Street and Myrtle Street, respectively. As can be seen from Figure 6, this section of the corridor contains three of the highest crash intersections on the corridor and accounts for nearly 70% of the crashes along the entire Front and Myrtle corridor. The west end of the corridor carries the largest traffic volumes, includes the transition area between downtown streets and the connector, and experiences the highest traffic peaks, which all contribute to the higher number of crashes along this segment.

REFERENCES

1. Transportation Research Board. *2000 Highway Capacity Manual*. 2000.

APPENDIX C

GROWTH ASSUMPTIONS



KITTELSON & ASSOCIATES, INC.

TRANSPORTATION ENGINEERING / PLANNING

101 S Capitol Boulevard, Suite 301, Boise, ID 83702 P 208.338.2683 F 208.338.2685

MEMORANDUM

Date: January 12, 2017

Project #: 20407

To: Ben Rosenblatt, AICP
Sam Schwartz Engineers

From: Jamie Markosian, EIT; Andy Daleiden, PE; Nick Foster, AICP

Project: Front and Myrtle Couplet Alternatives Analysis

Subject: Traffic Volume Growth Rates for Downtown Boise

Kittelison & Associates, Inc. has prepared this memorandum to summarize traffic growth rates in downtown Boise along the Front Street and Myrtle Street corridors from findings of two recent studies and three additional data sources. Further, trip generation estimates were calculated for several planned developments in the downtown area to supplement the traffic volume growth data for the two corridors. The purpose of this memorandum is to provide background information on growth rates and associated traffic patterns for planned developments in downtown Boise and to recommend a growth rate scenario to use in developing year 2040 traffic volumes on Front Street and Myrtle Street for the future conditions traffic analysis.

RECENT STUDIES AND DATA SOURCES FOR GROWTH RATES

The following studies and data sources were reviewed to identify growth rate information.

- JUMP Traffic Impact Study (completed in 2010)
- 5th Street and 6th Street Two-Way Conversion Feasibility Study (completed in 2016)
- Downtown Boise Automated Traffic Recorders (ATR) data (1990 – 2015) at the following locations:
 - Americana Boulevard
 - 9th Street
 - Capitol Boulevard
 - Broadway Avenue
- COMPASS Daily Model Run Output (years 2015 and 2040)
- COMPASS PM Peak Hour Model Run Output (years 2015 and 2040)

Table 1 summarizes the growth rates found in these studies and data sets, and the methods used to arrive at the growth rates.

Table 1 Annual Traffic Volume Growth Rates in Downtown Boise

Study/Data Source	Year Complete	Growth Rate	Method
JUMP Traffic Impact Study	2010	1.7%	The COMPASS 2010, 2020, & 2030 Community Choices forecasts were used to determine an average annual growth rate for the TIS. The Community Choices model is no longer used for the region.
5 th Street/6 th Street 2-Way Conversion Feasibility Study	2016	1%	Downtown model projections were analyzed for year 2040 in combination with year 2015 model run outputs. Upon analysis of the model output and deliberation amongst the project team, an average growth rate was determined that represented the model predictions and the one-way to two-way conversions.
Downtown Boise Automated Traffic Recorders (ATRs)	2016	1%	AADT volumes (years 1990 to 2015) were obtained from ATRs at Americana Blvd, 9 th St, Capitol Blvd, and Broadway Ave (none are located on Front Street or Myrtle Street). Annual, linear growth rates were calculated from those AADTs with the most recent 10-year period (2005-2015) reported as the growth rate. <i>An assessment of all ATRs in the area reveals a generally flat growth (~0%) in the downtown area.</i>
COMPASS Daily Model Run Output (years 2015 and 2040)	2016	1.1%	Daily model runs from COMPASS were compared from year 2015 and year 2040 for traffic volumes on Front and Myrtle. An annual, linear growth rate was calculated from each link volume on the corridor.
COMPASS PM Peak Hour Model Run Output (years 2015 and 2040)	2016	1.3%	PM peak model runs from COMPASS were compared from year 2015 and year 2040 for traffic volumes on Front and Myrtle. An annual, linear growth rate was calculated from each link volume on the corridor.

Overall, a growth rate of approximately 1% has been seen or used in recent studies in downtown Boise for developing traffic volume forecasts.

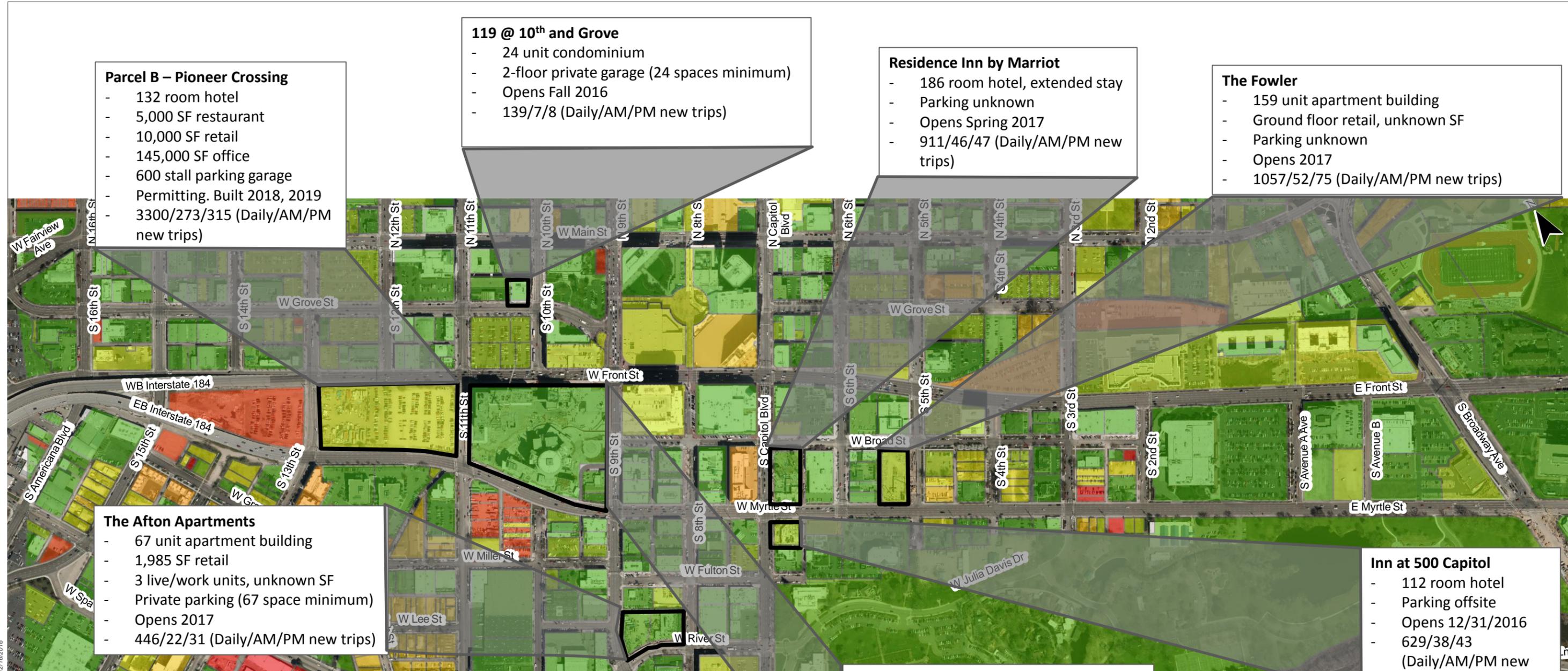
APPROVED, UNOCCUPIED DEVELOPMENTS IN DOWNTOWN BOISE

Development projects in downtown Boise are important to understand so that the effects they have on the surrounding transportation system can be analyzed under future year 2040 traffic conditions and with the various alternatives. The following approved unoccupied developments in downtown Boise on or near the Front/Myrtle corridors were identified from the *BoiseDev* website (Reference 1) and are listed below:

- 119 @ 10th & Grove
- The Fowler
- Afton Apartments
- Parcel B
- Inn @ 500 Capitol
- Residence Inn by Marriot
- JUMP

Figure 1 illustrates the location, size, and timeline of these approved, unoccupied developments in the study area.

Figure 1 – Approved, Not Yet Occupied Developments in Downtown Boise



Parcel B – Pioneer Crossing

- 132 room hotel
- 5,000 SF restaurant
- 10,000 SF retail
- 145,000 SF office
- 600 stall parking garage
- Permitting. Built 2018, 2019
- 3300/273/315 (Daily/AM/PM new trips)

119 @ 10th and Grove

- 24 unit condominium
- 2-floor private garage (24 spaces minimum)
- Opens Fall 2016
- 139/7/8 (Daily/AM/PM new trips)

Residence Inn by Marriot

- 186 room hotel, extended stay
- Parking unknown
- Opens Spring 2017
- 911/46/47 (Daily/AM/PM new trips)

The Fowler

- 159 unit apartment building
- Ground floor retail, unknown SF
- Parking unknown
- Opens 2017
- 1057/52/75 (Daily/AM/PM new trips)

The Afton Apartments

- 67 unit apartment building
- 1,985 SF retail
- 3 live/work units, unknown SF
- Private parking (67 space minimum)
- Opens 2017
- 446/22/31 (Daily/AM/PM new trips)

JUMP

- 32,500 SF Office - SIMPLOT
- Multi-use public facility
- 550-space parking facility
- 6 acre park/public space
- Opens 2017
- 700/250/250 (Daily/AM/PM new trips)

Inn at 500 Capitol

- 112 room hotel
- Parking offsite
- Opens 12/31/2016
- 629/38/43 (Daily/AM/PM new trips)

Current Land Use	
	Commercial Retail and Office
	Residential
	Open Space
	Other
	Residential TOD Density
	Parking
	Subdivision Feature
	Public/Government
	Utility
	Vacant Commercial
	Vacant Residential

AM and PM trips have been adjusted according to *ITE Trip Generation Handbook, 3rd Edition* to account for infill development. Only auto trips are shown. The walking, biking, and transit trips have been removed and are accounted for by the ITE methodology.

Approved, Unoccupied Developments On/Near the Front/Myrtle Corridors Boise, Idaho

Figure 1

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The ITE *Trip Generation, 9th Edition* (Reference 2) was used to estimate the traffic volumes associated with each of these developments, from which, the peak hour trips in both weekday a.m. and p.m. peak hours were then adjusted in accordance with the methodology in the *Trip Generation Handbook, 3rd Edition* (Reference 3) for a downtown/central business district (CBD) to account for non-auto trips (e.g. pedestrian, bicyclists, transit). The adjustments were not made to office land uses due to the parking availability, current vehicle users in the area (Simplot employees at the JUMP site), and that a high number of occupants use their vehicles. The non-auto trips percentage ranged from 20% to 35% for the retail/commercial/hotel uses with the overall reduction in total auto trips, shown in Table 2 being approximately 15%. Table 2 summarizes the trip generation estimate (vehicle trips only) for each development.

Table 2 Approved, Unoccupied Development Trip Generation Estimate (Vehicle Trips Only)

Development	Land Use	Size	ITE Code	Daily Trips	Weekday AM Peak Hour			Weekday PM Peak Hour		
					Total	In	Out	Total	In	Out
119 @ 10th & Grove	Apartments	24 units	230	139	7	1	6	8	5	3
The Fowler	Apartments	159 units	220	1057	52	11	41	75	41	34
Afton	Apartments	67 units	220	446	22	5	17	31	17	14
Parcel B	Hotel	132 rooms	310	808	45	27	18	51	26	25
	Office ²	145,000 square feet	710	1,599	226	199	27	216	37	179
	Restaurant	5,000 square feet	931	450	2	1	1	21	14	7
	Retail	10,000 square feet	826	443	-	-	-	27	12	15
Inn @ 500 Capitol	Hotel	112 rooms	310	629	38	23	15	43	22	21
Residence Inn by Marriot	Hotel & Suites	186 rooms	311	911	46	26	20	47	21	26
JUMP¹	Multi-Use (Non-ITE Method)			700	250	200	50	250	50	200
Total Trips				7182	688	493	195	769	245	524

¹ The trip generation for JUMP was taken from the completed TIS. The trip generation was estimated based on the available parking at the project site. These numbers represent the additional trips added to the site, since SIMPLOT employees were already using the project site for parking prior to construction.

² Office uses were not adjusted for the non-auto trip reduction.

The approved, unoccupied developments are anticipated to account for a total of 7,182 daily trips, of which 688 trips and 769 trips occur during the weekday a.m. and p.m. peak hours, respectively. This trip generation estimate could be used to assess the level of traffic volume growth anticipated to occur at the adjacent intersections and on the Front Street and Myrtle Street corridors.

ESTIMATING FUTURE YEAR 2040 TRAFFIC VOLUMES

We have a few options for estimating the future year 2040 traffic volumes, which include:

Option #1 - Apply a growth rate to the year 2016 traffic volumes:

Applying a blanket growth rate to the traffic in downtown Boise, according to the 1% growth rate shown in Table 1 would be a simple exercise, but may not take into account some of the localized

growth that will occur in the surrounding area from the significant development activity occurring and may overestimate the growth in traffic volumes. For example, using a 1% annual growth rate at the intersection of 9th Street/Front Street up to year 2040 would yield approximately 1,375 additional vehicles at the intersection over the 24 year period. The proposed uses at Parcel B and JUMP, located near the intersection of 9th Street/Front Street are anticipated to add approximately 300-500 trips during the weekday p.m. peak hour to this intersection, so a growth rate of 1% per year seems high if we look at the trips estimated from these major developments in conjunction with trips associated with regional growth and other development, not yet planned in the downtown area.

Option #2 - Use the trip generation estimates, shown in Table 2 and assign the trips

The new developments in downtown Boise are expected to add approximately 7,182 daily trips, of which 688 trips and 769 trips occur during the weekday a.m. and p.m. peak hours, respectively to the downtown network. The estimated trips would be added and distributed to the area roadways similar to a traffic impact study. This approach represents localized growth on the study area network and likely does not account for regional growth and other development activity located in adjacent areas to downtown, which would use the Front and Myrtle corridors as pass-through.

Option #3 - Use a combination of #1 and #2 to estimate the future year traffic volumes

Another option is to combine options #1 and #2, but maybe apply a lower growth rate than the 1% per year, so that the future year 2040 traffic volumes are not overly conservative. With this in mind, and using the example in Option #1, applying an average annual growth rate of 0.5% per year for the same 9th Street/Front Street intersection yields approximately 700 additional trips during the weekday p.m. peak hour. Therefore, applying a growth rate of 0.5% annually and adding the development trips to the network will result in a total growth rate of approximately 1% at the individual intersections and on the Front and Myrtle corridors. This approach provides a reasonable outlook into estimating traffic volume growth in the downtown area and captures the potential for regional growth and the localized traffic volume increase/loading at the intersections from the approved developments.

RECOMMENDATION

Based on the findings from the traffic volume growth review and analysis, we recommend using an average annual growth rate of 0.5% plus the estimated trips from the approved, unoccupied developments in estimating year 2040 traffic volumes in the study area.

Please let us know if you have any questions regarding this assessment and recommendation.

REFERENCES

1. BoiseDev. <https://boisedev.com/project-tracker-map>. Accessed December, 2016.
2. Institute of Transportation Engineers. *Trip Generation Manual, 9th Edition*. 2012.
3. Institute of Transportation Engineers. *Trip Generation Handbook, 3rd Edition*. 2014.

APPENDIX D

LANE WIDTH WHITEPAPER

I. Context

Historically, roadway design practice generally recommended wide travel lanes regardless of context, with the assumption that such “forgiving design” would minimize the risk of traffic crashes. And in some cases – i.e. limited access highways – this does appear to be the case. However, recent research has found that what improves safety on expressways may not improve safety in urban environments where conditions (land uses, mix of modes, presence of intersections and other sources of conflicts and friction) are significantly different from those on expressways.¹

Specifically, lane widths of 10 to 11 feet have been found to significantly reduce crashes in urban environments, e.g. by reducing speeding.² In addition, while the Highway Capacity Manual assumes a reduction in throughput for lanes less than 12 feet wide, more recent research has found no measurable difference in throughput for lanes between 10 and 12 feet.³

On Front Street and Myrtle Street in downtown Boise, each one-way street is currently configured with 5 travel lanes of 11 feet each. As shown in the research findings discussed above, and in the guidance sources below, urban streets can benefit from lane widths of 10 or 10.5 feet without measurable decreases in vehicle flow.

Accommodating heavy vehicles (large trucks) along with current and future transit service (buses) is also a consideration when evaluating design options for Front and Myrtle streets. Data collected and summarized below for Front and Myrtle streets at 13th Street shows that heavy vehicles are, on average, 1.1% of overall vehicular traffic. (*Note that data collection at Capitol Blvd and between Avenue B and Broadway show lower vehicle volumes and thus are not presented below*).

On Front Street during the PM peak, when volumes are highest, 1.1% of overall volumes of 4,200 vehicles per hour would equate to a maximum of approximately 46 heavy vehicles passing per hour, or less than one per minute. Nevertheless, the potential for an uneven distribution of heavy vehicles over the course of the day must also be considered.

¹ Ewing, R., & Dumbaugh, E. (2009). The built environment and traffic safety: A review of empirical evidence. *Journal of Planning Literature*, 23(4), 347-367

Dumbaugh, E., & Li, W. (2011). Designing for the Safety of Pedestrians, Cyclists, and Motorists in Urban Environments. *Journal of the American Planning Association* 77 (2011): 70.

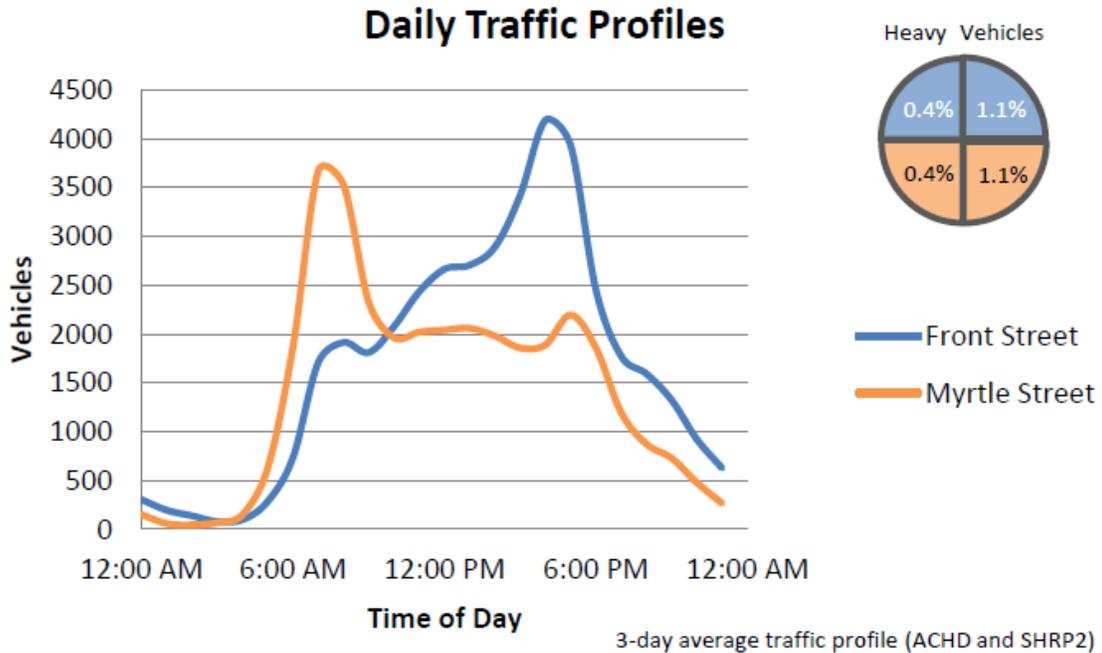
² The most recent and authoritative study is: Karim, D. (2015). Narrower Lanes, Safer Streets. Canadian Institute of Transportation Engineers Annual Conference. Also see:

Potts, I.B., Harwood, D., & Richard, K., Relationship of Lane Width to Safety for Urban and Suburban Arterials, TRR Volume 2023, pp. 63 - 82, Transportation Research Board, 2007.

Fitzpatrick, K., Carlson, P., Brewer, M., & Wooldridge, M. (2000). Design Factors That Affect Driver Speed on Suburban Arterials. *Transportation Research Record* 1751 (2000):18–25.

³ Petrisch, T. (2008). The Truth about Lane Widths. The Pedestrian and Bicycle Information Center.

Hourly Volumes and % of Heavy Vehicles at 13th Street



Top half of circle represents Heavy Vehicle percentage on Front Street for vehicle class 6-13/5-13
 - Bottom half of circle represents Heavy Vehicle percentage on Myrtle Street for vehicle class 6-13/5-13
 - Vehicle class 6-13 includes 3-axle, single-unit truck to multi-trailer truck. Class 5-13 adds delivery/mail/pick-up trucks

II. Best Practices and References

The following chart highlights relevant best practices for lane widths recommended by nationally recognized transportation planning and engineering bodies.

Best Practice / Reference	Guidance
American Association of State Highway and Transportation Officials (AASHTO) – <i>Policy on Geometric Design of Highways and Streets</i> (2011)	<ul style="list-style-type: none"> 10 foot lanes may be used in constrained areas where truck and bus volumes are relatively low and speeds are less than 35mph
Federal Highway Administration (FHWA) – <i>Applying Performance-Based Practical Design Methods to Complete Streets: A Primer on Employing Performance-Based Practical Design and Transportation Systems</i>	<ul style="list-style-type: none"> Lane widths in the 10 to 12 foot range have not been identified in the 2010 Highway Capacity Manual as a significant factor influencing traffic speeds in between intersections (for signal controlled streets with free-flow speeds in the 25 mph to 45 mph range).

<p><i>Management and Operations to Enhance the Design of Complete Streets (2016)</i></p>	
<p>Federal Highway Administration (FHWA) memo on Lane Width (2014)</p>	<ul style="list-style-type: none"> • For both “Rural” and “Urban” areas, acceptable lane width ranges from 10-12 feet for “Collector” streets and 9-12 feet for “Local” streets
<p>National Association of City Transportation Officials (NACTO) <i>Urban Street Design Guide (2013)</i></p>	<ul style="list-style-type: none"> • There is no measureable decrease in urban street capacity when through lane widths are narrowed from 12 feet to 10 feet • Lanes greater than 11 feet should not be used [on urban streets] as they may cause unintended speeding and assume valuable right of way at the expense of other modes • Travel lane widths of 10 feet generally provide adequate safety in urban settings while discouraging speeding. Cities may choose to use 11 foot lanes on designated truck and bus routes or adjacent to lanes in the opposing direction.
<p>National Association of City Transportation Officials (NACTO) <i>Global Street Design Guide (2016)</i></p>	<ul style="list-style-type: none"> • In multi-lane roadways where transit or freight vehicles are present, one wider travel lane may be provided. The wider lane should be the outside lane, curbside or next to parking. Inside lanes should continue to be designed at the minimum possible width at 3 meters (~10 feet) or less. • Design travel lanes and intersections assuming large freight vehicles are infrequent users to minimize the impact on other street users.
<p>AASHTO <i>Guide for the Development of Bicycle Facilities (2012)</i></p>	<ul style="list-style-type: none"> • Width needed for bike lanes or paved shoulders can be obtained by narrowing travel lanes • Lane widths on many roads are greater than the minimum values required – the <i>Policy on Geometric Design of Highways and Streets</i> provides significant flexibility to use travel lanes as narrow as 10 feet
<p>NCHRP Report 03-112 – <i>Operational and Safety</i></p>	<ul style="list-style-type: none"> • A NCHRP project currently investigating the effects of narrow lanes on safety and

Considerations in Making Lane Width Decisions on Urban and Suburban Arterials (expected Aug 2017)

operations of urban and suburban streets is due out in August 2017. It may bring more clarity to results of previous studies. Additional information available [here](#).

III. Conclusion

The range of guidance provided above does not explicitly provide a simple “yes” or “no” answer to the question of whether it would be beneficial to narrow some or all vehicle lanes on Front and Myrtle streets from 11 feet to 10 (or 10.5) feet wide. However, the guidance is consistent in describing the need to take the context of streets into account and exercise professional judgement. It also consistently predicts little to no change in capacity resulting from a decrease from 11 to 10 or 10.5 foot lanes.

Given the relatively low volumes of heavy vehicles on the two corridors, along with the current provision of 5 unidirectional vehicle travel lanes on each, a lane width reduction on interior lanes may not result in conflicts related to the physical widths of heavy vehicles. Because Front and Myrtle streets are both one-way streets with 5 travel lanes that provide ample options for horizontal positioning, and because the traffic count data shows that the chances of two or more heavy vehicles driving immediately adjacent to one another at any given time are statistically low, the potential for width-related sideswipes can be expected to be low.

At the same time, the potential benefits provided through the narrowing of lanes on the Front and Myrtle street corridors are significant: narrower lanes may result in lower speeds and crash rates, in addition to providing additional space for alternate uses of the right-of-way such as on-street parking, bicycle facilities, or expanded sidewalks and reduced pedestrian crossing distances.

APPENDIX E

ALTERNATIVES EVALUATION MATERIALS

Lane Configuration Cheatsheet

Mostly 3-lanes

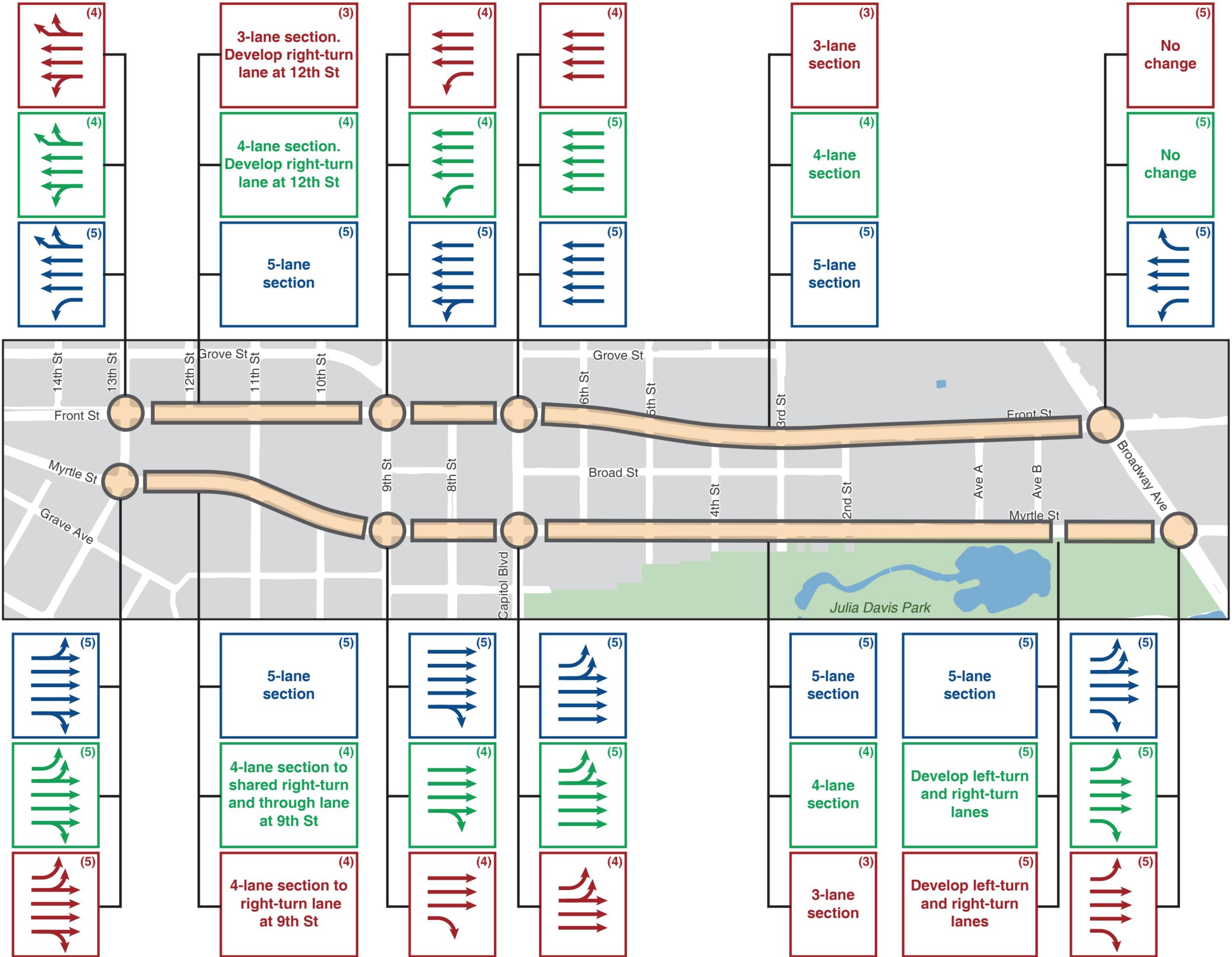
Mostly 4-lanes

No lane removal

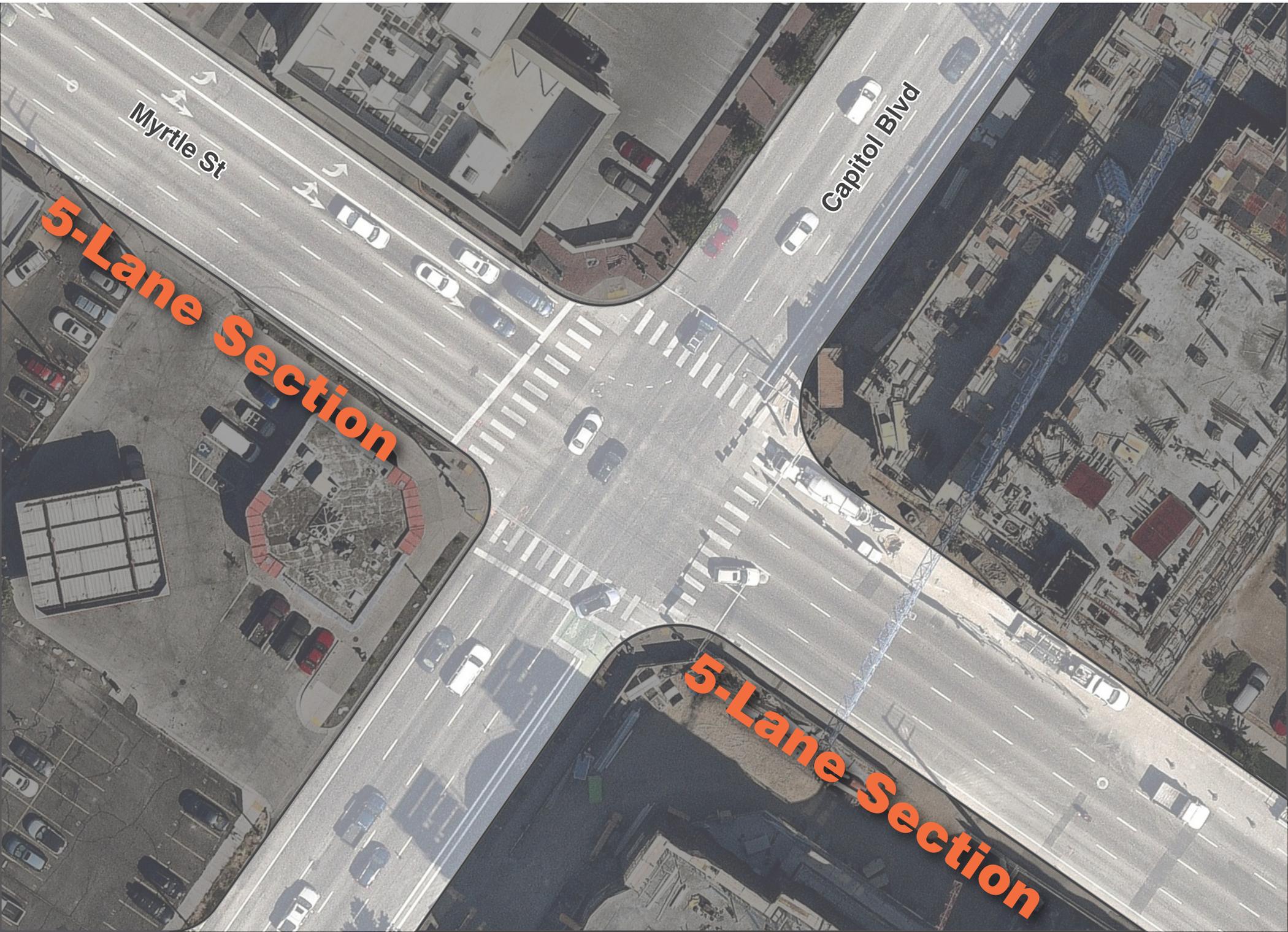
No lane removal

Mostly 4-lanes

Mostly 3-lanes



Keep 5-Lanes (design a): Existing Conditions



Keep 5-Lanes (design b): Lane Width Reduction



Exterior lanes remain at 11' wide

Exterior lanes remain at 11' wide

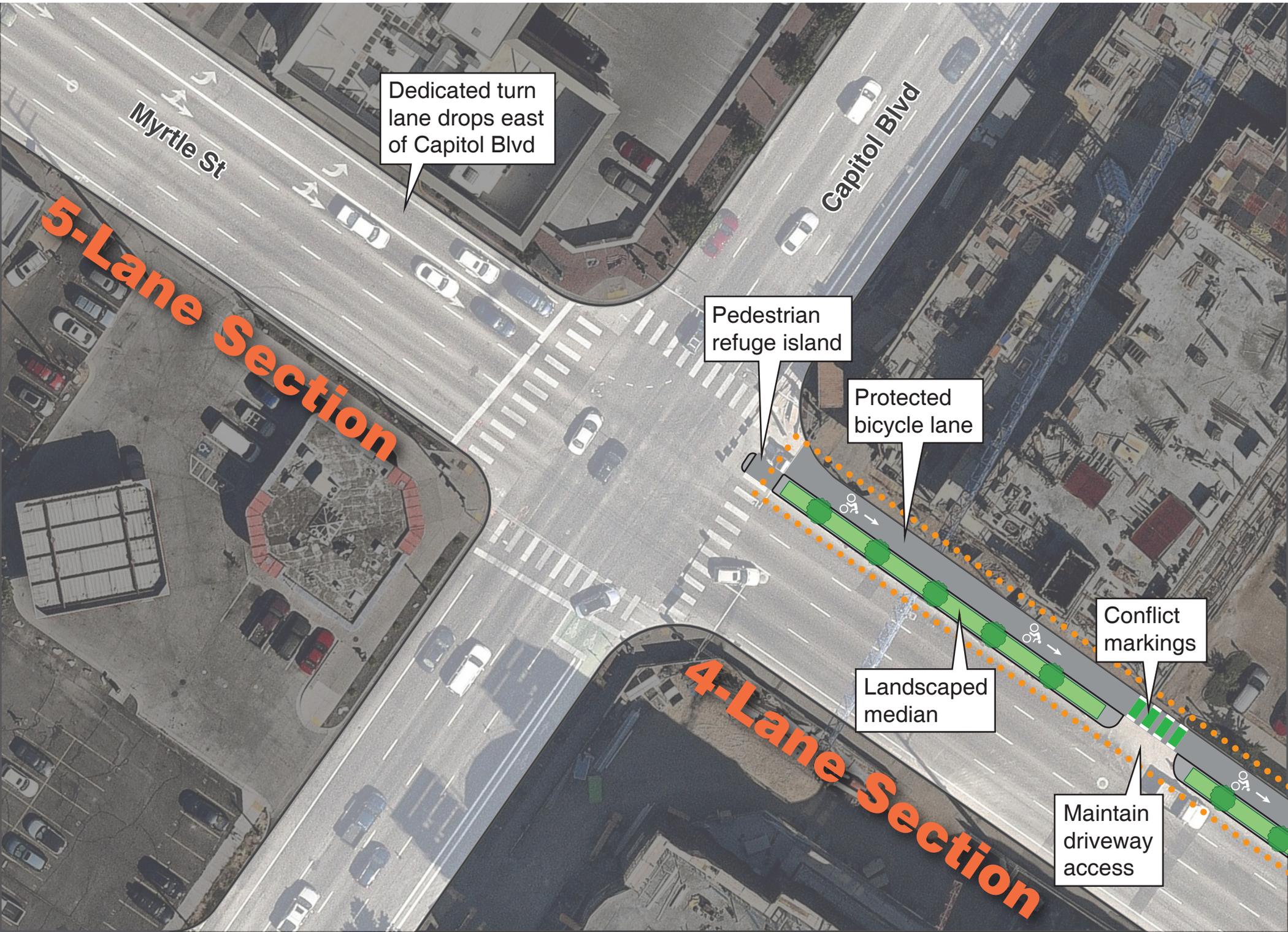
Reduce three interior lanes to 10.5' in width

Consolidate extra 1.5' of width with 2 x 2.5' shoulders into a single 6.5' buffered bicycle lane

5-Lane Section

5-Lane Section

Mostly 4-Lanes (design a)



Dedicated turn lane drops east of Capitol Blvd

5-Lane Section

Pedestrian refuge island

Protected bicycle lane

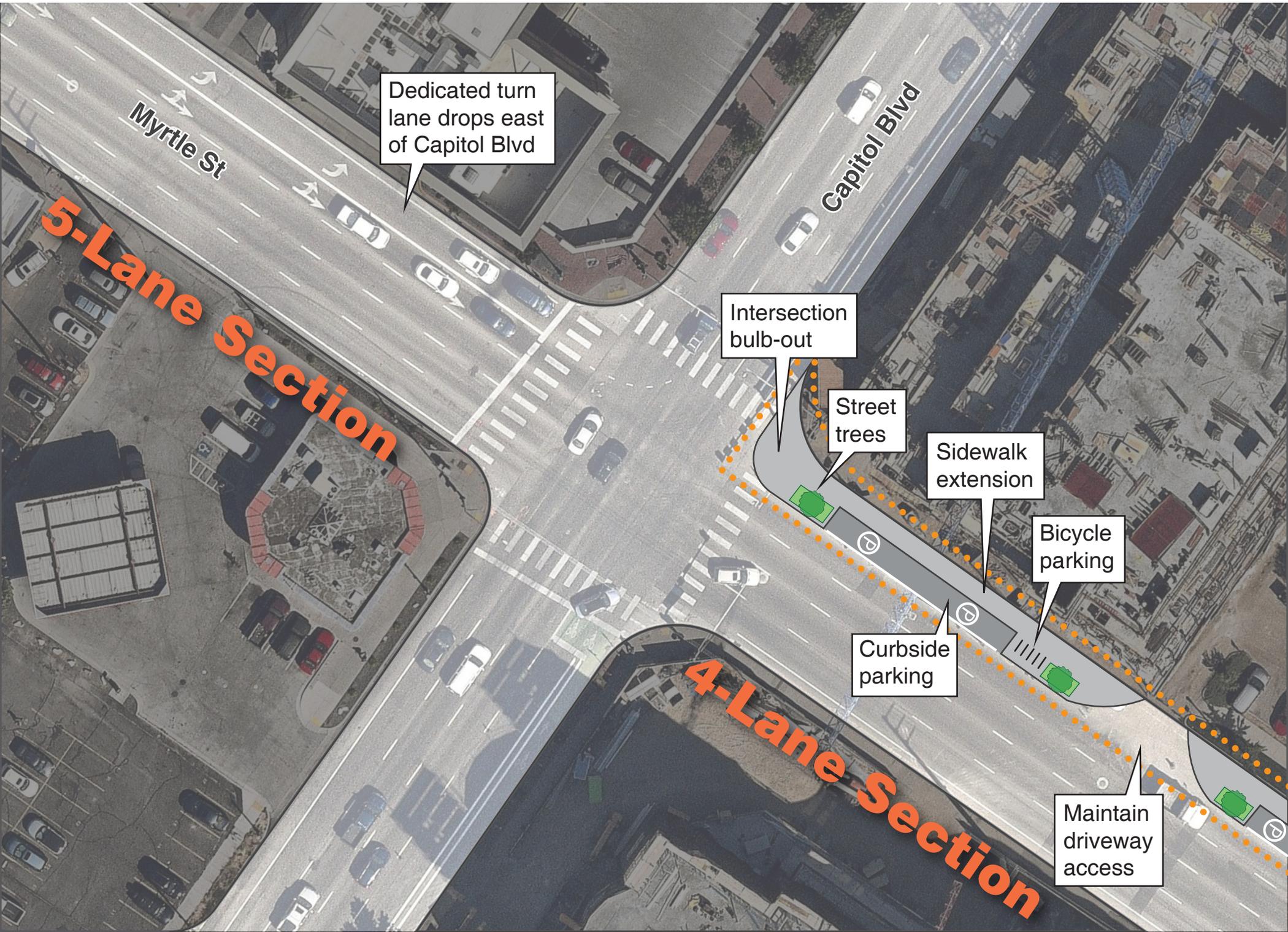
Landscaped median

Conflict markings

Maintain driveway access

4-Lane Section

Mostly 4-Lanes (design b)



Myrtle St

Capitol Blvd

Dedicated turn lane drops east of Capitol Blvd

5-Lane Section

Intersection bulb-out

Street trees

Sidewalk extension

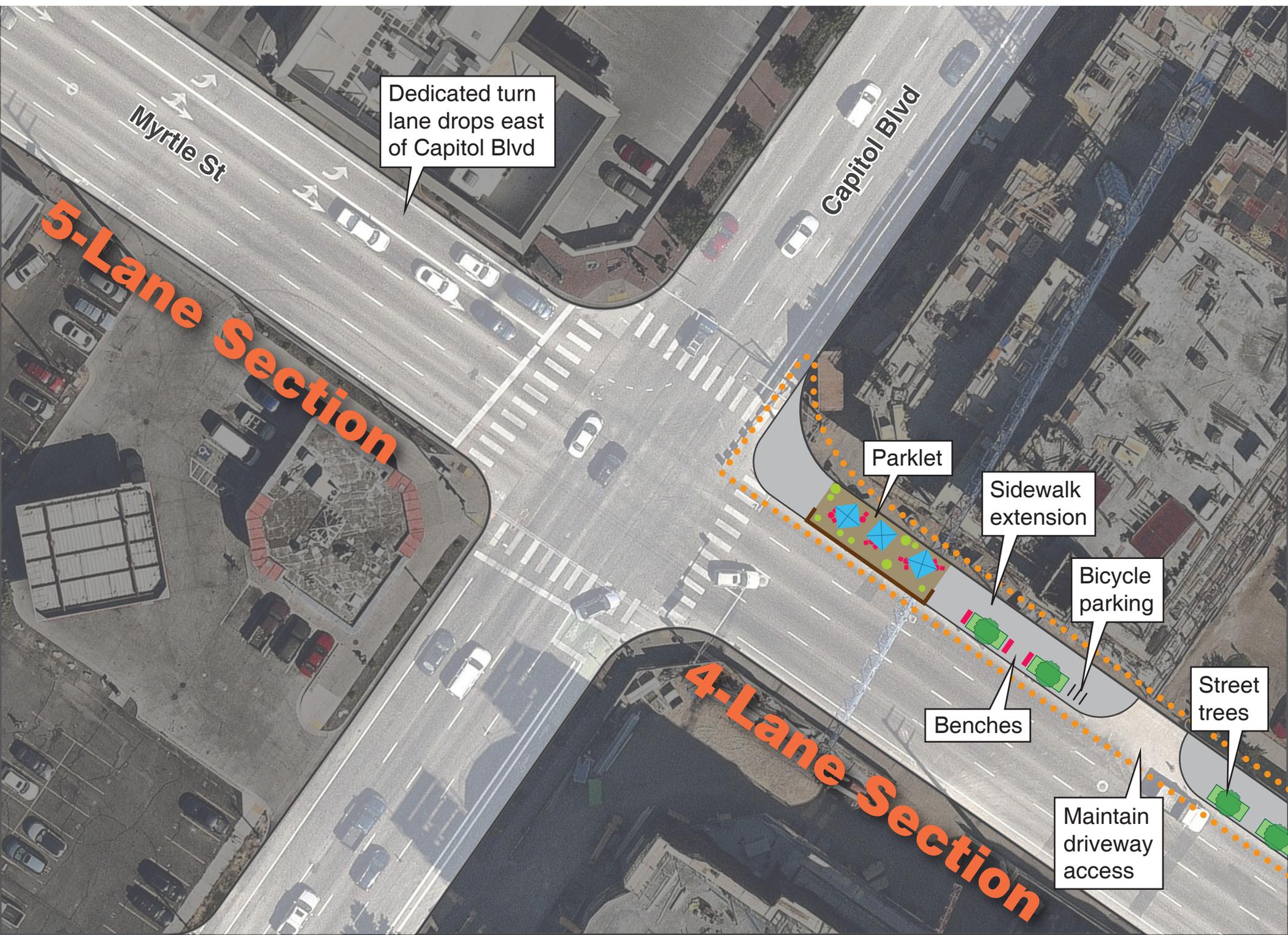
Bicycle parking

Curbside parking

4-Lane Section

Maintain driveway access

Mostly 4-Lanes (design c)



Myrtle St

Dedicated turn lane drops east of Capitol Blvd

Capitol Blvd

5-Lane Section

Parklet

Sidewalk extension

Bicycle parking

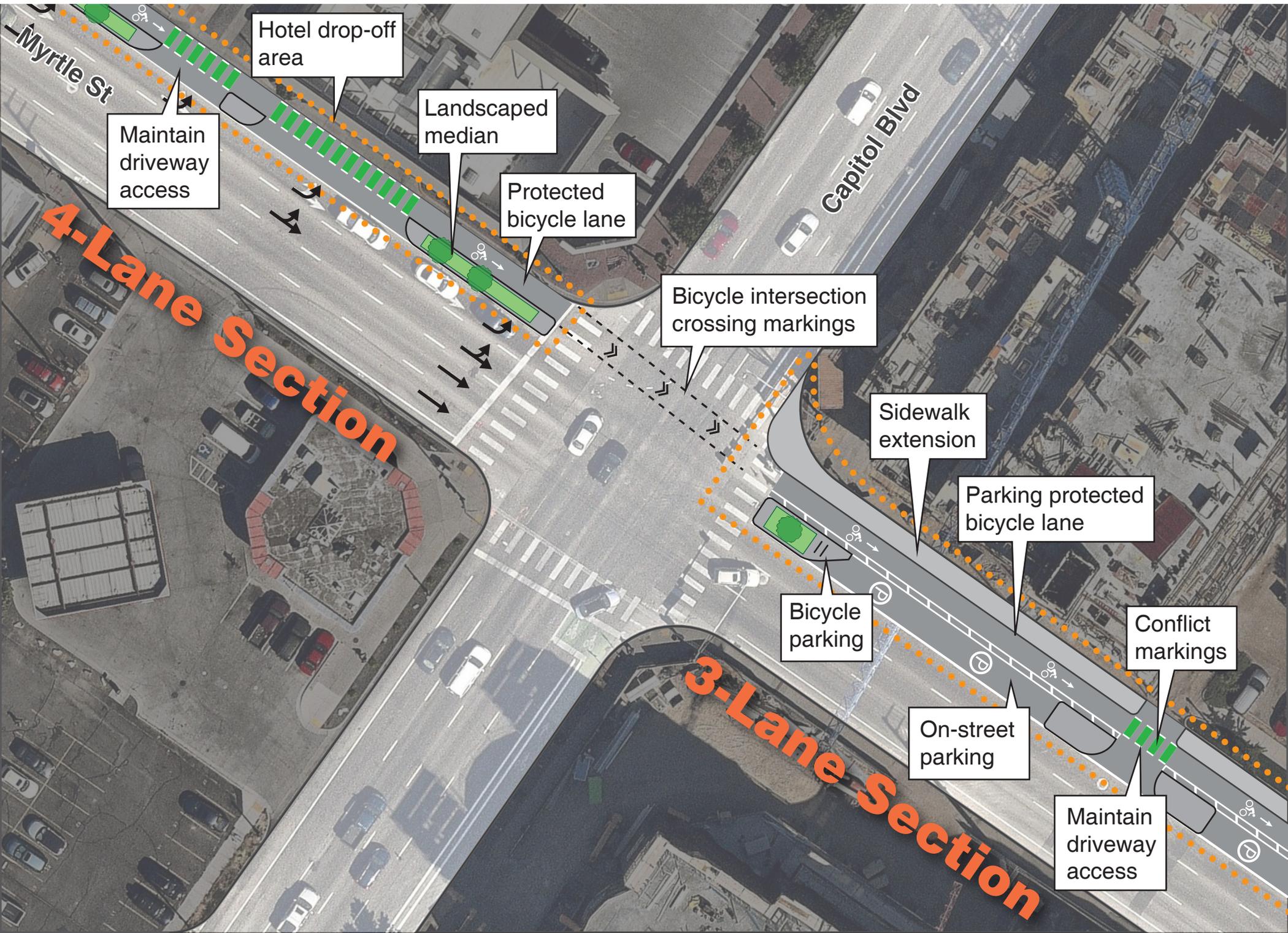
Benches

Street trees

Maintain driveway access

4-Lane Section

Mostly 3-Lanes (design a)



Hotel drop-off area

Maintain driveway access

Landscaped median

Protected bicycle lane

Bicycle intersection crossing markings

Sidewalk extension

Parking protected bicycle lane

Bicycle parking

Conflict markings

On-street parking

Maintain driveway access

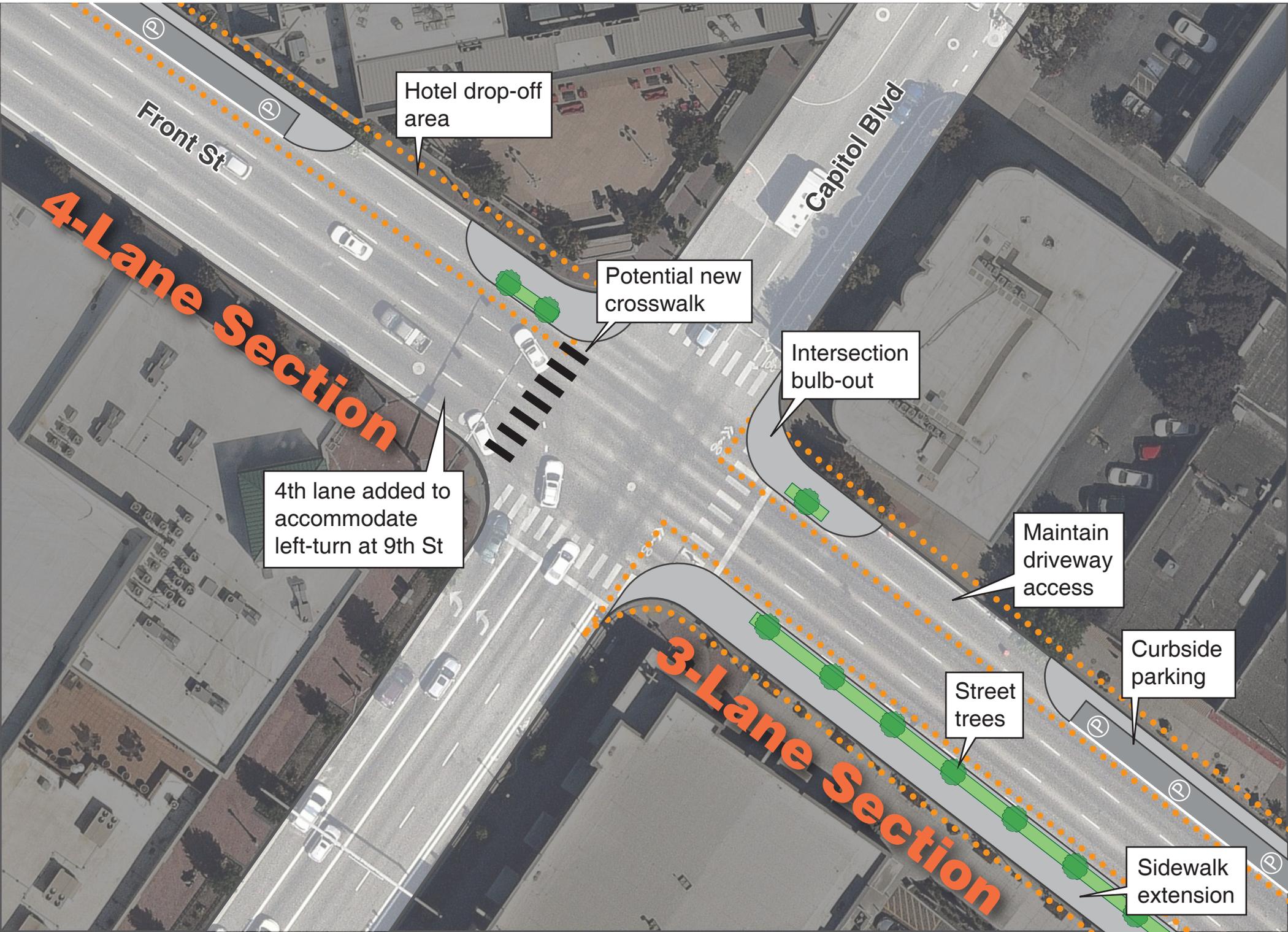
4-Lane Section

3-Lane Section

Myrtle St

Capitol Blvd

Mostly 3-Lanes (design b)



Front St

Capitol Blvd

4-Lane Section

3-Lane Section

Hotel drop-off area

Potential new crosswalk

Intersection bulb-out

4th lane added to accommodate left-turn at 9th St

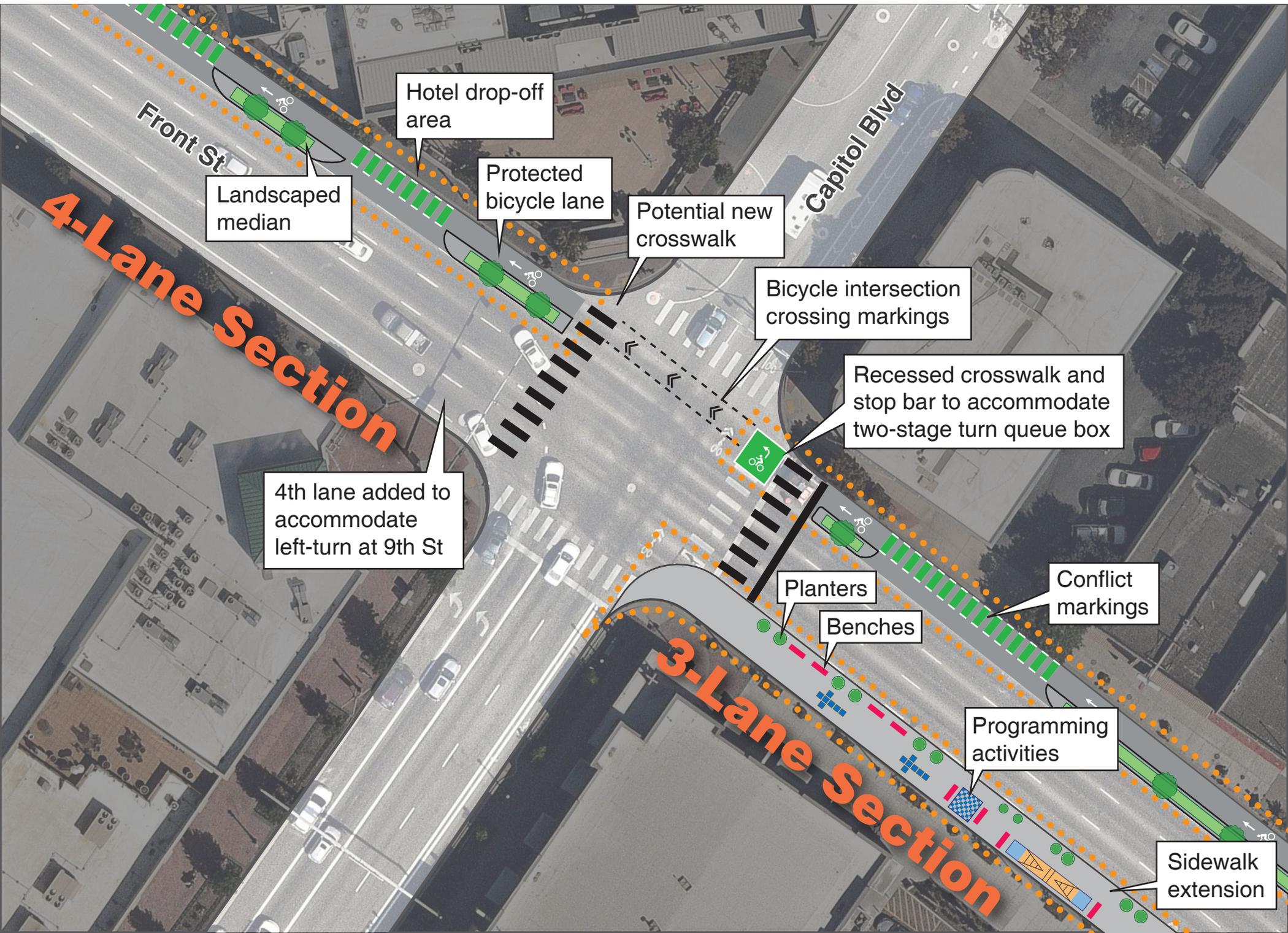
Maintain driveway access

Curbside parking

Street trees

Sidewalk extension

Mostly 3-Lanes (design c)



Front St

Capitol Blvd

4-Lane Section

3-Lane Section

Hotel drop-off area

Landscaped median

Protected bicycle lane

Potential new crosswalk

Bicycle intersection crossing markings

Recessed crosswalk and stop bar to accommodate two-stage turn queue box

4th lane added to accommodate left-turn at 9th St

Planters

Benches

Conflict markings

Programming activities

Sidewalk extension

KEEP 5-LANES (design a)

No changes to existing lane width and striping.
Provide other elements unrelated to geometry only.

		Our Scores	Based on...	What do you think?	
Safety + Traffic Calming	1		1	No changes to geometry would fail to reduce typical speeds, which often exceed the 35 mph speed limit.	
	2		1	No changes to geometry would fail to reduce crash rates or absolute numbers of crashes.	
Multimodal Accommodation	3		5	No changes to geometry would keep Front and Myrtle operating with excess capacity for a majority of the day.	
	4		3	No changes to geometry would keep Front and Myrtle travel times similar to today.	
	5		1	No changes to geometry would not reduce pedestrian crossing distances at most intersections.	
	6		3	No changes to geometry could still allow for placement of new crosswalks at existing intersections (e.g. Capitol and Front west leg) and/or new locations (e.g. 12th and Front).	
	7		2	New bicycle parking could be placed on sidewalks but without additional street width gained locations will not be as easy to identify.	
Economic Development + Downtown Integration	8		2	No changes to geometry will not provide traffic calming and walkability that generally correlates to economic benefits. However, Front and Myrtle may continue to grow simply due to robust Downtown development.	
	9		5	No changes to geometry will not impact truck turning movements, access, or deliveries as they currently function.	
	10		1	No changes to geometry will not allow for new on-street curbside parking to support burgeoning street-fronting retail.	
Sustainability + Public Life	11		2	No changes to geometry will not preclude new plantings on sidewalks, but without additional street width gained locations will not be as easy to identify.	
	12		2	No changes to geometry will not preclude certain locations for improved public spaces on sidewalks, but without additional street width gained locations will not be as easy to identify.	
Your Overall Score			General Thoughts:		

KEEP 5-LANES (design b)

Maintain 5 vehicle travel lanes, with interior lanes narrowed by 6" each.
Consolidate shoulders and use space for 6.5' buffered bicycle facility.

		Our Scores	Based on...	What do you think?		
Safety + Traffic Calming	1		Reduce Vehicle Speed	2	Some minor lane width reduction may induce more cautious driving and provide a subliminal signal to drivers to reduce speed. However, keeping a 5-lane section would serve to mitigate these speed reduction benefits.	
	2		Reduce Crash Rates	2	Some minor lane width reduction has the potential to reduce crash severities (due to lower speeds) but may increase incidence of crashes. However, the net impact is uncertain. Lane widths of 10 to 10.5' are generally considered optimal in urban environments.	
Multimodal Accommodation	3		Level of Service	5	Some minor lane width reduction is unlikely to materially change operational characteristics on Front and Myrtle, which would still feature excess capacity for a majority of the day.	
	4		Average Travel Time	3	Some minor lane width reduction would likely not materially impact travel times, which would be similar to today.	
	5		Shorter Crossing Distance	3	Minor lane width reduction could provide slightly shorter crossing distances if excess space is consolidated and dedicated to non-motorized use(s).	
	6		New Crosswalks	3	Minor lane width reduction could still allow for placement of new crosswalks at existing intersections (e.g. Capitol and Front west leg) and/or new locations (e.g. 12th and Front)	
	7		New Bicycle Parking	3	Minor lane width reduction might provide opportunity for new bicycle parking on sidewalks or extensions, but not necessarily due to a material amount of new space.	
Economic Development + Downtown Integration	8		Retail Sales / Property Values	2	Minor lane width reduction will provide very limited traffic calming and walkability improvements that generally correlate to economic benefits. However, Front and Myrtle may continue to grow simply due to robust Downtown development.	
	9		Truck Delivery	3	Minor lane width reduction should not result in material changes to truck turning movements, access, or deliveries as they currently function, given the low heavy vehicle percentages and the maintenance of a 5-lane section. Signage such as "trucks use right lane except for turns" could be provided.	
	10		On-Street Parking	1	Minor lane width reduction will not result in a sufficient amount of gained geometry for new on-street curbside parking to support burgeoning street-fronting retail.	
Sustainability + Public Life	11		Street Trees	3	Minor lane width reduction will not prelude new plantings on sidewalks, and may allow for plantings on sidewalk extensions gained from small amounts of additional width.	
	12		Public Seating / Placemaking	3	Minor lane width reduction will not prelude new public placemaking opportunities on sidewalks, and the additional width gained through markings changes could provide an opportunity to program wider sidewalks on a limited basis (e.g. benches).	
Your Overall Score					General Thoughts:	

MOSTLY 4-LANES (design a)

Provide mostly 4 vehicle travel lanes with selective placement of turn lanes.
Use extra space for protected bicycle lane and landscaped median.

		Our Scores	Based on...	What do you think?
Safety + Traffic Calming	1	4	Reduce Vehicle Speed	A mostly 4-lane section would provide physical and psychological signals to drivers to reduce speeds, as each lane would be moderately more congested and a slightly narrower section would lessen the "speedway" look and feel of the corridors.
	2	4	Reduce Crash Rates	A mostly 4-lane section has the potential to reduce crash severities (due to lower speeds) along with incidence of crashes, based on observed Crash Reduction Factors for lane reduction.
Multimodal Accommodation	3	3	Level of Service	In comparison to the 2040 5-lane projection, a mostly 4-lane section does not perform significantly worse at most intersections during peak hour. Three intersections during AM peak and two intersections during PM peak see a LOS decline by two letter grades or more. Most intersections remain at similar operational levels. Refer to traffic data sheets for additional information.
	4	3	Average Travel Time	A 4-lane section would have minimal impact on Front St compared with keeping 5 lanes by 2040, at all times. However, a projected increase from 4.5 to 7.5 minutes to travel the entire length of Myrtle is projected during the AM peak hour. The PM peak hour change, along with changes at non-peak hours of the day, is relatively minimal (3m13s vs. 3m44s during AM peak).
	5	4	Shorter Crossing Distance	A 4-lane section would provide for crossing distances that could effectively be reduced by as much as 25%, from around 60' today to around 44' in the future.
	6	3	New Crosswalks	A 4-lane section could still allow for placement of new crosswalks at existing intersections (e.g. Capitol and Front west leg) and/or new locations (e.g. 12th and Front), however vehicle operational impacts would need to be considered.
	7	4	New Bicycle Parking	A 4-lane section with this design would allow for strategic integration of new bicycle parking around medians.
	8	4	Retail Sales / Property Values	A 4-lane section will provide traffic calming and walkability improvements that generally correlate to economic benefits. This design provides some benefit that will come from a curbside protected bike lane.
	9	2	Truck Delivery	A reduction in street section should not significantly impact truck movements or congestion, given the low percentages of heavy vehicles on these corridors. However, a protected bike lane and landscaped median would limit curbside access
Economic Development + Downtown Integration	10	1	On-Street Parking	This 4-lane section design does not use additional space gained to supply curbside parking to support burgeoning street-fronting retail.
	11	4	Street Trees	This 4-lane section design provides space for plantings in landscaped median in selective locations.
Sustainability + Public Life	12	4	Public Seating / Placemaking	This 4-lane section does not explicitly call for public placemaking, although landscaped medians may provide limited opportunities to do so.
	Your Overall Score		General Thoughts:	

MOSTLY 4-LANES (design b)

Provide mostly 4 vehicle travel lanes with selective placement of turn lanes.
Use extra space for curbside parking and sidewalk extension.

		Our Scores	Based on...	What do you think?	
Safety + Traffic Calming	1	 Reduce Vehicle Speed	4	A mostly 4-lane section would provide physical and psychological signals to drivers to reduce speeds, as each lane would be moderately more congested and a slightly narrower section would lessen the “speedway” look and feel of the corridors.	
	2	 Reduce Crash Rates	4	A mostly 4-lane section has the potential to reduce crash severities (due to lower speeds) along with incidence of crashes, based on observed Crash Reduction Factors for lane reduction.	
Multimodal Accommodation	3	 Level of Service	3	In comparison to the 2040 5-lane projection, a mostly 4-lane section does not perform significantly worse at most intersections during peak hour. Three intersections during AM peak and two intersections during PM peak see a LOS decline by two letter grades or more. Most intersections remain at similar operational levels. Refer to traffic data sheets for additional information.	
	4	 Average Travel Time	3	A 4-lane section would have minimal impact on Front St compared with keeping 5 lanes by 2040, at all times. However, a projected increase from 4.5 to 7.5 minutes to travel the entire length of Myrtle is projected during the AM peak hour. The PM peak hour change, along with changes at non-peak hours of the day, is relatively minimal (3m13s vs. 3m44s during AM peak).	
	5	 Shorter Crossing Distance	4	A 4-lane section would provide for crossing distances that could effectively be reduced by as much as 25%, from around 60’ today to around 44’ in the future.	
	6	 New Crosswalks	3	A 4-lane section could still allow for placement of new crosswalks at existing intersections (e.g. Capitol and Front west leg) and/or new locations (e.g. 12th and Front), however vehicle operational impacts would need to be considered.	
	7	 New Bicycle Parking	5	A 4-lane section with this design would allow for strategic integration of new bicycle parking in place of selected curbside vehicle parking (e.g. “bike corrals”).	
	8	 Retail Sales / Property Values	5	A 4-lane section will provide traffic calming and walkability improvements that generally correlate to economic benefits. Strategic placement of new curbside parking can further support street-fronting retail.	
	9	 Truck Delivery	4	A reduction in street section should not significantly impact truck movements or congestion, given the low percentages of heavy vehicles on these corridors. The addition of curbside parking would provide an opportunity to designate formal loading zones at certain times and and/or locations.	
Economic Development + Downtown Integration	10	 On-Street Parking	4	This 4-lane section design provides some new curbside parking which can support burgeoning street-fronting retail.	
	11	 Street Trees	3	This 4-lane section design could include some plantings on sections of sidewalk extensions but mostly focuses on the provision of new on-street parking.	
Sustainability + Public Life	12	 Public Seating / Placemaking	3	This 4-lane section does not explicitly call for public placemaking.	
	Your Overall Score			General Thoughts:	

Scoring System: 1 = “Very Negative” 2 = “Somewhat Negative” 3 = “Neutral” 4 = “Somewhat Positive” 5 = “Very Positive”

MOSTLY 4-LANES (design c)

Provide mostly 4 vehicle travel lanes with selective placement of turn lanes.
Use extra space for parklet and other programming.

		Our Scores	Based on...	What do you think?
Safety + Traffic Calming	1	4	Reduce Vehicle Speed	A mostly 4-lane section would provide physical and psychological signals to drivers to reduce speeds, as each lane would be moderately more congested and a slightly narrower section would lessen the "speedway" look and feel of the corridors.
	2	4	Reduce Crash Rates	A mostly 4-lane section has the potential to reduce crash severities (due to lower speeds) along with incidence of crashes, based on observed Crash Reduction Factors for lane reduction.
Multimodal Accommodation	3	3	Level of Service	In comparison to the 2040 5-lane projection, a mostly 4-lane section does not perform significantly worse at most intersections during peak hour. Three intersections during AM peak and two intersections during PM peak see a LOS decline by two letter grades or more. Most intersections remain at similar operational levels. Refer to traffic data sheets for additional information.
	4	3	Average Travel Time	A 4-lane section would have minimal impact on Front St compared with keeping 5 lanes by 2040, at all times. However, a projected increase from 4.5 to 7.5 minutes to travel the entire length of Myrtle is projected during the AM peak hour. The PM peak hour change, along with changes at non-peak hours of the day, is relatively minimal (3m13s vs. 3m44s during AM peak).
	5	4	Shorter Crossing Distance	A 4-lane section would provide for crossing distances that could effectively be reduced by as much as 25%, from around 60' today to around 44' in the future.
	6	3	New Crosswalks	A 4-lane section could still allow for placement of new crosswalks at existing intersections (e.g. Capitol and Front west leg) and/or new locations (e.g. 12th and Front), however vehicle operational impacts would need to be considered.
	7	5	New Bicycle Parking	A 4-lane section with this design would allow ample opportunity for bicycle parking within programmed streetscape elements.
	8	5	Retail Sales / Property Values	A 4-lane section will provide traffic calming and walkability improvements that generally correlate to economic benefits. Through smartly programmed public spaces, local street-fronting retail will have an opportunity to thrive in the right location.
	9	3	Truck Delivery	A reduction in street section should not significantly impact truck movements or congestion, given the low percentages of heavy vehicles on these corridors. However, the installation of parklets or other programming may limit curbside access, and location choices would need to be strategic.
Economic Development + Downtown Integration	10	1	On-Street Parking	This 4-lane section design does not use additional space gained to supply curbside parking to support burgeoning street-fronting retail.
	11	5	Street Trees	This 4-lane section provides flexible space within programmed parklets and plazas that could allow for a significant investment in street trees.
Sustainability + Public Life	12	5	Public Seating / Placemaking	This 4-lane section uses extra width gained from one vehicle lane to create a linear set of public seating areas, plazas, activity areas, and other programmatic interventions.
	Your Overall Score		General Thoughts:	

MOSTLY 3-LANES (design a)

Provide mostly 3 vehicle travel lanes with selective placement of turn lanes.
Use extra space on one side of street for protected bicycle lane and on-street parking.

		Our Scores	Based on...	What do you think?	
Safety + Traffic Calming	1	 Reduce Vehicle Speed	5	A mostly 3-lane section would provide significant physical and psychological signals to drivers to reduce speeds, as each lane would be more congested and a much narrower section would significantly lessen the “speedway” look and feel of the corridors.	
	2	 Reduce Crash Rates	4	A mostly 3-lane section has the potential to reduce crash severities (due to lower speeds) along with incidence of crashes, based on observed Crash Reduction Factors for lane reduction.	
Multimodal Accommodation	3	 Level of Service	2	In comparison to the 2040 5-lane projection, a mostly 3-lane section performs worse at some intersections during peak hour. Five intersections during AM peak and six intersections during PM peak see a LOS decline by two letter grades or more. Other intersections remain at similar operational levels. Refer to traffic data sheets for additional information.	
	4	 Average Travel Time	1	A 3-lane section would have minimal impact on Front St compared with keeping 5 lanes by 2040 during the AM peak, and would have a moderate impact on travel times on Myrtle during the PM peak. However, significant increases in travel time are projected in peak directions on Myrtle in the AM (4.5 minutes to 13.5 minutes) and Front in the PM (7.5 minutes to 13.5 minutes).	
	5	 Shorter Crossing Distance	5	A 3-lane section would provide for crossing distances that could effectively be reduced by as much as 45%, from around 60’ today to around 33’ in the future.	
	6	 New Crosswalks	2	A 3-lane section could still allow for placement of new crosswalks at existing intersections (e.g. Capitol and Front west leg) and/or new locations (e.g. 12th and Front), however vehicle operational impacts may render such additions challenging from a traffic perspective.	
	7	 New Bicycle Parking	5	A 3-lane section with this design would allow for strategic integration of new bicycle parking in place of selected curbside vehicle parking (e.g. “bike corrals”).	
	8	 Retail Sales / Property Values	5	A 3-lane section will provide significant traffic calming and walkability improvements that could potentially transform Front and Myrtle into vibrant, walkable corridors. This design provides benefit in the form of curbside parking and a protected bike lane to increase access.	
	9	 Truck Delivery	4	A reduction in street section should not significantly impact truck movements or congestion, given the low percentages of heavy vehicles on these corridors. The addition of curbside parking would provide an opportunity to designate formal loading zones at certain times and and/or locations.	
Economic Development + Downtown Integration	10	 On-Street Parking	5	This 4-lane section design provides significant opportunity for new curbside parking which can support burgeoning street-fronting retail.	
	11	 Street Trees	3	This 3-lane section design could include some plantings on sections of sidewalk extensions but mostly focuses on the provision of new on-street parking along with a protected bike lane.	
Sustainability + Public Life	12	 Public Seating / Placemaking	4	This 3-lane section does not explicitly call for public placemaking, although landscaped medians adjacent to the protected bike lane may provide limited opportunities to do so.	
	Your Overall Score			General Thoughts:	

Scoring System: 1 = “Very Negative” 2 = “Somewhat Negative” 3 = “Neutral” 4 = “Somewhat Positive” 5 = “Very Positive”

MOSTLY 3-LANES (design b)

Provide mostly 3 vehicle travel lanes with selective placement of turn lanes.

Use extra space on one side of street for curbside parking and space on other side of street for landscaped sidewalk extension.

		Our Scores	Based on...	What do you think?	
Safety + Traffic Calming	1		5	A mostly 3-lane section would provide significant physical and psychological signals to drivers to reduce speeds, as each lane would be more congested and a much narrower section would significantly lessen the "speedway" look and feel of the corridors.	
	2		4	A mostly 3-lane section has the potential to reduce crash severities (due to lower speeds) along with incidence of crashes, based on observed Crash Reduction Factors for lane reduction.	
Multimodal Accommodation	3		2	In comparison to the 2040 5-lane projection, a mostly 3-lane section performs worse at some intersections during peak hour. Five intersections during AM peak and six intersections during PM peak see a LOS decline by two letter grades or more. Other intersections remain at similar operational levels. Refer to traffic data sheets for additional information.	
	4		1	A 3-lane section would have minimal impact on Front St compared with keeping 5 lanes by 2040 during the AM peak, and would have a moderate impact on travel times on Myrtle during the PM peak. However, significant increases in travel time are projected in peak directions on Myrtle in the AM (4.5 minutes to 13.5 minutes) and Front in the PM (7.5 minutes to 13.5 minutes).	
	5		5	A 3-lane section would provide for crossing distances that could effectively be reduced by as much as 45%, from around 60' today to around 33' in the future.	
	6		2	A 3-lane section could still allow for placement of new crosswalks at existing intersections (e.g. Capitol and Front west leg) and/or new locations (e.g. 12th and Front), however vehicle operational impacts may render such additions challenging from a traffic perspective.	
	7		5	A 3-lane section with this design would allow ample opportunity for bicycle parking within landscaped sidewalk extension and/or in place of select curbside vehicle parking (e.g. "bike corrals") streetscape elements.	
	8		5	A 3-lane section will provide significant traffic calming and walkability improvements that could potentially transform Front and Myrtle into vibrant, walkable corridors. This design provides benefit in the form of curbside parking and landscaping to increase walkability.	
	9		4	A reduction in street section should not significantly impact truck movements or congestion, given the low percentages of heavy vehicles on these corridors. The addition of curbside parking would provide an opportunity to designate formal loading zones at certain times and and/or locations.	
Economic Development + Downtown Integration	10		5	This 4-lane section design provides significant opportunity for new curbside parking which can support burgeoning street-fronting retail.	
	11		4	This 3-lane section design provides space for plantings in a linear landscaped median.	
Sustainability + Public Life	12		4	This 3-lane section does not explicitly call for public placemaking, although the linear landscaped median may provide opportunities to do so.	
	Your Overall Score			General Thoughts:	

MOSTLY 3-LANES (design c)

Provide mostly 3 vehicle travel lanes with selective placement of turn lanes.
Use extra space on one side of street for protected bicycle lane and space on other side of street for sidewalk extension with programming.

		Our Scores	Based on...	What do you think?
Safety + Traffic Calming	1	5	Reduce Vehicle Speed	A mostly 3-lane section would provide significant physical and psychological signals to drivers to reduce speeds, as each lane would be more congested and a much narrower section would significantly lessen the "speedway" look and feel of the corridors.
	2	4	Reduce Crash Rates	A mostly 3-lane section has the potential to reduce crash severities (due to lower speeds) along with incidence of crashes, based on observed Crash Reduction Factors for lane reduction.
Multimodal Accommodation	3	2	Level of Service	In comparison to the 2040 5-lane projection, a mostly 3-lane section performs worse at some intersections during peak hour. Five intersections during AM peak and six intersections during PM peak see a LOS decline by two letter grades or more. Other intersections remain at similar operational levels. Refer to traffic data sheets for additional information.
	4	1	Average Travel Time	A 3-lane section would have minimal impact on Front St compared with keeping 5 lanes by 2040 during the AM peak, and would have a moderate impact on travel times on Myrtle during the PM peak. However, significant increases in travel time are projected in peak directions on Myrtle in the AM (4.5 minutes to 13.5 minutes) and Front in the PM (7.5 minutes to 13.5 minutes).
	5	5	Shorter Crossing Distance	A 3-lane section would provide for crossing distances that could effectively be reduced by as much as 45%, from around 60' today to around 33' in the future.
	6	2	New Crosswalks	A 3-lane section could still allow for placement of new crosswalks at existing intersections (e.g. Capitol and Front west leg) and/or new locations (e.g. 12th and Front), however vehicle operational impacts may render such additions challenging from a traffic perspective.
	7	5	New Bicycle Parking	A 3-lane section with this design would allow ample opportunity for bicycle parking within programmed streetscape elements.
	8	5	Retail Sales / Property Values	A 3-lane section will provide significant traffic calming and walkability improvements that could potentially transform Front and Myrtle into vibrant, walkable corridors. This design provides benefit in the form of a protected bike lane and a well-programmed sidewalk extension that will draw in bike and foot traffic to street-fronting retail.
	9	2	Truck Delivery	A reduction in street section should not significantly impact truck movements or congestion, given the low percentages of heavy vehicles on these corridors. However, the installation of parklets or other programming may limit curbside access, and location choices would need to be strategic.
Economic Development + Downtown Integration	10	1	On-Street Parking	This 4-lane section design does not use additional space gained to supply curbside parking to support burgeoning street-fronting retail.
	11	5	Street Trees	This 3-lane section design provides flexible space within programmed parklets that could allow for a significant investment in street trees. Planters could also be added selectively on the side of the street with a protected bike lane.
Sustainability + Public Life	12	5	Public Seating / Placemaking	This 3-lane section uses extra width gained from one vehicle lane to create a linear set of public seating areas, plazas, activity areas, and other programmatic interventions.
	Your Overall Score		General Thoughts:	

Scoring System: 1 = "Very Negative" 2 = "Somewhat Negative" 3 = "Neutral" 4 = "Somewhat Positive" 5 = "Very Positive"

Front + Myrtle Traffic Analysis Summary Information

OPERATIONS

AM Peak Hour Traffic Operations													
Intersection		Existing: 5 Lanes			Keep 5 Lanes (2040)			Mostly 4-Lanes (2040)			Mostly 3-Lanes (2040)		
		LOS	Front and Myrtle v/c	Intersection v/c	LOS	Front and Myrtle v/c	Intersection v/c	LOS	Front and Myrtle v/c	Intersection v/c	LOS	Front and Myrtle v/c	Intersection v/c
Front Street	13th	B	0.54	0.59	B	0.67	0.70	B	0.69	0.71	B	0.69	0.71
	11th	A	0.63	0.48	B	0.72	0.58	B	0.72	0.57	B	0.72	0.57
	9th	B	0.60	0.57	B	0.75	0.67	B	0.67	0.62	B	0.68	0.62
	8th	B	0.46	0.35	B	0.57	0.43	B	0.56	0.43	B	0.66	0.50
	Capitol	B	0.59	0.66	B	0.84	0.83	B	0.84	0.83	B	0.84	0.84
	6th	A	0.42	0.35	A	0.53	0.41	A	0.53	0.40	A	0.53	0.40
	5th	B	0.55	0.52	B	0.63	0.61	B	0.70	0.66	B	0.81	0.77
	3rd	A	0.49	0.53	A	0.66	0.60	A	0.71	0.65	A	0.45	0.76
	2nd	A	0.49	0.38	A	0.46	0.35	A	0.51	0.40	A	0.62	0.49
	Avenue A	B	0.42	0.55	B	0.70	0.63	B	0.75	0.68	C	0.85	0.79
Broadway	D	0.61	0.74	D	0.66	0.84	D	0.65	0.82	D	0.65	0.82	
Myrtle Street	13th	C	1.01	0.83	F	1.23	0.99	F	1.21	0.97	F	1.28	1.02
	11th	A	0.93	0.67	D	1.08	0.78	F	1.24	0.89	F	1.24	0.89
	9th	A	0.86	0.75	A	0.97	0.86	D	1.12	0.97	E	1.22	1.03
	8th	A	0.85	0.63	A	0.96	0.72	E	1.11	0.83	F	1.40	1.03
	Capitol	B	0.97	0.88	D	1.10	1.02	D	1.10	1.02	D	1.10	1.02
	6th	A	0.77	0.60	A	0.87	0.69	A	1.00	0.78	F	1.26	0.96
	3rd	A	0.63	0.67	A	0.76	0.75	B	0.88	0.84	D	1.11	1.03
	Broadway	D	1.15	0.82	C	0.96	0.92	C	0.91	0.86	C	0.91	0.86

PM Peak Hour Traffic Operations													
Intersection		Existing: 5 Lanes			Keep 5 Lanes (2040)			Mostly 4-Lanes (2040)			Mostly 3-Lanes (2040)		
		LOS	Front and Myrtle v/c	Intersection v/c	LOS	Front and Myrtle v/c	Intersection v/c	LOS	Front and Myrtle v/c	Intersection v/c	LOS	Front and Myrtle v/c	Intersection v/c
Front Street	13th	D	0.98	0.98	F	1.23	1.22	F	1.24	1.23	F	1.30	1.23
	11th	C	0.84	1.02	F	1.28	1.27	F	1.28	1.27	F	1.36	1.22
	9th	C	0.99	0.95	E	1.10	1.09	C	1.01	1.01	C	1.01	1.01
	8th	A	0.81	0.66	A	0.90	0.77	A	0.90	0.77	D	1.06	0.90
	Capitol	C	0.76	0.78	C	0.93	0.92	C	0.93	0.92	C	0.93	0.92
	6th	A	0.89	0.72	B	1.01	0.81	B	1.01	0.81	B	1.01	0.81
	5th	B	0.85	0.61	C	0.95	0.70	E	1.12	0.80	F	1.42	0.97
	3rd	A	0.71	0.74	A	0.81	0.73	A	0.93	0.81	E	1.17	0.95
	2nd	A	0.67	0.44	A	0.73	0.50	A	0.86	0.58	D	1.08	0.73
	Avenue A	B	0.51	0.53	B	0.68	0.60	B	0.76	0.67	C	0.96	0.80
Broadway	C	0.80	0.79	D	0.91	0.91	D	0.91	0.91	D	0.91	0.91	
Myrtle Street	13th	B	0.82	0.57	C	0.94	0.70	C	1.00	0.73	C	1.00	0.73
	11th	A	0.76	0.49	A	0.71	0.59	C	1.04	0.68	C	1.04	0.68
	9th	A	0.86	0.65	A	0.84	0.80	B	0.92	0.88	B	0.90	0.86
	8th	A	0.61	0.50	A	0.71	0.58	A	0.84	0.65	D	1.06	0.78
	Capitol	A	0.74	0.70	B	0.83	0.82	A	0.83	0.82	A	0.83	0.82
	6th	A	0.57	0.34	A	0.66	0.40	A	0.78	0.46	B	0.98	0.58
	3rd	B	0.50	0.46	B	0.65	0.52	B	0.72	0.59	B	0.85	0.70
	Broadway	C	0.69	0.61	C	0.75	0.69	C	0.71	0.67	C	0.71	0.67

Bolded cells indicate volume to capacity ratios greater than 1.0

Cells in red indicate intersections whose Level of Service has declined by 2 letter grades or more between "Keep 5 Lanes" (2040) and the Mostly 4 or Mostly 3 Lane options.

TRAVEL TIME ESTIMATES

Segment		Front and Myrtle Travel Times (mm:ss) and Percent Change (%)									
		Keep 5 Lanes (2040)		Mostly 4 Lanes (2040)				Mostly 3 Lanes (2040)			
		AM	PM	AM	AM % Change	PM	PM % Change	AM	AM % Change	PM	PM % Change
Front Street	Broadway to 13th Street	4:03	7:34	4:03	0%	7:53	4%	4:06	1%	13:26	78%
Myrtle Street	13th Street to Broadway	4:36	3:13	7:42	67%	3:44	16%	13:28	193%	4:32	41%

"MIX AND MATCH" ALTERNATIVE ELEMENTS

Sidewalks and Crossings

What is it?	Benefits	Relative Cost (\$ to \$\$\$)	Your Score (1 to 5)	What do you think?
Sidewalk Construction (e.g. Myrtle, eastern half)	Creates continuous and high-quality pedestrian network	\$\$\$		
Install Leading Pedestrian Intervals (LPIs)	Provides increased visibility for pedestrians; reduces potential vehicle-pedestrian conflicts	\$		
Extend sidewalks into shoulders (bulbouts)	Shorter crossing distances; more waiting space; space for streetscape amenities	\$\$		
Install pedestrian crossings at all corners (e.g. Front/Capitol)	Reduce pedestrian detours and provide calming element to intersections	\$\$		

Corridor Management and Operations

What is it?	Benefits	Relative Cost (\$ to \$\$\$)	Your Score (1 to 5)	What do you think?
Install new pedestrian crossings + signals (e.g. Front/12th; Myrtle/5th, etc)	Provides safe & convenient crossing opportunities and access to evolving land uses	\$\$		
Reduce posted speed limit to 30 or 25 mph	Reduce speeding + provide mechanism for enforcement	\$		
Retime signal progression & speed limit to 25 or 30mph	Reduces average speed (decreases crash rates and severity; reduces noise; improves walkability) with minimal impacts on delay	\$		
Decrease overall signal cycles and reduce pedestrian wait times	Reduced pedestrian crossing delay; less opportunity for speeding; may create additional vehicle delay	\$		
Install Variable Messaging Signs (VMS) to discourage speeding	Reduces speeding in short-term (long-term impact unclear); no impact on capacity	\$		

"MIX AND MATCH" ALTERNATIVE ELEMENTS

Streetscape Enhancement

What is it?	Benefits	Relative Cost (\$ to \$\$\$)	Your Score (1 to 5)	What do you think?
Plant street trees	Enhances sidewalk environment; provides buffer from moving traffic	\$\$		
Install landscaped buffer in current shoulder locations	Continuous enhancement to sidewalk environment; provides buffer from moving traffic	\$\$\$		
Install pedestrian scale lighting	Enhances pedestrian experience; signals an urban street rather than extension of highway	\$\$		
Install clear and visible bicycle parking (off-street)	Highlights a non-auto mode; requires no change to street capacity	\$		
Install wayfinding signage to key destinations and parking	Creates an identity for Front + Myrtle and/or opportunity to become part of Downtown Boise brand identity	\$		

Land Use + Development

What is it?	Benefits	Relative Cost (\$ to \$\$\$)	Your Score (1 to 5)	What do you think?
CCDC selectively funds sidewalk construction in tandem with development	May make development more feasible at certain locations; mechanism for negotiation in development type/scope/goals	\$\$\$		
Broaden C-5 zoning designation	Maximizes development flexibility; sets stage for consistent development landscape for all of Downtown	\$		
Change frontage standards in Downtown Design Standards + Guidelines (I)	Reduction in building setbacks on east side of both corridors, which currently can be designed with a "landscape" standard (e.g. more setbacks than "commercial/mixed use" standard)	\$		
Change frontage standards in Downtown Design Standards + Guidelines (II)	Expand "commercial/mixed use" + "storefront" standards east on Front from Capitol to 5th, to influence street frontages of new development	\$		
Centralize parking information and limit new construction of parking	Given large parking investments coming online (e.g. JUMP), limit parking construction to improve profit on development and in anticipation of shared/autonomous vehicles; invest in technology to make parking downtown easier	\$\$		

APPENDIX F

PREFERRED ALTERNATIVE TRAFFIC ANALYSIS

MEMORANDUM

Date: June 27, 2017

Project #: 20407

To: Ben Rosenblatt, AICP

From: Jamie Markosian, EIT and Andy Daleiden, PE

Project: Front and Myrtle Alternatives Analysis

Subject: Preferred Alternatives Traffic Operations Summary

This memorandum summarizes the assumptions and operational results completed for the preferred alternative configuration on the Front and Myrtle corridor in downtown Boise, Idaho. The preferred alternative combines elements of 3-, 4-, and 5-lane cross-sections to accommodate improvements along the corridor, while managing existing and projected year 2040 demand. See the Preferred Alternative chapter of this report for additional information and diagrams describing the preferred alternative.

PREFERRED ALTERNATIVE TRAFFIC OPERATIONS

Methodology, Assumptions, and Scenarios

An operational analysis was performed using Synchro 9 for the no-build (5-lane) and preferred alternative (mix of 3, 4 and 5-lane) condition. Projected year 2040 traffic volumes from the *“Traffic Volume Growth Rates in Downtown Boise” memorandum* (refer to Appendix C – Growth Assumptions) were added to the preferred alternative Synchro 9 network. The no-build and preferred alternative were analyzed under two traffic volume scenarios: 1) existing traffic volumes and 2) year 2040 traffic volumes. The operational analysis evaluated weekday a.m. and p.m. peak hour conditions and reported intersection level of service (LOS) and volume-to-capacity ratios from the 2000 Highway Capacity Manual (Reference 2 from Existing Conditions Memo).

The no-build scenario (5-lane cross-section) was analyzed with no new improvements or adjustment to the traffic signal timings. The preferred alternative maintains the current cycle lengths. However, flash/don't walk times were adjusted to reflect changes to the cross-section and splits and offsets were optimized to improve traffic flow with the changes in lane geometry.

Changes to Lane Geometry

The preferred alternative is a combination of 3-, 4-, and 5-lane cross-sections to balance vehicle demand, connectivity with adjacent land uses, and enhanced pedestrian/bicycle facilities. On Myrtle Street, the preferred alternative maintains a minimum of 3 through lanes consistently from 13th Street to Broadway Avenue. On Front Street, the preferred alternative maintains a minimum of 4 through lanes consistently from 13th Street to Broadway Avenue. As a result, vehicles using Front or Myrtle as through routes between the Connector and Broadway Avenue are not required to change lanes at all, if desired.

- The eastern section of Myrtle Street is proposed to operate with a 3-lane cross-section with left-turn lanes developed at 5th Street and 3rd Street and left- and right-turn lanes developed at Broadway Avenue. This section of Myrtle Street experiences acceptable LOS and provides adequate capacity for year 2040 traffic volumes.
- The eastern section of Front Street is proposed to shift from a 5-lane cross-section to a 4-lane cross-section. This shift preserves continuity for southbound right-turning vehicles from Broadway Avenue and provides adequate capacity for the traffic volumes leaving the downtown area during the weekday p.m. peak hour.

Constraints of reducing through lanes on Front Street and Myrtle Street are most prevalent throughout the western section of the corridor, where the highest traffic volumes typically occur. Segments and intersections that experience capacity issues under the no-build scenario are expected to remain under the preferred alternative scenario. As described later in this memo and illustrated in the “Traffic Analysis Summary” section of the Preferred Alternative chapter of this report, very few intersections fare considerably worse in the preferred alternative alignment than in the no-build alignment by 2040. With this in mind, several key changes were made to lane geometry in the western section of the corridor:

- The Front Street/13th Street intersection is modified to a 4-lane cross-section on Front Street, removing the dedicated left turn that currently only carries 2% of the traffic at that intersection (refer to lane utilization discussion in Appendix B). This modification reduces weaving behaviors for vehicles in the left-most lane that wish to continue straight onto the connector, as well as reduces the crossing distance for pedestrians and bicyclists at 13th Street, 12th Street, 11th Street, and 10th Street intersections.
- A fifth through lane is maintained on Front Street between Capitol Boulevard and 9th Street to provide circulation and access to BODO, parking garages, and other amenities in the heart of downtown. A fourth through lane is maintained on Myrtle Street to facilitate this same vehicle activity.
- A dedicated right turn lane is provided at the Myrtle Street/9th Street intersection to accommodate the heavy right-turning volumes from the Connector to Myrtle Street onto 9th Street that occurs throughout the day.

- A dedicated left-turn lane was established at Myrtle Street/11th Street for eastbound left-turning vehicles, reducing the through movement on 11th Street to 4-lanes and serving the employment centers at Simplot and the future Pioneer Crossing development.

Additionally, four new traffic signals are proposed at the intersections of Front Street/12th Street, Front Street/10th Street, Myrtle Street/5th Street, and Myrtle Street/Avenue A to provide desired protected pedestrian crossings. Each of these locations will require a signal warrant analysis to be completed in accordance with the MUTCD and ITD Form 1415 requirements. The signal warrant analysis will take into account the existing vehicle and pedestrian patterns and volumes, future patterns and volumes, surrounding land uses, and the effect the signal would have on the downtown traffic signal system as a whole.

Operational Results

Comparing the results of the two traffic volume scenarios above under the current configuration and preferred alternative, Table 1 and Table 2 provide a summary of the traffic operations at the signalized intersections along the Front and Myrtle corridor. As shown in Tables 1 and 2, traffic operations are generally good under existing traffic volumes and get worse under the projected year 2040 traffic conditions. *(Note: see end of this technical memo for all supporting Tables).*

Under existing traffic volumes today, the no-build condition experiences one intersection that operates over capacity (e.g. Front Street/11th Street during the p.m. peak hour), while the preferred alternative as of today would experience two intersections operating over capacity (e.g. Front Street/13th Street and Front Street/Capitol Boulevard, both during the p.m. peak hour).

Under year 2040 traffic volumes, the no-build (5-lane) condition could experience up to four intersections operating over capacity (e.g. Myrtle Street/Capitol Boulevard during the a.m. peak hour as well as Front Street/13th Street, Front Street/11th Street, and Front Street/9th Street during the p.m. peak hour). The preferred alternative could experience an additional two intersections operating over capacity, for a total of six (e.g. Myrtle Street/9th Street during the a.m. peak hour and Front Street/Capitol Boulevard during the p.m. peak hour, in addition to the four intersections listed above that would be over capacity regardless, e.g. in the no-build scenario). *(Note: the preferred alternative would have an additional intersection operating above capacity at Front Street/12th Street, but this intersection was not signalized in the no-build condition).*

Existing Traffic Volumes

Traffic operations with existing traffic volumes along the corridor are relatively similar and generally very good between the no-build and preferred alternative. The western section (13th Street to Capitol Boulevard) of the corridor experiences the highest traffic volumes and poorer operations in peak direction (e.g. mostly LOS C or worse) during the weekday a.m. and p.m. peak hours on Myrtle and Front, respectively. The eastern section (Capitol Boulevard to Broadway Avenue) of the corridor

experiences lighter traffic volumes and relatively good operations (e.g. mostly LOS B or better) during the weekday a.m. and p.m. peak hours.

- Western Section Operations for Preferred Alternative:
 - Adjustments to lane geometry result in intersection volume-to-capacity (v/c) ratios on Front Street and Myrtle Street exceeding 1.0 during the weekday a.m. peak hour on Front Street at 13th Street and Front Street at 11th Street, during the p.m. peak hour.
 - The preferred alternative is projected to operate well within acceptable LOS and v/c ratios at all locations other than the aforementioned, serving the existing demand and providing minimal delay during all other hours of a typical day.
- Eastern Section Operations for Preferred Alternative:
 - The most significant changes in lane geometry occurs in the eastern section of the corridor. With these changes, the existing traffic volumes are still accommodated and result in acceptable operations at all intersections.

Year 2040 Traffic Volumes

Projected year 2040 traffic volumes and the changes to lane geometry result in poorer LOS and higher v/c ratios along the western section of the Front and Myrtle corridor, but also accommodate the projected demand throughout much of the eastern section of the corridor. Negative impacts occur almost as much in the 2040 no-build scenario, indicating that a great portion of degraded performance is based on general growth assumptions in traffic volume between today and 2040, and not exclusively related to the geometric changes envisioned in the preferred alternative.

- Western Section Operations for Preferred Alternative:
 - During the weekday a.m. peak hour, all of the intersections along Myrtle Street operate under capacity except for the intersections of Myrtle Street/9th Street and Myrtle Street/Capitol Boulevard which experience v/c ratios over 1.0. It is notable that Myrtle Street/Capitol Boulevard also operates over capacity in the no-build 2040 condition.
 - During the weekday p.m. peak hour, heavy traffic volumes and adjustments to lane geometry cause the western section of the corridor to poor LOS E or F and operate over capacity at the intersections of Front Street/13th Street, Front Street/12th Street (new signal), Front Street/11th Street, Front Street/9th Street, and Front Street/Capitol Boulevard during the weekday p.m. peak hour. It is notable that these declines in projected operation are similar in the no-build condition at all intersections except Front Street/Capitol Boulevard.
- Eastern Section Operations for Preferred Alternative:

- Adjustments to lane geometry result in increased v/c ratios along the eastern section of the corridor; however, all intersections are projected to operate with sufficient capacity to process year 2040 traffic volumes under weekday a.m. and p.m. peak hours. The eastbound through movement at the Myrtle Street/6th Street intersection is projected to operate with a v/c greater than 1.0. Other than this movement, all other through movements on Front Street and Myrtle Street within this section are projected to operate under capacity.

Operational Effects of New Traffic Signals

Four new traffic signals are proposed at the intersections of Front Street/12th Street, Front Street/10th Street, Myrtle Street/5th Street, and Myrtle Street/Avenue A to provide desired pedestrian crossings to accommodate future pedestrian demand due to the planned and ongoing development and land uses in those areas of the corridor.

The addition of these traffic signals is not expected to affect the operational characteristics of the corridor greatly; however, travel time increases can be expected with any new signal installation. While some through vehicles will be delayed as a result of catching a red signal at these locations, the maximum additional delay for any given through vehicle would be 24 seconds. The average delay for through vehicles collectively, however, is expected to be less than 5 seconds as these signals will be coordinated with the others already in place. As a result, the impacts of the new signals themselves – separate from background growth in traffic volume and other geometric changes envisioned in the preferred alternative – will be minimal.

All of the intersections with new signals experience LOS B or better with sufficient capacity during all time periods except for the intersection of Front Street/12th Street. This intersection is expected to operate at LOS F and an intersection v/c ratio of 1.07 during the year 2040 weekday p.m. peak hour. This operation is directly related to the lane drop from five to four lanes, which leads to lesser capacity in this section, and the effect of the downstream intersection of Front Street/13th Street operating over capacity, producing queue spill back and delay for upstream intersections. As seen in Table 2, the intersections of Front Street/13th Street and Front Street/11th Street operate at LOS F and over capacity for both no-build and preferred alternative in 2040, so the additional signal can be expected to operate similarly.

New traffic signals along Myrtle Street at 5th Street and Avenue A provide strategic pedestrian crossing opportunities with direct access to Julia Davis Park and its amenities on the south side of Myrtle Street. Additionally, these traffic signals break up the long stretches on Myrtle Street without signalization, which can assist with managing vehicle speeds on this section. Both new traffic signals are projected to operate with sufficient capacity and acceptable LOS in year 2040.

Potential Travel Time Impacts

Table 3 and Table 4 show the travel times reported from the Synchro operational models for both existing traffic volumes and projected year 2040 traffic volumes. Implementing the preferred alternative today is not expected to have a material impact on travel times for most portions of the day. During the p.m. peak hour on Front Street, however, an expected travel time increase of between 2 and 3 minutes is projected. By 2040, it is important to note that projected travel times are expected to rise even in the no-build condition as a result of projected traffic volume growth of approximately 1% per year (refer to Appendix C for growth assumptions). For the preferred alternative in 2040, Synchro results project additional increases in travel time over the no-build condition of between 5 and 6 minutes on Front Street during the p.m. peak and between 3 and 4 minutes on Myrtle Street during the a.m. peak.

TABLE 1: AM Peak Hour Traffic Operations

Intersection	Cycle Length (sec)	Existing: 5 Lanes			Existing: Preferred Alternative			No-Build Year 2040: 5 Lanes			Year 2040: Preferred Alternative			
		LOS	Front and Myrtle v/c	Intersection v/c	LOS	Front and Myrtle v/c	Intersection v/c	LOS	Front and Myrtle v/c	Intersection v/c	LOS	Front and Myrtle v/c	Intersection v/c	
Front	13th	85	B	0.54	0.59	B	0.56	0.61	B	0.67	0.70	B	0.69	0.71
	12th	85	-	-	-	A	0.51	0.43	-	-	-	A	0.60	0.50
	11th	85	A	0.63	0.48	A	0.53	0.48	B	0.72	0.58	A	0.65	0.57
	10th	85	-	-	-	A	0.60	0.45	-	-	-	A	0.74	0.70
	9th	85	B	0.60	0.57	B	0.53	0.53	B	0.75	0.67	A	0.67	0.62
	8th	85	B	0.46	0.35	A	0.46	0.35	B	0.57	0.43	A	0.56	0.43
	Capitol	85	B	0.59	0.66	B	0.74	0.67	B	0.84	0.83	B	0.84	0.83
	6th	85	A	0.42	0.35	A	0.41	0.35	A	0.53	0.41	A	0.48	0.40
	5th	85	B	0.55	0.52	B	0.62	0.57	B	0.63	0.61	A	0.70	0.66
	3rd	85	A	0.49	0.53	A	0.63	0.58	A	0.66	0.60	A	0.71	0.65
	2nd	85	A	0.49	0.38	A	0.53	0.44	A	0.46	0.35	A	0.58	0.44
	Avenue A	85	B	0.42	0.55	B	0.67	0.61	B	0.70	0.63	B	0.75	0.68
Broadway	85	D	0.61	0.74	D	0.67	0.73	D	0.66	0.84	D	0.73	0.82	
Myrtle	13th	85	C	1.01	0.83	C	1.02	0.83	F	1.23	0.99	F	1.21	0.97
	11th	85	A	0.93	0.67	B	1.01	0.72	D	1.08	0.78	D	1.13	0.82
	9th	85	A	0.86	0.75	B	1.03	0.92	A	0.97	0.86	E	1.15	1.03
	8th	85	A	0.85	0.63	A	0.93	0.74	A	0.96	0.72	C	1.03	0.83
	Capitol	85	B	0.97	0.88	A	0.90	0.88	D	1.10	1.02	C	1.02	1.02
	6th	85	A	0.77	0.60	B	1.00	0.86	A	0.87	0.69	E	1.11	0.96
	5th	85	-	-	-	A	0.76	0.59	-	-	-	A	0.84	0.66
	3rd	85	A	0.63	0.67	A	0.86	0.85	A	0.76	0.75	B	0.98	0.94
	Avenue A	85	-	-	-	A	0.88	0.75	-	-	-	B	0.99	0.85
	Broadway	120	D	1.15	0.82	C	0.83	0.78	C	0.96	0.92	C	0.91	0.86

Bolded cells indicate volume to capacity ratios greater than 1.0

Cells in red indicate intersections whose Level of Service has declined by 2 letter grades or more between "5 Lanes" and "Preferred Alternative"
 Note: this evaluation is done separately for today (Existing) and for 2040 projections.

TABLE 2: PM Peak Hour Traffic Operations

Intersection	Cycle Length (sec)	Existing: 5 Lanes			Existing: Preferred Alternative			No-Build Year 2040: 5 Lanes			Year 2040: Preferred Alternative			
		LOS	Front and Myrtle v/c	Intersection v/c	LOS	Front and Myrtle v/c	Intersection v/c	LOS	Front and Myrtle v/c	Intersection v/c	LOS	Front and Myrtle v/c	Intersection v/c	
Front	13th	130	D	0.98	0.98	C	1.03	1.06	F	1.23	1.22	F	1.24	1.23
	12th	130	-	-	-	C	1.01	0.94	-	-	-	F	1.17	1.07
	11th	130	C	0.84	1.02	D	1.04	0.88	F	1.28	1.27	F	1.28	1.28
	10th	130	-	-	-	A	0.70	0.67	-	-	-	A	0.70	0.67
	9th	130	C	0.99	0.95	C	0.91	0.92	E	1.10	1.09	D	1.05	1.06
	8th	130	A	0.81	0.66	A	0.80	0.68	A	0.90	0.77	B	0.93	0.79
	Capitol	130	C	0.76	0.78	E	1.09	1.09	C	0.93	0.92	F	1.24	1.31
	6th	65	A	0.89	0.72	A	0.76	0.70	B	1.01	0.81	A	0.86	0.79
	5th	65	B	0.85	0.61	B	0.91	0.72	C	0.95	0.70	C	1.03	0.82
	3rd	65	A	0.71	0.74	B	0.79	0.87	A	0.81	0.73	A	0.87	0.84
	2nd	65	A	0.67	0.44	A	0.78	0.53	A	0.73	0.50	A	0.88	0.60
	Avenue A	65	B	0.51	0.53	B	0.71	0.62	B	0.68	0.60	B	0.81	0.71
Broadway	140	C	0.80	0.79	D	0.82	0.82	D	0.91	0.91	D	0.93	0.93	
Myrtle	13th	65	B	0.82	0.57	B	0.80	0.57	C	0.94	0.70	C	0.92	0.69
	11th	65	A	0.76	0.49	A	0.81	0.52	A	0.71	0.59	A	0.93	0.62
	9th	65	A	0.86	0.65	B	0.72	0.74	A	0.84	0.80	B	0.87	0.89
	8th	65	A	0.61	0.50	A	0.68	0.58	A	0.71	0.58	A	0.79	0.68
	Capitol	65	A	0.74	0.70	B	0.69	0.70	B	0.83	0.82	B	0.83	0.82
	6th	65	A	0.57	0.34	A	0.72	0.51	A	0.66	0.40	A	0.83	0.60
	5th	65	-	-	-	A	0.81	0.57	-	-	-	A	0.92	0.66
	3rd	65	B	0.50	0.46	A	0.59	0.62	B	0.65	0.52	A	0.71	0.71
	Avenue A	65	-	-	-	A	0.69	0.56	-	-	-	A	0.78	0.63
	Broadway	140	C	0.69	0.61	C	0.67	0.60	C	0.75	0.69	C	0.73	0.68

Bolded cells indicate volume to capacity ratios greater than 1.0

Cells in red indicate intersections whose Level of Service has declined by 2 letter grades or more between "5 Lanes" and "Preferred Alternative"

Note: this evaluation is done separately for today (Existing) and for 2040 projections.

TABLE 3: AS OF TODAY

	Current, 5-Lanes	Current, Pref. Alt.
FRONT		
AM	3:16	3:45
PM	3:45	6:21
MYRTLE		
AM	3:36	4:18
PM	3:07	3:18

TABLE 4: PROJECTED IN 2040

	2040, 5-Lanes	2040, Pref. Alt.
FRONT		
AM	4:03	3:41
PM	7:34	12:59
MYRTLE		
AM	4:36	7:41
PM	3:13	3:57

Projected travel times highlighted in red indicate relatively significant potential increases of more than 2 minutes.