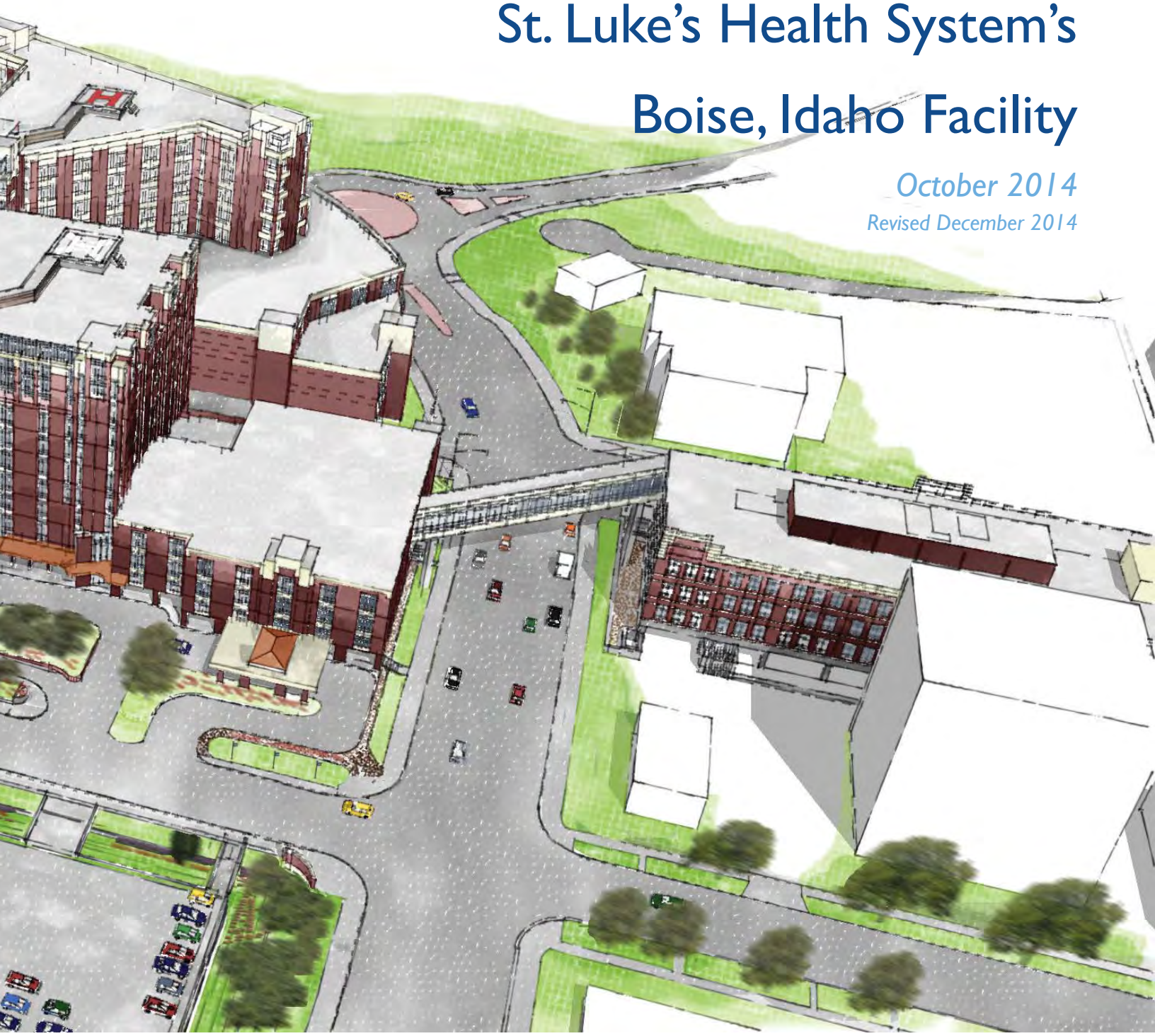
APPENDIX

for

St. Luke's Health System's Boise, Idaho Facility

October 2014

Revised December 2014



Prepared by: HUMMEL ARCHITECTS

2785 N. Bogus Basin Road

Boise, Idaho 83702

www.hummelarch.com

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Final Traffic Impact Study for

St. Luke's Boise Facility Expansion

Prepared for

St. Luke's Health System

July 2014

CH2MHILL®

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Acronyms and Abbreviations

ACHD	Ada County Highway District
ATR	automatic traffic recorder
AWSC	all-way stop-controlled intersection
CIP	Capital Improvements Plan
COMPASS	Community Planning Association of Southwest Idaho
DBA	Downtown Boise Association
DBIP	Downtown Boise Implementation Plan
ITD	Idaho Transportation Department
ITE	Institute of Transportation Engineers
LOS	level of service
NCHRP	National Cooperative Highway Research Program
TAZ	Traffic Analysis Zone
TIS	Traffic Impact Study
TMC	turn movement counts
TWSC	Two-way stop-controlled intersection
VRT	Valley Regional Transit

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Executive Summary

St. Luke's Boise is currently embarking on a Master Plan process that proposes extensive facility improvements to enhance current operations and meet future regional healthcare needs.

This Traffic Impact Study (TIS) is a technical document that evaluates the potential impacts of vehicular, pedestrian, and bicycle traffic caused by the proposed expansion of the St. Luke's downtown Boise facility. The technical analysis provided in this document is based on what the planning team has determined is the most effective and efficient expansion layout for the downtown facility. Building square footages that were estimated in the planning process were used to develop the trip generation numbers; while they may look very precise in this document, those square footages could vary slightly in reality as design moves forward. It is necessary to take this snapshot of the facility expansion to provide a base for analysis. Similarly, while it may appear that mitigation measures for the predicted impacts have been selected, the process should not be viewed so narrowly. The mitigation opportunities provided are simply examples to show that mitigation is in fact possible. It is anticipated that future public involvement and continued negotiation with the City and the Ada County Highway District (ACHD) will result in a collaborative set of mitigation solutions that respond more fully to the needs of all stakeholders.

The new hospital additions should ideally be contiguous to the existing facilities so that improvements can provide maximum facility efficiency, avoid duplication of services, eliminate facility sprawl, and optimize patient service and response needs. In order to accomplish these objectives, a street vacation of Jefferson Street is necessary.

The proposed St. Luke's Boise facility development is planned to include five main components identified as:

1. Children's Pavilion – This 85,000-square-foot facility is located on the southeast corner of Jefferson Street and Avenue B and has already been entitled. This facility will include the addition of a below-grade parking facility.
2. Downtown Hospital Expansion – 357,000-square-foot expansion will include expansion of the existing hospital departments, including inpatient amenities for the Center for Heart & Vascular Health, Women's Services, Children's Hospital, and Medical/Surgical Services. This facility is located in the block south of Fort Street and east of 1st Street, with a third-floor connection across 1st Street through the Physician Clinic Building to the proposed parking garage, while connecting at all floors across Jefferson Street to the existing hospital.
3. Parking Garage/Central Plant – This combined facility will be located in the block south of State Street and west of 1st Street. The parking portion of the facility is designed for four full floors and two partial floors below grade. The below-grade parking facility will serve staff, while the ground floor and succeeding upper floors will serve patient needs. The footprint of the Central Plant will include approximately half of the block on the ground floor and a subbasement space. This provides close proximity to the utility tunnels already existing in Jefferson Street.
4. Shipping and Receiving – This facility, while currently combined with the hospital's Central Plant, will be split off and located on the south side of Jefferson Street on the west side of the block, nearest 2nd Street. This facility will be approximately 25,000 square feet in size. For trip generation purposes, it has been considered to be the equivalent of approximately 15,000 square feet of office space. Much of the space is open for temporary holding and moving of materials.
5. Warm Springs Medical Office Building – This 100,000 square-foot facility is located south of Main Street, between Broadway Avenue and 1st Street. Parking will be accommodated via an existing parking garage located adjacent to this site.

A comprehensive Traffic Impact Study (TIS) was conducted to review impacts associated with the proposed development and to identify potential mitigation measures. The following conclusions and recommendations have been developed as part of this effort:

- Existing through-traffic demand in the vicinity is low. The majority of local traffic is hospital origin-destination traffic.
- Reasonable measures such as traffic signals, roundabouts, and intersection configuration improvements can mitigate all of St. Luke's forecasted traffic-related impacts.
- Jefferson Street can be vacated and closed between Avenue B and 1st Street without significant impacts associated with diverted traffic. Proposed bicycle and pedestrian improvements will maintain east-west connectivity from the east end to downtown, and north-south connectivity from Fort Street to Idaho Street and beyond.
- The new parking garage located in the northwest quadrant of the St. Luke's facility will serve the proposed hospital facilities and offer convenience for medical center staff and patients while avoiding direct neighborhood impacts because of it its proximity.

As of early 2014, the following conditions have occurred or are in process:

- On September 25, 2013, the Ada County Highway District (ACHD) adopted the recommendations of the original Downtown Boise Implementation Plan (DBIP). The DBIP, led by ACHD, was a collaborative effort including the input of the City of Boise and Capitol City Development Corporation (CCDC), as well as the Valley Regional Transit (VRT) and Downtown Boise Association (DBA). A significant part of the DBIP includes conversion of one-way streets to two-way and modification to the downtown bicycle network. The conversion of one-way to two-way streets has been incorporated into the planning model used by St. Luke's for this TIS. Similarly, the expanded bicycle network has been incorporated into the planning process. Currently, ACHD and its partners are working on an update to the adopted DBIP. The first public open house was held March 13, 2014. This TIS has been modified to reflect the proposed changes in the updated DBIP, though it is recognized that the proposed changes have not been adopted.
- The City of Boise (City) has engaged in a preliminary master planning effort centered at the Military Reserve, Fort Boise, and Veteran's Administration area. Planning to date has involved brainstorming with project partners in developing possible circulation, growth scenarios, and land use opportunities. Several stakeholder meetings have been held and public open houses are planned for early March and April 2014. Development of the TIS included analysis of anticipated growth and land use projections developed by the City. No alterations have been incorporated into this TIS, as this is an on-going process. It was determined that TIS mitigation opportunities would not exclude future growth and development in the City's proposed larger master plan area.
- During the course of the traffic impact analysis development, several coordination meetings were held with ACHD, St. Luke's, and the City. Key decisions reached during these efforts included examination of impacts associated with Jefferson Street closed versus Jefferson Street open, and impacts of possible development in the Military Reserve, Fort Boise, and Veteran's Administration area. In both circumstances it was determined that potential impacts were negligible and did not merit further review. As a result, the proposed improvement plan assumes vacation of Jefferson Street and current Community Planning Association of Southwest Idaho (COMPASS) land-use forecasts.

SECTION 1

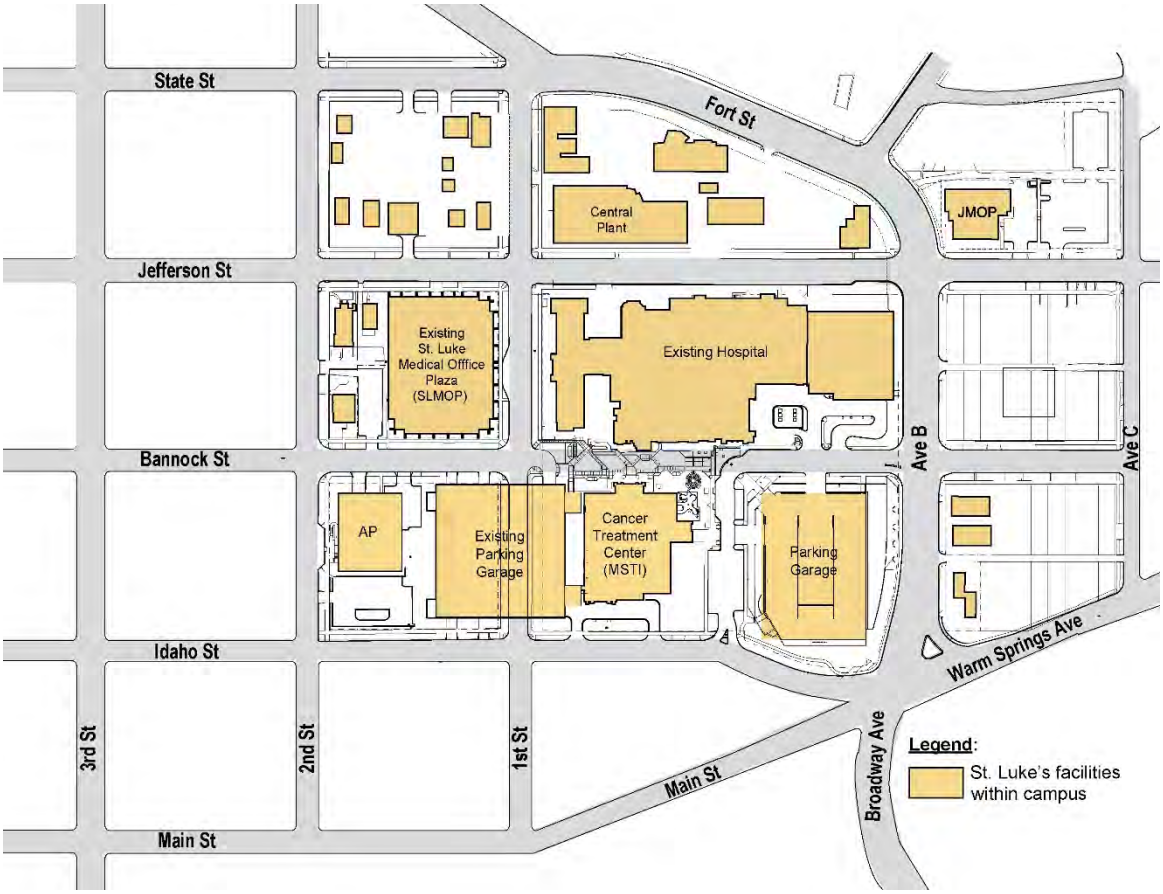
Introduction

CH2M HILL has been retained to prepare a Traffic Impact Study (TIS) in conjunction with the development of the St. Luke's Boise Master Plan. The Master Plan (Plan) generally covers a four-block-by-four-block area in east downtown, Boise, Idaho, and is bounded by Fort Street on the north, Main Street on the south, 2nd Street on the west, and Avenue B on the east. See Figure 1 for existing site map. The Plan is required as part of the City of Boise (City) Planning and Development Services entitlement process and is a comprehensive long-term strategy for future expansion of the St. Luke's Boise downtown facility. The purpose of this study is to evaluate the traffic impacts resulting from the proposed development and provide recommendations for mitigation of associated impacts. The scope of the study includes the following discussion and analysis:

- Regional Healthcare Planning Overview
- Existing Conditions
- Proposed Development
- Traffic Forecasts
- Traffic Operations Analysis
- Mitigation Measures
- Findings and Recommendations

This traffic impact study has been conducted in accordance with the requirements for a full traffic impact study as required by the ACHD Policy Manual.

FIGURE 1
Existing Site Map



1.1 Regional Healthcare Planning Overview

Understanding St. Luke's overall mission and goal helps set the stage for understanding the purpose of the proposed downtown facility development.

> *Mission: To improve the health of people in our region.*
> *Goal: To build better health by delivering personalized, innovative, and exceptional care.*

St. Luke's is committed to serving the Treasure Valley, as well as the broader region's healthcare needs. Growth in the Treasure Valley is expected to increase by as much as 46 percent, or nearly 300,000 people, by 2030, according to John Church and Idaho Economics. An aging population, increases in obesity and chronic conditions, and population growth drive the need for St. Luke's to transform the downtown hospital in order to continue to deliver innovative and exceptional care to patients in the decades ahead.

Beyond the important need of meeting the healthcare needs in the future, expansion of the downtown Boise facility will create substantial local economic development investments. The current estimate for the proposed construction is approximately $400 million. Using a standard 3x multiplier, this equates to roughly $1 billion in total local economic benefit and potentially up to about 400 new jobs to support the expanded facility when construction related to the Master Plan is fully completed. Expanding St. Luke's also will spur related growth and economic opportunities in the surrounding area.

The St. Luke's Boise downtown expansion is consistent with the Mayor's livability goal and the City's vision for developing the Military Reserve area. The hospital co-exists with surrounding land uses, including high density and compact residential on the east, government and parks on the north, downtown on the west, and business on the south. It is envisioned that increasing job opportunities in this distinctive downtown area will create best-practice public transportation and non-motor vehicle commuting opportunities. Discussions are underway with VRT regarding their planned multi-modal center and new opportunities for public transit serving St. Luke's.

1.2 St. Luke's Boise Master Plan

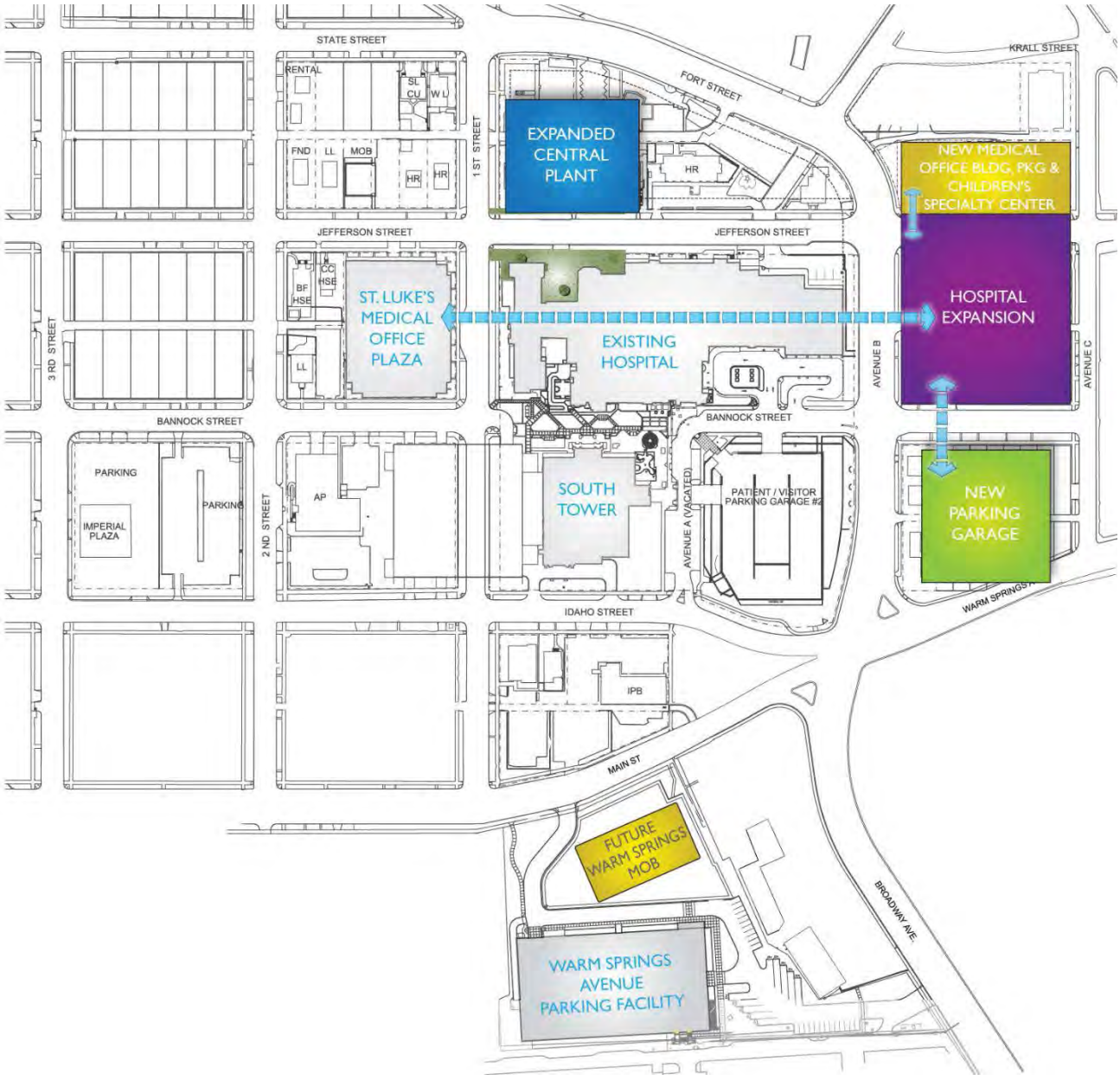
The St. Luke's Boise facility is in the process of developing a Master Plan that will expand and improve current hospital operations to meet future healthcare needs, while honoring community commitments. It is desirable that the new hospital additions be contiguous to the existing facilities so that improvements can provide optimal efficiency and be implemented as expeditiously as possible.

The original St. Luke's footprint, first established in the early 20th century and continually growing to meet community needs since that time, occupied the space between Avenue B and 1st Street and Bannock Street and Jefferson Street. Hospital care has evolved since that first facility more than 100 years ago. Today, nearly 90 percent of the procedures are now outpatient in nature. This trend emphasizes the critical need for convenience, safety in moving people, simple way-finding, and proximity to the right medical care staff and equipment. Best practices in healthcare planning dictate the use of an Integrated Care Model – this means creating a horizontal relationship between specific doctor office space, diagnostic and treatment space, and beds as needed. Through many iterations, the currently developing master plan has been based on this design model.

The theme of the master plan is to balance hospital planning with integration into the surrounding community. St. Luke's has recognized the special context within which this particular healthcare facility resides and has engaged a wide range of professionals in the development of the Master Plan. Architects, landscape architects, planners, traffic engineers, and other professionals reviewed the opportunities and developed creative solutions to meet the hospital's needs. The following list shows the general direction of alternatives reviewed as the master plan has developed. The descriptions below are brief; more detail can be found in the final Master Plan.

1. **No Build Alternative – Development Elsewhere.** This is a standard No Build Alternative reviewed in any concept development phase. A No Build Alternative looks at leaving the site as it currently exists with no modifications or additions. Selecting a No Build Alternative for this site would force expansion to occur at other St. Luke's facilities, such as the St. Luke's Meridian facilities on Eagle Road. That expansion would move staffing and medical offices to that location. The long-range view would be the development of the St. Luke's Meridian facilities into a regional medical center and the reduction of services and staff at the downtown St. Luke's Boise facility.
2. **Expand Across Jefferson East of Avenue B (Expansion East).** This expansion would include an attached Medical Office Building and Children's Pavilion across Jefferson Street, between Avenues B and C, to the new Patient Tower in the south block. The main entrance to the new Patient Tower, or main hospital expansion, would be on Bannock Street between Avenues B and C. The expansion to the east would require Jefferson Street to be vacated on the neighborhood side of Avenue B, which would eliminate traffic between the East End and Avenue B via Jefferson Street. Neighborhood traffic trying to leave the East End of Boise may alternatively use Bannock Street as an option. Bannock Street between Avenues B and C would have additional increased congestion (resulting in additional vehicular and pedestrian conflicts) due to the main hospital parking and lobby entrances on Bannock. Addition of the parking and lobby entrances on Bannock Street could result in queuing that backs up into Avenues B or C. The new Patient Tower across from Avenue B is an unrealistic location for departmental connections to the existing hospital. In addition to the increased traffic along Bannock Street, there would also be an anticipated increase in traffic along Avenue C, which would encroach on the neighborhood space. Additional challenges with this direction of expansion include the lack of floor space, which would require significant upward expansion or increased building height, as well as significant time and resources from St. Luke's to acquire property east of Avenue B, as not all of the space identified above is currently owned by St. Luke's.

FIGURE 2
Potential St. Luke's facility east solution for expansion

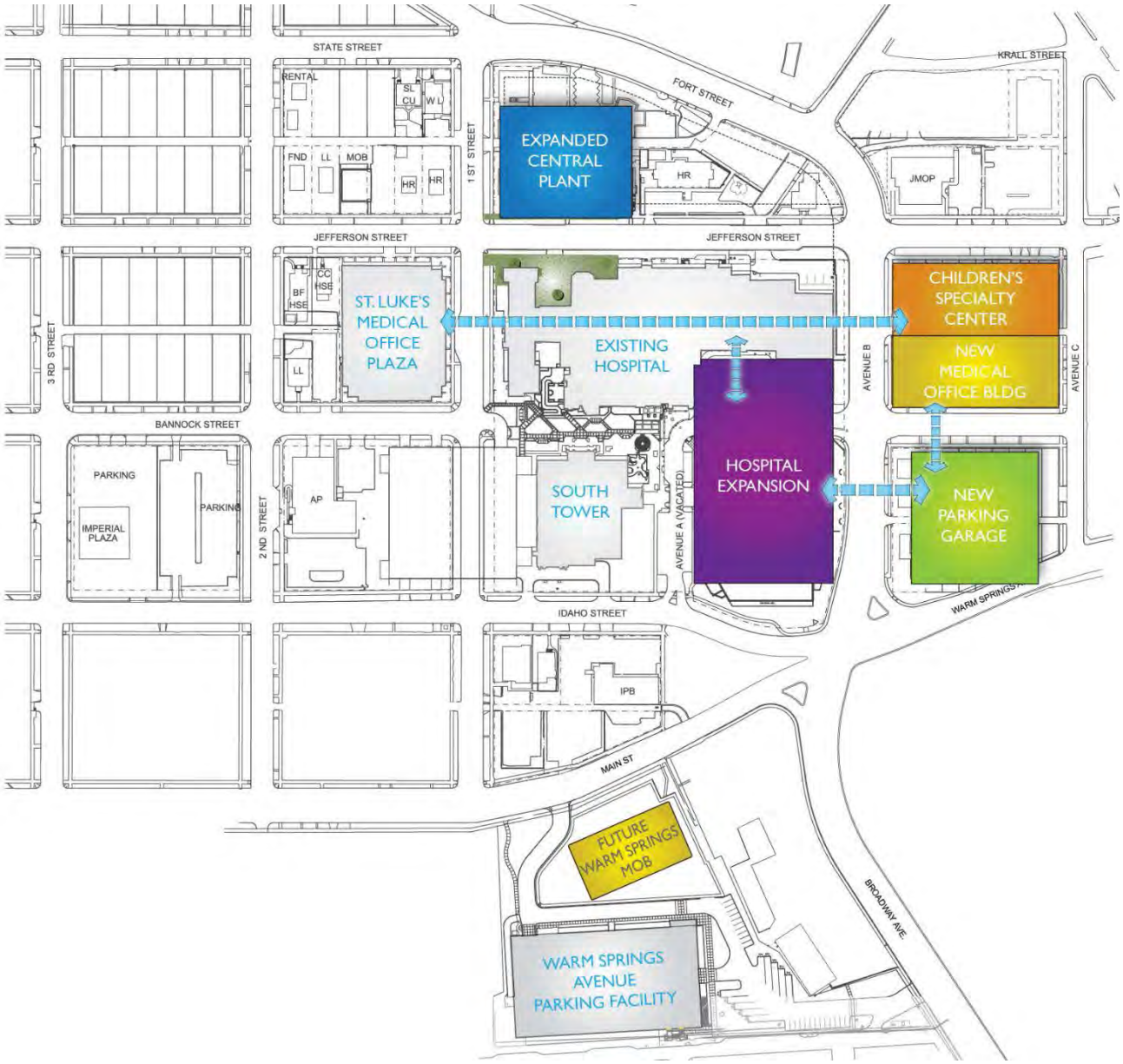


3. **Expand toward Warms Springs and over Avenue B (Expansion South).** The new Patient Tower would be located between Avenues A and B in place of the existing parking garage and expand through Bannock Street to the current emergency room entrance. The new parking garage would be located across Avenue B between Avenues B and C south of Bannock Street. The Children's Pavilion and the new Medical Office Building would be combined in the block north of the garage. This expansion would require the relocation of the emergency department entrance to Jefferson Street, and cause a significant impact to the traffic load on Jefferson Street. Access on Bannock between Avenues A and B would be eliminated to accommodate the expansion of the hospital. Congestion on Bannock Street between Avenues B and C would be increased due to lobby and parking garage entrances, increasing the potential for vehicular-pedestrian conflict on this block. The location of the parking and lobby entrances on Bannock Street between Avenues B and C would likely increase the use of Avenue C as an access route, increasing the encroachment on the neighborhood. Skybridges over Avenue B would provide the

conduit from the parking garage to the new hospital and between the new hospital and the Children's Pavilion/Medical Office Building.

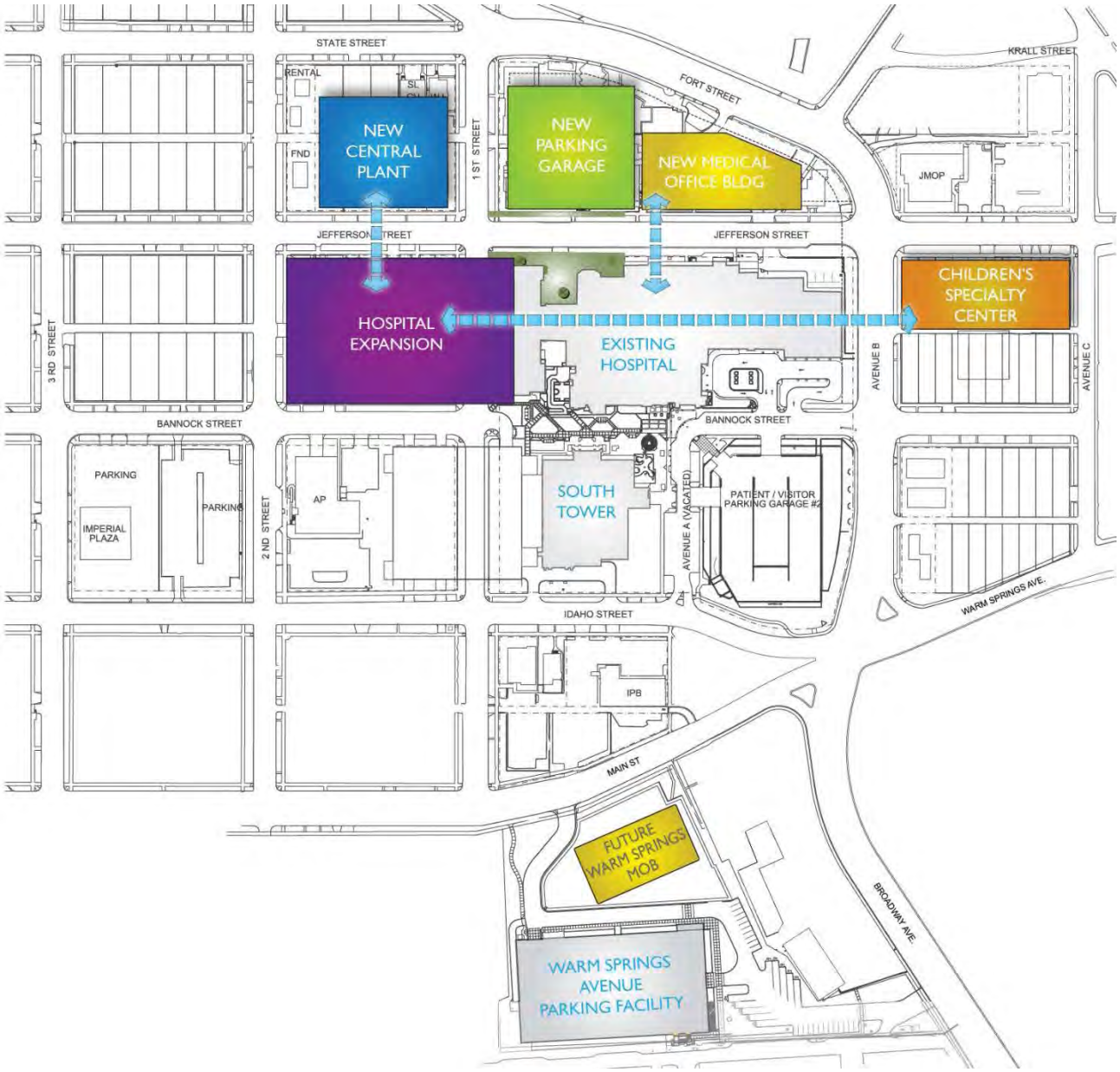
With the parking and lobby entrances on Bannock Street, queue lengths could extend back to Avenues B and C during peak hours. Increased congestion is correlated to increased emissions and decreased air quality. The increased traffic exiting the hospital lobby or parking garage left onto Avenue B from Bannock Street would likely require a signal to get onto Avenue B. Proximity to the Warm Springs signal would be a challenge for signal timing. Additionally, as noted with the expansion to the east, St. Luke's does not currently own all of the property between Avenues B and C from Warm Springs north to Jefferson Street. Acquiring these properties requires time and resources.

FIGURE 3
Potential St. Luke's facility south solution for expansion



4. **Expand toward 3rd Street (Expansion West).** One alternative direction for expansion would be toward 3rd Street from Idaho Street to State Street. However, this expansion prevents the availability of contiguous critical care services such as cardiac care, emergency access, and a central medical lobby. This scenario would create a bigger facility footprint, duplicate facilities, and result in lack of hospital connectivity and efficiency.

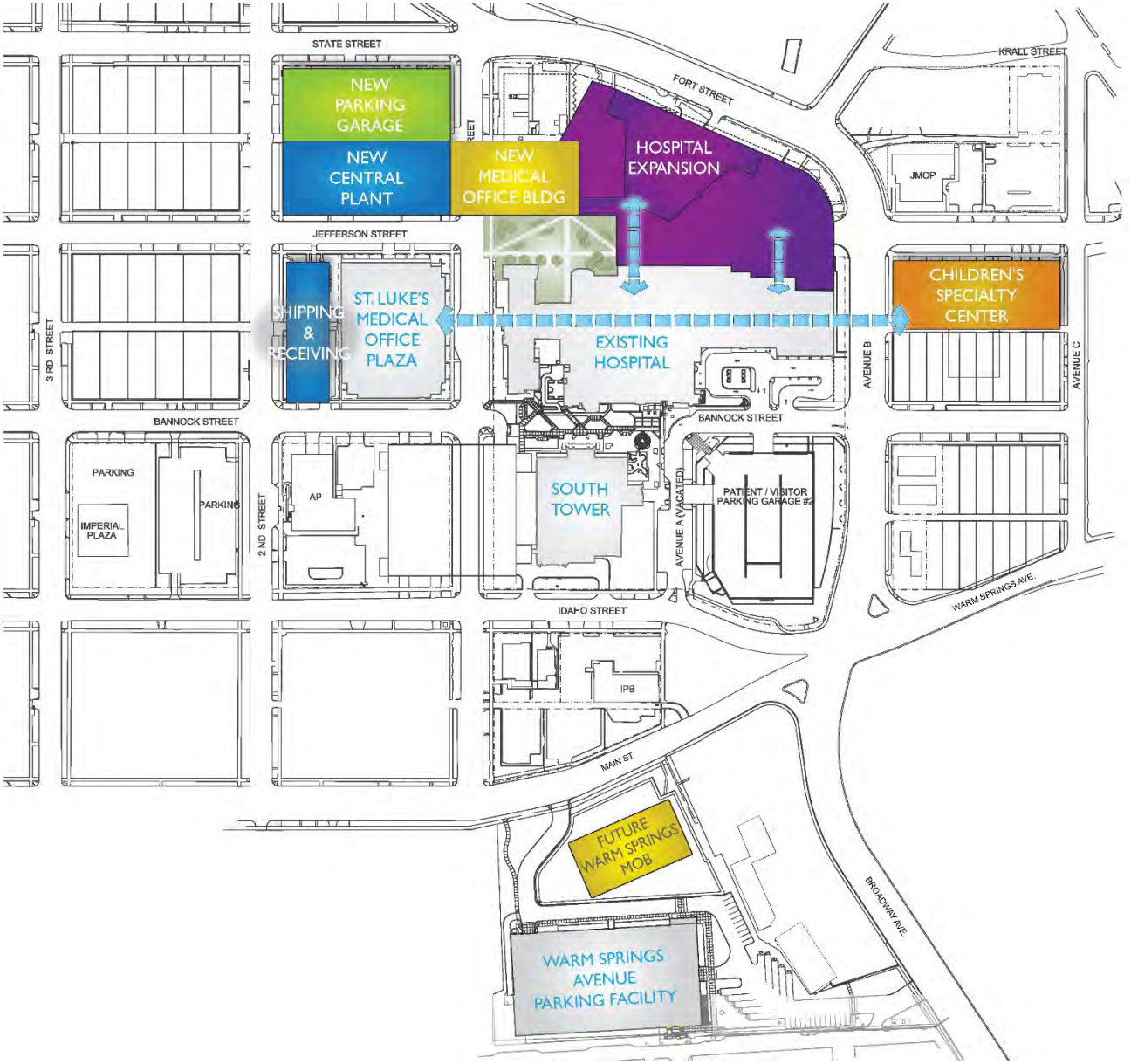
FIGURE 4
Potential St. Luke's facility west solution for expansion



5. **Expand Across Jefferson and 1st Street (Expansion North).** As proposed in this document, this alternative is based on densification of the current facility by developing internally, or, as it has also been called, expanding the hospital to the north. This option requires vacation of Jefferson Street from Avenue B to 2nd Street. Jefferson Street would be completely closed to traffic from Avenue B to 1st Street to accommodate expansion of the hospital across Jefferson from the basement level upward at this location. From a regional perspective, access to the facility is simple from I-84 via Broadway Avenue, and State Street brings visitors directly from the west to the hospital's door. Local north-south and east-west traffic not destined for the hospital is minimal through this already compact, dense facility space. Further opportunities to improve bicycle/pedestrian connectivity and circulation exist and will be examined herein.

FIGURE 5

Potential St. Luke's facility north solution for expansion



SECTION 2

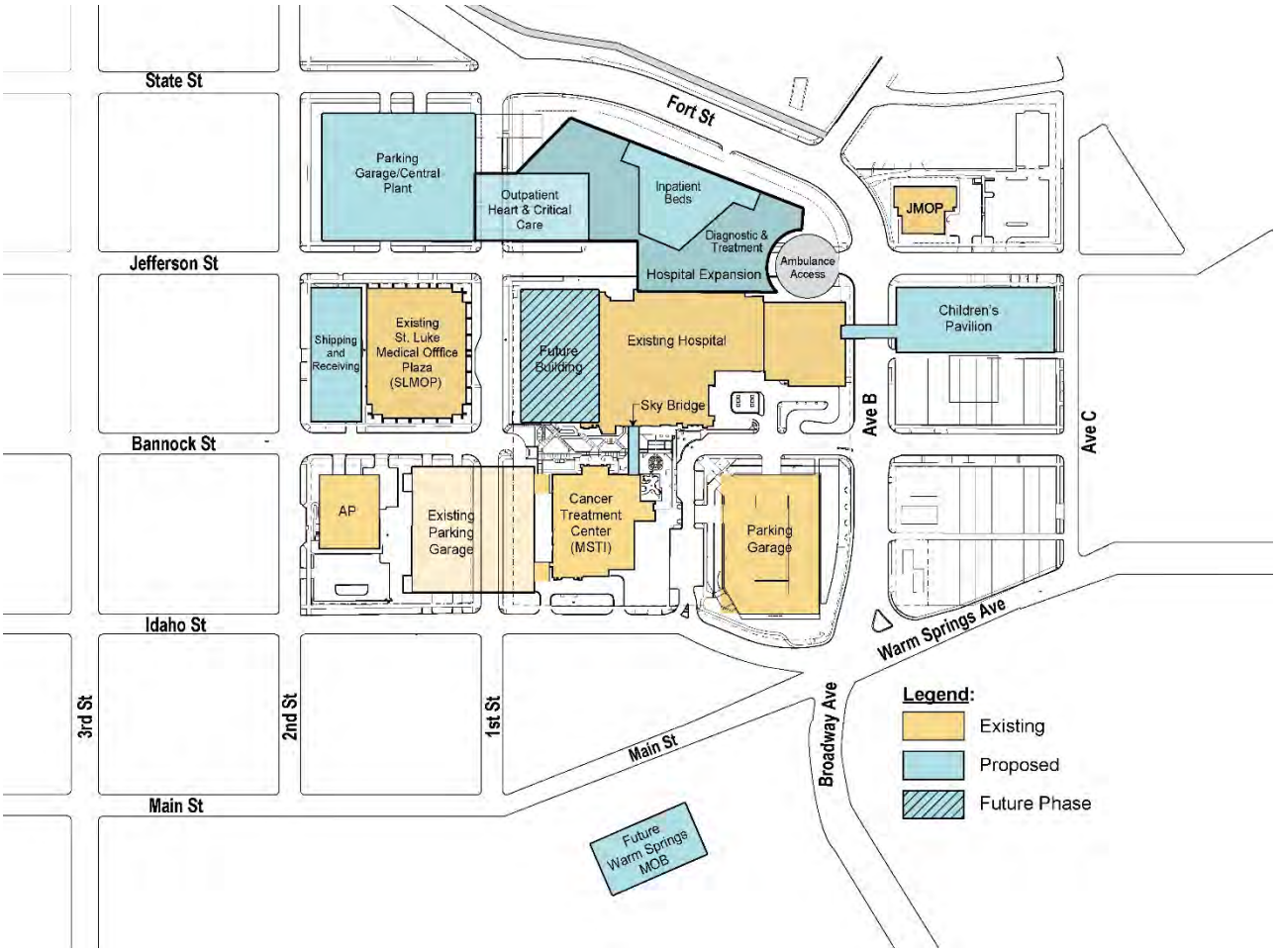
Proposed Development

As noted previously in Figure 1, the existing St. Luke's site is situated northeast of downtown Boise and generally extends from 2nd Street east to Avenue B and from Main Street north to the State Street/Fort Street corridor. A few private ownerships exist within the hospital facility area, but they have been or are being converted to medical support facilities. Other support facilities are adjacent to the hospital area, such as the parking garage south of Main Street, two medical office buildings on the east side of Avenue B, and several medical office buildings west of the facility on 2nd Street. The proposed site is situated primarily adjacent to and north of the existing medical center facilities, as shown in Figure 6. Facility expansion, as planned within the scope of the Master Plan, has been segmented into the following five facilities:

- Children's Pavilion
- Downtown Hospital Expansion
- Parking Garage/Central Plant
- Shipping & Receiving
- Warm Springs Medical Office Building

Each of these facilities (described in detail below) is critical to future facility operations and patient services.

FIGURE 6
Proposed St. Luke's Site Improvements



2.1 Children's Pavilion

The Children's Pavilion will be located on the southeast corner of the Jefferson Street and Avenue B intersection. An 85,000-square-foot, four-story office building is planned with 300 underground parking stalls. The Children's Pavilion has previously been addressed in a Traffic Impact Study for Guho Corporation by Stanley Consultants, dated March 18, 2009. The scope of the development and size of the building has changed only moderately since the previous study. Access to and from the site will be by way of Avenue B and Jefferson Street. The existing traffic signal at Jefferson Street and Avenue B will facilitate patient ingress and egress. Access to the building and parking facilities will be from Jefferson Street and Avenue C. The Children's Pavilion is anticipated to be the first improvement completed, with construction anticipated to begin in early 2015.

2.2 Downtown Hospital Expansion

The existing downtown expansion is planned south of Fort Street and east of 1st Street to accommodate growth for existing hospital departments, the treatment of heart/vascular patients, a clinic for women and children, and medical surgical supplies. The hospital expansion will be approximately 357,000 square feet, and include 210 beds, surgical space, doctor offices, and treatment facilities. Development of this concept for hospital expansion is based on the ability to vacate and close Jefferson Street from Avenue B to 1st Street. Vacation of Jefferson Street from Avenue B to 1st Street is necessary to provide direct connection to the existing medical center central lobby, emergency response and surgery facilities, and to eliminate duplication of facilities. Vacation is also requested for Jefferson Street between 1st and 2nd Streets to accommodate concentrated hospital traffic and extensive use of underground space along Jefferson Street to accommodate Central Plant tunnels. Though vacation is requested on Jefferson Street between 1st and 2nd Streets, this block of Jefferson Street would remain open to traffic. A third-level connection will be provided between the hospital and the proposed parking garage to the west over 1st Street. Patient pick-up and drop-off access will be provided on the west side of the hospital via 1st Street just south of the Fort Street/1st Street/State Street intersection, and directly across from the patient access to the parking garage on the west side of 1st Street. The existing offices located onsite will be relocated to other St. Luke's facilities offsite. The majority of users on 1st Street between Bannock and State Streets will be St. Luke's staff and visitors while below grade, utility tunnels will carry both utilities and supplies. Proposed construction for this improvement would be complete by approximately 2021.

2.3 Parking Garage/Central Plant

A 1,200-stall parking garage is proposed between State and Jefferson streets on the west side of 1st Street. Walker Parking Consultants has conducted a parking study for St. Luke's in conjunction with the master plan activities. A summary of parking recommendations can be found in Appendix A. The existing Central Plant and individual medical office buildings on this site will be relocated to accommodate the parking garage. The Shipping and Receiving portion of the Central Plant will be moved to the block south of Jefferson while the equipment will be incorporated into the south half of the parking garage. The Central Plant will take up the south half of the first floor of the parking garage and the subfloor, down to approximately 20 feet below grade. The Central Plant generates no normal vehicular trips on a daily basis that will impact the existing roadway system. The garage will provide additional parking spaces in the northwest quadrant of the medical facility to serve existing parking needs and the proposed new facilities. Primary access to the parking garage for visitors and patients will be via 1st Street and secondary access for staff will be by way of 2nd Street. The primary access will be located directly west of the new hospital drop-off area. Direct pedestrian access from the garage back to the hospital will be provided at the ground floor level, as well as at the 3rd floor through an office space bridge connecting the hospital to the garage over 1st Street.

The Central Plant will be constructed concurrent with the hospital expansion and the parking garage, and be complete by approximately 2021.

2.4 Shipping and Receiving

The Shipping and Receiving facility will be located on the south side of Jefferson Street and the east side of 2nd Street. This part of the current Central Plant facility is being separated in order to accommodate delivery truck access, office space, and access to utility and supply tunnels in and across Jefferson Street. Access and loading and drop-off by delivery trucks will occur off of Jefferson Street, just east of 2nd Street. The alley will remain open so that trucks can continue through to Bannock Street. Of the 25,000 square feet of total space, approximately 15,000 square feet have been identified as office space and included in the trip generation calculations. The Shipping and Receiving facility also will be complete by approximately 2021.

2.5 Warm Springs Medical Office Building

The Warm Springs Medical Office Building will be located south of Main Street, between Broadway Avenue and 1st Street, and just north of the existing parking garage. The building will accommodate 100,000 square feet of physician offices, exam rooms, and minor outpatient services. Primary access will be via Main Street while secondary access will be available at Broadway Avenue. The Warm Springs Medical Office Building is expected to be constructed by 2023.

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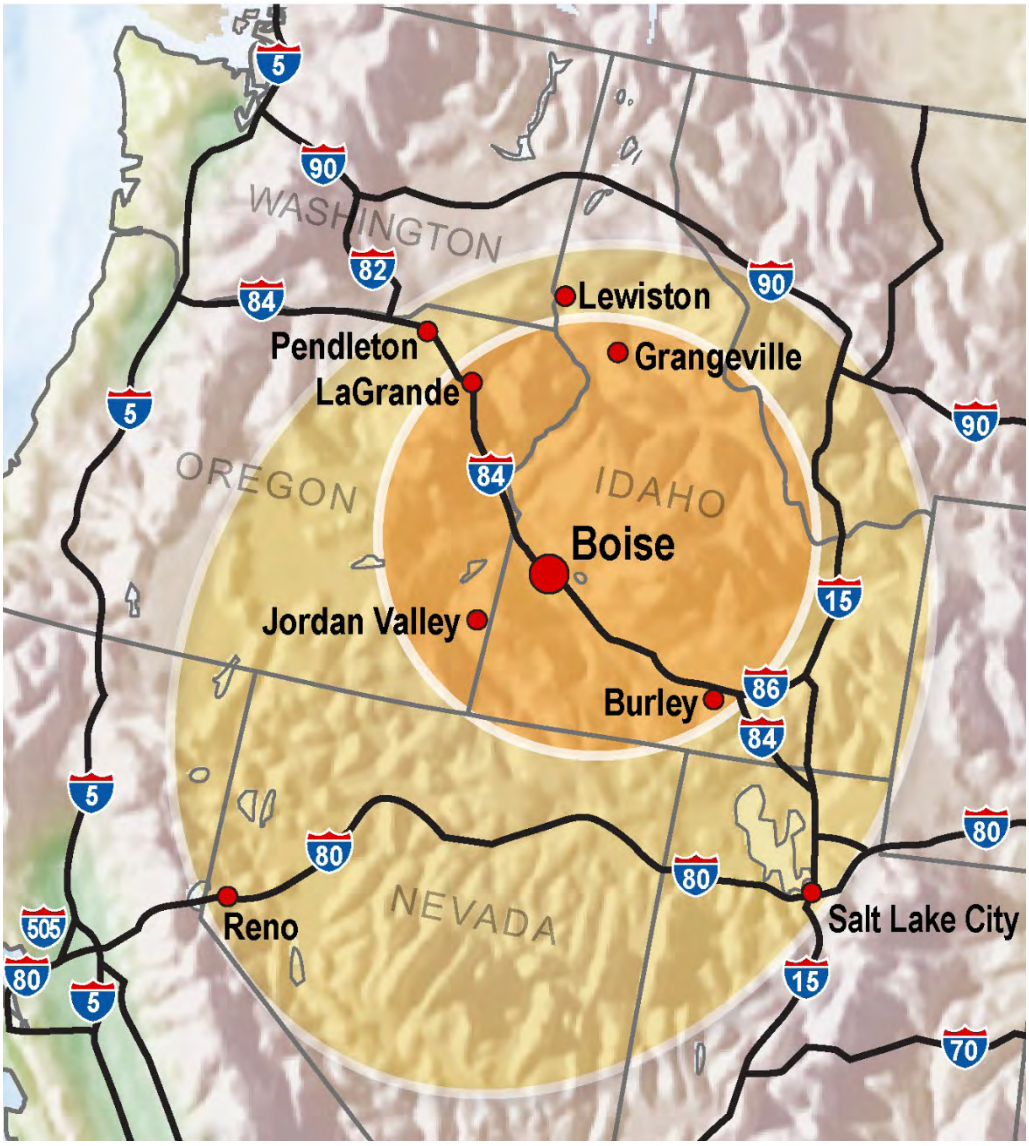
SECTION 3

Study Area Parameters

St. Luke's provides services to a vast area as indicated by Figure 7. The region generally served is approximately half-way between Boise and the next tertiary medical center[1]. In this regard, the St. Luke's service area of influence extends east to Burley, Idaho (Salt Lake City service beyond), Grangeville to the north (Lewiston service beyond), La Grande, Oregon, to the west (Pendleton service beyond), and Jordan Valley, Oregon, to the southwest (Reno service beyond). Access to and from St. Luke's Boise facility will largely occur using the Interstate system, as well as State Street, and connect to streets such as Broadway Avenue, Front Street, and Myrtle Street.

FIGURE 7
St. Luke's Service Area

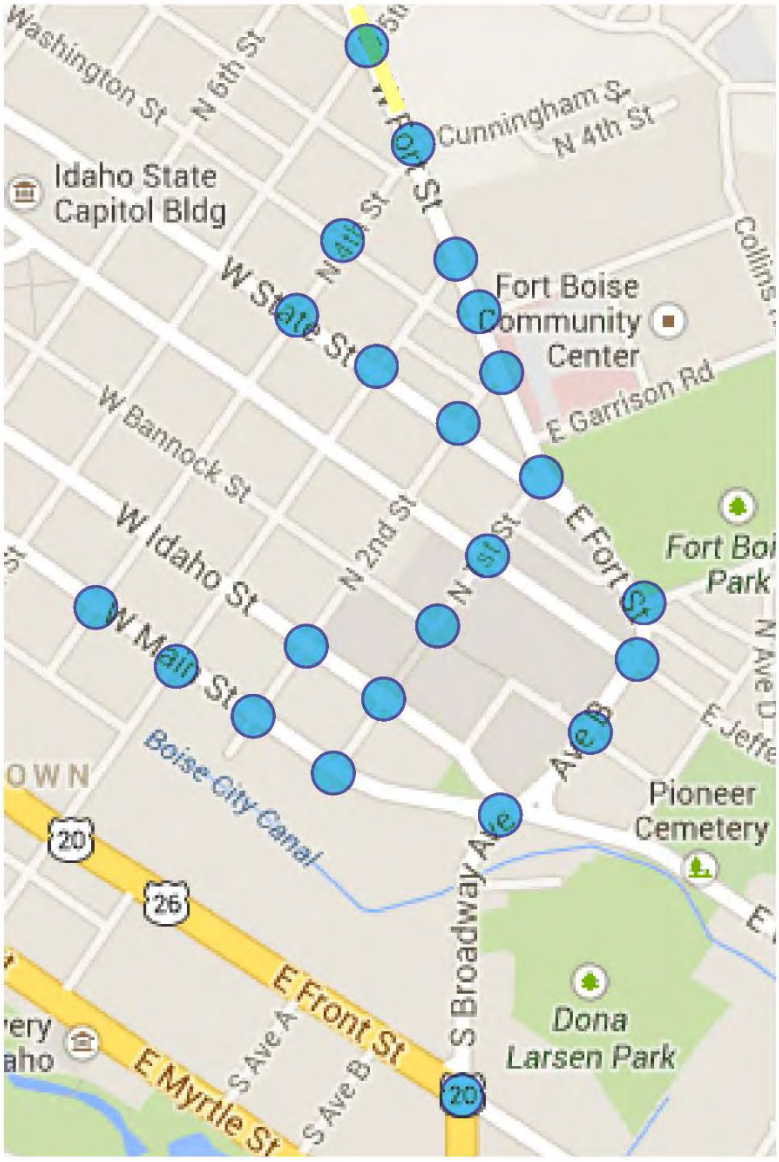


[1] A tertiary medical center has the ability to provide highly specialized medical care, usually over an extended period of time that involves advanced and complex procedures and treatments performed by medical specialists in state-of-the-art facilities.

3.1 Study Area Intersections

Generally the study area is bounded by Fort Street and State Street to the north, 5th Street to the west, Main Street and Idaho Street to the south, and Avenue B to the east. Specific intersections located within the study area are identified in Figure 8.

FIGURE 8
Study Area Intersections

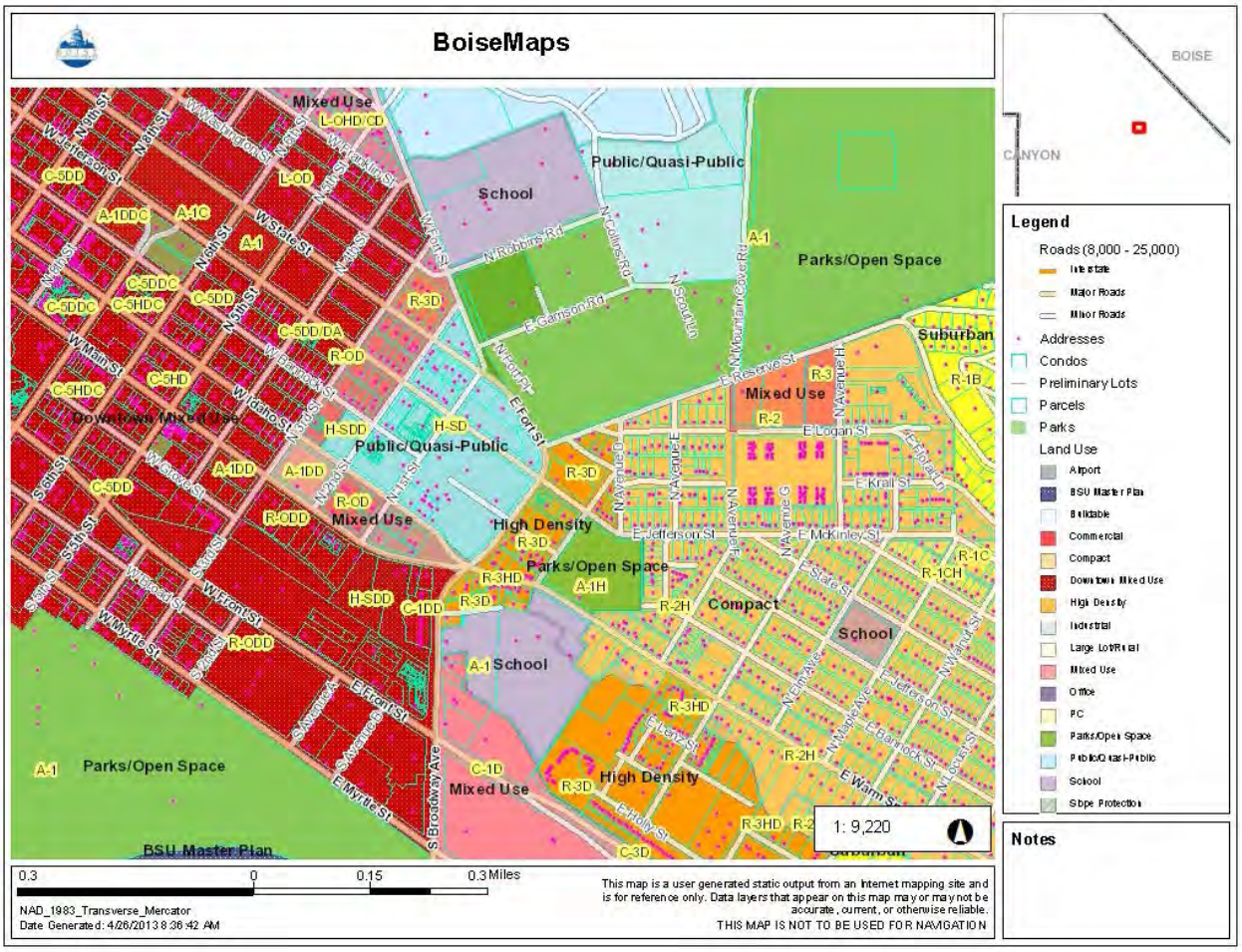


The proposed study area was reviewed and accepted by ACHD prior to study development.

3.2 Study Area Land Use

The St. Luke's hospital facility area is zoned H-SD, Health Services and is identified as a Public/Quasi-Public space. Figure 9 is a current Boise City Zoning Map. St. Luke's is directly surrounded by high density residential on the southeast, known locally as the East End; parks and open space on the northeast, specifically the Fort Boise and Military Reserve area; school and government on the north; downtown mixed use on the west; and mixed use and school to the south.

FIGURE 9
Boise Zone Map



Being located at the edge of downtown and adjacent to several other land uses creates an opportunity for development and growth for the City and St. Luke's. The facility is close to potential housing for staff, recreation areas, schools, and the downtown core, making it a desirable area in which to live and work all within 1 mile of the hospital facility area.

3.3 Other Project Coordination

In September of 2013, ACHD adopted the recommendations of the original DBIP. The goal of the plan was to coordinate planned improvements in the downtown area so as to impact workers, residents, and visitors to downtown Boise as little as possible. As noted in the Executive Summary, the DBIP, led by ACHD, was a collaborative effort including the input of the City of Boise and Capitol City Development Corporation, as well as VRT and the DBA. ACHD and its partners are currently working on an update to the adopted DBIP. The first public open house was held March 13, 2014 and a pilot project temporarily testing the impacts of some of the proposed changes in the current DBIP was completed in May and June. This TIS has been modified to reflect the proposed changes in the updated DBIP, though it is recognized that the proposed changes have not been adopted.

In addition to the work done as part of the DBIP, the City of Boise is currently reviewing the land use north and northeast of the St. Luke's facility. The City would like to see the area develop and is exploring opportunities with current property owners. In light of this effort, the St. Luke's team is working with City planners and ACHD to ensure connectivity related to adjacent development. The City planning effort will

take into account increased growth in the area, the impact on the existing transportation and bicycle networks, and potential improvements to those networks. Understanding that the City's plans may be further in the future than the current St. Luke's plan, the St. Luke's goal is to not preclude any City growth or improvement opportunities with its own expansion and mitigation plans.

A significant part of the adopted and the updated DBIP includes conversion of one-way streets to two-way and modification and expansion of the downtown bicycle network. The conversion of one-way streets to two-way streets has been incorporated into the planning model used by St. Luke's for this TIS. Similarly, the expanded and proposed updated bicycle network has been incorporated into the planning process. Expansion of the St. Luke's facility incorporates opportunities to connect into the currently planned network and to enhance cycle travel through increased safety and improved route continuity. The current bike network is discussed in further detail in Section 5: Existing Conditions, and new opportunities for linkages are discussed in Section 6: Future Conditions.

SECTION 4

Study Periods

ACHD traffic impact policy typically requires a traffic analysis for the anticipated year of opening, meaning start of construction, and a build-out analysis if improvements are to be staged over a period of several years. The proposed construction for St. Luke's would begin in early 2015 and continue over approximately 7 years. The first phase is defined when 100 percent of the proposed facilities have been completed but are only about 70 percent utilized. Phase 1 operations are anticipated to commence around 2021 and be up to the 70 percent utilization by 2024. Facility sizing is based on space required to serve projected growth up to 2035, otherwise considered as full build-out. It is anticipated that increase in staff and patient numbers will be a linear progression starting with the completion of the Children's Pavilion and continuing to full capacity, estimated in 2035. As such, existing (2013), 2024, and 2035 (build-out) conditions are examined in this review. The A.M. and P.M. peak-hour medical center traffic is fairly balanced; however, the critical background traffic condition occurs mainly in the P.M. peak hour. For purposes of this review, and as required by ACHD, both A.M. and P.M. peak hours have been examined.

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SECTION 5

Existing Conditions

5.1 Roadway System

The existing roadway system serving the area is described as follows:

- Avenue B is a minor arterial with four lanes with left-turn lanes at intersections and a traffic signal at Jefferson Street.
- State Street is a two-lane minor arterial (to 15th Street) that terminates at Fort Street/1st Street. A traffic signal exists at this location and just beyond the study area at 5th Street.
- Fort Street is an urban two-lane collector located northwest of the area. Traffic signals exist at Washington Street/Robbins Road and 5th Street.
- Main Street and Idaho Street are one-way minor arterials that converge at Broadway Avenue/Avenue B/Warm Springs Boulevard with a traffic signal at their intersection.
- Broadway Avenue is a multi-lane minor arterial that terminates at the previously noted intersection. It becomes a principal arterial south of Front Street.
- Warm Springs Avenue and Jefferson Street are two-lane minor arterials.
- Reserve Street and 1st through 4th streets are two-lane urban collectors.

The only site access constraints are the traffic volume limitations placed on east Warm Springs Avenue by the residents of that area in their discussions with ACHD. The project area is in full use and occupied with no vacant properties. The existing Idaho Transportation Department (ITD) automatic traffic recorder (ATR) Stations on Warm Springs Avenue and Parkcenter Boulevard indicate a small transfer of traffic from Warm Springs Avenue with completion of the East Parkcenter Bridge in September 2009. The data from these ATR reports are included in Appendix B. The Warm Springs Avenue Station has data available through 2012 and indicates that approximately 2,000 fewer vehicles are using Warm Springs Avenue on a daily basis since construction of the East Parkcenter Bridge.

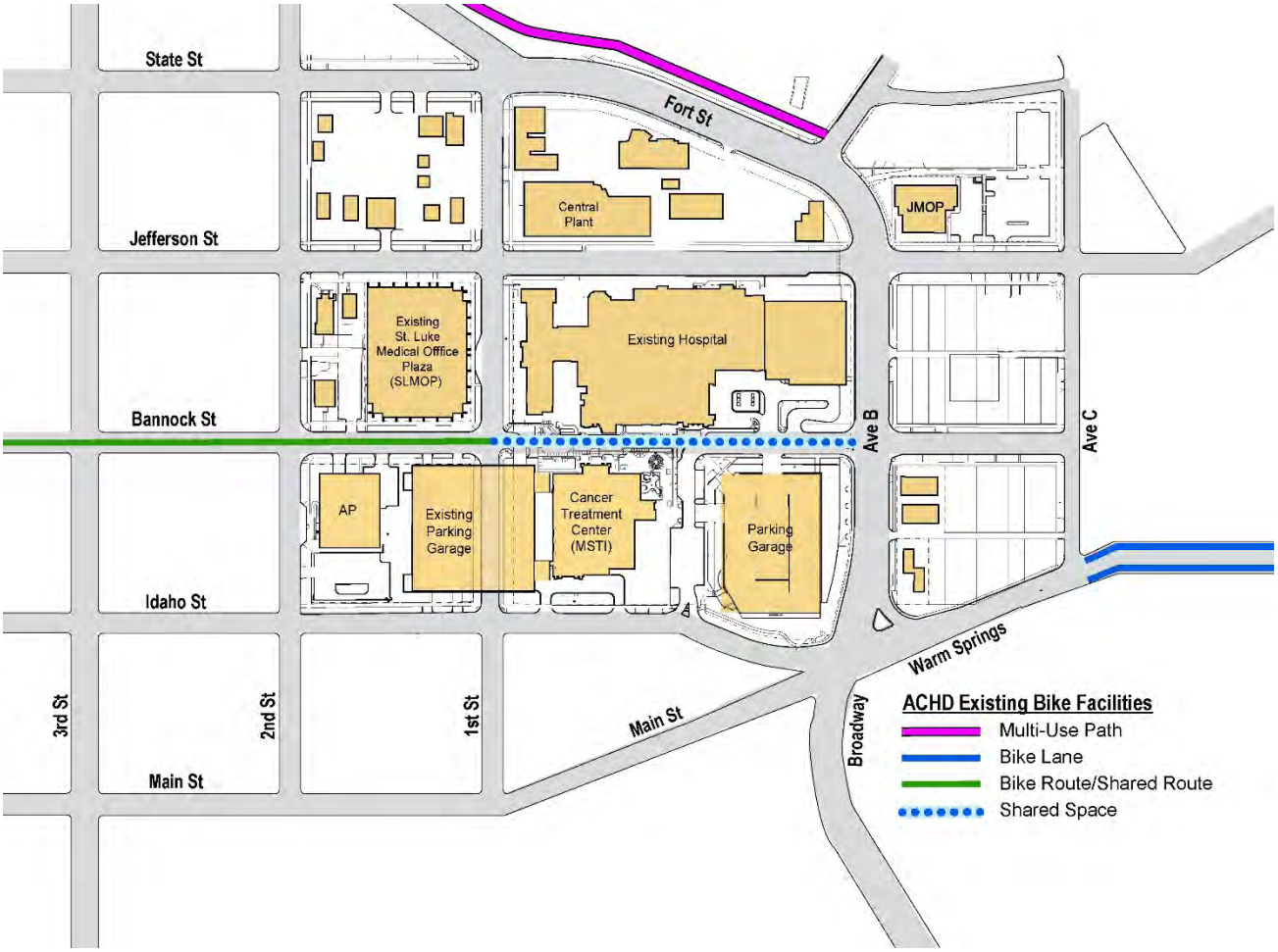
At the study area southeastern limits, the southbound Broadway Avenue right turn at Front Street experiences excessive vehicle queuing because of the heavy right-turn in the P.M. peak hour and conflicting pedestrian access across Front Street. The ultimate improvement at this location may include a longer southbound right-turn lane on Broadway Avenue and/or channelization islands to facilitate right-turn maneuvers and improve protection of pedestrians. This condition will be further examined in the subsequent traffic analysis performed in Section 7.0.

5.2 Bicycle and Pedestrian System

The existing bicycle and pedestrian network in this vicinity has been identified for improvement in the DBIP. At the time of the writing of this TIS, components of the existing network include:

- A multi-use path on the north side of Fort Street from Reserve Street to 6th Street
- A shared on-street bike route on Bannock, beginning at 1st Street and continuing to the west
- A dedicated bike lane on Warm Springs Avenue beginning at Avenue C and continuing east
- Existing sidewalks are prevalent on both sides of the street throughout the study area

FIGURE 10
Existing Bike Facilities



5.3 Traffic Volumes

A thorough data collection effort was undertaken to establish baseline traffic conditions. Existing turn movement counts (TMCs) were collected by L2 Data Collection for both the A.M. and P.M. peak hours. To capture peak-hour conditions, counts were recorded during the weeks of April 23, 2013, and April 30, 2013, from 7:00 A.M. to 9:00 A.M. and from 4:00 P.M. to 6:00 P.M. TMCs available through ACHD's existing traffic count database were used to supplement this data. Table 1 summarizes these locations by source.

TABLE 1
Existing Traffic Count Locations

#	Intersection	A.M.	P.M.
1	Fort/4th	L2 Data	L2 Data
2	Fort/3rd	L2 Data	L2 Data
3	Fort/2nd	L2 Data	L2 Data
4	Washington/4th	L2 Data	L2 Data
5	State/4th	L2 Data	ACHD
6	State/3rd	L2 Data	ACHD

TABLE 1
Existing Traffic Count Locations

#	Intersection	A.M.	P.M.
7	State/2nd	L2 Data	xxxx
8	State/Fort	ACHD	ACHD
9	Fort/Reserve	ACHD	ACHD
10	Jefferson/4th	xxxx	L2 Data
11	Jefferson/3rd	xxxx	L2 Data
12	Jefferson/2nd	xxxx	L2 Data
13	Jefferson/1st	L2 Data	L2 Data
14	Jefferson/Ave B	ACHD	ACHD
15	Bannock/4th	xxxx	L2 Data
16	Bannock/3rd	xxxx	L2 Data
17	Bannock/2nd	xxxx	L2 Data
18	Bannock/1st	L2 Data	L2 Data
19	Bannock/Ave B	L2 Data	L2 Data
20	Idaho/4th	xxxx	L2 Data
21	Idaho/3rd	xxxx	ACHD
22	Idaho/2nd	L2 Data	L2 Data
23	Idaho/1st	L2 Data	ACHD
24	Idaho/Ave B/Main/Broadway	ACHD	ACHD
25	Main/4th	L2 Data	L2 Data
26	Main/3rd	L2 Data	ACHD
27	Main/2nd	L2 Data	L2 Data
28	Main/1st	L2 Data	ACHD
29	Fort/Robbins/Washington	L2 Data	ACHD
30	Broadway/Front	ACHD	ACHD

xxxx – Not Modeled/Counted

As existing counts were recorded over a span of several days and by different sources, some data balancing between intersections was necessary. These existing peak-hour traffic volumes are illustrated in Figure 11.

FIGURE 11
Existing Peak Hour Traffic Volumes

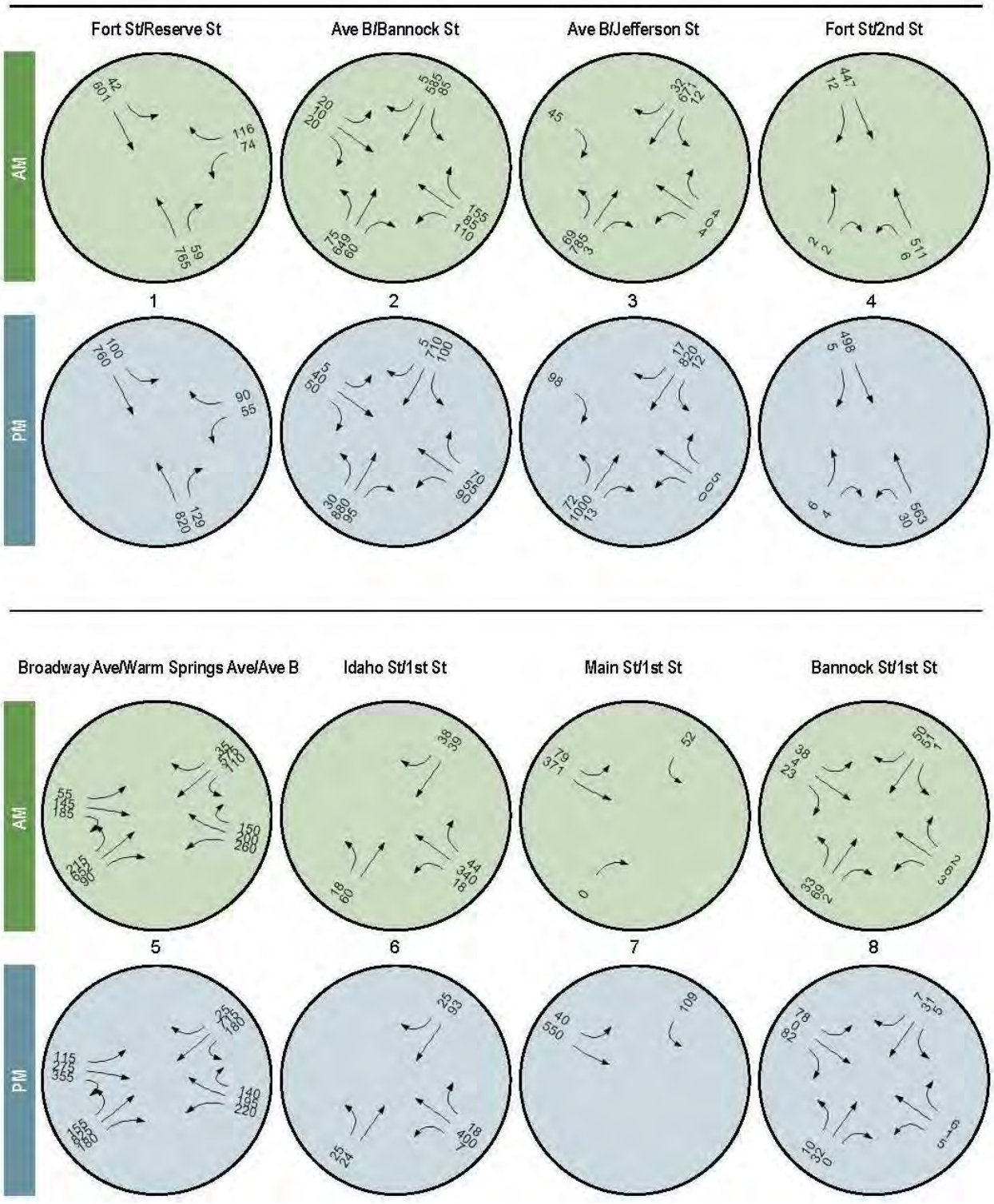
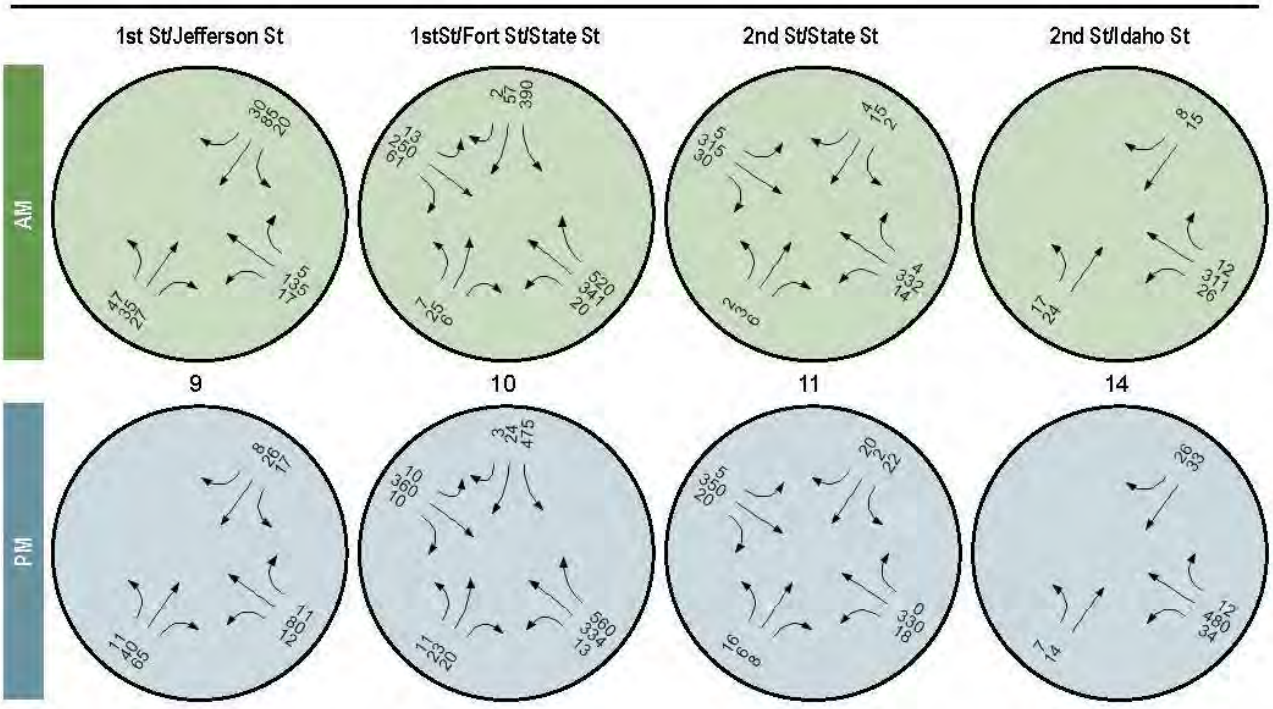


FIGURE 11 (CONTINUED)
Existing Peak Hour Traffic Volumes



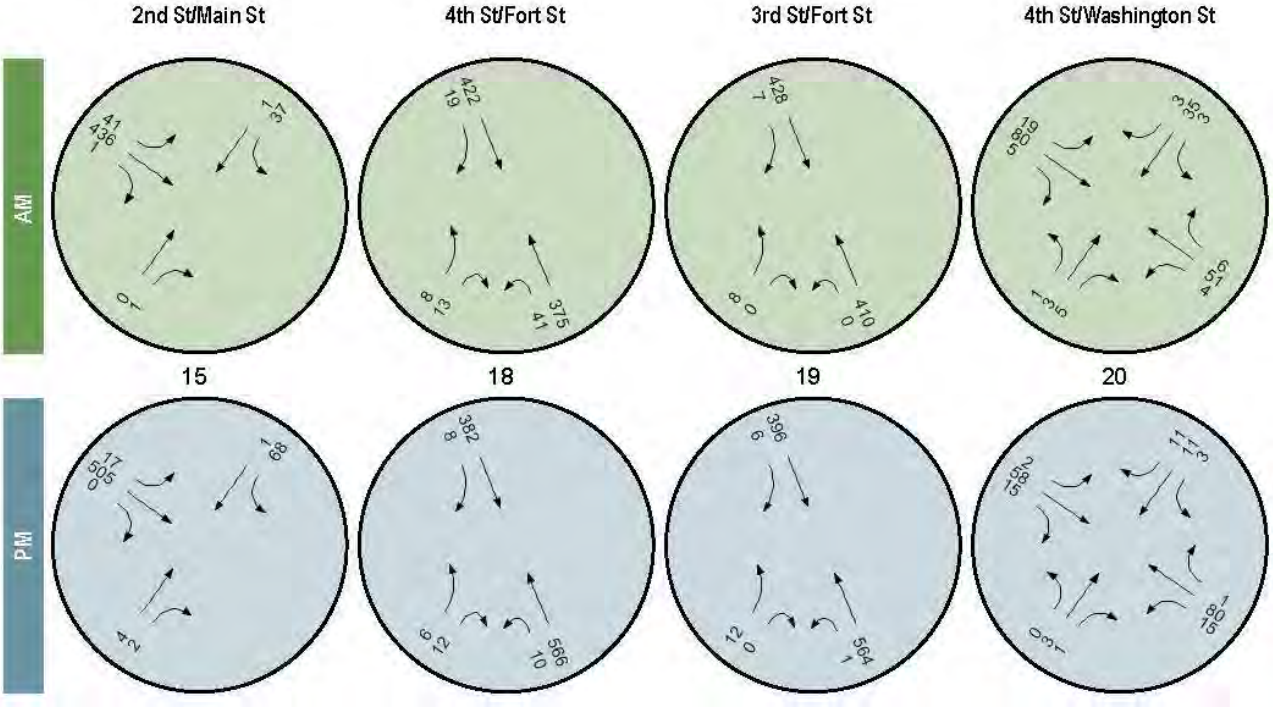
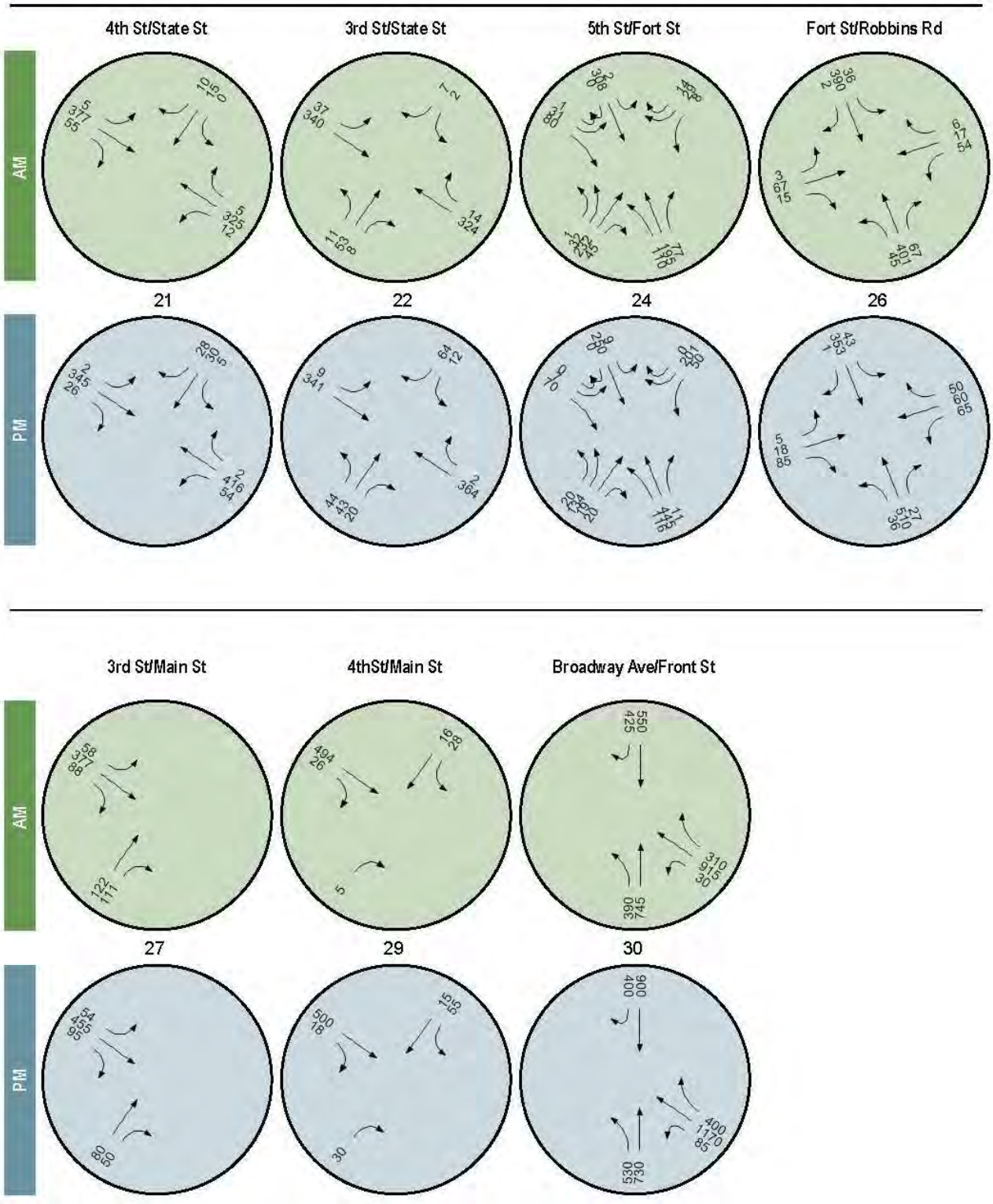


FIGURE 11 (CONTINUED)
Existing Peak Hour Traffic Volumes



Daily counts and peak-hour directional counts were also secured from ACHD online resources. Table 2 summarizes these results and the dates recorded.

TABLE 2
Existing Daily and Directional Traffic Counts

Location	Date	Daily Volume	A.M. Peak Hour	P.M. Peak Hour
Broadway (north of Front Street)	June 28, 2012	31,224	NB908/SB877	NB115/SB1197
Broadway (north of Myrtle Street)	Oct 26, 2010	29,734	NB817/SB719	NB819/SB1451
Avenue B (south of Jefferson Street)	Sept 2, 2009	23,920	NB753/SB711	NB965/SB976
Fort (east of State)	May 19, 2011	20,933	EB544/WB901	EB913/WB890
Warm Springs (east of Broadway)	Jul 12, 2012	13,266	EB210/WB442	EB567/WB574
Idaho (east of 1st)	Feb 15, 2012	5063	WB344	WB387
Jefferson (west of 2nd)	Aug 7, 2013	1532	WB105	WB168
1st (north of Idaho)	Aug 25, 2010	2132	NB83/SB83	NB62/SB80
1st (south of State)	Jan 31, 2006	1892	NB41/SB109	NB49/SB63
2nd (north of Idaho)	Feb 10, 2011	1601	NB27/SB51	NB15/SB65
2nd (south of State)	Jul 8, 2010	3299	NB52/SB37	NB173/SB94
Reserve (east of Fort)	Aug 1, 2013	4637	EB102/WB98	EB227/WB122

The proposed closure of Jefferson Street would reroute both through and local access traffic. To quantify the amount of through traffic that would be diverted, an origin-destination study in the form of a license plate survey was conducted on Tuesday, October 4, 2011, from 6:00 A.M. to 9:00 A.M. and from 3:00 P.M. to 6:00 P.M. Recording stations were located on Jefferson Street, west of Avenue B and west of 2nd Street, and on 1st Street, north of Main Street and north of Jefferson, to capture through vehicular traffic volume. Resultant counts indicated that through traffic demand was light along both streets, ranging from 11 to 16 percent on 1st Street and 11 to 14 percent on Jefferson Street during these time periods. These volumes suggest that Jefferson Street and 1st Street in the vicinity of the medical center mostly serves medical center employees, patrons, and patients.

Traffic count summaries and results of the license plate survey are included in Appendix B.

5.4 Bicycle and Pedestrian Volumes

Bicycle and pedestrian counts were taken at several different dates throughout project development. Figure 12 provides a summary of these counts and records the dates. Morning counts were obtained between 7:00 A.M. and 9:00 A.M., and evening counts were obtained between 4:00 P.M. and 6:00 P.M.

FIGURE 12
Bike and Pedestrian Counts

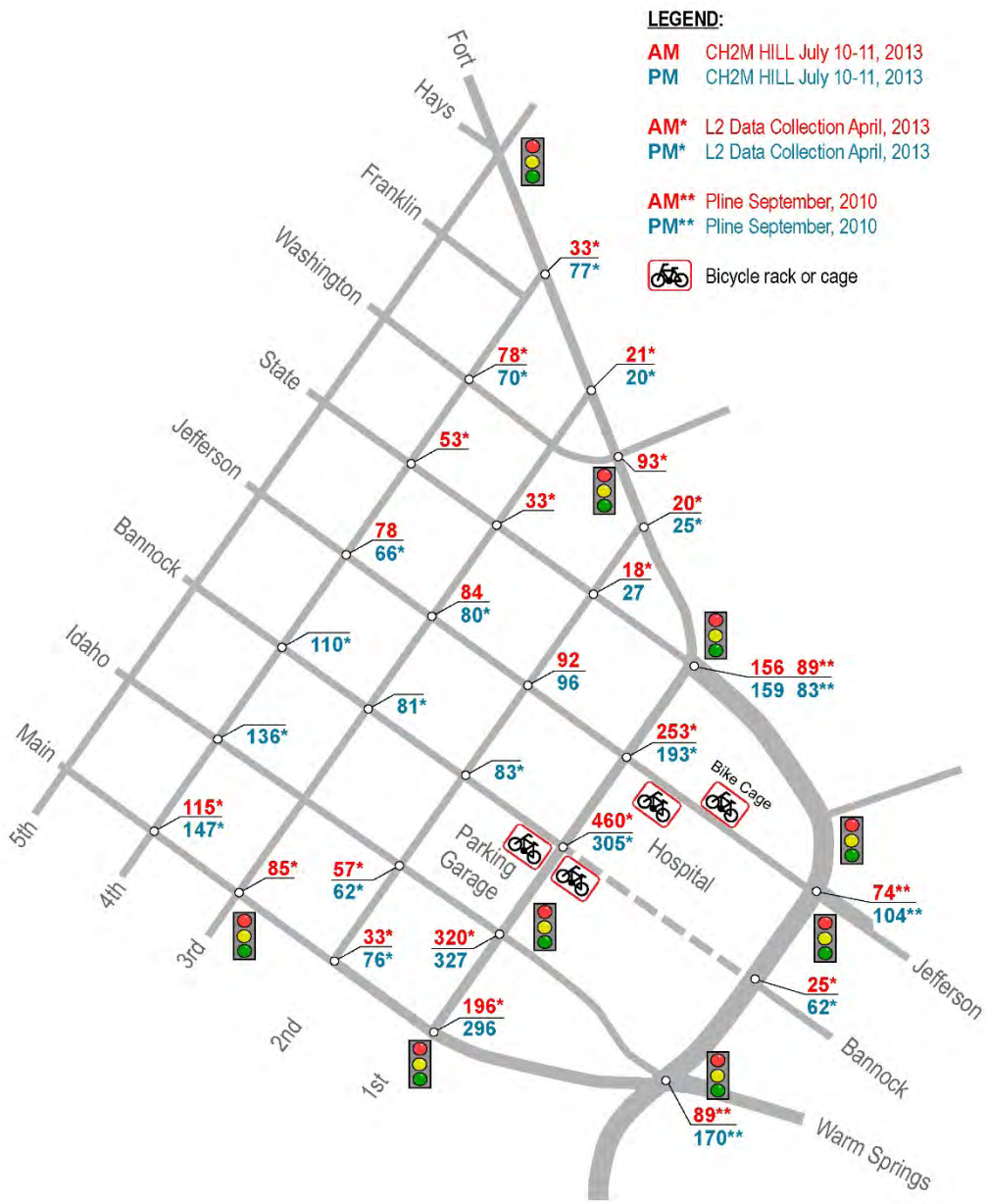
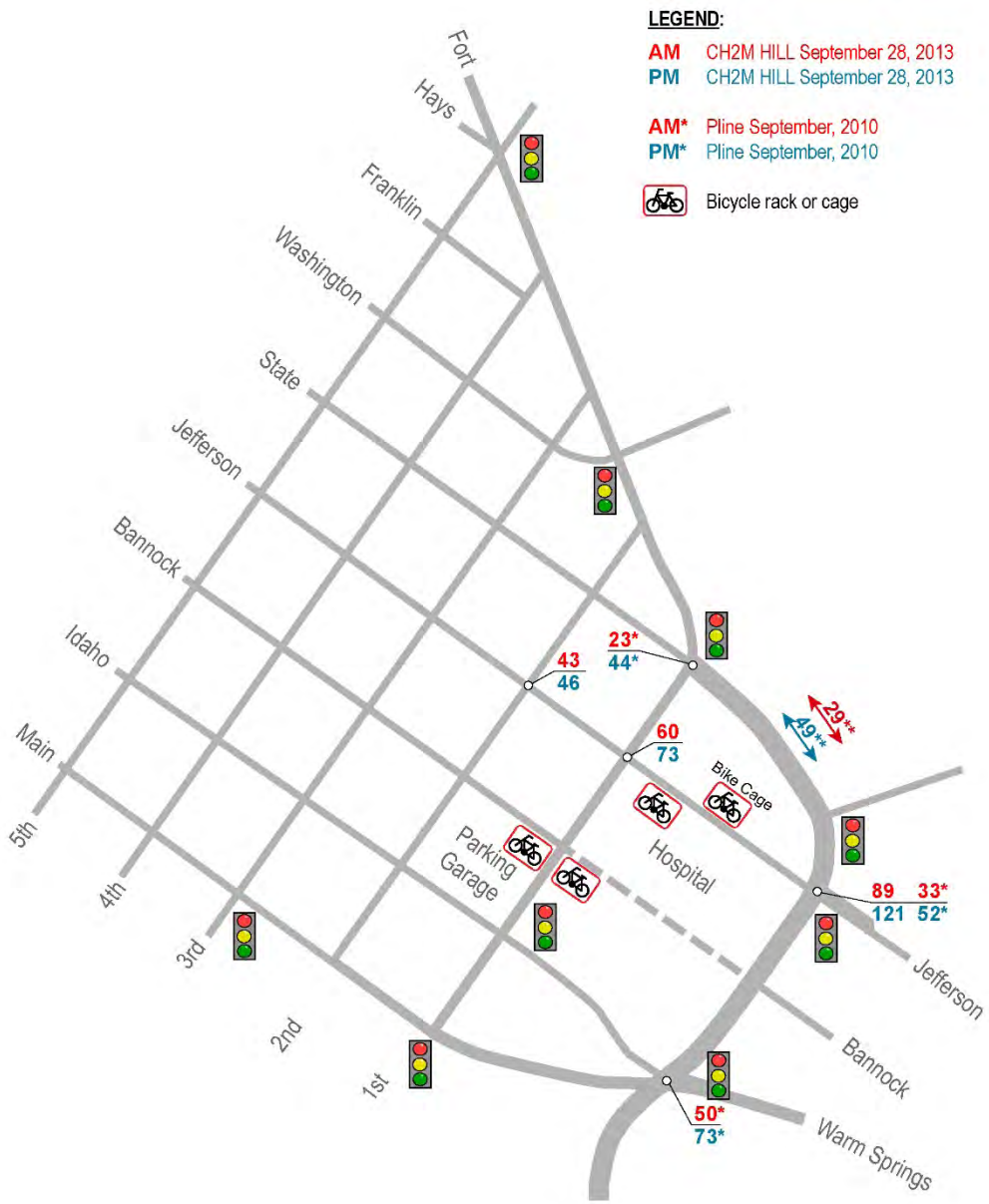


Figure 13 shows overall bicycle-only volumes (no pedestrians included) recorded by Pline Engineering, Inc. and CH2M HILL. The numbers represent cyclists approaching the intersection from all directions.

FIGURE 13
Bicycle Volume



On September 28, 2013, CH2M HILL conducted an additional bicycle-specific count. This turn movement count was focused solely on cyclists commuting to and through the St. Luke's facility, along Jefferson Street in particular. Figures 14 and 15 show the total number of riders in the intersections, including approaches from all directions, as well as the number of riders who passed all the way through the facility on Jefferson Street. The definition used for "through the facility" was between the east side of the intersection of Jefferson Street and 2nd Street to the west side of the intersection of Jefferson Street and Avenue B. The figures are split between morning and afternoon peaks; as with the overall counts above, the counts were recorded from 7:00 A.M. to 9:00 A.M. and from 4:00 P.M. to 6:00 P.M.

FIGURE 14
A.M. Peak Count – Bicycles on Jefferson through Facility

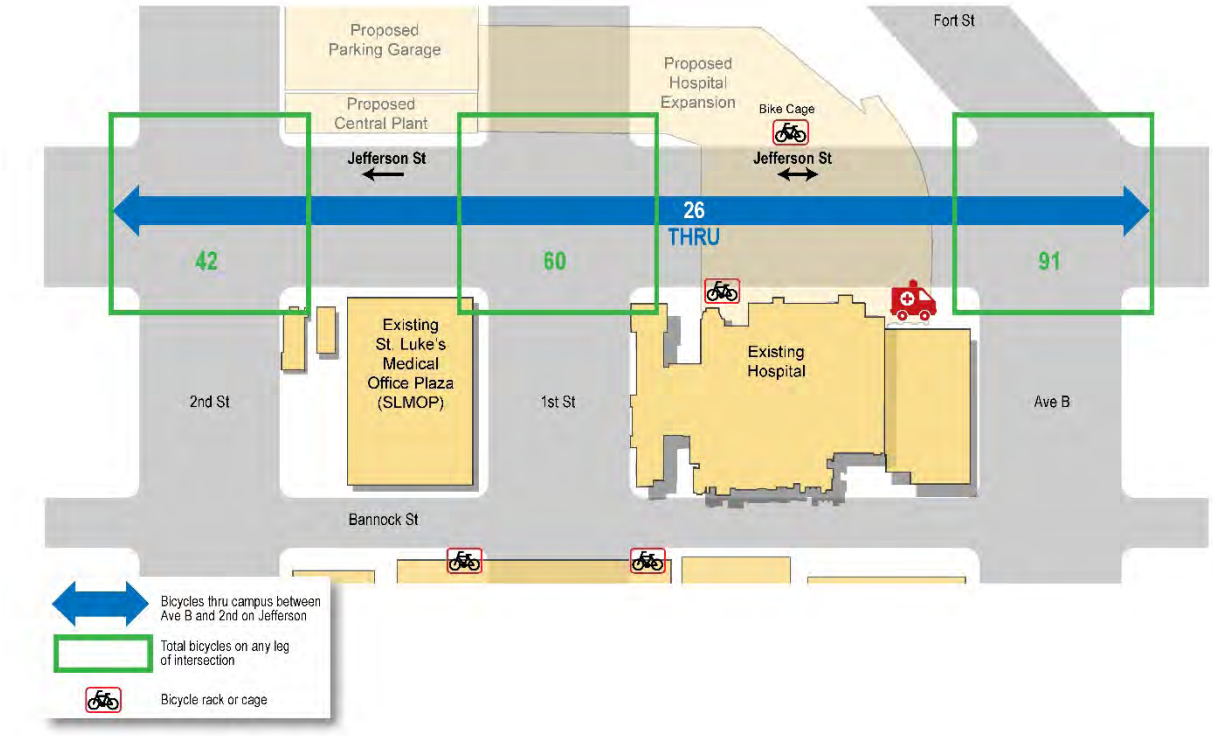
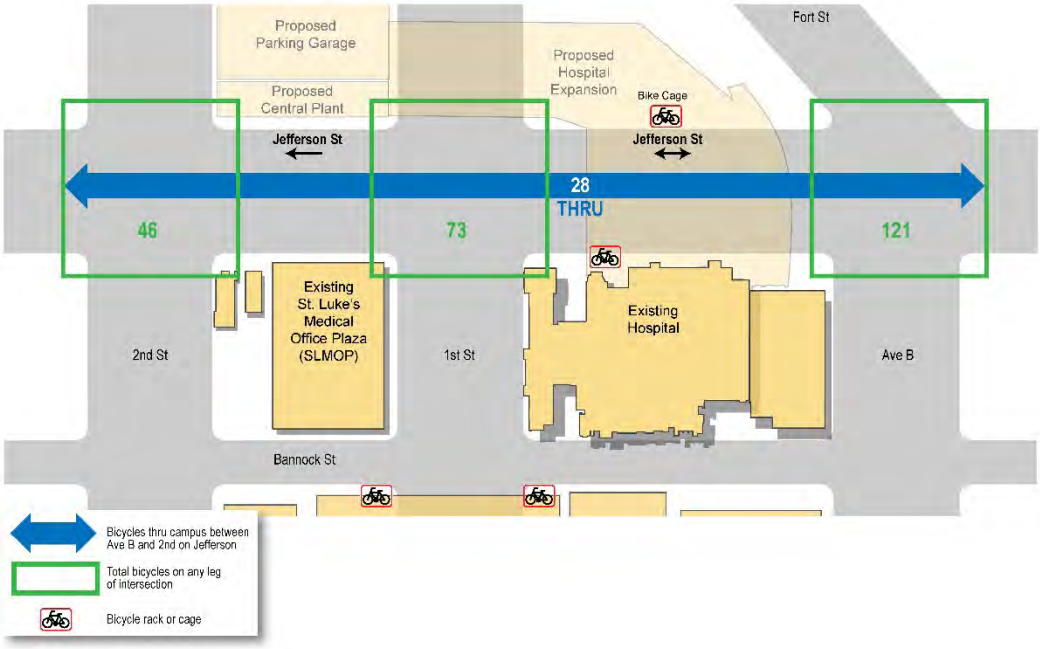


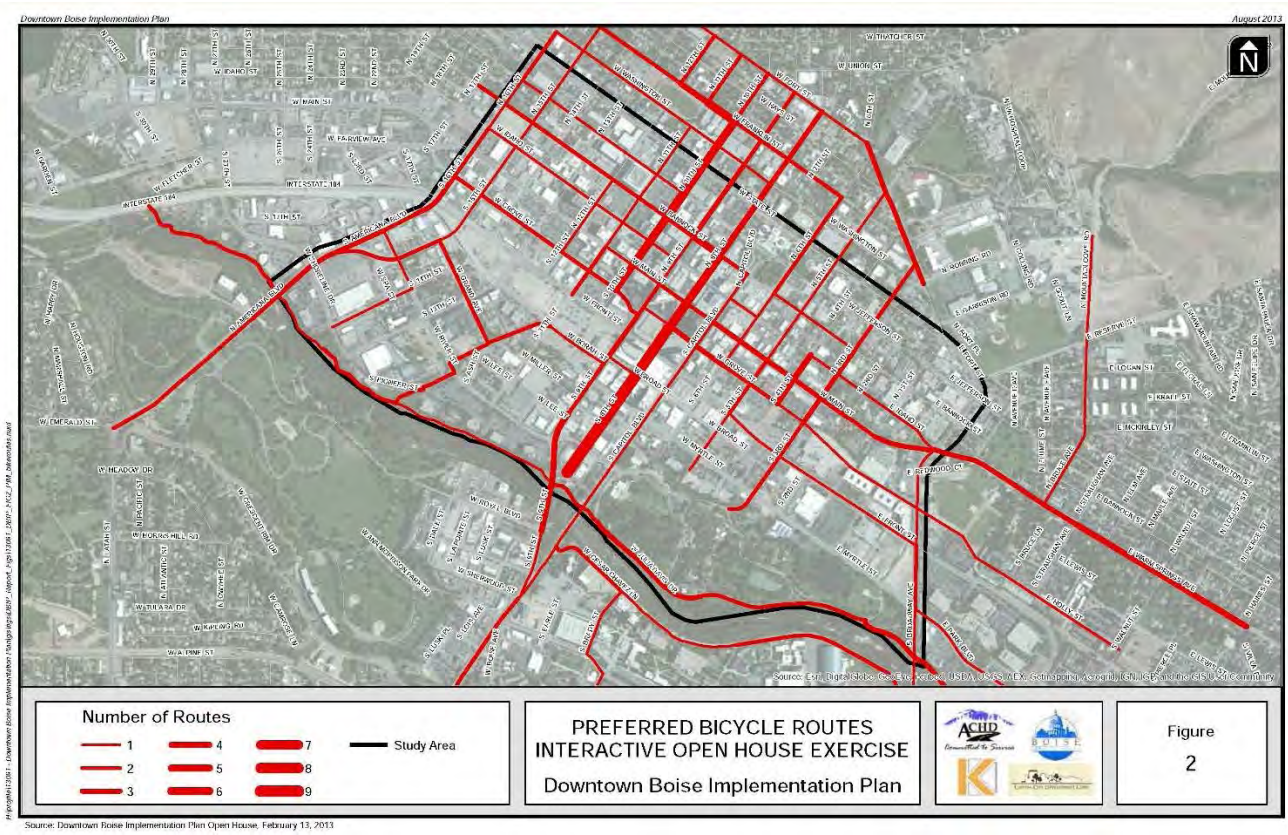
FIGURE 15
P.M. Peak Count – Bicycles on Jefferson through Facility



Through facility cyclists in the morning numbered 26 out of 191 riders total; just under 14 percent of all riders. The evening numbers were similar, with 28 through cyclists out of a total of 239 riders (just under 12 percent of total riders). In both the morning and evening, fewer than 1 in 6 riders passed through the facility on Jefferson Street. Many riders entered the hospital facility on Jefferson Street and stayed, while others may have turned north or south within the facility to reach either another facility destination or a destination outside of the hospital facility, but presumably not along Jefferson Street in the downtown core. Locations of hospital facility bike racks are identified on the figures.

This trend seems to match with the findings of Figure 2 of the DBIP, seen in Figure 16 of this document. This figure was developed during one of the open house events for the project. The figure shows the currently preferred routes of cyclists. Interestingly, Jefferson Street through the facility was not identified at all during this exercise.

FIGURE 16
Preferred Bicycle Routes – Interactive Open House Exercise
(Figure 2 of the DBIP)



Figures 17 and 18 provide a more in-depth look at bicycle movement through the facility on September 28, 2013. The majority of through cyclists in the morning were riding from the East End westward toward downtown. The same cannot be said for the evening through facility travelers. In part, this appears to be due to the fact that Jefferson Street is currently one-way to the west beyond 1st Street.

FIGURE 17
A.M. Peak Count – Bicycles at Jefferson Intersections through Facility

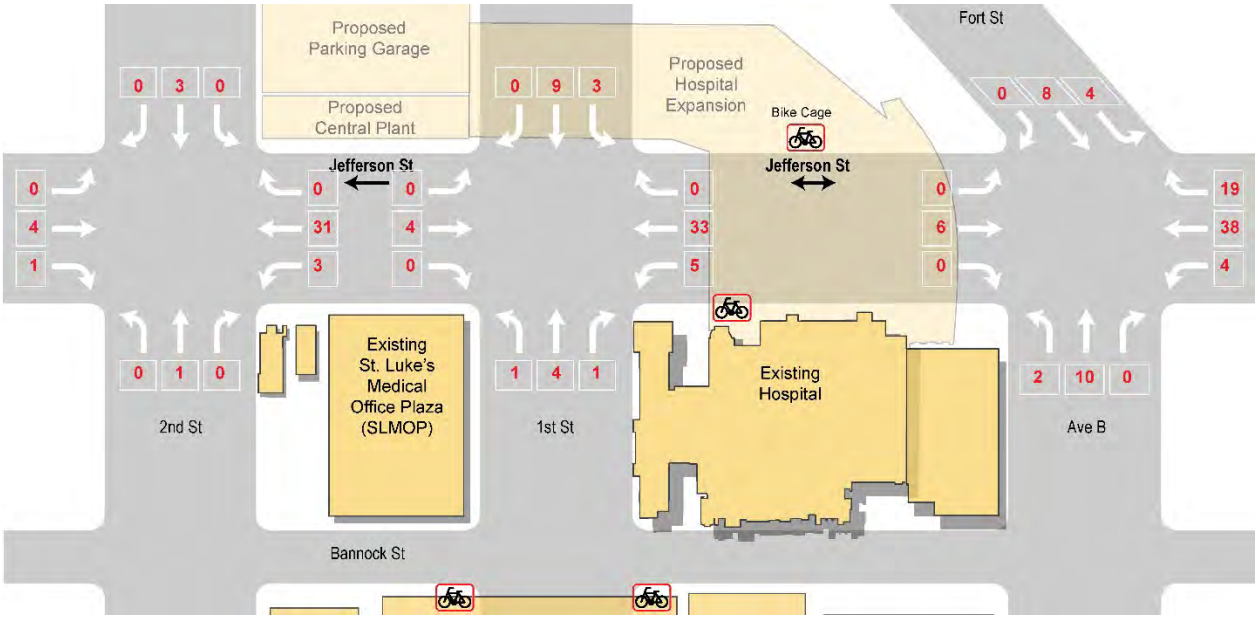
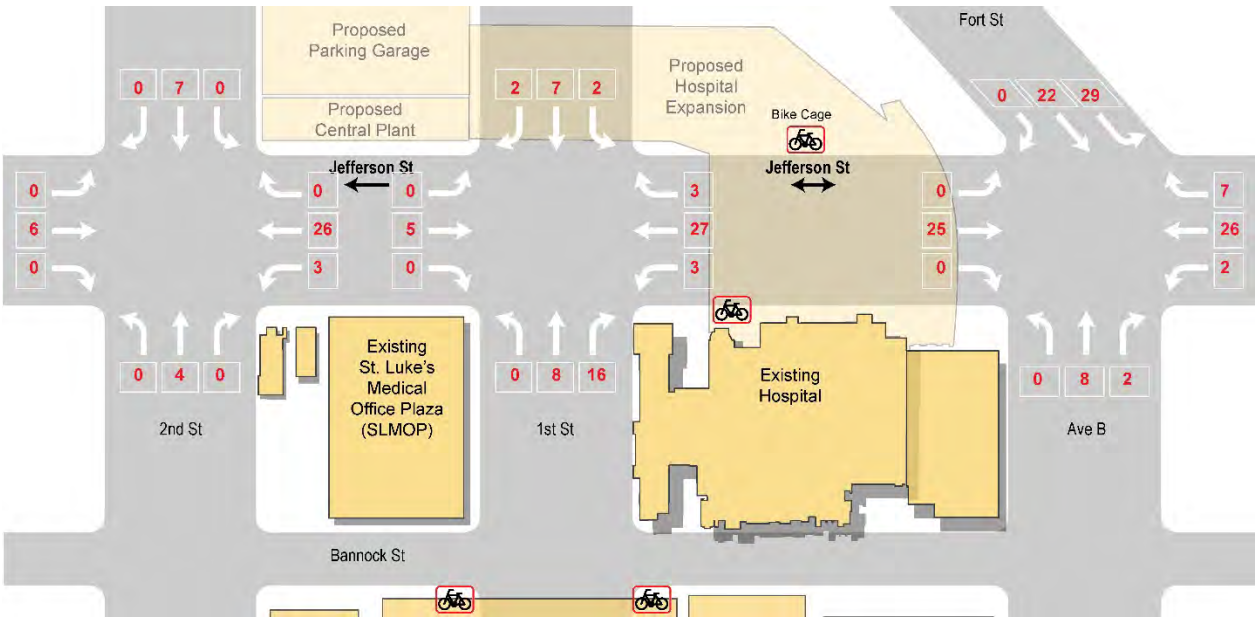


FIGURE 18
P.M. Peak Count – Bicycles at Jefferson Intersections through Facility



Several popular moves were noted during the counting period on September 28, 2013. They are as follows:

- The right-turn movement for northbound cyclists on 1st Street is significantly higher in the afternoon (16 instead of 1). Input from several cyclists indicated that due to the one-way traffic on Jefferson, they return to the East End via Bannock Street until they reach 1st Street, where they can access Jefferson as a two-way street.
- A significant number of cyclists, 19 in the morning and 29 in the afternoon, navigated around the northeast corner of Jefferson Street and Avenue B/Fort Street. In the morning, the cyclists moved

generally westbound to northbound on Fort Street, while in the evening, the cyclists navigated from southbound on Fort Street to eastbound on Jefferson Street.

- North-south movement on Avenue B at Jefferson Street is one of the more heavily used moves, with 18 cyclists traveling through the intersection in the morning and 30 traveling through in the evening.

Other general observations that were made during the count period include:

- Many cyclists on the north side of Jefferson Street (typically westbound) use the sidewalk for safety and to push the pedestrian signal button
- A.M. cyclists generally include elementary, junior high, and high school students and adults commuting to work
- Getting a walk/green light to cross Avenue B was slow; many pedestrians push both Jefferson Street and Avenue B "Walk" push buttons in order to get the quickest one
- A potential conflict exists between southbound Fort Street drivers turning left onto Jefferson and northbound cyclists on Avenue B — vehicles have flashing yellow arrow; cyclists have green light
- Verbal input from cyclists indicated eastbound cyclists in the evening used Bannock Street to 1st Street, then travelled north on 1st Street to Jefferson Street to continue east into the east end
- Westbound cyclists on Jefferson Street, planning to turn onto Fort Street, often cut behind the Jefferson Medical Office Building

Other general observations from the September 28, 2013, exercise effort include:

- Jefferson Street through the facility was not identified as a preferred route
- No preferred route seemed to include a continuous north-south or west-east segment completely through the downtown study area

A subsequent bike count was conducted after the original was TIS submitted on April 3, 2014. This count was based on a request coming from the East End to ensure that the design team understood the volume and type of users in the area on Saturday mornings, particularly in relation to the Saturday Farmer's Market downtown. As a response to this request, a team of individuals were stationed at Jefferson and Avenue B, Jefferson and 1st Street, and Jefferson and 2nd Street. The count was conducted from 9 A.M. to 2 P.M. on Saturday, May 17, 2014. The team counted all bicyclists and identified the number of cyclists passing through the area (similar to previous counts). Overall, the counts were very similar to the hourly count volumes found during the peak hour times. The team counting at the Jefferson and Avenue B intersection conducted a survey with as many users as would take the time (18 completed the survey) requesting input regarding how they use the area, why they selected this route, what would make them most comfortable, and other questions. It is recognized that these users on Saturday morning are not necessarily the same users as during the peak hour work week. Survey responses are provided in Appendix C.

5.5 Transit

The St. Luke's downtown Boise facility and surrounding area are served by the ValleyRide transit system. ValleyRide connects users between Canyon and Ada Counties and within the counties, focusing on downtown areas. Transit in the St. Luke's area generally consists of the bus, though ValleyRide also offers ACCESS to a paratransit service to complement the regular bus system. ACCESS is available to people not able to use the bus system because of disability. The primary service route consists of a loop serving the St. Luke's and Boise Veterans Administration Medical Center and then extending out to Coston Street on the Warm Springs corridor. The service runs every 30 to 60 minutes.

Figure 19 shows the current bus routes and stops in the St. Luke's downtown Boise facility area.

Figure 19
Existing Transit Facilities

SECTION 6

Future Conditions

6.1 Roadway System

The only significant, currently planned roadway or intersection improvement in the project area is located at the Broadway Avenue/Warm Springs Avenue/Avenue B intersection. The project is included in the Draft 2012 Capital Improvements Plan (CIP) list with planned construction dates of 2022 to 2026. The Broadway Avenue/Warm Springs Avenue/Avenue B project would widen each of the north, south, and east approach legs to accommodate two left-turn lanes, two through lanes, and a single right-turn lane. At the west leg, two left-turn lanes, a single through lane, and a single right-turn lane would be provided. Securing right-of-way would be necessary for the accomplishment of the proposed widening. Traffic signal modifications would also be provided to accommodate this new configuration. It is the desire of St. Luke's that the impact fee calculated for their improvements, as established by ACHD, be applied to the Broadway Avenue/Warm Springs Avenue/Avenue B project.

The adopted DBIP recommended that 3rd Street, 4th Street, and Jefferson Street (from 1st to 5th Street) be converted from one-way to two-way facilities. Additionally, the updated DBIP has proposed converting 5th and 6th Streets to two-way facilities as well; no significant impact on the St. Luke's mitigation requirements is anticipated from this change. The 3rd and 4th Street conversions are planned to accommodate one lane of travel in each direction, in addition to bicycle, parking, and pedestrian facilities. Construction of these improvements is anticipated to occur in 2014. Timing for the 5th and 6th Street conversions is not yet clear.

As noted previously, the St. Luke's Master Plan proposes vacating Jefferson Street within the confines of the facility. Jefferson Street would require a complete closure between Avenue B and 1st Street in order to facilitate the proposed improvements.

No other planned roadway improvements have been noted within the study area.

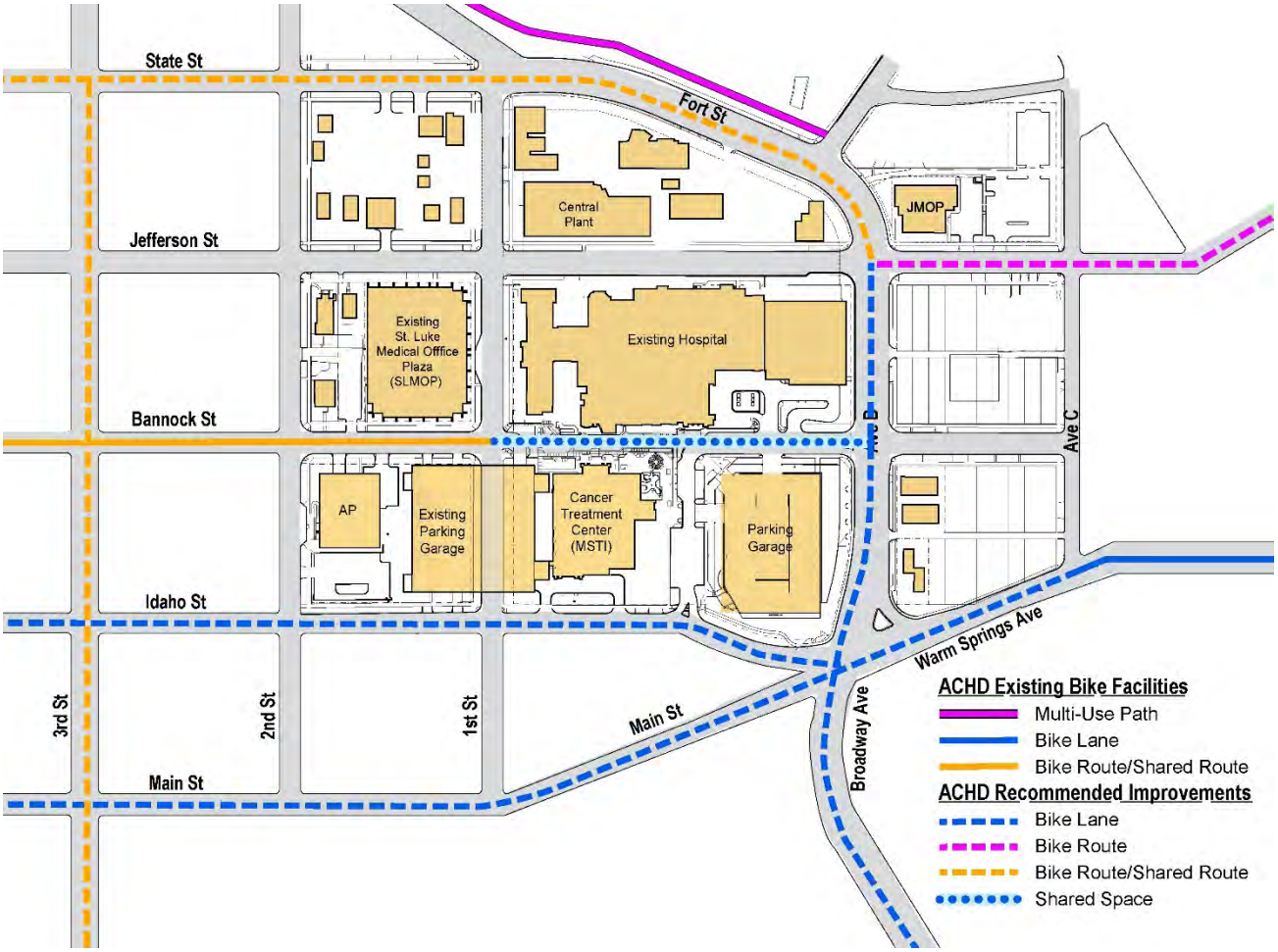
6.2 Bicycle and Pedestrian System

Major findings identified in the adopted 2013 DBIP relating to bicycle and pedestrian facilities include:

- Desire of cyclists to designate bike routes on lower traffic volume streets
- Higher traffic volume and speed were seen as deterrents to riding downtown
- Highest priority improvement included a bicycle lane on Broadway Avenue/Avenue B

Based on the findings of the DBIP, an implementation plan was developed. Figure 20 illustrates the proposed recommendations of the updated DBIP within the St. Luke's downtown Boise facility area.

FIGURE 20
ACHD - DBIP Recommended Improvements

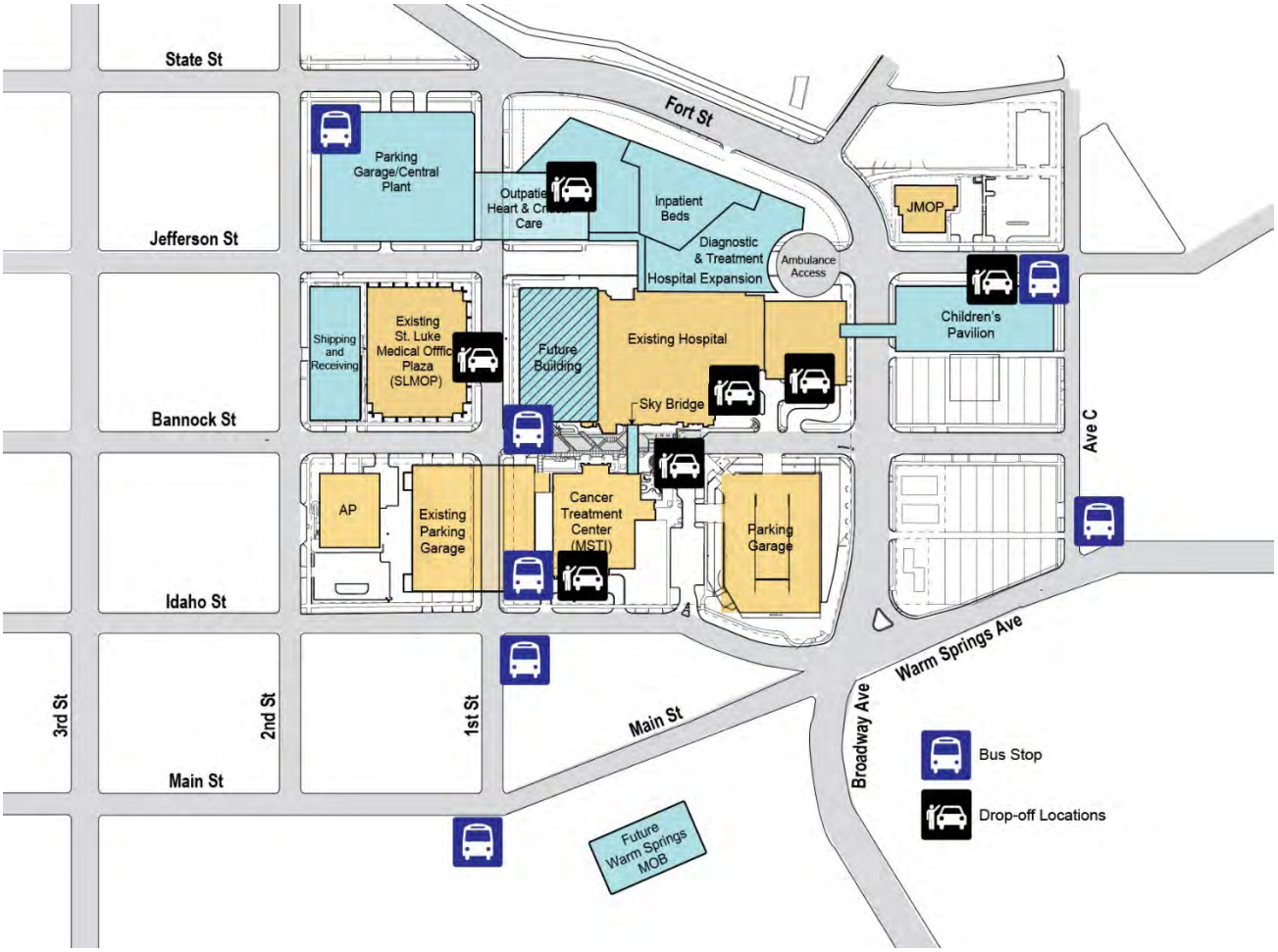


6.3 Transit

The St. Luke's team has engaged staff at VRT to coordinate potential changes in the St. Luke's downtown Boise facility area with transit service. The VRT staff have expressed no concerns with the proposed changes at the facility. They have requested an opportunity to review the approved plan and finalize bus stop locations with the design team at the appropriate phase of the project. They have indicated that design requirements that support the access of buses and paratransit vehicles can be provided so that specific design elements such as bus stop locations, entrance dropoffs, and intersection channelization are designed to meet the needs of the size of vehicles anticipated.

Figure 21 shows the potential future bus stop locations and drop off points. The drop-off points serve the general public as well as paratransit vehicles and should be sized to meet those needs.

FIGURE 21
Future Transit Facilities



6.4 Background Traffic

Forecast model data were requested from the Community Planning Association of Southwest Idaho (COMPASS) for the 2012 (existing), 2015, and 2035 forecast year periods. The 2015 and 2035 forecast periods were also evaluated with the proposed Jefferson Street closure. The COMPASS Traffic Analysis Zone (TAZ) encompassing the St. Luke's Boise facility is bordered by Main Street, Fort Street, 3rd Street, and Avenue B and is served by the Myrtle/Front Street Couplet, Main/Idaho Street Couplet, Broadway Avenue, Warm Springs Avenue, and State/Fort Street. Future growth within this zone will be limited because of the current land uses and planned development of the regional medical center. Current Department of Labor statistics show approximately 5,100 employees in this TAZ. The 2035 projection for this TAZ is 5,775 employees, or about a 14 percent increase.

COMPASS link volume projections require some post-processing to arrive at forecast turn movement conditions. These procedures follow the methodologies presented in *National Cooperative Highway Research Program (NCHRP) Report 255.* Year 2035 peak-hour model link volumes were compared to the existing model results to determine relative differences in link volume (deltas) for each period. These deltas were then applied to the existing balanced ground count entering/exiting link volumes at each intersection to determine 2035 link volumes. The *Furness Method* was then used to derive forecast turn movements (without the proposed development) using the balanced existing turn movement volumes and the calculated future link volumes.

The future 2035 No Build volumes were also adjusted to include the DBIP background projects. Again, these projects include transitioning 3rd and 4th Street to two-way traffic between State Street and Main Street and changing Jefferson to two-way traffic east of 1st Street. Resultant 2035 No Build volumes are illustrated in Figure 22.

2024 No Build volumes were interpolated from the existing and 2035 No Build volumes and are illustrated in Figure 23. For further review, the COMPASS traffic forecasts are included in Appendix D.

To reflect the impacts associated with the closure of Jefferson Street from Avenue B to 1st Street a separate model run was developed indicating the required redistribution of background traffic volumes. 2024 and 2035 redistributed volumes are indicated in Figures 24 and 25.

6.5 Trip Generation

Site traffic generation is estimated by procedures recommended in the latest edition of the *Trip Generation Manual* (8th Edition) published by the Institute of Transportation Engineers (ITE). The trip rates are estimated from actual site studies performed on a nationwide basis and are representative of the St. Luke's facilities based on past traffic impact studies. As indicated previously, two development scenarios are proposed including a 2024 interim condition and a 2035 full build condition. The interim 2024 condition assumes full buildout of the development with approximately 70 percent usage. The following trip generation conditions are applicable for the 2035 condition:

Children's Pavilion - Medical Office Building		**Gross Trip Generation**	
Land Use	**Quantity**	**A.M.**	**P.M.**
Medical Office Building (ITE 720)	85,000 square feet	198	245
Existing Medical Office Building	6,790 square feet	-20	-26
NET		*178*	*219*

The trip generation was reduced to reflect the trips generated by the existing Medical Office Building on the site.

Hospital Expansion		**Gross Trip Generation**	
Land Use	**Quantity**	**A.M.**	**P.M.**
Hospital (ITE 610)	357,000 square feet	443	465

FIGURE 22
2035 No Build Peak Hour Traffic Volumes

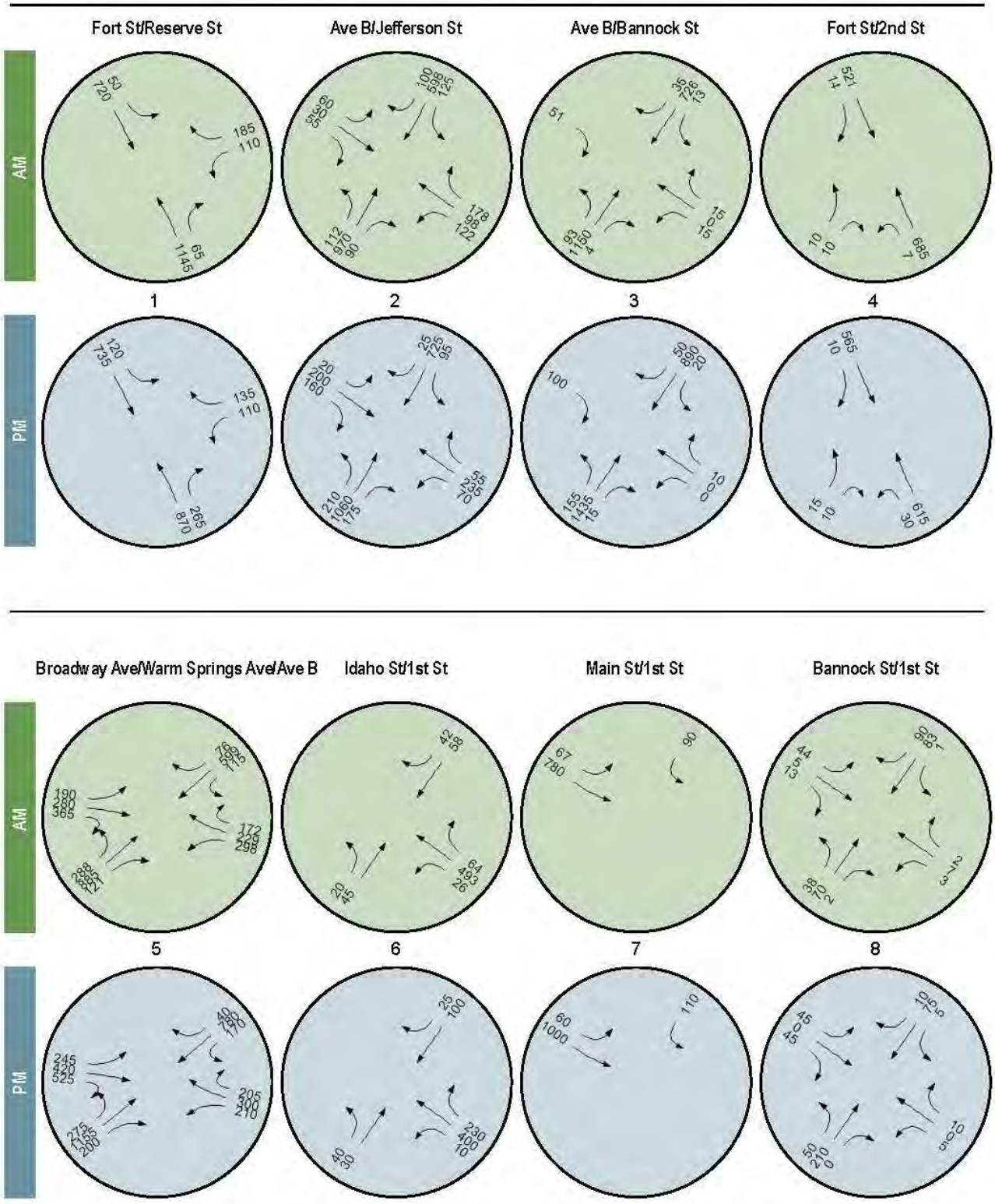


FIGURE 22 (CONTINUED)
2035 No Build Peak Hour Traffic Volumes

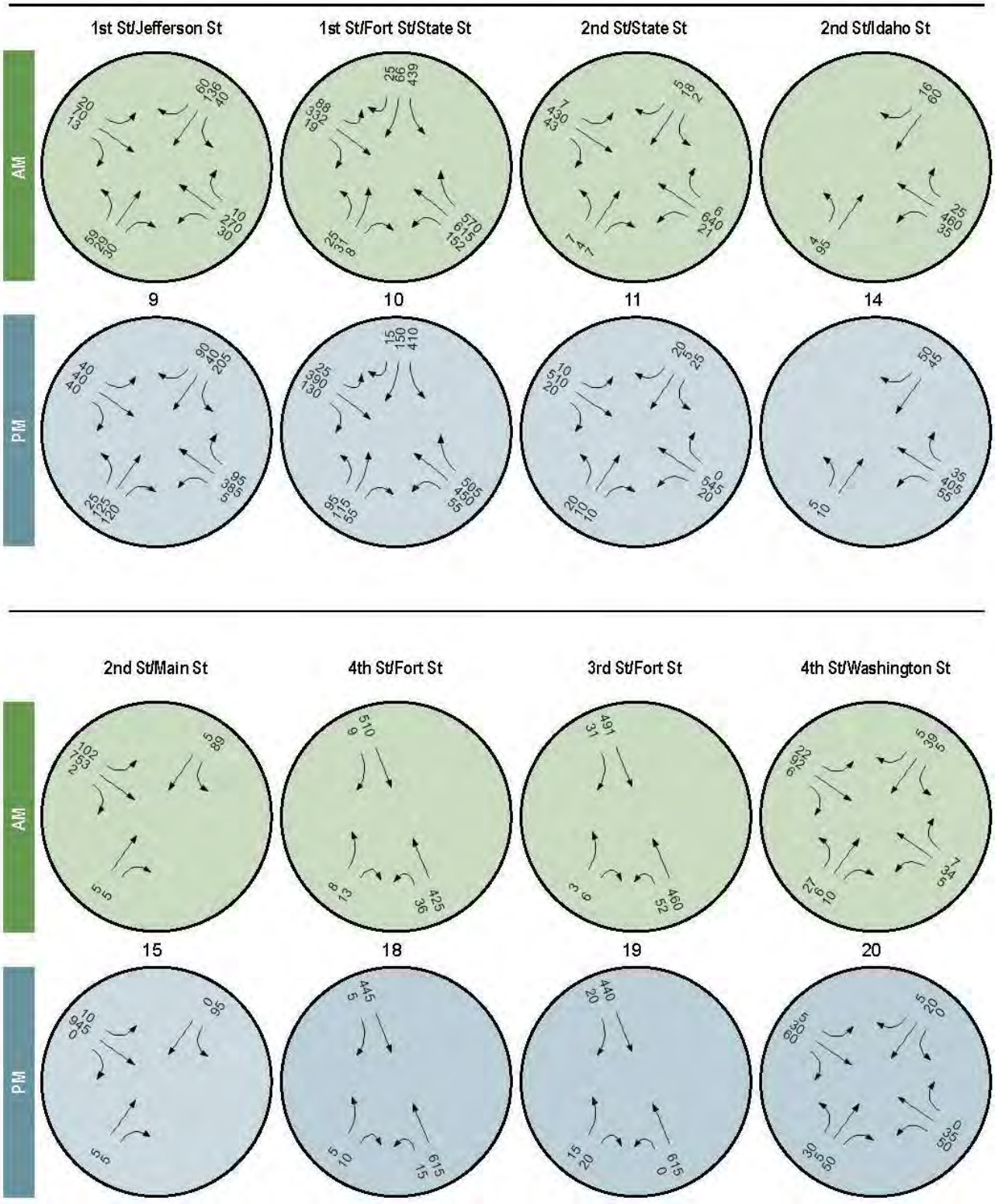
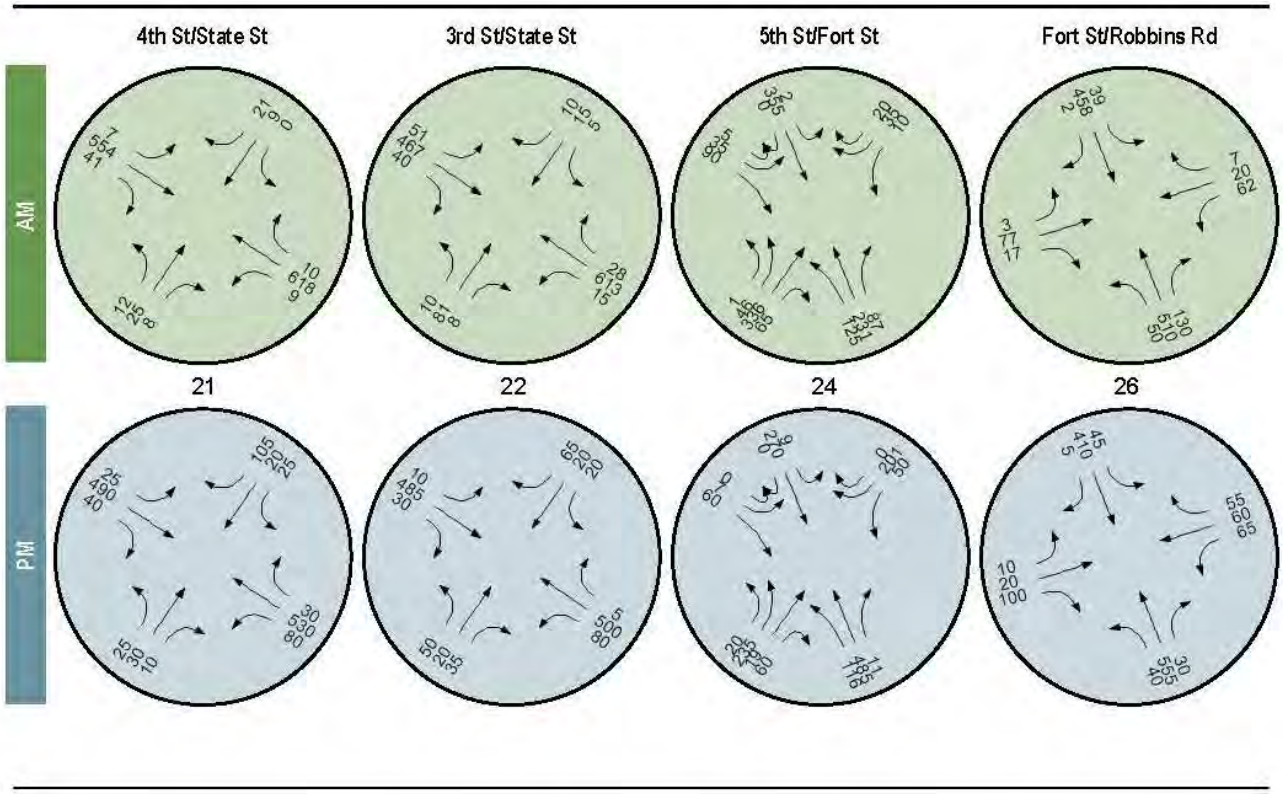


FIGURE 22 (CONTINUED)
2035 No Build Peak Hour Traffic Volumes



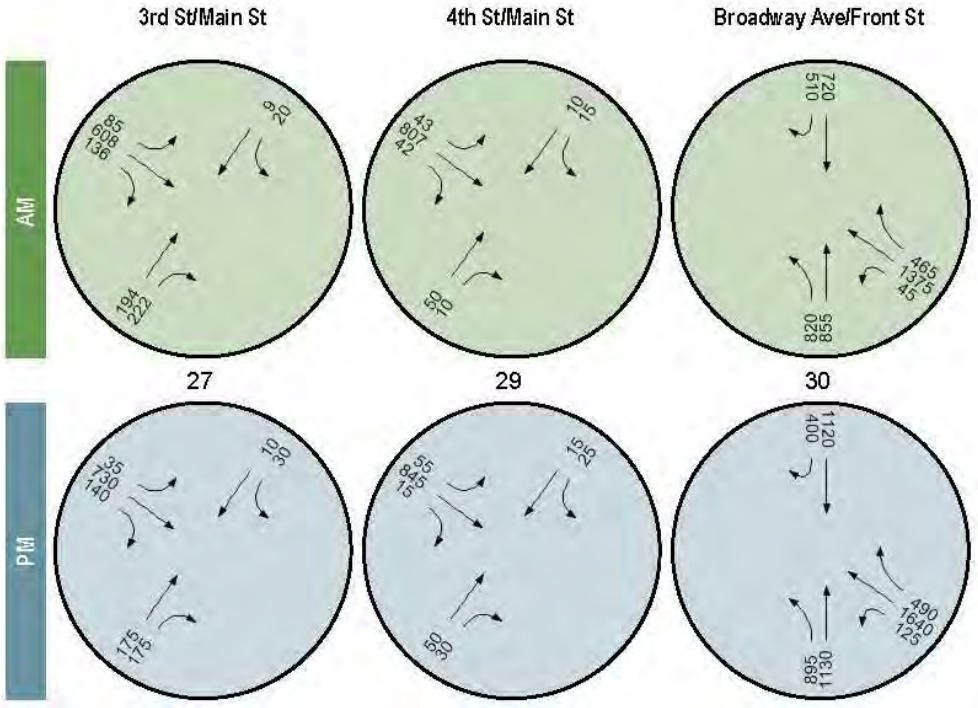


FIGURE 23
2024 No Build Traffic

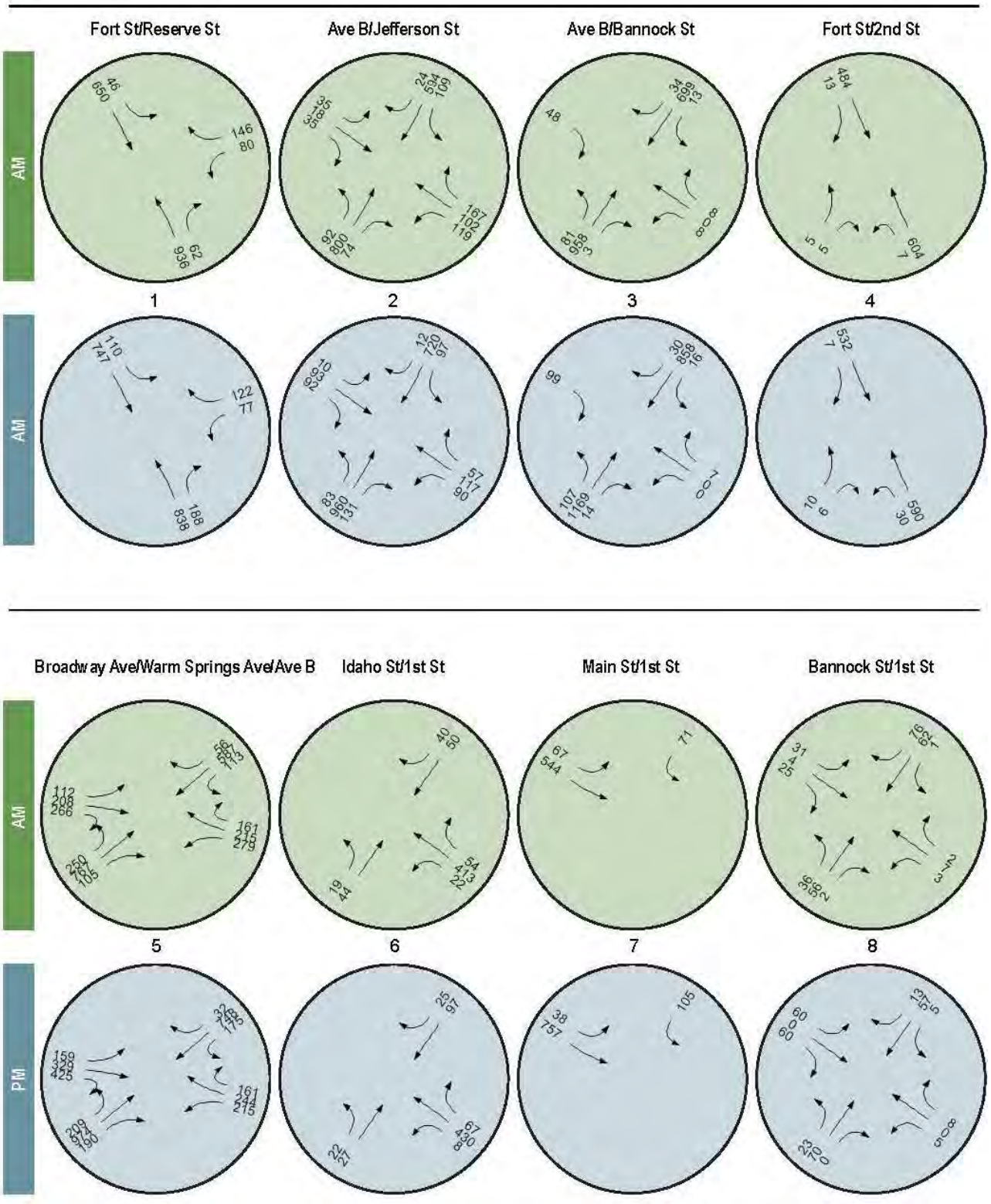
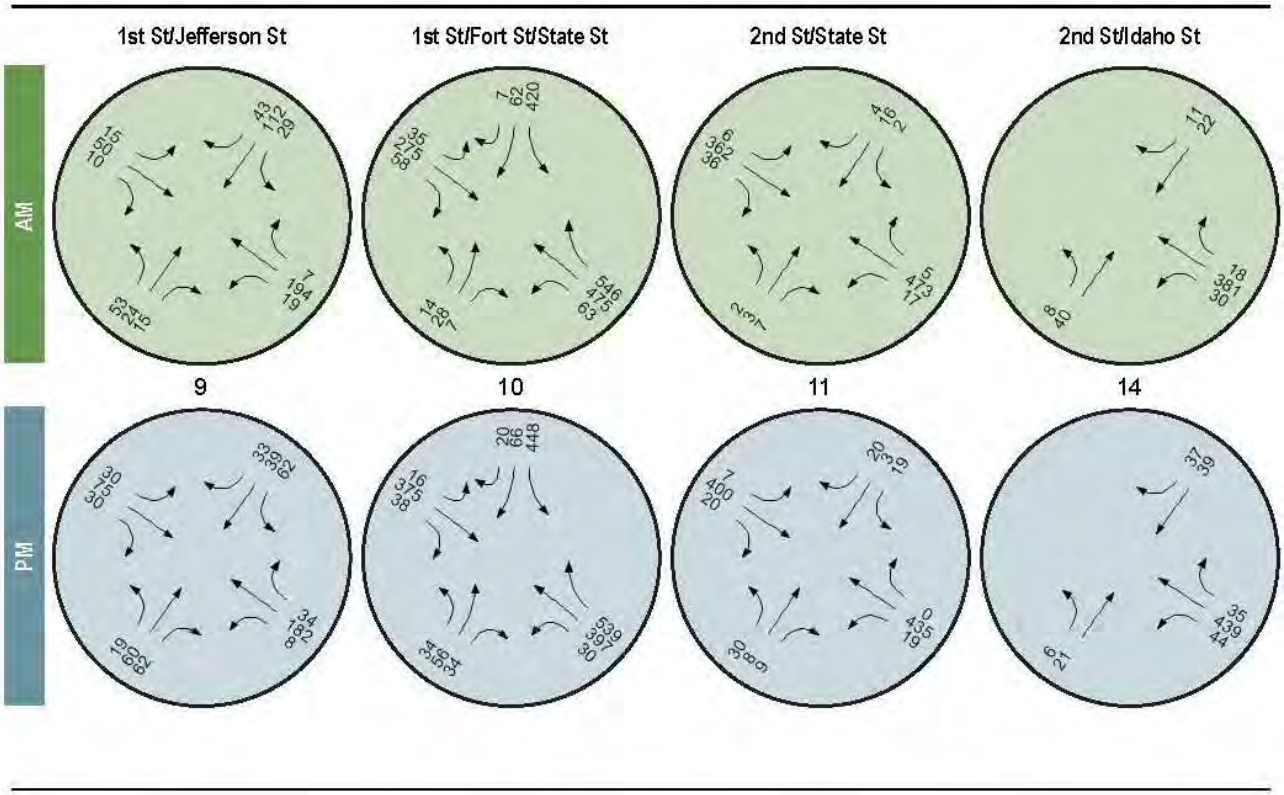


FIGURE 23 (CONTINUED)
2024 No Build Traffic



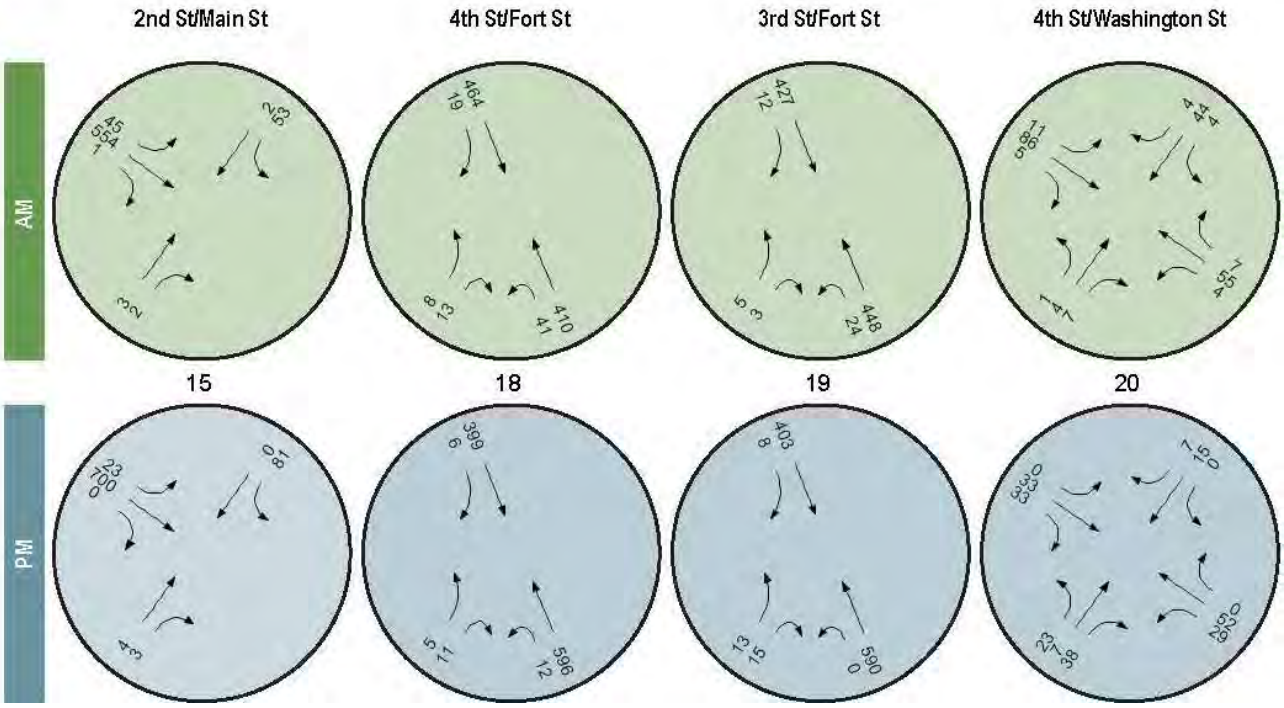
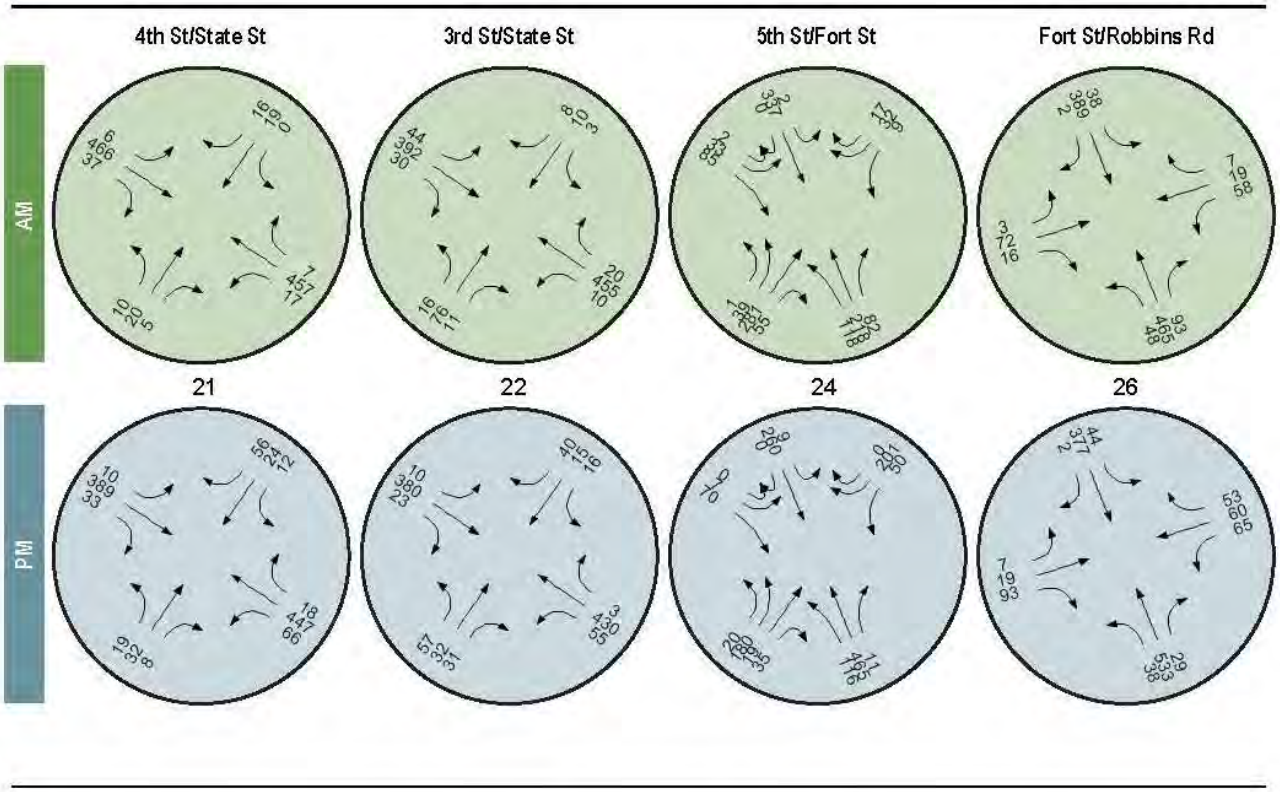


FIGURE 23 (CONTINUED)
2024 No Build Traffic



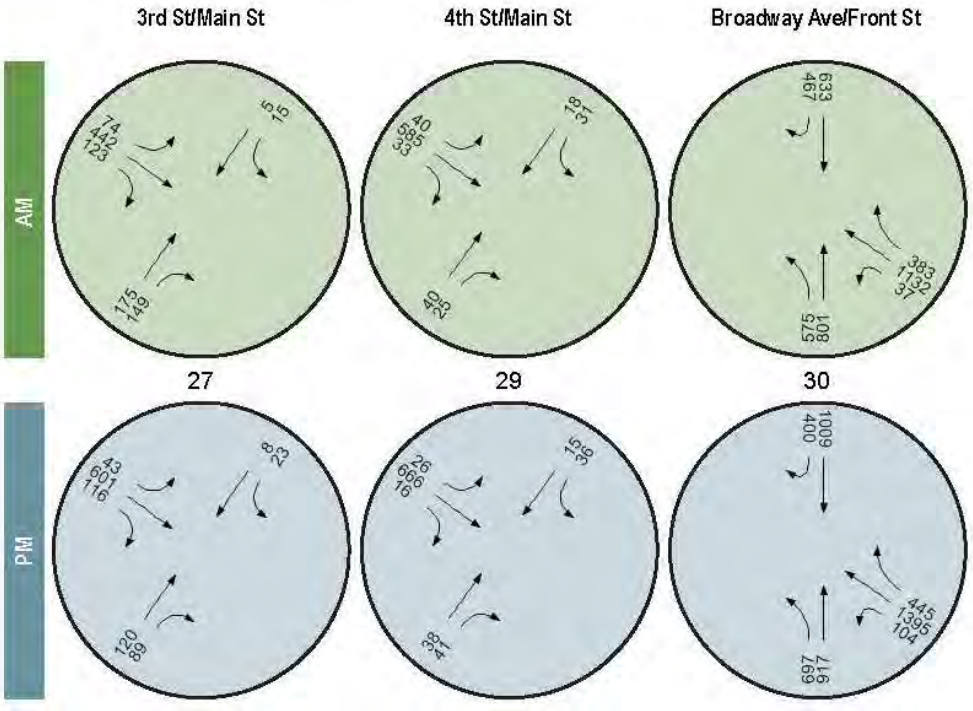


FIGURE 24
2024 Redistributed Peak Hour Traffic Volumes

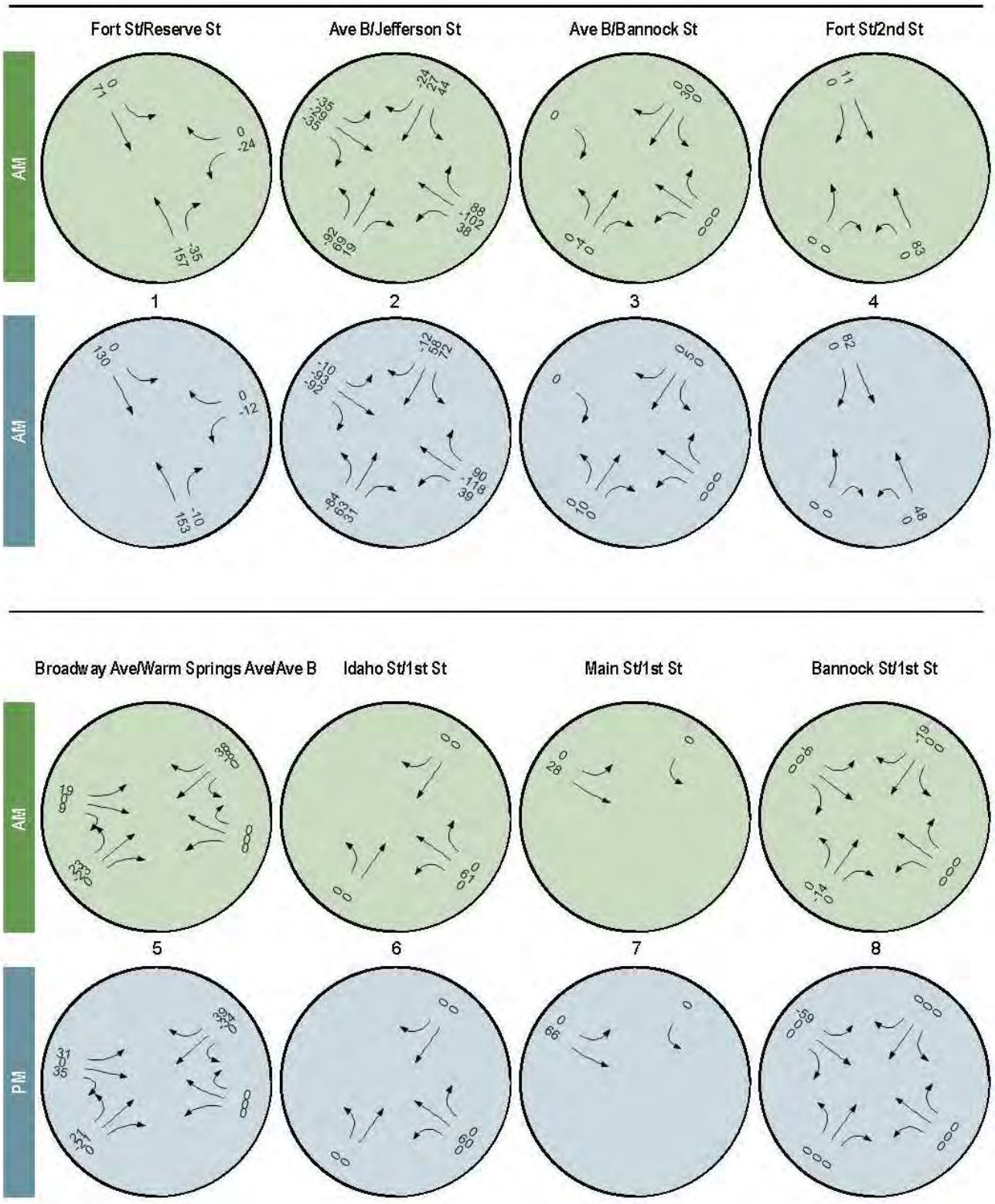


FIGURE 24 (CONTINUED)
2024 Redistributed Peak Hour Traffic Volumes

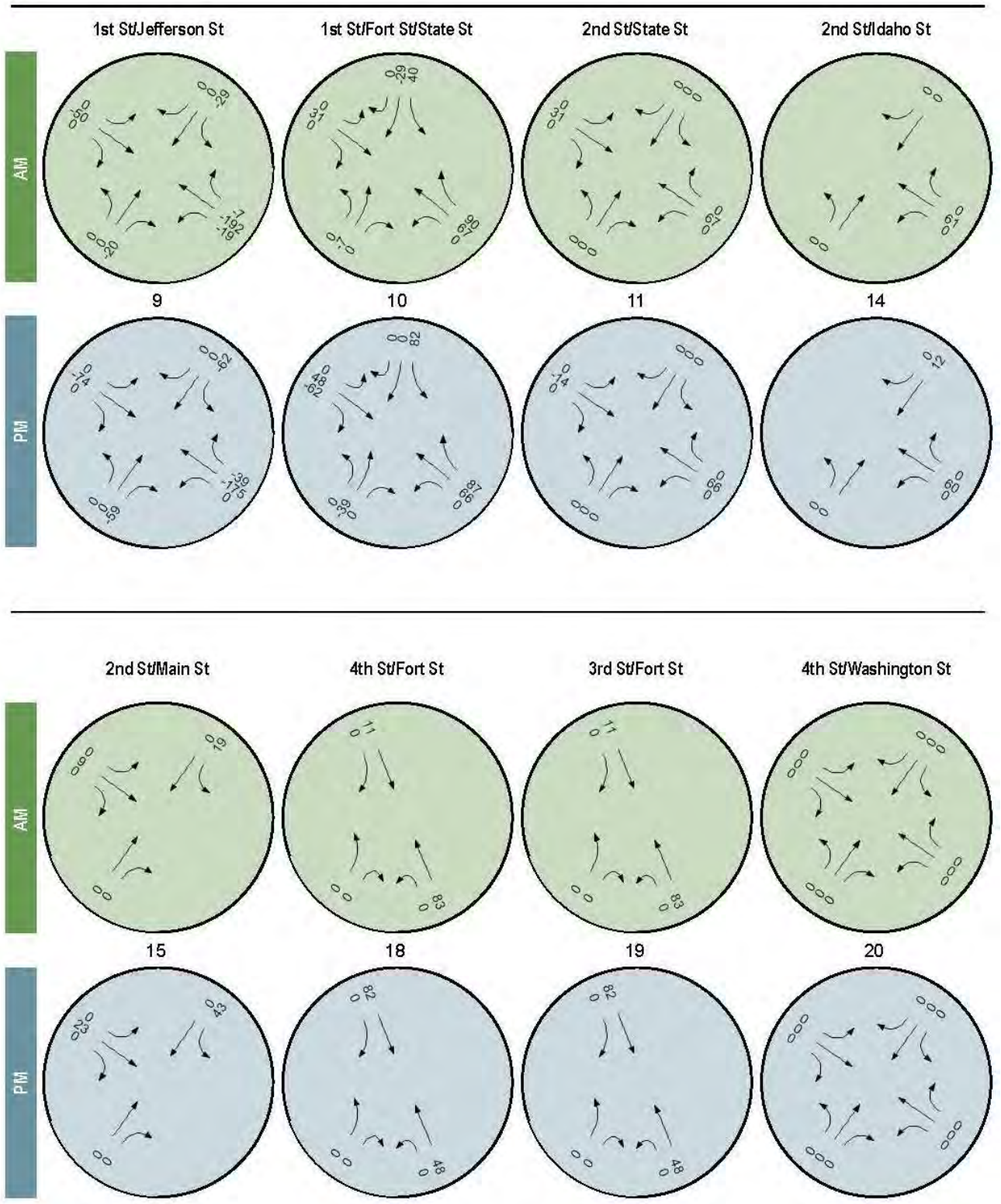
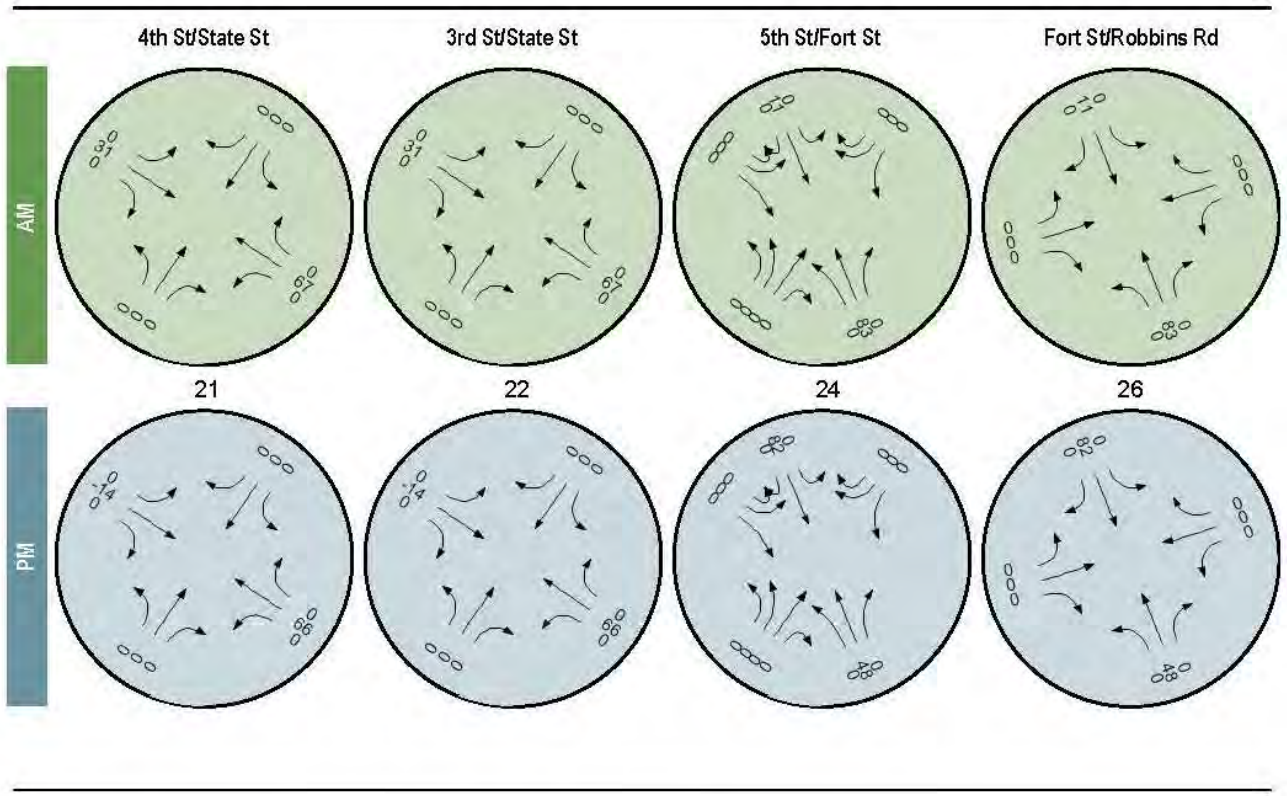


FIGURE 24 (CONTINUED)
2024 Redistributed Peak Hour Traffic Volumes



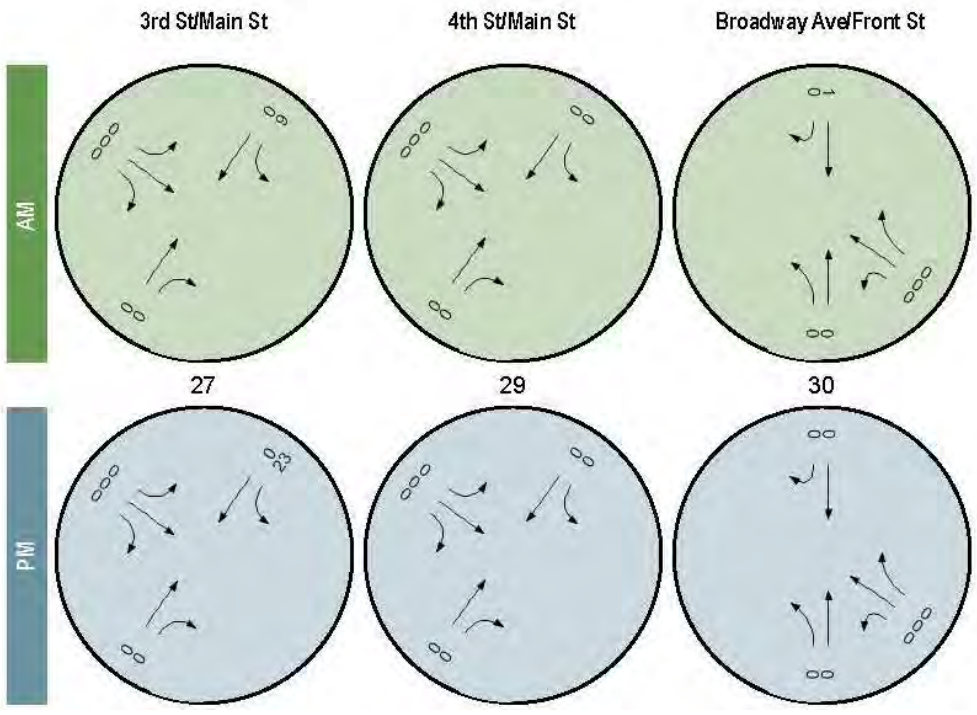


FIGURE 25
2035 Redistributed Peak Hour Traffic Volumes

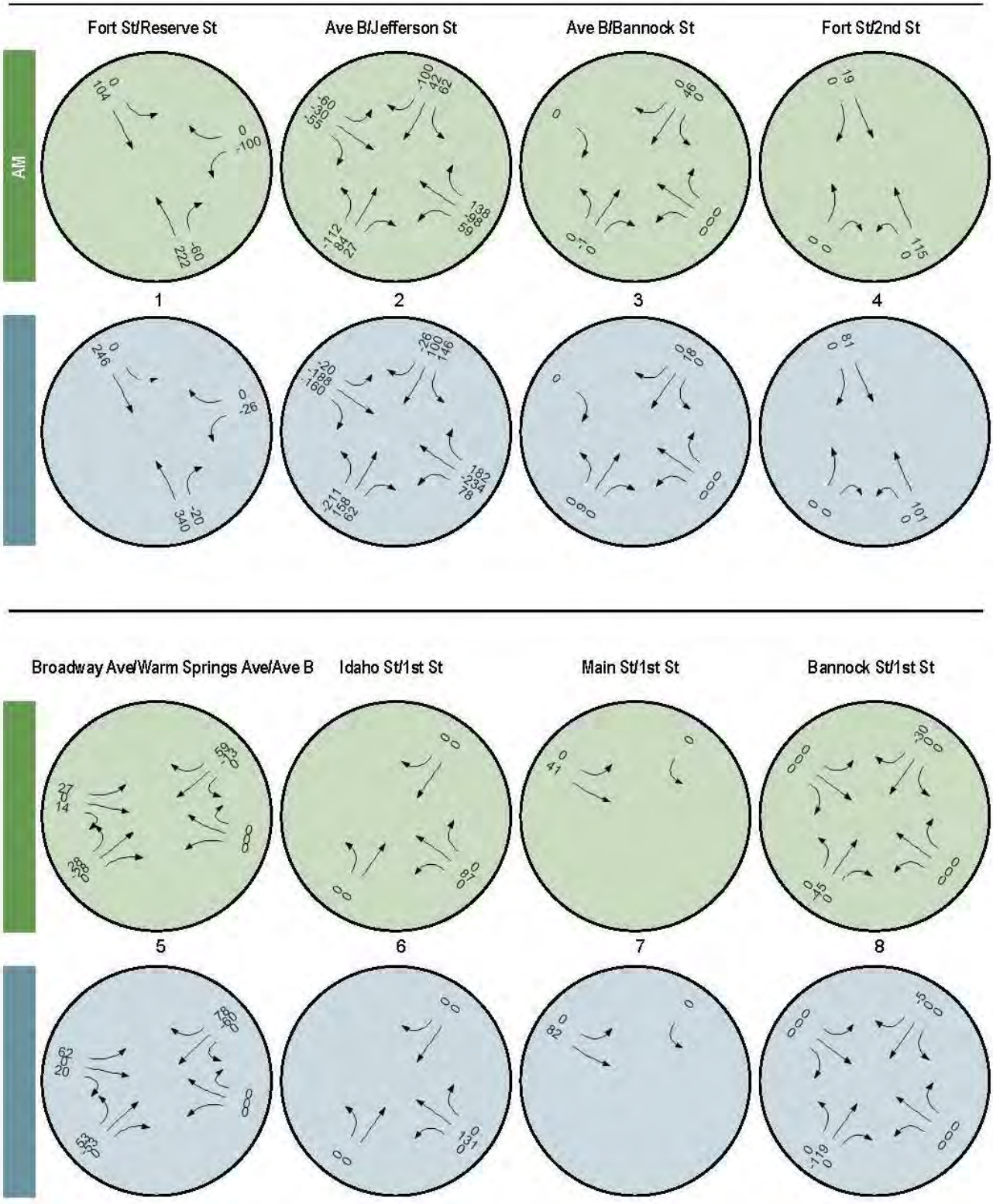


FIGURE 25 (CONTINUED)
2035 Redistributed Peak Hour Traffic Volumes

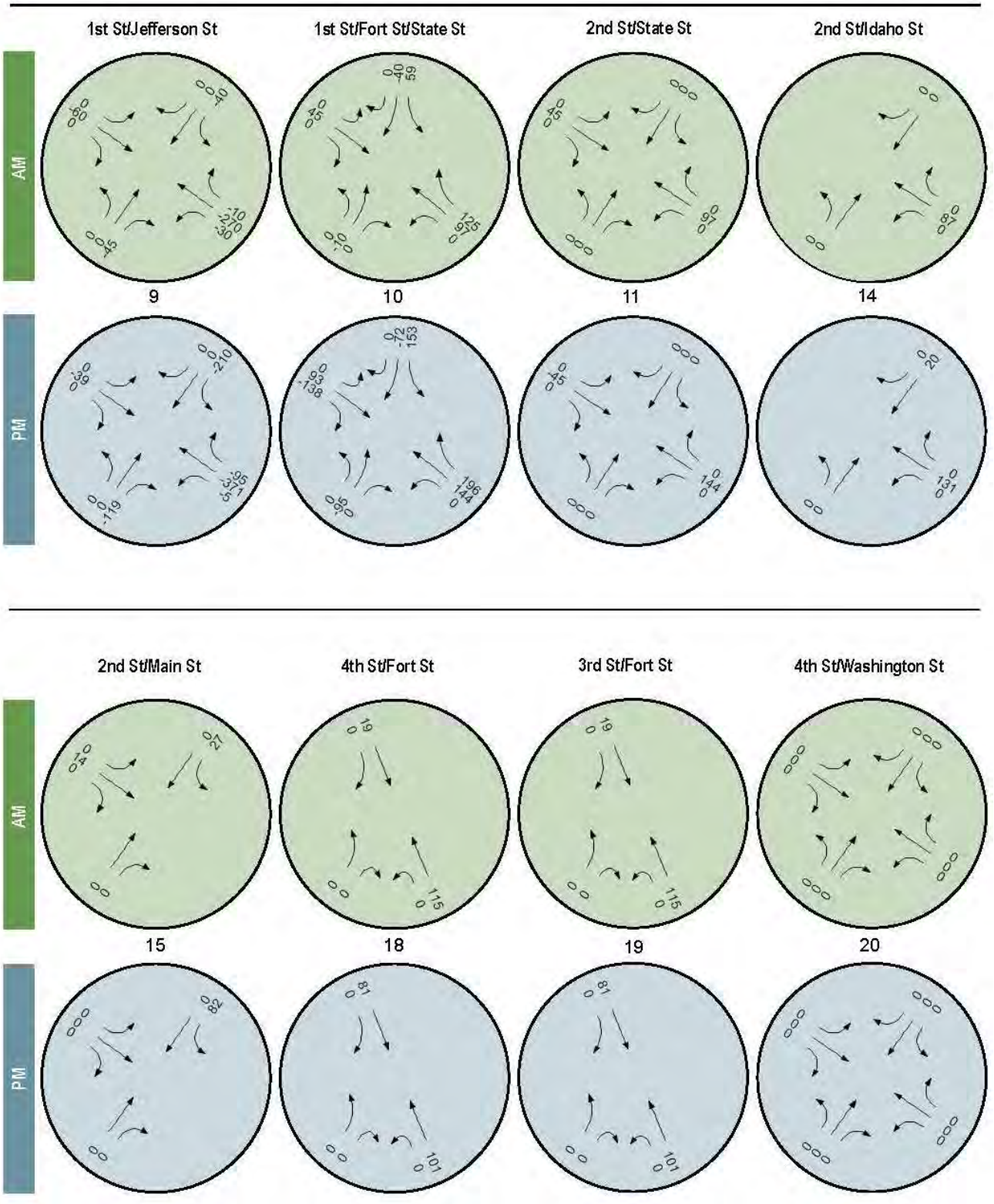
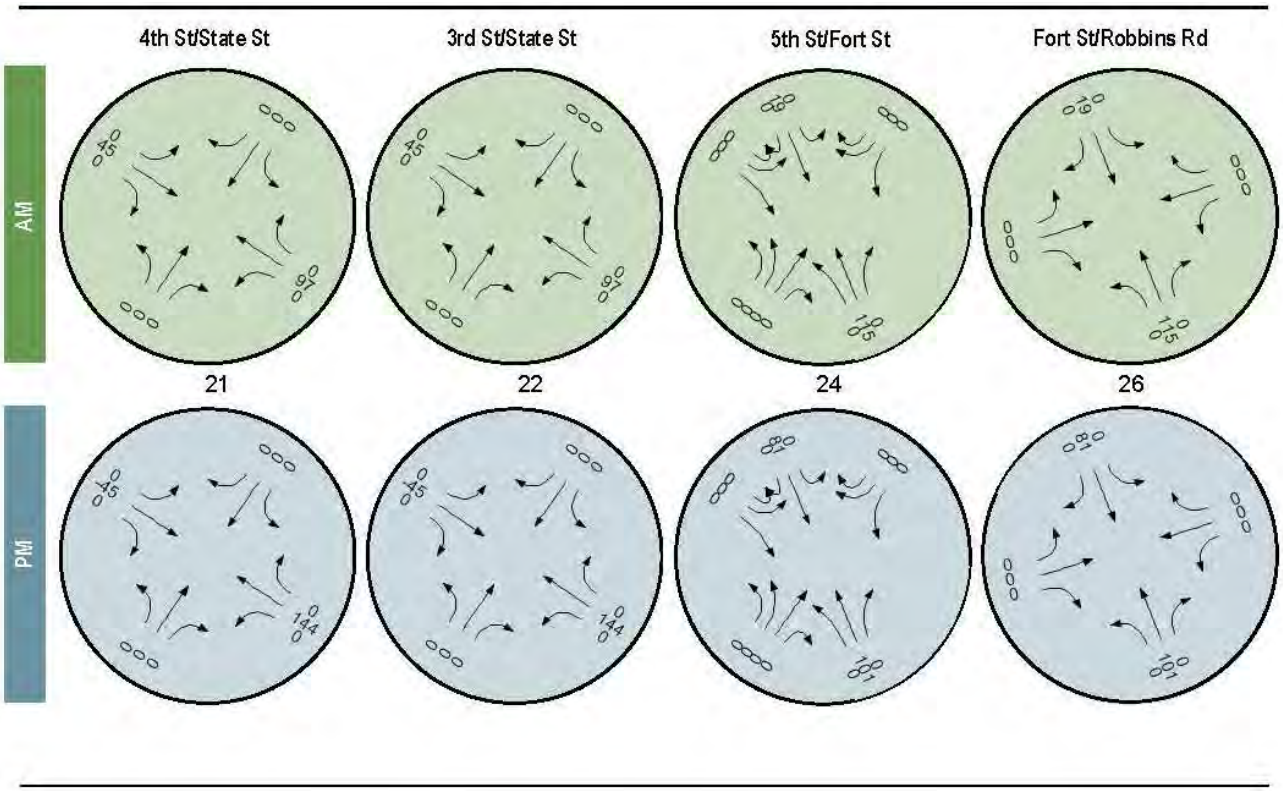
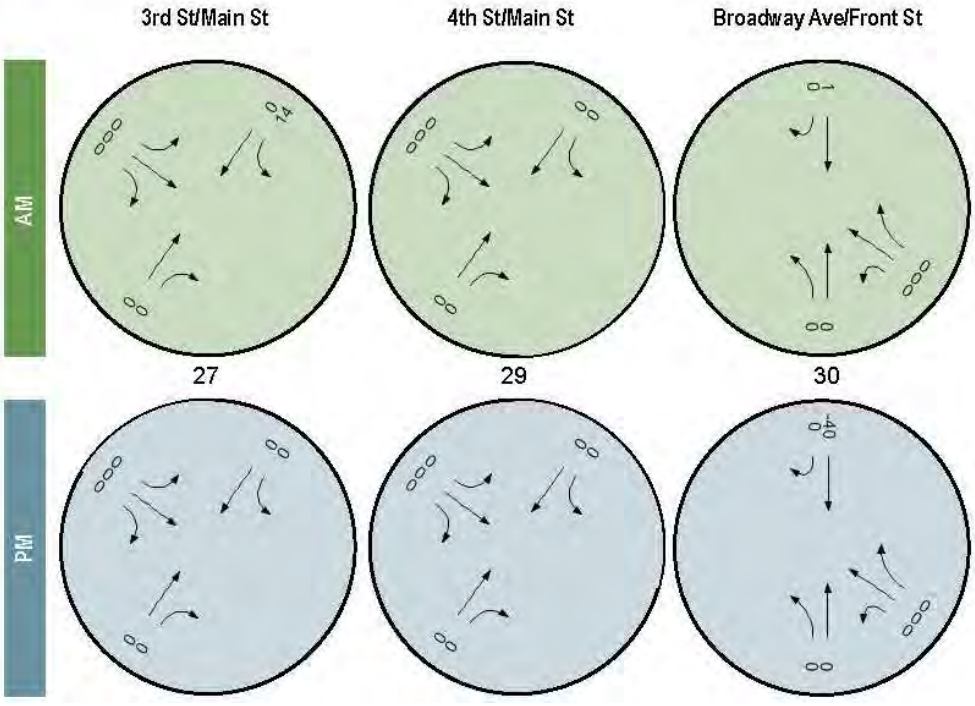


FIGURE 25 (CONTINUED)
2035 Redistributed Peak Hour Traffic Volumes





)

The 357,000-square-foot hospital expansion will include various services such as a heart/vascular center. The expansion is considered to generate new trips based on the additional square footage.

Shipping and Receiving		Gross Trip Generation	
Land Use	**Quantity**	**A.M.**	**P.M.**
Single Tenant Office (ITE 715)	15,000 square feet	@50%=24	@50%= 29

The Shipping and Receiving office building provides administration services for the hospital operations. It is assumed that half of these trips occur during off-peak time periods. The trip generation was reduced accordingly. In 2024, the Children's Pavilion and Central Plant offices are assumed to be completed. These two land uses assume the same trip generation as the 2035 summarized above. Approximately 63 percent (225,000 square feet) of the hospital tower is assumed to be completed in 2024. Based on this assumption, 328 A.M. trips and 362 P.M. peak-hour trips will be generated in this year.

Warm Springs Medical Office Building		Gross Trip Generation	
Land Use	**Quantity**	**A.M.**	**P.M.**
Medical Office Building (ITE 720)	100,000 square feet	230	282

The Warm Springs Medical Office Building will provide physician office, exam facilities, and minor outpatient services. Trip rates will be consistent with those established for the Children's Pavilion.

6.6 Trip Distribution and Assignment

To determine impacts, the peak-hour generated trips must be distributed and assigned to the existing roadways and intersections. These new trips were distributed to the network assuming the closure of Jefferson Street between Avenue B and 1st Street and the conversion of 1st Street between Jefferson and Fort Streets to primarily local hospital traffic. Based on the regional influence area and discussion with hospital staff regarding patient service area, this distribution pattern was assumed as follows:

- 40 percent to/from the south via Broadway Avenue (and east to I-84)
- 30 percent to/from the west via Myrtle Street/Front Street (and I-184)
- 20 percent to/from the north via Fort Street and State Street
- 10 percent to/from the east via Warm Springs Avenue

Resultant site generated traffic volumes for 2024 and 2035 are depicted in Figure 26 and Figure 27.

6.7 Total Traffic

Site generated traffic volumes and the re-distributed volumes were then added to 2024 and 2035 No Build forecast turn movements to create 2024 and 2035 total traffic conditions with the proposed medical center expansion and Jefferson Street vacation. These resultant traffic volumes are illustrated in Figures 28 and 29, respectively.

FIGURE 26
2024 Site Generated Peak Hour Traffic Volumes

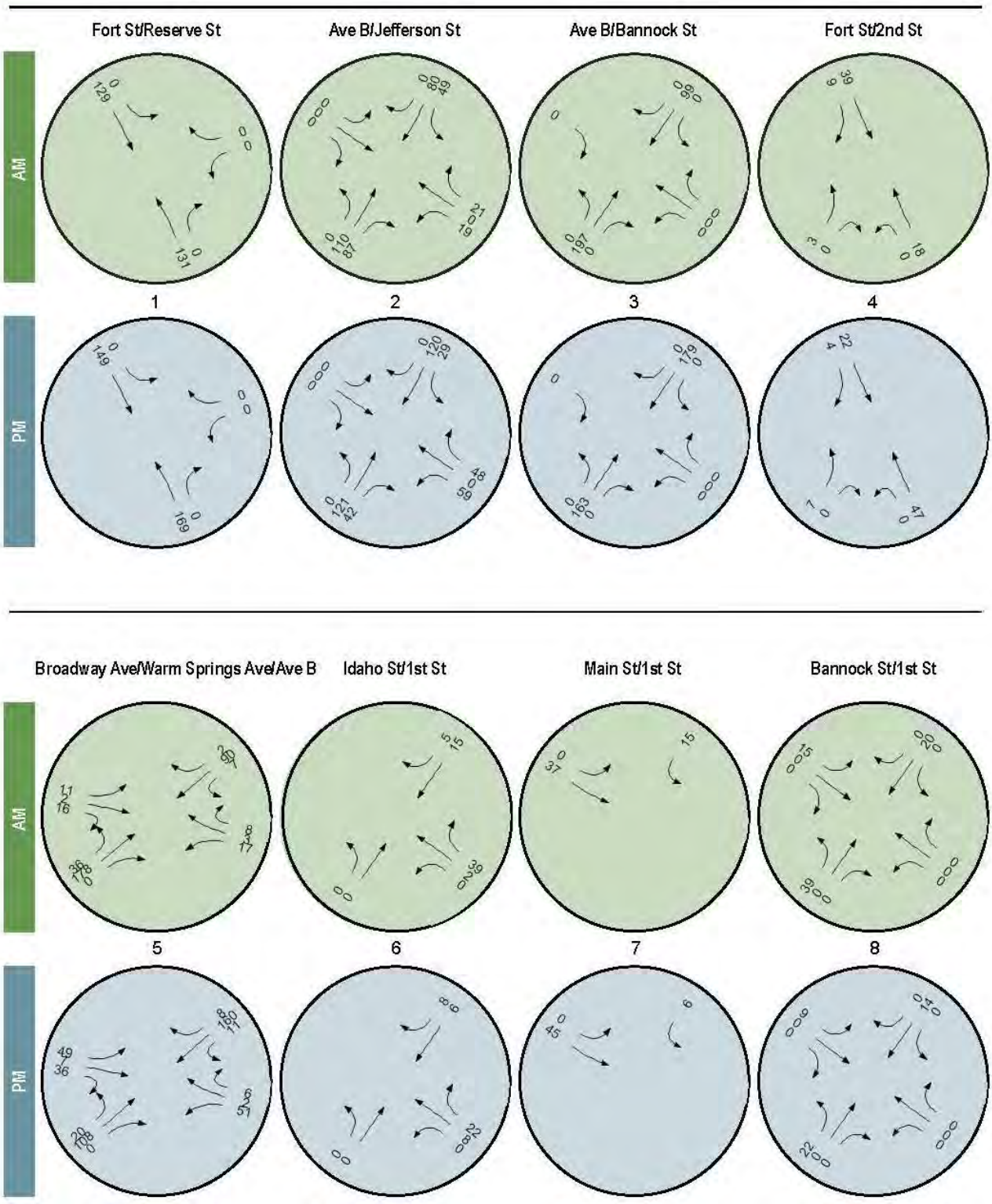


FIGURE 26 (CONTINUED)
2024 Site Generated Peak Hour Traffic Volumes

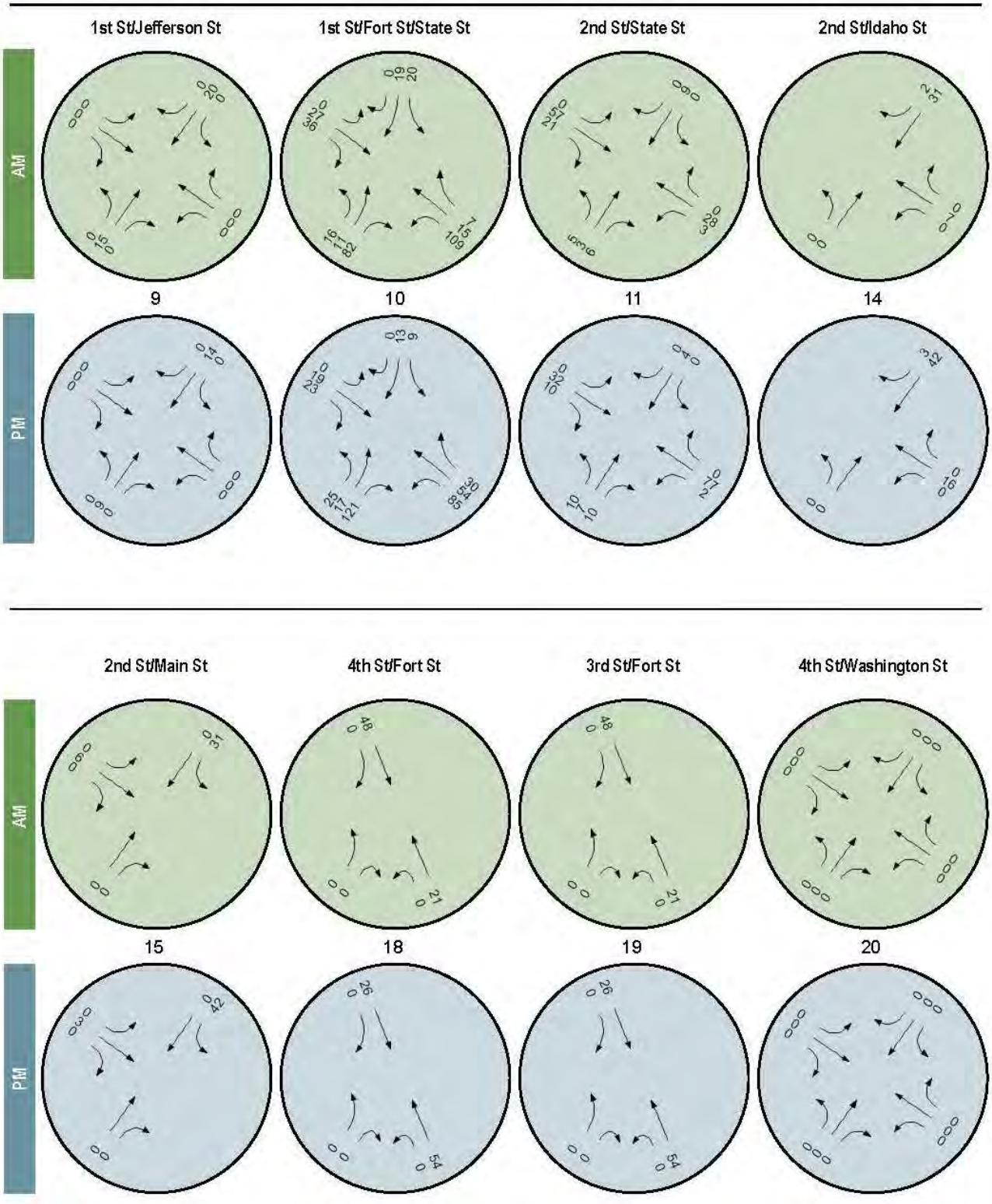
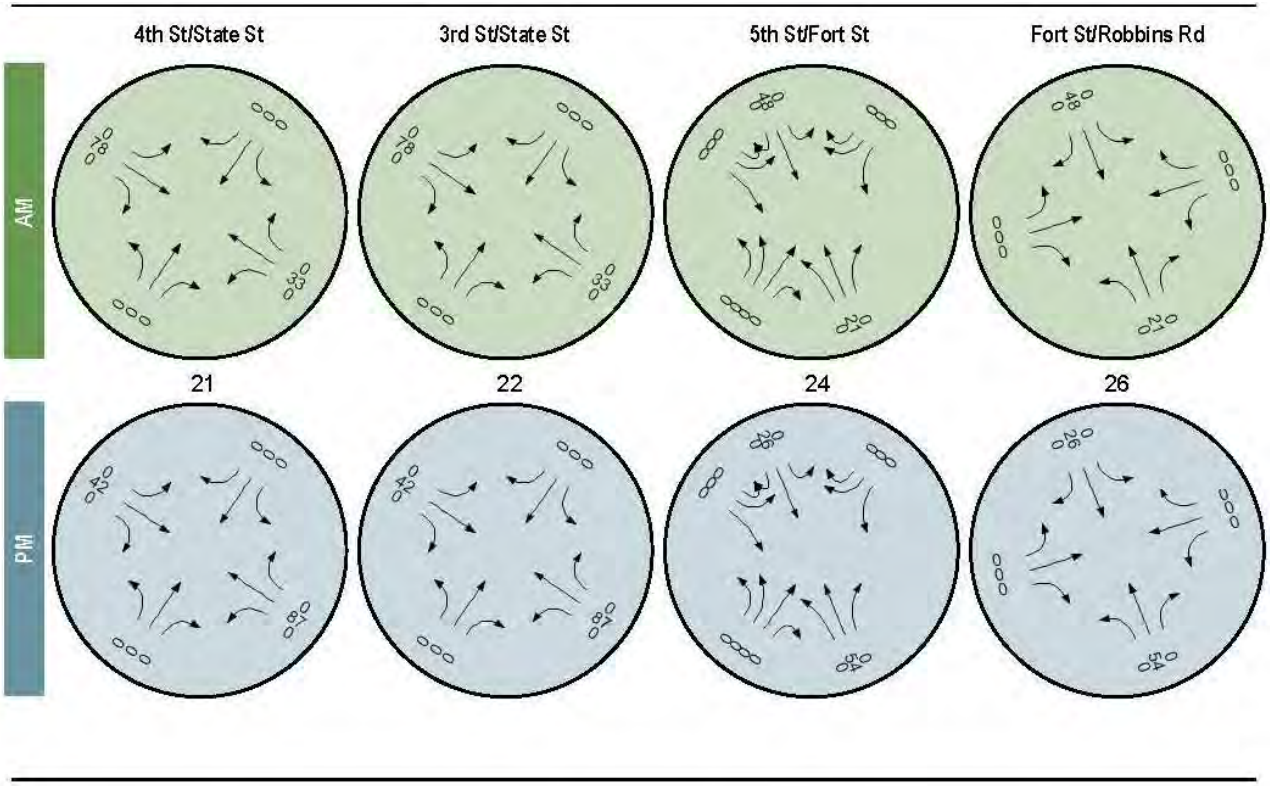


FIGURE 26 (CONTINUED)
2024 Site Generated Peak Hour Traffic Volumes



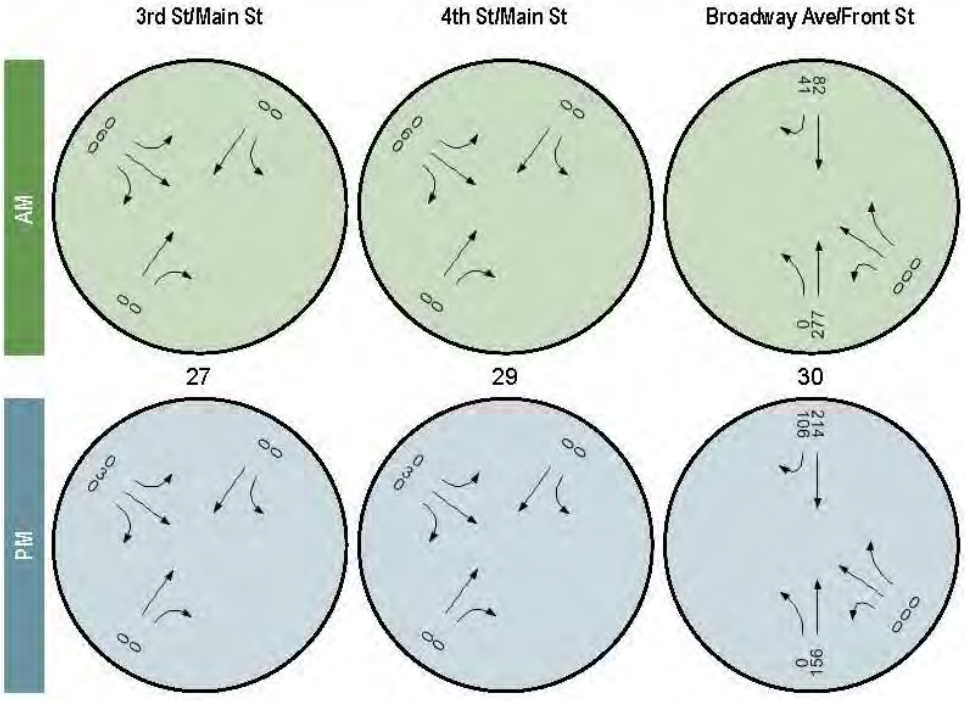


FIGURE 27
2035 Site Generated Peak Hour Traffic Volumes

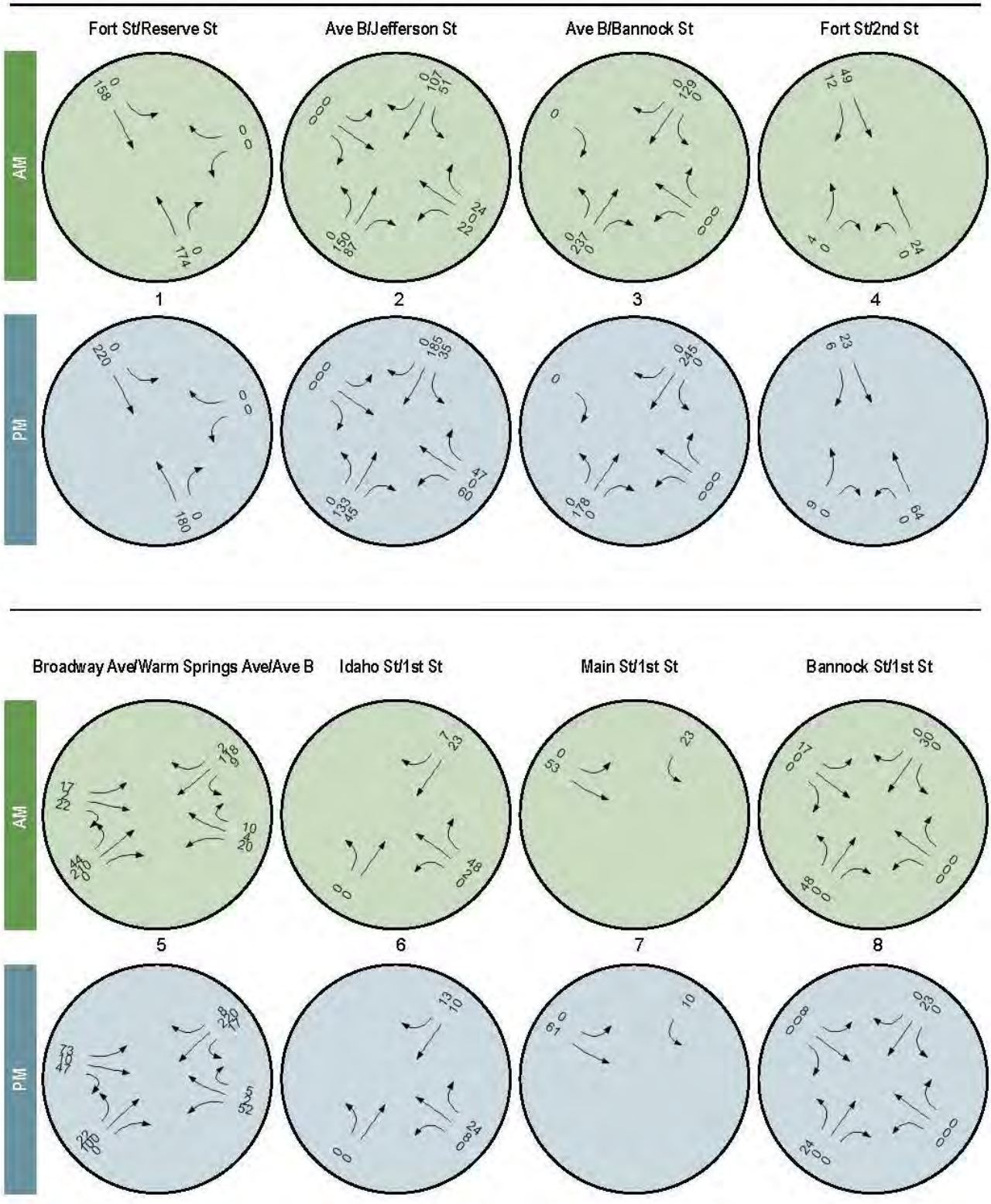
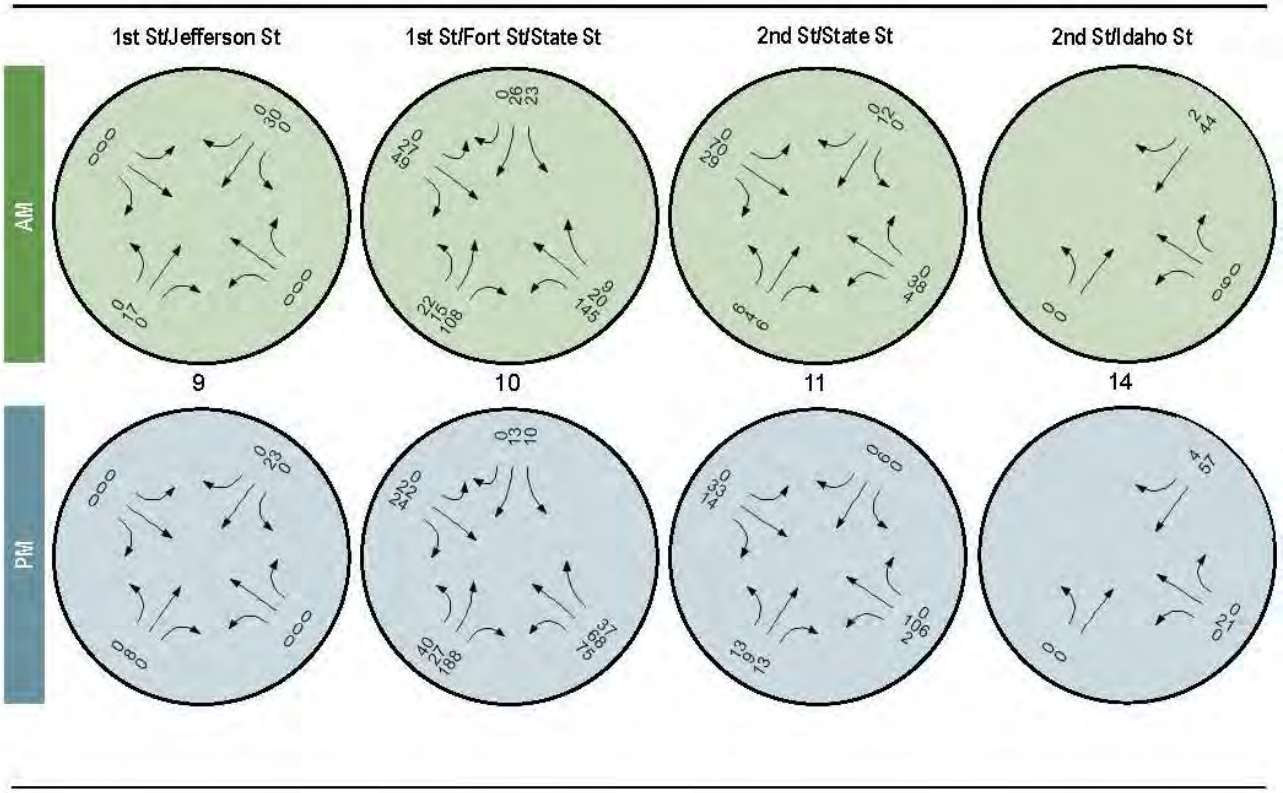


FIGURE 27 (CONTINUED)
2035 Site Generated Peak Hour Traffic Volumes



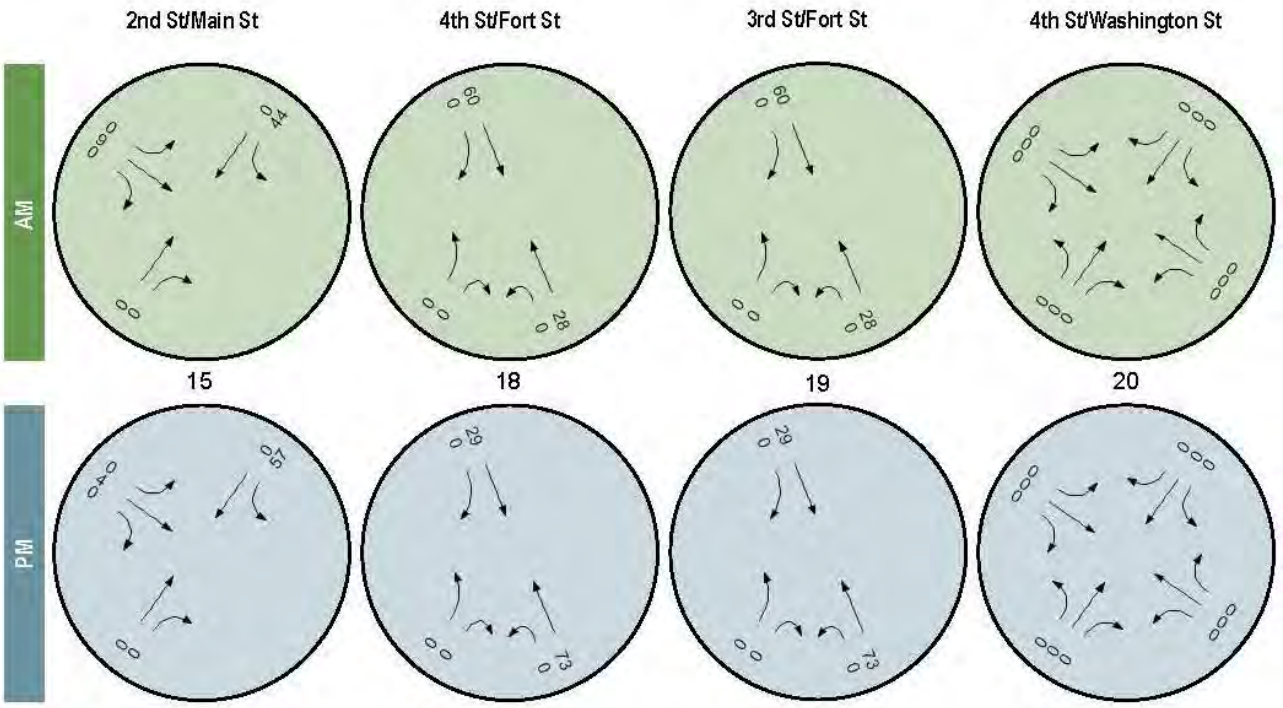
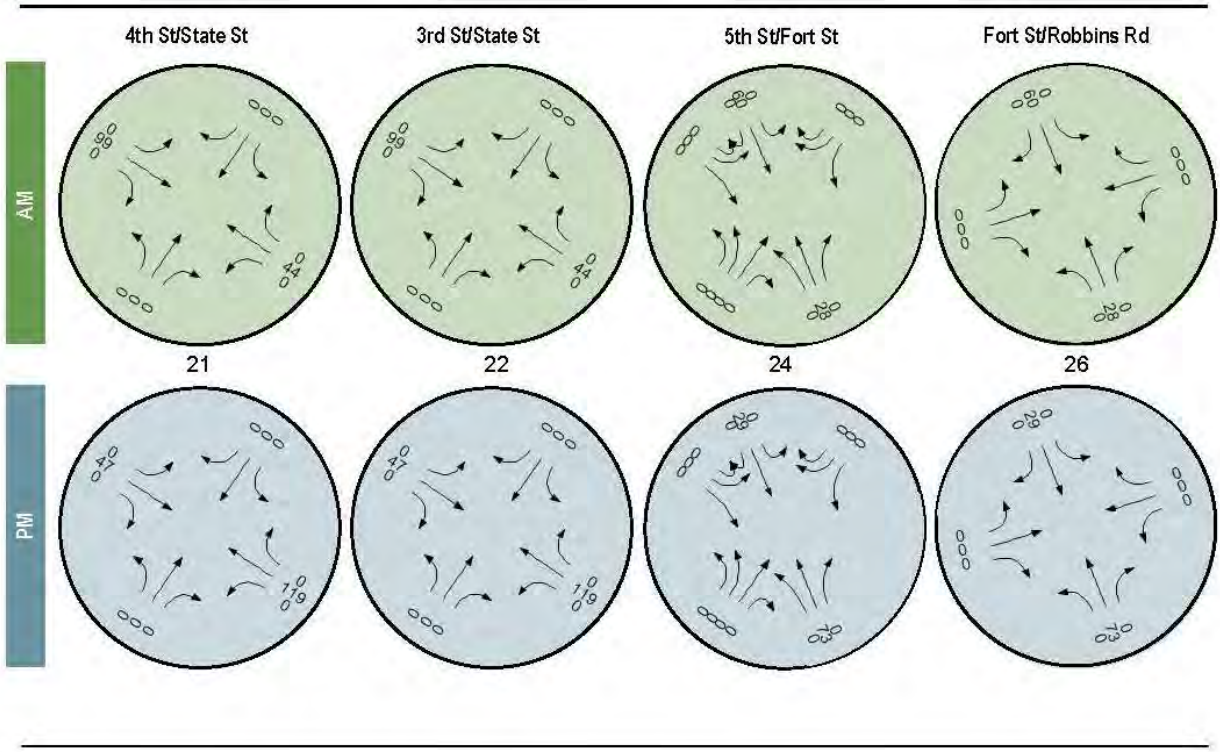


FIGURE 27 (CONTINUED)
2035 Site Generated Peak Hour Traffic Volumes



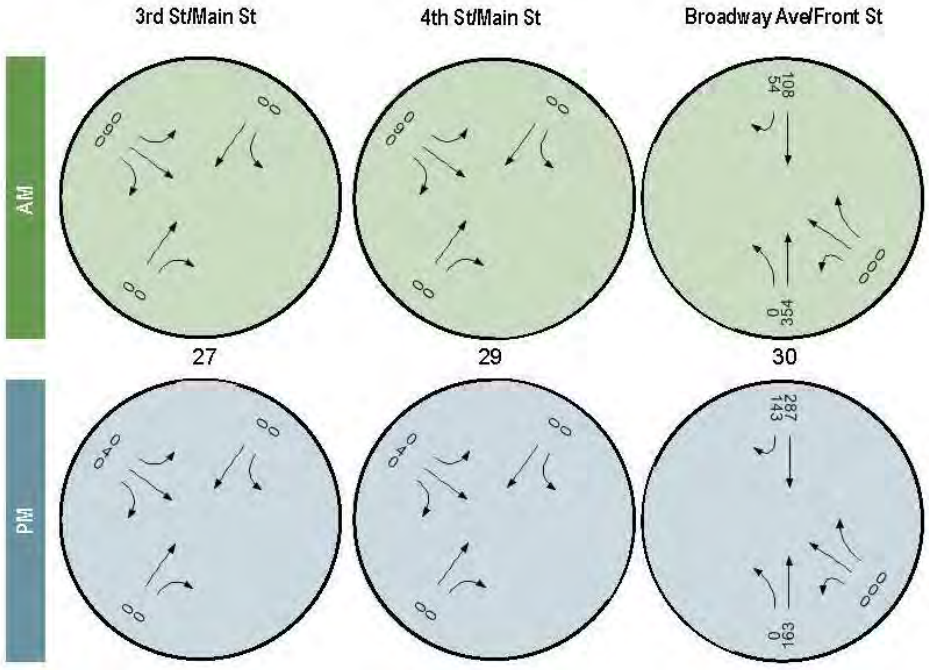
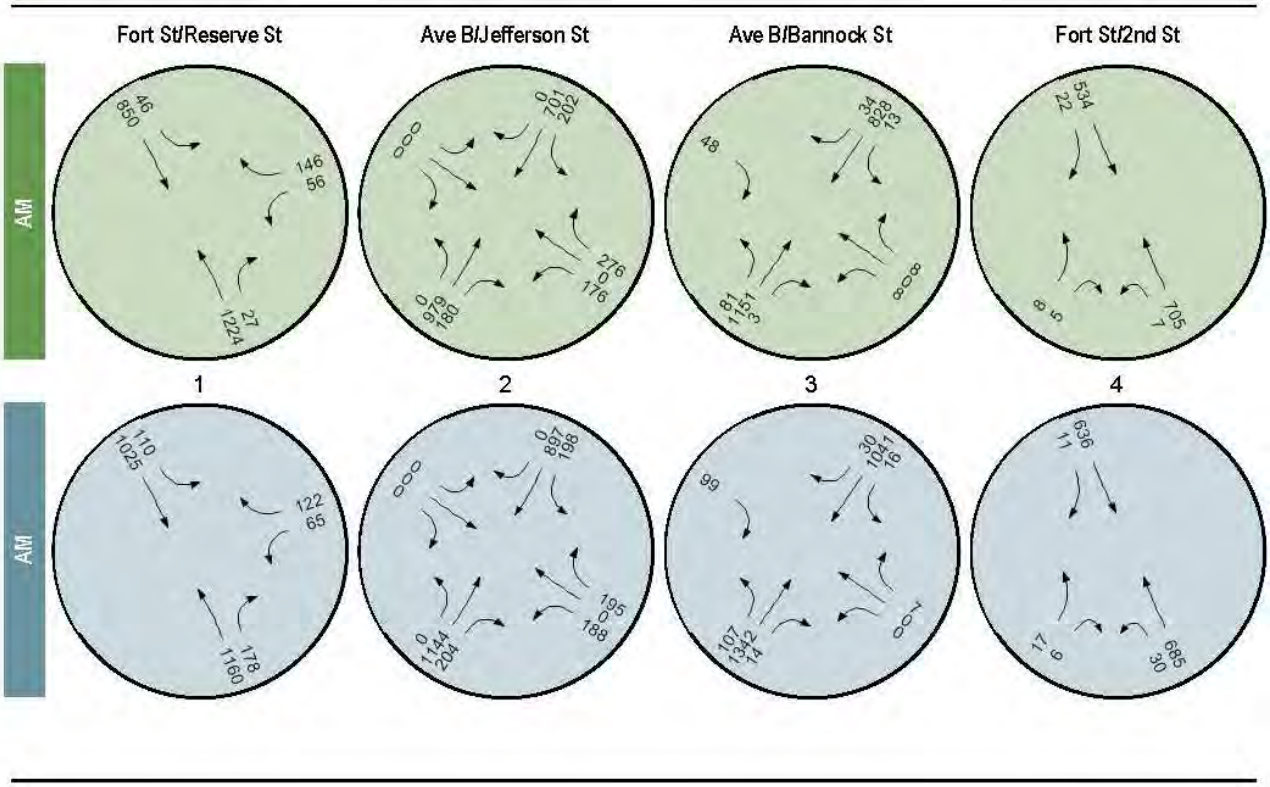


FIGURE 28
2024 Total Peak Hour Traffic Volumes



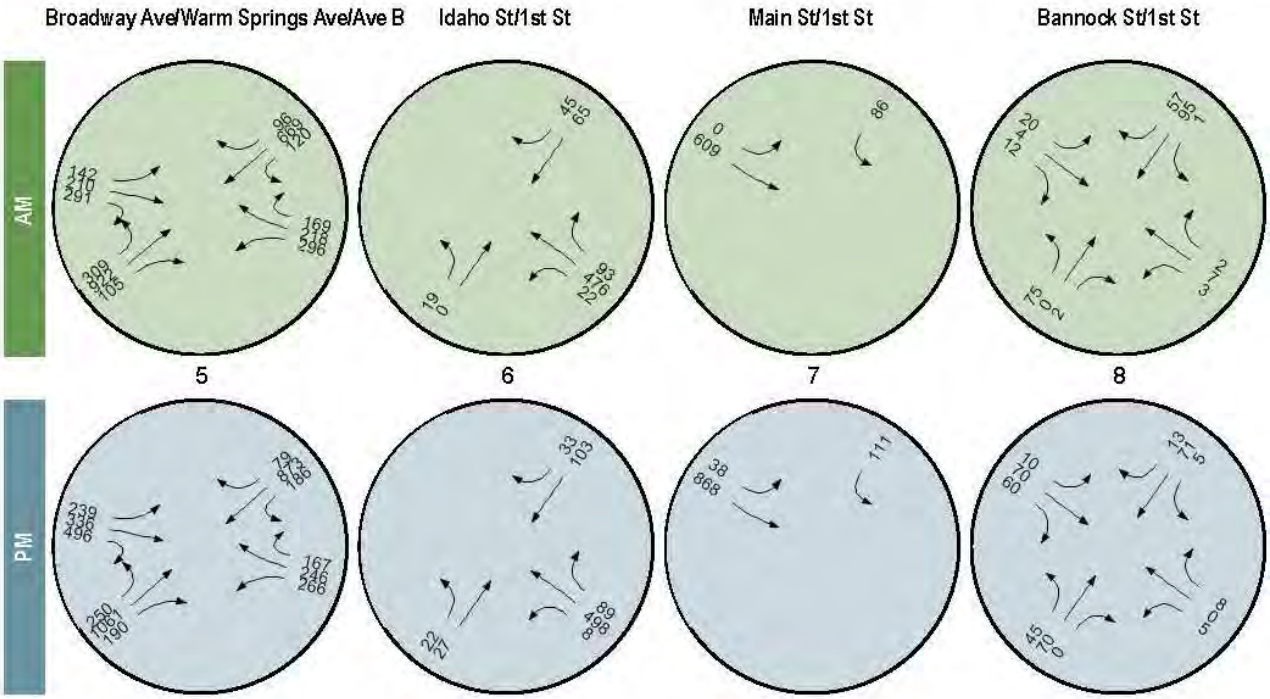


FIGURE 28 (CONTINUED)
2024 Total Peak Hour Traffic Volumes

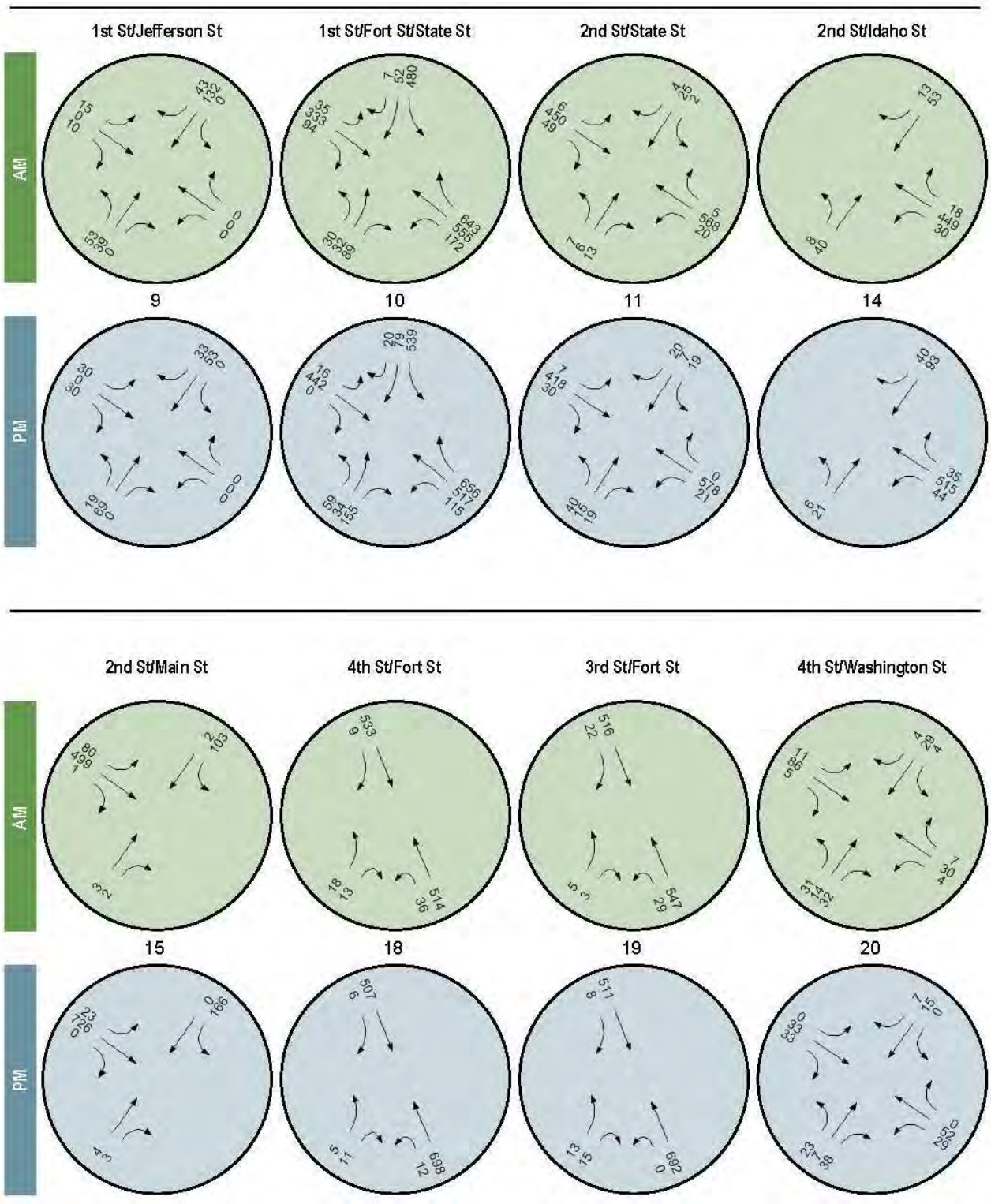
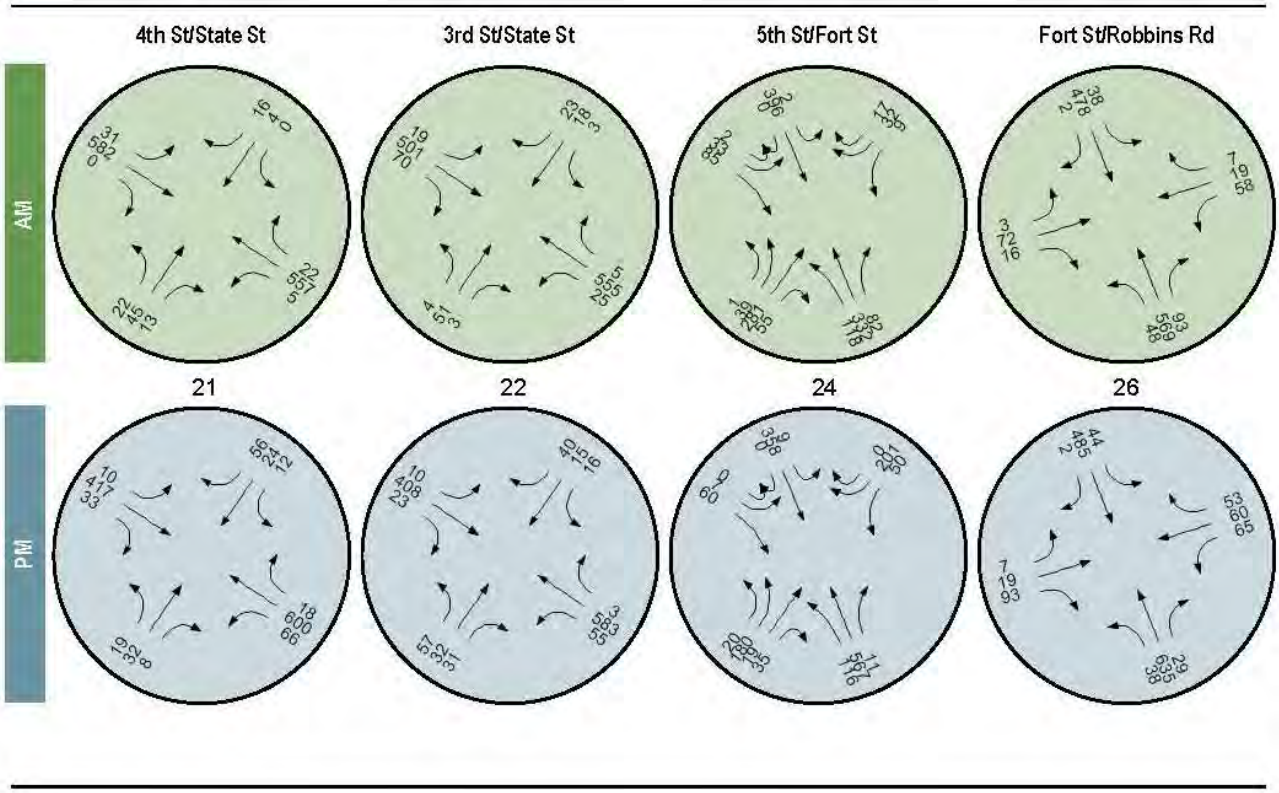


FIGURE 28 (CONTINUED)
2024 Total Peak Hour Traffic Volumes



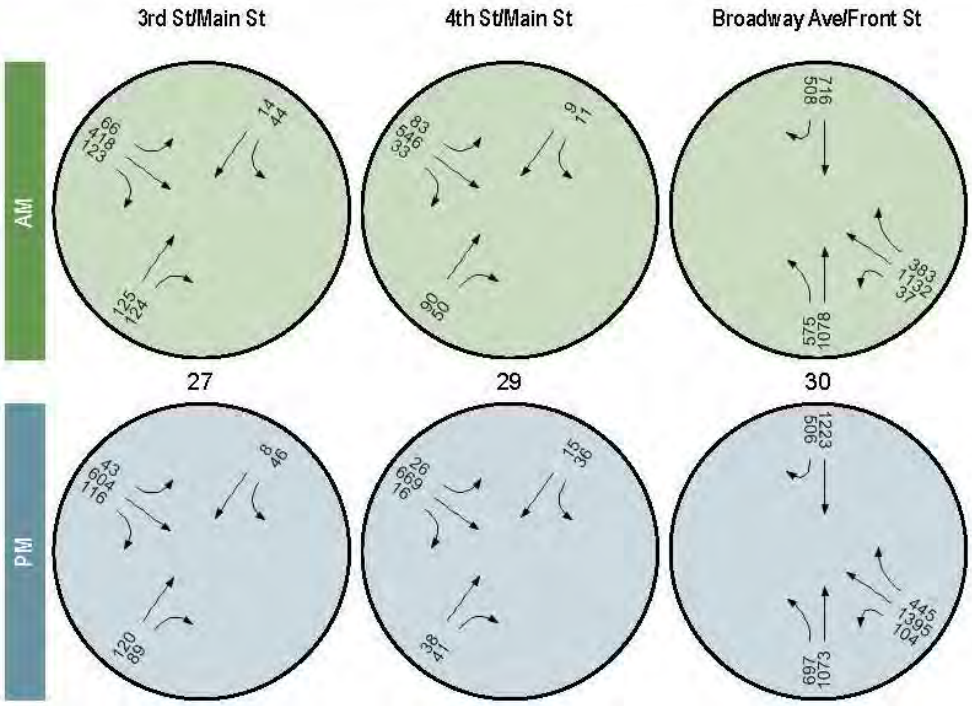


FIGURE 29
2035 Total Peak Hour Traffic Volumes

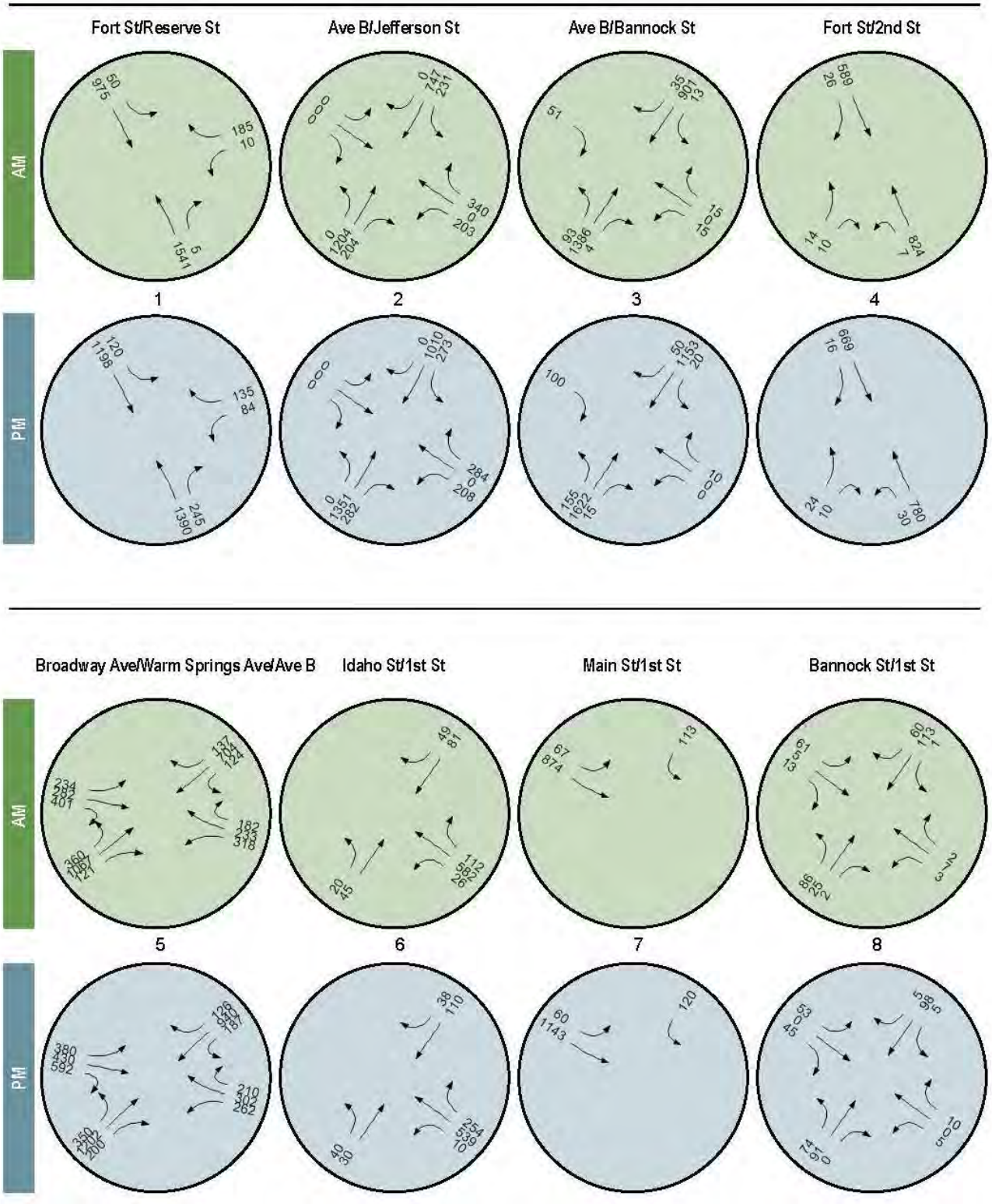
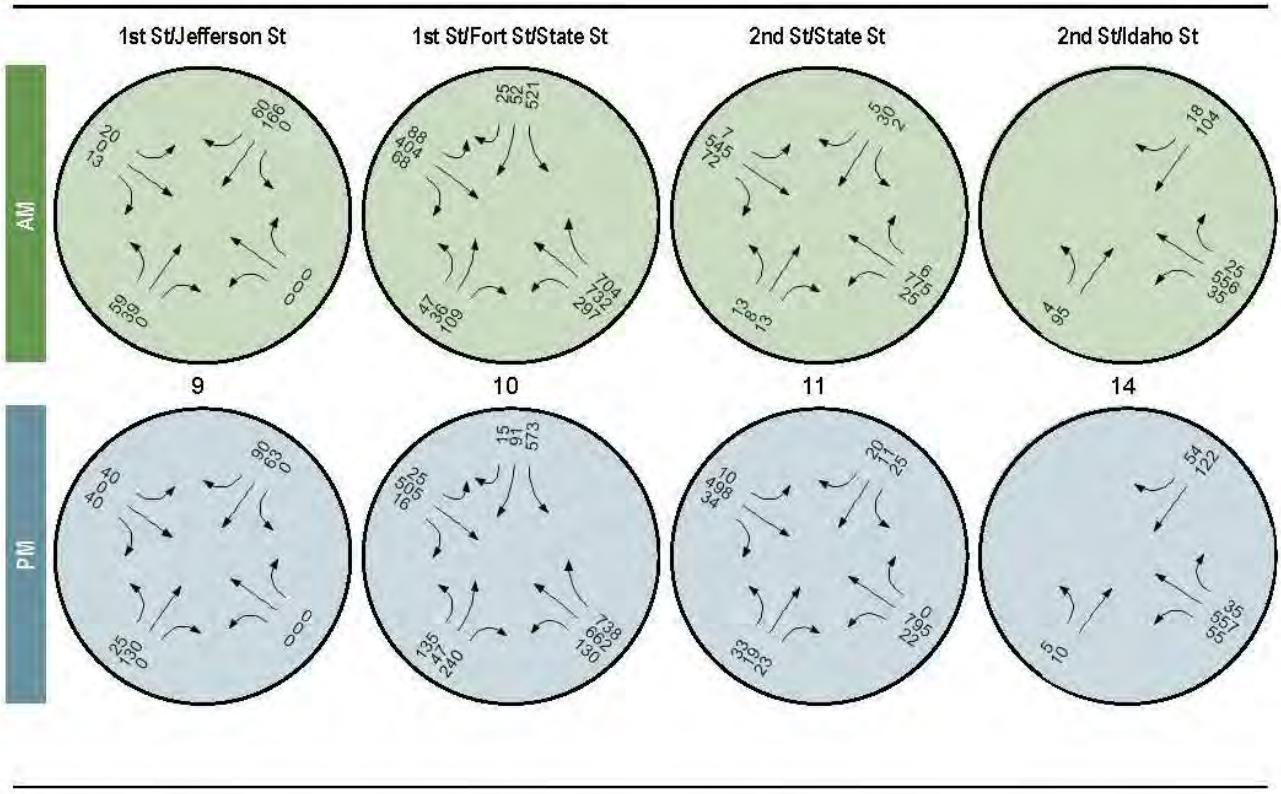


FIGURE 29 (CONTINUED)
2035 Total Peak Hour Traffic Volumes



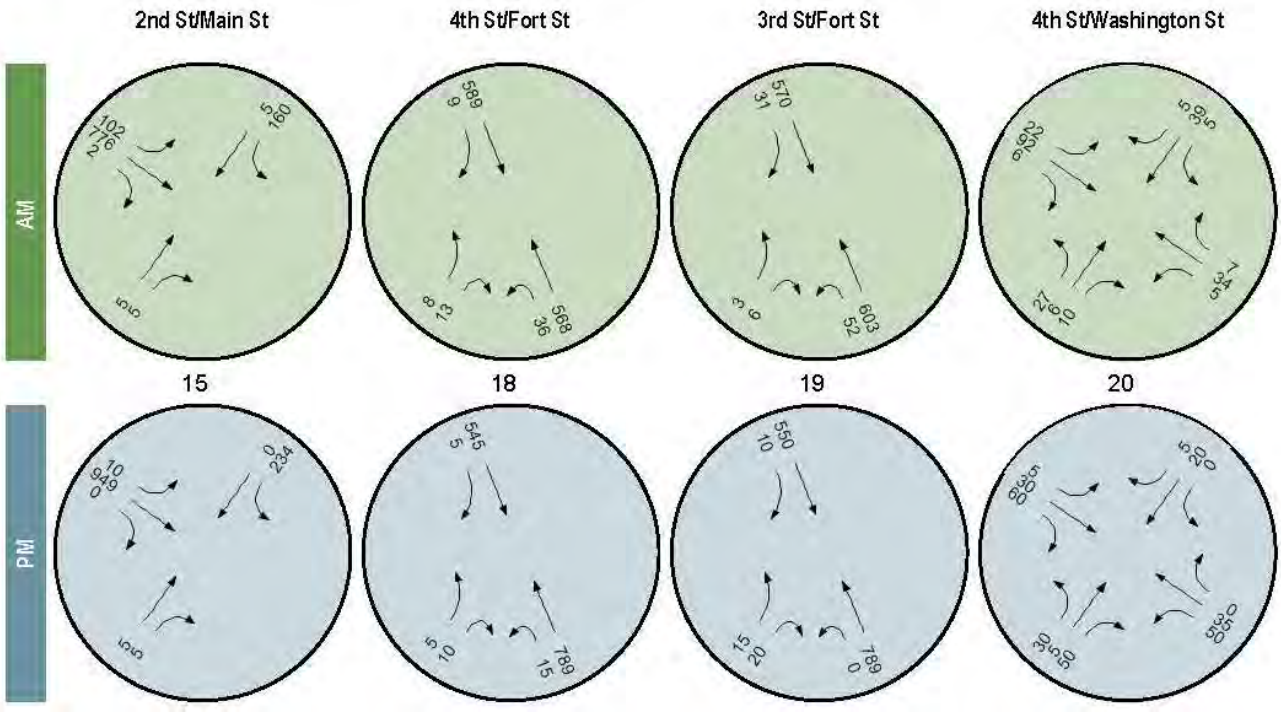
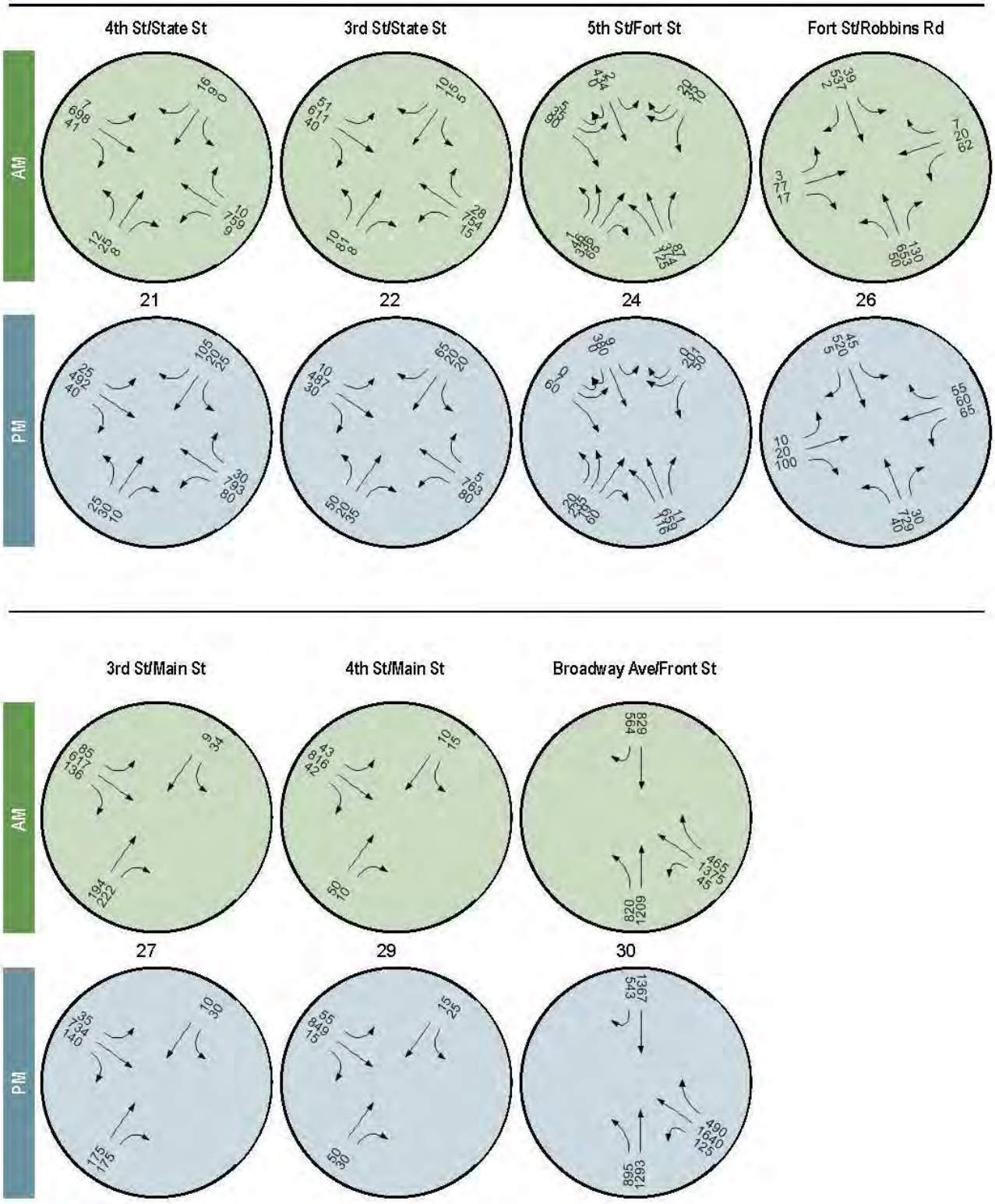


FIGURE 29 (CONTINUED)
2035 Total Peak Hour Traffic Volumes



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SECTION 7

Traffic Analysis

7.1 Level-of-Service for Existing Conditions

Roadway Segment LOS

ACHD has developed LOS standards for roadway segments based on directional peak hour volumes for various functional classifications, number of lanes, and left-turn treatments. Based on the current *ACHD Policy Manual*, the minimum acceptable LOS for a roadway segment is LOS E for principal arterials and LOS D for minor arterials. Table 3 summarizes ACHD's LOS standards as opposed to existing (2013) traffic conditions for major roadway segments within the study area.

TABLE 3
Roadway Segment Review - Existing

Roadway	From	To	Functional Classification	No. of Through Lanes	Left-Turn Treatment	Threshold Volume		Existing – AM			Existing – PM		
						LOS D	LOS E	Pk Dir	Volume	LOS	Pk Dir	Volume	LOS
Broadway	Front	Wm Spgs	Minor Arterial	2	Continuous	1540	1770	SB	1020	< D	SB	1290	< D
Ave B	Wm Spgs	Bannock	Minor Arterial	2	Continuous	1540	1770	NB	857	< D	NB	1080	< D
Ave B	Bannock	Jefferson	Minor Arterial	2	Continuous	1540	1770	NB	789	< D	NB	1005	< D
Fort	Jefferson	Reserve	Minor Arterial	2	Continuous	1540	1770	NWB	824	< D	NWB	955	< D
Fort	Reserve	1st Street	Minor Arterial	2	Continuous	1540	1770	NWB	881	< D	NWB	910	< D
Fort	1st Street	2nd Street	Collector	1	Unrestricted	530	660	NWB	558	E	NWB	593	E
Fort	2nd Street	Robbins	Collector	1	Unrestricted	530	660	NWB	513	< D	NWB	569	E
Fort	Robbins	3rd Street	Collector	1	Unrestricted	530	660	SEB	428	< D	NWB	565	E
Fort	3rd Street	4th Street	Collector	1	No LT Lane	425	525	SEB	435	E	NWB	576	F
State	1st Street	2nd Street	Minor Arterial	1	No LT Lane	550	690	WB	350	< D	EB	380	< D
State	2nd Street	3rd Street	Minor Arterial	1	No LT Lane	550	690	EB	350	< D	EB	375	< D
State	3rd Street	4th Street	Minor Arterial	1	No LT Lane	550	690	EB	372	< D	WB	472	< D
State	4th Street	5th Street	Minor Arterial	1	No LT Lane	550	690	EB	437	< D	WB	444	< D
Idaho	Ave B	1st Street	Minor Arterial	2	Unrestricted	1540	1770	WB	450	< D	WB	375	< D
Idaho	1st Street	2nd Street	Minor Arterial	2	Unrestricted	1540	1770	WB	349	< D	WB	526	< D
Main	Ave B	1st Street	Minor Arterial	3	Unrestricted	2370	2660	EB	385	< D	EB	745	< D
Main	1st Street	2nd Street	Minor Arterial	2	Unrestricted	1540	1770	EB	450	< D	EB	590	< D
Main	2nd Street	3rd Street	Minor Arterial	2	Unrestricted	1540	1770	EB	471	< D	EB	522	< D
Main	3rd Street	4th Street	Minor Arterial	2	Unrestricted	1540	1770	EB	523	< D	EB	604	< D
Main	4th Street	5th Street	Minor Arterial	2	Unrestricted	1540	1770	EB	520	< D	EB	518	< D
Reserve	Fort	Krall	Collector	1	Unrestricted	530	660	SB	190	< D	NB	229	< D

The existing roadway segment analysis reveals acceptable LOS conditions on all segments, with the exception of Fort Street from 1st Street to 4th Street. LOS E operations are prevalent in this two-lane section. Further examination of intersection operations, as discussed in the following section, reveals acceptable LOS at each of the intersections within this section. Additionally, v/c ratios are well below threshold limits; therefore, no significant capacity improvements are recommended at this time. However, a review of left-turn operations in accordance with ACHD left-turn guidelines reveals that a westbound left-turn lane is warranted at 2nd Street and Fort Street, and 4th Street and Fort Street. The addition of left-turn lanes at these locations will be carried forward in the proceeding analysis.

Intersection LOS

In order to review both existing and proposed traffic impacts *PTV Vistro* software was used. The software is an effective tool for conducting large-scale traffic impact analyses due to its multi-function capabilities including trip generation, trip distribution, and assignment. This software uses current *Highway Capacity Manual* procedures to compute intersection level of service (LOS), delay, and volume to capacity (v/c) ratios. Intersection LOS values for signalized and unsignalized intersections are defined in terms of the average control delay per vehicle. For signalized intersections, the maximum acceptable overall intersection v/c ratio is 0.90. The intersection v/c ratio for roundabouts and unsignalized intersections is undefined by the *Highway Capacity Manual*. The maximum acceptable lane group v/c ratio for signalized and unsignalized intersections is 1.0, and 0.85 for roundabouts.

An intersection traffic operations review was conducted for the existing (2013) traffic conditions. Results are presented in Table 4 while comprehensive output reports are provided in Appendix E.

TABLE 4
Intersection Operations Review - Existing

Intersection	Traffic Control / Lane Group	AM LOS/Delay (sec) / v/c	PM LOS/Delay (sec) / v/c
5th/Fort/Hayes	Traffic Signal	D/43.1	D/39.1
		0.51	0.45
	SBLTTH	0.42	0.02
	SBRT	0.41	0.26
	NEBLT	0.11	0.61
	NEBTHRT	0.82	0.15
	SWBLT	0.10	0.24
	SWBRT	0.15	0.87
	NWBLT	0.94	0.91
	NWBTHRT	0.33	0.42
	SEB	0.83	0.77
4th/Fort	TWSC	D/27.3	C/23.3
		0.06	0.03
	NBLT	0.06	0.01
	NBTH	0.01	0.01

TABLE 4
Intersection Operations Review - Existing

Intersection	Traffic Control / Lane Group	AM LOS/Delay (sec) v/c	PM LOS/Delay (sec) v/c
	NEBLT	0.06	0.03
	NEBRT	0.04	0.02
	SEBTH	0.01	0.00
	SEBRT	0.00	0.00
4th/Washington	TWSC	B/11.7	B/11.4
		0.11	0.02
	NEBLT	0.00	0.00
	NEBTH	0.01	0.01
	NEBRT	0.01	0.00
	SWBLT	0.01	0.01
	SWBTH	0.11	0.02
	SWBRT	0.01	0.02
	NWBLT	0.00	0.01
	NWBTH	0.00	0.00
	NWBRT	0.00	0.00
	SEBLT	0.01	0.00
	SEBTH	0.00	0.00
	SEBRT	0.00	0.00
4th/State	TWSC	D/29.7	C/24.3
		0.20	0.14
	NEBLT	NR	NR
	NEBTH	NR	NR
	NEBRT	NR	NR
	SWBLT	0.00	0.02
	SWBTH	0.20	0.14
	SWBRT	0.04	0.05
	NWBLT	0.02	0.05
	NWBTH	0.00	0.00
	NWBRT	0.00	0.00
	SEBLT	0.01	0.00
	SEBTH	0.01	0.00
	SEBRT	0.00	0.00

TABLE 4
Intersection Operations Review - Existing

Intersection	Traffic Control / Lane Group	AM LOS/Delay (sec) v/c	PM LOS/Delay (sec) v/c
4th/Main	TWSC	C/17.4	C/18.7
		0.11	0.23
	NEBLT	NR	NR
	NEBTH	NR	NR
	NEBRT	0.02	0.14
	SWBLT	0.11	0.23
	SWBTH	0.06	0.06
	SEBLT	NR	NR
	SEBTH	0.01	0.01
	SEBRT	0.00	0.00
3rd/Fort	TWSC	C/23.2	C/22.8
		0.07	0.12
	NBLT	0.00	0.00
	NBTH	0.01	0.01
	SBTH	0.01	0.00
	SBRT	0.00	0.00
	NEBLT	0.07	0.12
	NEBRT	0.00	0.00
3rd/State	TWSC	D/28.3	C/22.0
		0.27	0.19
	NEBLT	0.06	0.19
	NEBTH	0.27	0.15
	NEBRT	0.02	0.03
	SWBLT	0.03	0.05
	SWBTH	NR	NR
	SWBRT	0.02	0.11
	NWBLT	NR	NR
	NWBTH	0.00	0.00
	NWBRT	0.00	0.00
	SEBLT	0.05	0.01
	SEBTH	0.01	0.00
	SEBRT	NR	NR

TABLE 4
Intersection Operations Review - Existing

Intersection	Traffic Control / Lane Group	AM LOS/Delay (sec) v/c	PM LOS/Delay (sec) v/c
3rd/Main	Traffic Signal	B/15.8	B/11.8
		0.42	0.31
	NEB	0.47	0.30
	SEBLTTH	0.51	0.40
	SEBTHRT	0.52	0.41
Fort/Washington/Robbins	Traffic Signal	B/17.6	B/13.6
		0.48	0.40
	NBLT	0.12	0.06
	NBTHRT	0.49	0.47
	SBLT	0.12	0.09
	SBTHRT	0.47	0.31
	EBLT	0.42	0.37
	EBTHRT	0.81	0.78
	WBLT	0.79	0.70
	WBTHRT	0.14	0.51
2nd/Fort	TWSC	D/26.2	D/27.0
		0.02	0.06
	SBTH	0.01	0.01
	SBRT	0.00	0.00
	NEBLT	0.02	0.06
	NEBRT	0.01	0.01
	NWBLT	0.01	0.03
	NWBTH	0.01	0.01

TABLE 4
Intersection Operations Review - Existing

Intersection	Traffic Control / Lane Group	AM LOS/Delay (sec) / v/c	PM LOS/Delay (sec) / v/c
2nd/State	TWSC	D/28.3	C/19.0
		0.14	0.08
	NEBLT	0.02	0.06
	NEBTH	0.02	0.02
	NEBRT	0.02	0.01
	SWBLT	0.02	0.08
	SWBTH	0.14	0.01
	SWBLT	0.01	0.03
	NWBLT	0.02	0.02
	NWBTH	0.01	0.00
	NWBRT	0.00	0.00
	SEBLT	0.01	0.00
	SEBTH	0.00	0.00
	SEBRT	0.00	0.00
2nd/Idaho	TWSC	C/15.2	C/24.4
		0.07	0.17
	NEBLT	0.05	0.04
	NEBTH	0.07	0.07
	SWBTH	0.05	0.17
	SWBRT	0.02	0.09
	NWBLT	0.02	0.03
	NWBTH	0.00	0.01
	NWBRT	0.00	0.00
2nd/Main	TWSC	C/17.5	C/19.0
		0.16	0.28
	NEBTH	0.00	0.02
	NEBRT	0.01	0.01
	SWBLT	0.16	0.28
	SWBTH	0.00	0.01
	SEBLT	0.03	0.01
	SEBTH	0.01	0.01
	SEBRT	0.00	0.00

TABLE 4
Intersection Operations Review - Existing

Intersection	Traffic Control / Lane Group	AM LOS/Delay (sec) v/c	PM LOS/Delay (sec) v/c
1st/Fort/State	Traffic Signal	C/24.1	B/17.8
		0.51	0.55
	SBLT	0.89	0.67
	SBTH	0.13	0.04
	NEBLT	0.15	0.15
	NEBTH	0.48	0.60
	NWBLT	0.15	0.09
	NWBTH	0.83	0.72
	NWBRT	0.52	0.49
	SEBLT	0.11	0.06
	SEBTH	0.78	0.80
1st/Jefferson	AWSC	A/9.3	A/7.9
		NR	NR
1st/Bannock	AWSC	A/8.3	A/7.9
		NR	NR
1st/Idaho	Traffic Signal	A/9.6	B/11.3
		0.29	0.23
	NEB	0.47	0.11
	SWB	0.40	0.24
	NWBTL	0.28	0.30
	NWBTR	0.28	0.30
1st/Main	Traffic Signal	A/7.1	B/11.3
		0.25	0.28
	SWBLT	0.79	0.25
	SEBLT	0.25	0.38
	SEBTH	0.25	0.38
Fort/Reserve	TWSC	***F/96.5***	***F/260.1***
		0.76	***1.10***
	NBTH	0.01	0.01
	NBRT	0.00	0.00
	WBLT	0.76	***1.10***
	WBRT	0.27	0.23
	SEBLT	0.07	0.20
	SEBTH	0.01	0.01

TABLE 4
Intersection Operations Review - Existing

Intersection	Traffic Control / Lane Group	AM LOS/Delay (sec) v/c	PM LOS/Delay (sec) v/c
Ave B/Jefferson	Traffic Signal	C/22.0	C/23.7
		0.42	0.69
	NEBLT	0.78	0.56
	NEBTH	0.30	0.58
	NEBRT	0.30	0.58
	SWBLT	0.78	0.85
	SWBTH	0.25	0.42
	SWBRT	0.25	0.42
	NWBTH	0.71	0.73
	NWBRT	0.49	0.14
	SEB	0.46	0.21
Ave B/Bannock	TWSC	***F/118.9***	***F/109.1***
		0.17	0.24
	NEBLT	0.13	0.11
	NEBTH	0.01	0.01
	NEBRT	0.00	0.00
	SWBLT	0.02	0.02
	SWBTH	0.01	0.01
	SWBRT	0.00	0.00
	NWBLT	0.17	0.00
	NWBTH	0.00	0.00
	NWBRT	0.02	0.02
	SEBRT	0.09	0.24
Ave B/Broadway/Warm Springs/Main	Traffic Signal	D/48.5	D/50.3
		0.58	0.74
	EBLT	0.18	0.28
	EBTH	0.58	0.90
	EBRT	0.87	0.43
	WBLT	0.91	0.81
	WBTH	0.85	0.53
	WBRT	0.75	0.85
	NEBLT	0.89	0.68
	NEBTH	0.59	0.67
	NEBRT	0.59	0.68
	SWBLT	0.49	0.89
	SWBTH	0.46	0.55
	SWBRT	0.46	0.55

TABLE 4
Intersection Operations Review - Existing

Intersection	Traffic Control / Lane Group	AM LOS/Delay (sec) / v/c	PM LOS/Delay (sec) / v/c
Broadway/Front/Parkcenter	Traffic Signal	C/32.2	D/40.4
		0.65	0.74
	NBLT	0.85	0.91
	NBTH	0.37	0.38
	SBTH	0.28	0.51
	SBRT	0.68	0.73
	NWBLT	0.07	0.17
	NWBTH	0.77	0.81
	NWBRT	0.83	0.89

NOTES:

Results noted are for the A.M. (P.M.) peak hours

Bold italics indicated where ACHD minimum LOS D threshold was exceeded, or maximum v/c ratio exceeds 1.00

Overall intersection v/c reported for signalized intersections, worst movement v/c reported for two-way stop locations

NR = Not Reported

TWSC = Two-way stop-controlled intersection

AWSC = All-way stop-controlled intersection

This review indicates that under existing conditions LOS thresholds are exceeded at 1) Fort Street and Reserve Street and 2) Avenue B and Bannock Street. At Avenue B and Bannock Street, v/c ratios are well below threshold limits therefore no intersections improvements are recommended. At Fort Street and Reserve Street, the v/c threshold is exceeded for the WB LT movement. Because of this condition, traffic signal warrants, as outlined by the *Manual on Uniform Traffic Control Devices (MUTCD)* were reviewed. This review indicates that traffic signal warrants would likely be met at this location. However, installation of a traffic signal at this location given the close proximity to existing traffic signals at Avenue B and Jefferson Street and 1st Street/Fort St/State Street could create excessive stopping, vehicle queuing, unnecessary delay, increased fuel consumption, vehicle emissions, and higher crash rates. As an alternative, a roundabout is proposed at this intersection. A roundabout configuration would be a viable solution as long as vehicle queue lengths from the adjacent signalized intersections do not encroach upon this location.

7.2 Level-of-Service for 2024 No Build Conditions

Roadway Segment LOS

Table 5 summarizes ACHD's LOS standards as opposed to 2024 No Build traffic conditions for roadway segments within the study area.

TABLE 5

Roadway Segment Review – 2024 No Build

Roadway	From	To	Functional Classification	No. of Through Lanes	Left-Turn Treatment	Threshold Volume		2024 No Build – AM			2024 No Build – PM		
						LOS D	LOS E	Pk Dir	Volume	LOS	Pk Dir	Volume	LOS
Broadway	Front	Wm Spgs	Minor Arterial	2	Continuous	1540	1770	SB	1132	< D	SB	1388	< D
Ave B	Wm Spgs	Bannock	Minor Arterial	2	Continuous	1540	1770	NB	1040	< D	NB	1294	< D
Ave B	Bannock	Jefferson	Minor Arterial	2	Continuous	1540	1770	NB	966	< D	NB	1176	< D
Fort	Jefferson	Reserve	Minor Arterial	2	Continuous	1540	1770	NWB	1002	< D	NWB	1022	< D
Fort	Reserve	1st Street	Minor Arterial	2	Continuous	1540	1770	NWB	1082	< D	NWB	960	< D
Fort	1st Street	2nd Street	Collector	1	Unrestricted	530	660	NWB	609	E	NWB	611	E
Fort	2nd Street	Robbins	Collector	1	Unrestricted	530	660	NWB	606	E	NWB	600	E
Fort	Robbins	3rd Street	Collector	1	Unrestricted	530	660	NWB	475	< D	NWB	593	E
Fort	3rd Street	4th Street	Collector	1	Unrestricted	530	660	NWB	453	< D	NWB	603	E
State	1st Street	2nd Street	Minor Arterial	1	No LT Lane	550	690	WB	496	< D	EB	451	< D
State	2nd Street	3rd Street	Minor Arterial	1	No LT Lane	550	690	WB	479	< D	WB	485	< D
State	3rd Street	4th Street	Minor Arterial	1	No LT Lane	550	690	WB	479	< D	WB	527	< D
State	4th Street	5th Street	Minor Arterial	1	No LT Lane	550	690	EB	509	< D	WB	522	< D
Idaho	Ave B	1st Street	Minor Arterial	2	Unrestricted	1540	1770	WB	521	< D	WB	485	< D
Idaho	1st Street	2nd Street	Minor Arterial	2	Unrestricted	1540	1770	WB	429	< D	WB	518	< D
Main	Ave B	1st Street	Minor Arterial	3	Unrestricted	2370	2660	EB	586	< D	EB	913	< D
Main	1st Street	2nd Street	Minor Arterial	2	Unrestricted	1540	1770	EB	611	< D	EB	795	< D
Main	2nd Street	3rd Street	Minor Arterial	2	Unrestricted	1540	1770	EB	600	< D	EB	723	< D
Main	3rd Street	4th Street	Minor Arterial	2	Unrestricted	1540	1770	EB	639	< D	EB	760	< D
Main	4th Street	5th Street	Minor Arterial	2	Unrestricted	1540	1770	EB	658	< D	EB	708	
Reserve	Fort	Krall	Collector	1	Unrestricted	530	660	SB	226	< D	NB	298	< D

Similar to the existing condition review, roadway segment LOS results exceed threshold limits along Fort Street, from 1st Street to 4th Street; however, examination of associated intersection operations for this period indicate favorable LOS and v/c ratio conditions. As such, no further improvements are recommended under the 2024 No Build scenario.

Intersection LOS

An intersection traffic operations review was conducted for 2024 No Build traffic conditions. Results are presented in Table 6 while comprehensive output reports are provided in Appendix E.

TABLE 6
Intersection Operations Review – 2024 No Build

		AM	PM
	Traffic Control	2024 No Build[a] LOS/Delay (sec)	2024 No Build[a] LOS/Delay (sec)
Intersection	Lane Group	v/c	v/c
5th/Fort/Hayes	Traffic Signal	D/43.6	D/39.0
		0.53	0.46
	SBLTTH	0.00	0.02
	SBRT	0.43	0.28
	NEBLT	0.11	0.71
	NEBTHRT	0.84	0.18
	SWBLT	0.10	0.22
	SWBRT	0.15	0.76
	NWBLT	0.93	0.91
	NWBTHRT	0.34	0.46
	SEB	0.83	0.77
4th/Fort	TWSC	C/22.1	C/22.5
		0.04	0.03
	NBLT	0.04	0.01
	NBTH	0.00	0.01
	NEBLT	0.04	0.03
	NEBRT	0.03	0.02
	SEBTH	0.01	0.00
	SEBRT	0.00	0.00
4th/Washington	TWSC	B/11.2	B/11.0
		0.08	0.04
	NEBLT	0.00	0.04
	NEBTH	0.01	0.01
	NEBRT	0.01	0.04
	SWBLT	0.01	0.00

TABLE 6
Intersection Operations Review – 2024 No Build

Intersection	Traffic Control / Lane Group	AM 2024 No Build[a] LOS/Delay (sec) v/c	PM 2024 No Build[a] LOS/Delay (sec) v/c
	SWBTH	0.08	0.03
	SWBRT	0.00	0.01
	NWBLT	0.00	0.02
	NWBTH	0.00	0.00
	NWBRT	0.00	0.00
	SEBLT	0.01	0.00
	SEBTH	0.00	0.00
	SEBRT	0.00	0.00
4th/State	TWSC	D/30.0	***E/42.6***
		0.10	0.17
	NEBLT	0.06	0.15
	NEBTH	0.10	0.17
	NEBRT	0.01	0.01
	SWBLT	0.00	0.09
	SWBTH	0.10	0.14
	SWBRT	0.03	0.11
	NWBLT	0.02	0.07
	NWBTH	0.00	0.00
	NWBRT	0.00	0.00
	SEBLT	0.01	0.01
	SEBTH	0.01	0.00
	SEBRT	0.00	0.00
4th/Main	TWSC	C/22.3	D/25.5
		0.13	0.18
	NEBLT	NR	NR
	NEBTH	0.13	0.13
	NEBRT	0.06	0.11
	SWBLT	0.13	0.18
	SWBTH	0.07	0.06
	SEBLT	0.03	0.02
	SEBTH	0.01	0.01

TABLE 6
Intersection Operations Review – 2024 No Build

Intersection	Traffic Control / Lane Group	AM 2024 No Build[a] LOS/Delay (sec) v/c	PM 2024 No Build[a] LOS/Delay (sec) v/c
	SEBRT	0.00	0.00
3rd/Fort	TWSC	C/20.1	C/21.8
		0.03	0.06
	NBLT	0.03	0.00
	NBTH	0.00	0.01
	SBTH	0.00	0.00
	SBRT	0.00	0.00
	NEBLT	0.02	0.06
	NEBRT	0.01	0.03
3rd/State	TWSC	***E/42.5***	***E/46.9***
		0.10	0.37
	NEBLT	0.10	0.37
	NEBTH	0.41	0.16
	NEBRT	0.02	0.05
	SWBLT	0.03	0.11
	SWBTH	0.05	0.07
	SWBRT	0.02	0.07
	NWBLT	0.01	0.05
	NWBTH	0.00	0.00
	NWBRT	0.00	0.00
	SEBLT	0.05	0.01
	SEBTH	0.00	0.00
	SEBRT	0.00	0.00
3rd/Main	Traffic Signal	B/17.2	B/13.8
		0.47	0.42
	NEBTHRT	0.56	0.51
	SWBLTTH	0.06	0.11
	SEBLTTH	0.54	0.49
	SEBTHRT	0.54	0.49
Fort/Washington/Robbins	Traffic Signal	B/11.3	B/13.9
		0.40	0.42
	NBLT	0.08	0.06

TABLE 6
Intersection Operations Review – 2024 No Build

Intersection	Traffic Control / Lane Group	AM 2024 No Build[a] LOS/Delay (sec) v/c	PM 2024 No Build[a] LOS/Delay (sec) v/c
	NBTHRT	0.49	0.50
	SBLT	0.08	0.10
	SBTHRT	0.33	0.33
	EBLT	0.33	0.39
	EBTHRT	0.76	0.79
	WBLT	0.66	0.70
	WBTHRT	0.13	0.50
2nd/Fort	TWSC	C/24.2	D/28.4
		0.03	0.07
	SBTH	0.01	0.01
	SBRT	0.00	0.00
	NEBLT	0.03	0.07
	NEBRT	0.01	0.01
	NWBLT	0.01	0.03
	NWBTH	0.01	0.01
2nd/State	TWSC	C/22.9	D/26.1
		0.07	0.16
	NEBLT	0.01	0.16
	NEBTH	0.01	0.04
	NEBRT	0.01	0.02
	SWBLT	0.01	0.10
	SWBTH	0.07	0.01
	SWBLT	0.01	0.04
	NWBLT	0.02	0.02
	NWBTH	0.01	0.00
	NWBRT	0.00	0.00
	SEBLT	0.01	0.01
	SEBTH	0.00	0.00
	SEBRT	0.00	0.00

TABLE 6
Intersection Operations Review – 2024 No Build

Intersection	Traffic Control / Lane Group	AM 2024 No Build[a] LOS/Delay (sec) v/c	PM 2024 No Build[a] LOS/Delay (sec) v/c
2nd/Idaho	TWSC	B/14.8	C/17.7
		0.10	0.11
	NEBLT	0.02	0.02
	NEBTH	0.10	0.06
	SWBTH	0.05	0.11
	SWBRT	0.02	0.08
	NWBLT	0.02	0.03
	NWBTH	0.00	0.00
	NWBRT	0.00	0.00
2nd/Main	TWSC	C/18.8	C/24.3
		0.18	0.33
	NEBTH	0.01	0.01
	NEBRT	0.00	0.01
	SWBLT	0.18	0.33
	SWBTH	0.01	0.00
	SEBLT	0.03	0.02
	SEBTH	0.01	0.01
	SEBRT	0.00	0.00
1st/Fort/State	Traffic Signal	C/20.6	C/21.7
		0.57	0.59
	SBLT	0.59	0.71
	SBTH	0.09	0.14
	NEBLT	0.23	0.29
	NEBTH	0.59	0.78
	NWBLT	0.31	0.20
	NWBTH	0.87	0.70
	NWBRT	0.46	0.47
	SEBLT	0.31	0.09
	SEBTH	0.63	0.74
1st/Jefferson	AWSC	A/9.5	A/9.6
		NR	NR
1st/Bannock	AWSC	A/7.8	A/7.9
		NR	NR

TABLE 6
Intersection Operations Review – 2024 No Build

Intersection	Traffic Control / Lane Group	AM 2024 No Build[a] LOS/Delay (sec) v/c	PM 2024 No Build[a] LOS/Delay (sec) v/c
1st/Idaho	Traffic Signal	B/11.4	B/11.7
		0.24	0.27
	NEB	0.12	0.11
	SWB	0.19	0.25
	NWBTL	0.35	0.36
	NWBTR	0.35	0.36
1st/Main	Traffic Signal	B/10.9	B/12.6
		0.26	0.35
	SWBLT	0.16	0.24
	SEBLT	0.40	0.52
	SEBTH	0.40	0.52
Fort/Reserve	Roundabout (Signal)	C/15.3 (B/15.0)	B/12.2 (B/16.8)
		0.48 (0.50)	0.52 (0.55)
	NBTH	0.44 (0.64)	0.52 (0.63)
	NBRT	0.44 (0.66)	0.52 (0.68)
	WBLT	0.48 (0.31)	0.39 (0.37)
	WBRT	0.48 (0.63)	0.39 (0.65)
	SEBLT	0.34 (0.46)	0.41 (0.70)
	SEBTH	0.34 (0.35)	0.41 (0.37)
Ave B/Jefferson	Traffic Signal	B/14.9	B/17.9
		0.46	0.58
	NEBLT	0.67	0.73
	NEBTH	0.72	0.80
	NEBRT	0.72	0.81
	SWBLT	0.73	0.79
	SWBTH	0.53	0.55
	SWBRT	0.53	0.55
	NWBTH	0.54	0.63
	NWBRT	0.47	0.13
	SEB	0.33	0.45

TABLE 6
Intersection Operations Review – 2024 No Build

Intersection	Traffic Control / Lane Group	AM 2024 No Build[a] LOS/Delay (sec) v/c	PM 2024 No Build[a] LOS/Delay (sec) v/c
Ave B/Bannock	TWSC	***F/96.5***	***F/186.2***
		0.18	0.21
	NEBLT	0.11	0.17
	NEBTH	0.01	0.01
	NEBRT	0.00	0.00
	SWBLT	0.02	0.04
	SWBTH	0.01	0.01
	SWBRT	0.00	0.00
	NWBLT	0.18	0.00
	NWBTH	0.00	0.00
	NWBRT	0.02	0.02
	SEBRT	0.09	0.21
Ave B/Broadway/ Warm Springs/Main	Traffic Signal	D/40.6	D/44.9
		0.55	0.69
	EBLT	0.24	0.27
	EBTH	0.87	0.94
	EBRT	0.38	0.51
	WBLT	0.77	0.72
	WBTH	0.52	0.58
	WBRT	0.86	0.86
	NEBLT	0.57	0.36
	NEBTH	0.46	0.67
	NEBRT	0.14	0.29
	SWBLT	0.71	0.78
	SWBTH	0.43	0.69
	SWBRT	0.09	0.07
Broadway/Front/Parkcenter	Traffic Signal	D/39.1	D/41.9
		0.72	0.75
	NBLT	0.84	0.87
	NBTH	0.41	0.49
	SBTH	0.32	0.59
	SBRT	0.75	0.75
	NWBLT	0.08	0.19
	NWBTH	0.81	0.90
	NWBRT	0.88	0.92

TABLE 6
Intersection Operations Review – 2024 No Build

Intersection	Traffic Control / Lane Group	AM 2024 No Build[a] LOS/Delay (sec) v/c	PM 2024 No Build[a] LOS/Delay (sec) v/c

NOTES:

Results noted are for the A.M. and P.M peak hours

Bold italics indicated where ACHD minimum LOS D threshold was exceeded, or maximum v/c ratio exceeds 1.00

Overall intersection v/c reported for signalized intersections, worst movement v/c reported for two-way stop locations

NR = Not Reported

TWSC = Two-way stop-controlled intersection

AWSC = All-way stop-controlled intersection

[a] Existing network with 2024 baseline traffic plus CIP improvements and DBIP

This review indicates that under 2024 No Build conditions LOS thresholds are exceeded at 1) 4th Street and State Street, 2) 3rd Street and State Street, and 3) Avenue B and Bannock Street. As v/c ratios are well below threshold limits at each of these intersections no further improvements are recommended under the 2024 No Build scenario.

7.3 Level-of-Service for 2024 Total (with project) Conditions

Roadway Segment LOS

Table 7 summarizes ACHD's LOS standards as opposed to 2024 Total traffic conditions for roadway segments within the study area.

TABLE 7

Roadway Segment Review – 2024 Total

Roadway	From	To	Functional Classification	No. of Through Lanes	Left-Turn Treatment	Threshold Volume		2024 Total – AM			2024 Total – PM		
						LOS D	LOS E	Pk Dir	Volume	LOS	Pk Dir	Volume	LOS
Broadway	Front	Wm Spgs	Minor Arterial	2	Continuous	1540	1770	NB	1336	< D	SB	1635	< D
Ave B	Wm Spgs	Bannock	Minor Arterial	2	Continuous	1540	1770	NB	1235	< D	NB	1463	< D
Ave B	Bannock	Jefferson	Minor Arterial	2	Continuous	1540	1770	NB	1159	< D	NB	1348	< D
Fort	Jefferson	Reserve	Minor Arterial	2	Continuous	1540	1770	NWB	1255	< D	NWB	1339	< D
Fort	Reserve	1st Street	Minor Arterial	2	Continuous	1540	1770	NWB	1370	< D	NWB	1288	< D
Fort	1st Street	2nd Street	Collector	1	Unrestricted	530	660	NWB	710	F	NWB	706	F
Fort	2nd Street	Robbins	Collector	1	Unrestricted	530	660	NWB	710	F	NWB	702	F
Fort	Robbins	3rd Street	Collector	1	Unrestricted	530	660	NWB	576	E	NWB	692	F
Fort	3rd Street	4th Street	Collector	1	Unrestricted	530	660	NWB	576	E	NWB	692	F
State	1st Street	2nd Street	Minor Arterial	1	No LT Lane	550	690	WB	593	E	WB	599	E
State	2nd Street	3rd Street	Minor Arterial	1	No LT Lane	550	690	WB	585	E	WB	641	E
State	3rd Street	4th Street	Minor Arterial	1	No LT Lane	550	690	EB	590	E	WB	684	E
State	4th Street	5th Street	Minor Arterial	1	No LT Lane	550	690	EB	613	E	WB	675	E
Idaho	Ave B	1st Street	Minor Arterial	2	Unrestricted	1540	1770	WB	623	< D	WB	575	< D
Idaho	1st Street	2nd Street	Minor Arterial	2	Unrestricted	1540	1770	WB	497	< D	WB	594	< D
Main	Ave B	1st Street	Minor Arterial	3	Unrestricted	2370	2660	EB	643	< D	EB	1071	< D
Main	1st Street	2nd Street	Minor Arterial	2	Unrestricted	1540	1770	EB	941	< D	EB	1203	< D
Main	2nd Street	3rd Street	Minor Arterial	2	Unrestricted	1540	1770	EB	580	< D	EB	749	< D
Main	3rd Street	4th Street	Minor Arterial	2	Unrestricted	1540	1770	EB	607	< D	EB	763	< D
Main	4th Street	5th Street	Minor Arterial	2	Unrestricted	1540	1770	EB	662	< D	EB	711	< D
Reserve	Fort	Krall	Collector	1	Unrestricted	530	660	SB	202	< D	NB	288	< D

Under 2024 Total traffic conditions, several roadway segments operate below LOS threshold conditions including Fort Street, from 1st Street to 4th Street; and State Street, from 1st Street to 5th Street. Regarding Fort Street, associated intersection operations remain acceptable within this section therefore no further improvements are recommended. The addition of left-turn lane accommodations along State Street, from 1st Street to 5th Street would achieve desired LOS conditions along this section although associated intersection operations remain well below v/c threshold conditions. Further review of the need for left-turn lanes in this area was examined using ACHD left-turn guidelines. The turn lane warrant review indicates that left-turn lanes are warranted at each intersection along State Street; therefore, left-turn lanes will be assumed in all subsequent analysis. Further documentation regarding this analysis is in included in Appendix E.

Intersection LOS

An intersection traffic operations review was conducted for 2024 Total traffic conditions. Results are presented in Table 8 while comprehensive output reports are provided in Appendix E.

TABLE 8
Intersection Operations Review – 2024 Total

		AM	PM
Intersection	**Traffic Control**	**2024 Total[a] LOS/Delay (sec)**	**2024 Total[a] LOS/Delay (sec)**
5th/Fort/Hayes	Traffic Signal	D/44.6	D/36.8
		0.60	0.52
	SBL	0.00	0.02
	SBTHRT	0.56	0.39
	NEBLT	0.11	0.71
	NEBTHRT	0.82	0.18
	SWBLT	0.12	0.22
	SWBRT	0.14	0.76
	NWBLT	0.99	0.91
	NWBTHRT	0.52	0.55
	SEB	0.83	0.76
4th/Fort	TWSC	D/28.0	D/29.5
		0.11	0.04
	NBLT	0.04	0.01
	NBTH	0.01	0.01
	NEBLT	0.11	0.04
	NEBRT	0.03	0.02
	SEBTH	0.01	0.01
	SEBRT	0.00	0.00
4th/Washington	TWSC	B/11.1	B/11.0
		0.05	0.04

TABLE 8
Intersection Operations Review – 2024 Total

Intersection	Traffic Control	AM 2024 Total[a] LOS/Delay (sec)	PM 2024 Total[a] LOS/Delay (sec)
	NEBLT	0.05	0.04
	NEBTH	0.02	0.01
	NEBRT	0.04	0.04
	SWBLT	0.01	0.00
	SWBTH	0.05	0.03
	SWBRT	0.00	0.01
	NWBLT	0.00	0.02
	NWBTH	0.00	0.00
	NWBRT	0.00	0.00
	SEBLT	0.01	0.00
	SEBTH	0.00	0.00
	SEBRT	0.00	0.00
4th/State	TWSC	***F/68.2***	***F/68.6***
		0.34	0.23
	NEBLT	0.20	0.22
	NEBTH	0.34	0.23
	NEBRT	0.03	0.01
	SWBLT	0.00	0.13
	SWBTH	0.03	0.19
	SWBRT	0.04	0.13
	NWBLT	0.01	0.07
	NWBTH	0.01	0.01
	NWBRT	0.00	0.00
	SEBLT	0.04	0.01
	SEBTH	0.01	0.00
	SEBRT	0.00	0.00
4th/Main	TWSC	D/27.5	D/25.6
		0.32	0.18
	NEBTH	0.32	0.13
	NEBRT	0.12	0.11
	SWBLT	0.07	0.18
	SWBTH	0.04	0.06

TABLE 8
Intersection Operations Review – 2024 Total

Intersection	Traffic Control	AM 2024 Total[a] LOS/Delay (sec)	PM 2024 Total[a] LOS/Delay (sec)
	SEBLT	0.05	0.02
	SEBTH	0.01	0.01
	SEBRT	0.00	0.00
3rd/Fort	TWSC	D/35.7	D/28.7
		0.03	0.08
	NBLT	0.03	0.00
	NBTH	0.01	0.01
	SBTH	0.01	0.01
	SBRT	0.00	0.00
	NEBLT	0.03	0.08
	NEBRT	0.01	0.03
3rd/State	TWSC	***F/58.0***	***F/90.7***
		0.39	0.53
	NEBLT	0.04	0.53
	NEBTH	0.39	0.22
	NEBRT	0.01	0.06
	SWBLT	0.04	0.16
	SWBTH	0.13	0.09
	SWBRT	0.06	0.09
	NWBLT	0.03	0.05
	NWBTH	0.01	0.01
	NWBRT	0.00	0.00
	SEBLT	0.02	0.01
	SEBTH	0.01	0.00
	SEBRT	0.00	0.00
3rd/Main	Traffic Signal	B/15.5	B/13.9
		0.41	0.42
	NEBTHRT	0.50	0.61
	SWBLTTH	0.18	0.27
	SEBLTTH	0.47	0.46
	SEBTHRT	0.47	0.46
Fort/Washington/Robbins	Traffic Signal	B/12.7	B/13.9
		0.51	0.48

TABLE 8
Intersection Operations Review – 2024 Total

Intersection	Traffic Control	AM 2024 Total[a] LOS/Delay (sec)	PM 2024 Total[a] LOS/Delay (sec)
	NBLT	0.11	0.07
	NBTHRT	0.66	0.59
	SBLT	0.12	0.11
	SBTHRT	0.46	0.43
	EBLT	0.33	0.39
	EBTHRT	0.68	0.79
	WBLT	0.69	0.70
	WBTHRT	0.13	0.50
2nd/Fort	TWSC	D/30.7	***E/40.4***
		0.06	0.16
	SBTH	0.01	0.01
	SBRT	0.00	0.00
	NEBLT	0.06	0.16
	NEBRT	0.01	0.02
	NWBLT	0.01	0.04
	NWBTH	0.01	0.01
2nd/State	TWSC	**E/36.0**	***E/41.1***
		0.17	0.29
	NEBLT	0.06	0.29
	NEBTH	0.04	0.09
	NEBRT	0.03	0.04
	SWBLT	0.01	0.14
	SWBTH	0.17	0.04
	SWBRT	0.01	0.05
	NWBLT	0.02	0.02
	NWBTH	0.01	0.01
	NWBRT	0.00	0.00
	SEBLT	0.01	0.01
	SEBTH	0.01	0.00
	SEBRT	0.00	0.00
2nd/Idaho	TWSC	C/17.1	C/22.9
		0.15	0.30

TABLE 8
Intersection Operations Review – 2024 Total

Intersection	Traffic Control	AM 2024 Total[a] LOS/Delay (sec)	PM 2024 Total[a] LOS/Delay (sec)
	NEBLT	0.03	0.03
	NEBTH	0.11	0.07
	SWBTH	0.15	0.30
	SWBRT	0.03	0.09
	NWBLT	0.02	0.03
	NWBTH	0.00	0.01
	NWBRT	0.00	0.00
2nd/Main	TWSC	C/23.8	***E/45.5***
	NEBTH	0.01	0.02
	NEBRT	0.00	0.01
	SWBLT	0.37	0.70
	SWBTH	0.01	0.00
	SEBLT	0.06	0.02
	SEBTH	0.01	0.01
	SEBRT	0.00	0.00
1st/Fort/State	Traffic Signal	C/31.9	D/40.4
		0.72	0.78
	SBLT	0.93	0.99
	SBTHRT	0.11	0.18
	NEBLT	0.19	0.28
	NEBTHRT	0.84	0.98
	NWBLT	0.66	0.58
	NWBTH	0.74	0.77
	NWBRT	0.43	0.45
	SEBLT	0.20	0.11
	SEBTHRT	0.59	0.66
1st/Jefferson	AWSC	A/7.9	A/7.5
		NR	NR
1st/Bannock	AWSC	A/7.8	A/8.2
		NR	NR
1st/Idaho	Traffic Signal	B/12.2	B/12.3
		0.30	0.31

TABLE 8
Intersection Operations Review – 2024 Total

Intersection	Traffic Control	AM 2024 Total[a] LOS/Delay (sec)	PM 2024 Total[a] LOS/Delay (sec)
	NEB	0.05	0.11
	SWB	0.24	0.28
	NWBLTTH	0.43	0.43
	NWBTHRT	0.44	0.43
1st/Main	Traffic Signal	B/11.2	B/13.7
		0.28	0.39
	SWB	0.20	0.25
	SEBLT	0.40	0.59
	SWBTH	0.40	0.59
Fort/Reserve	Roundabout (Signal)	C/18.3 (B/18.6)	C/15.7 (B/19.7)
		0.52 (0.58)	0.63 (0.65)
	NBLT	0.52 (0.85)	0.63 (0.72)
	NBRT	0.52 (0.86)	0.63 (0.75)
	WBLT	0.47 (0.24)	0.41 (0.35)
	WBTH	0.47 (0.70)	0.41 (0.74)
	SEBTH	0.40 (0.39)	0.51 (0.72)
	SEBRT	0.40 (0.46)	0.51 (0.47)
Ave B/Jefferson	Traffic Signal	C/31.0	C/30.8
		0.68	0.68
	NEBLT	0.00	0.00
	NEBTH	0.79	0.80
	NEBRT	0.79	0.81
	SWBLT	0.85	0.83
	SWBTH	0.28	0.31
	SWBRT	0.28	0.31
	NWBLTTH	0.44	0.57
	NWBRT	0.78	0.66
Ave B/Bannock	TWSC	***F/167.5***	***F/341.2***
		0.30	0.25
	NEBLT	0.12	0.19
	NEBTH	0.01	0.01
	NEBRT	0.00	0.00

TABLE 8
Intersection Operations Review – 2024 Total

Intersection	Traffic Control	AM 2024 Total[a] LOS/Delay (sec)	PM 2024 Total[a] LOS/Delay (sec)
	SWBLT	0.03	0.04
	SWBTH	0.01	0.01
	SWBRT	0.00	0.00
	NWBLT	0.30	0.00
	NWBTH	0.00	0.00
	NWBRT	0.02	0.02
	SEB	0.10	0.25
Ave B/Broadway/Warm Springs/Main	Traffic Signal	D/41.1 0.62	D/47.0 0.79
	EBLT	0.29	0.35
	EBTH	0.85	0.88
	EBRT	0.40	0.60
	WBLT	0.78	0.77
	WBTH	0.50	0.57
	WBRT	0.87	0.87
	NEBLT	0.67	0.53
	NEBTH	0.57	0.80
	NEBRT	0.15	0.32
	SWBLT	0.71	0.78
	SWBTH	0.51	0.80
	SWBRT	0.16	0.16
Broadway/Front/Park center	Traffic Signal	D/38.4 0.75	D/40.3 0.82
	NBLT	0.84	0.89
	NBTH	0.55	0.59
	SBTH	0.36	0.75
	SBRT	0.81	0.99
	NWBLT	0.08	0.19
	NWBTH	0.81	0.88
	NWBRT	0.88	0.90

TABLE 8
Intersection Operations Review – 2024 Total

Intersection	Traffic Control	AM 2024 Total[a] LOS/Delay (sec)	PM 2024 Total[a] LOS/Delay (sec)

NOTES:
Results noted are for the A.M. and P.M. peak hours
Bold italics indicated where minimum LOS D threshold exceeded

TWSC = Two-way stop-controlled intersection

AWSC = All-way stop-controlled intersection
[a] Existing network with 2024 total traffic plus CIP improvements at Warm Springs and Front Street and DBIP.
[b] Existing network with 2035 total traffic plus CIP improvements at Warm Springs and Front Street and DBIP.

Under 2024 Total traffic conditions the LOS threshold is exceeded at six intersections, however at each of these locations resultant v/c ratios are well below threshold limits therefore no further intersection improvements are recommended at these locations.

7.4 Level-of-Service for 2035 No Build Conditions

Roadway Segment LOS

Table 9 summarizes ACHD's LOS standards as opposed to 2035 No Build traffic conditions for roadway segments within the study area.

TABLE 9

Roadway Segment Review – 2035 No Build

Roadway	From	To	Functional Classification	No. of Through Lanes	Left-Turn Treatment	Threshold Volume		2035 No Build – AM			2035 No Build – PM		
						LOS D	LOS E	Pk Dir	Volume	LOS	Pk Dir	Volume	LOS
Broadway	Front	Wm Spgs	Minor Arterial	2	Continuous	1540	1770	NB	1294	< D	NB	1630	E
Ave B	Wm Spgs	Bannock	Minor Arterial	2	Continuous	1540	1770	NB	1247	< D	NB	1605	E
Ave B	Bannock	Jefferson	Minor Arterial	2	Continuous	1540	1770	NB	1165	< D	NB	1445	< D
Fort	Jefferson	Reserve	Minor Arterial	2	Continuous	1540	1770	NWB	1208	< D	NWB	1135	< D
Fort	Reserve	1st Street	Minor Arterial	2	Continuous	1540	1770	NWB	1330	< D	NWB	1005	< D
Fort	1st Street	2nd Street	Collector	1	Unrestricted	530	660	NWB	689	F	NWB	645	E
Fort	2nd Street	Robbins	Collector	1	Unrestricted	530	660	NWB	690	F	NWB	625	E
Fort	Robbins	3rd Street	Collector	1	Unrestricted	530	660	NWB	520	< D	NWB	620	E
Fort	3rd Street	4th Street	Collector	1	Unrestricted	530	660	NWB	523	< D	SEB	630	E
State	1st Street	2nd Street	Minor Arterial	1	Unrestricted	720	880	WB	665	< D	EB	560	< D
State	2nd Street	3rd Street	Minor Arterial	1	Unrestricted	720	880	WB	656	< D	WB	585	< D
State	3rd Street	4th Street	Minor Arterial	1	Unrestricted	720	880	WB	637	< D	WB	640	< D
State	4th Street	5th Street	Minor Arterial	1	Unrestricted	720	880	WB	651	< D	WB	660	< D
Idaho	Ave B	1st Street	Minor Arterial	2	Unrestricted	1540	1770	WB	593	< D	WB	615	< D
Idaho	1st Street	2nd Street	Minor Arterial	2	Unrestricted	1540	1770	WB	520	< D	WB	495	< D
Main	Ave B	1st Street	Minor Arterial	3	Unrestricted	2370	2660	EB	835	< D	EB	1190	< D
Main	1st Street	2nd Street	Minor Arterial	2	Unrestricted	1540	1770	EB	876	< D	EB	1060	< D
Main	2nd Street	3rd Street	Minor Arterial	2	Unrestricted	1540	1770	EB	857	< D	EB	955	< D
Main	3rd Street	4th Street	Minor Arterial	2	Unrestricted	1540	1770	EB	829	< D	EB	905	< D
Main	4th Street	5th Street	Minor Arterial	2	Unrestricted	1540	1770	EB	829	< D	EB	915	< D
Reserve	Fort	Krall	Collector	1	Unrestricted	530	660	SB	295	< D	NB	385	< D

Under 2035 No Build traffic conditions two additional roadway segments exceed the LOS threshold. On Broadway Avenue and Avenue B from Front Street to Bannock Street, median control and channelized left-turn lanes at major intersections would increase LOS volume thresholds to generally acceptable conditions. Intersection operations continue to remain below v/c threshold conditions along Fort Street from 1st Street to 4th Street, therefore no further improvements are recommended for this section.

Intersection LOS

An intersection traffic operations review was conducted for 2035 No Build traffic conditions. Results are presented in Table 10 while comprehensive output reports are provided in Appendix E.

TABLE 10
Intersection Operations Review – 2035 No Build

		AM	PM
	Traffic Control	2035 No Build[b] LOS/Delay (sec)	2035 No Build[b] LOS/Delay (sec)
Intersection	Lane Group	v/c	v/c
5th/Fort/Hayes	Traffic Signal	D/46.2	D/39.0
		0.62	0.51
	SBLTTH	0.42	0.02
	SBRT	0.58	0.31
	NEBLT	0.12	0.75
	NEBTHRT	0.86	0.23
	SWBLT	0.13	0.19
	SWBRT	0.14	0.62
	NWBLT	0.85	0.91
	NWBTHRT	0.44	0.50
	SEB	0.84	0.77
4th/Fort	TWSC	C/23.0	C/24.7
		0.04	0.03
	NBLT	0.04	0.02
	NBTH	0.00	0.01
	NEBLT	0.04	0.03
	NEBRT	0.03	0.02
	SEBTH	0.01	0.00
	SEBRT	0.00	0.00
4th/Washington	TWSC	B/11.3	B/11.8
		0.07	0.06
	NEBLT	0.05	0.05
	NEBTH	0.01	0.01
	NEBRT	0.01	0.06

TABLE 10
Intersection Operations Review – 2035 No Build

Intersection	Traffic Control / Lane Group	AM 2035 No Build[b] LOS/Delay (sec) v/c	PM 2035 No Build[b] LOS/Delay (sec) v/c
	SWBLT	0.01	0.00
	SWBTH	0.07	0.04
	SWBRT	0.01	0.01
	NWBLT	0.00	0.04
	NWBTH	0.00	0.00
	NWBRT	0.00	0.00
	SEBLT	0.02	0.00
	SEBTH	0.00	0.00
	SEBRT	0.00	0.00
4th/State	TWSC	***F/51.6***	***F/104.2***
		0.18	0.37
	NEBLT	0.12	0.37
	NEBTH	0.18	0.24
	NEBRT	0.02	0.02
	SWBLT	0.00	0.31
	SWBTH	0.08	0.18
	SWBRT	0.05	0.23
	NWBLT	0.01	0.09
	NWBTH	0.01	0.01
	NWBRT	0.00	0.00
	SEBLT	0.01	0.03
	SEBTH	0.01	0.01
	SEBRT	0.00	0.00
4th/Main	TWSC	***D/33.6***	***E/43.0***
		0.24	0.25
	NEBLT	NR	NR
	NEBTH	0.24	0.25
	NEBRT	0.04	0.11
	SWBLT	0.11	0.21
	SWBTH	0.06	0.09
	SEBLT	0.03	0.04

TABLE 10
Intersection Operations Review – 2035 No Build

Intersection	Traffic Control / Lane Group	AM 2035 No Build[b] LOS/Delay (sec) v/c	PM 2035 No Build[b] LOS/Delay (sec) v/c
	SEBTH	0.01	0.01
	SEBRT	0.00	0.00
3rd/Fort	TWSC	C/24.9	C/24.1
		0.06	0.08
	NBLT	0.06	0.00
	NBTH	0.01	0.01
	SBTH	0.01	0.00
	SBRT	0.00	0.00
	NEBLT	0.02	0.08
	NEBRT	0.01	0.04
3rd/State	TWSC	***F/113.6***	***F/94.1***
		0.70	0.55
	NEBLT	0.11	0.55
	NEBTH	0.70	0.14
	NEBRT	0.02	0.07
	SWBLT	0.14	0.21
	SWBTH	0.12	0.13
	SWBRT	0.03	0.13
	NWBLT	0.01	0.08
	NWBTH	0.01	0.01
	NWBRT	0.00	0.00
	SEBLT	0.06	0.01
	SEBTH	0.01	0.01
	SEBRT	0.00	0.00
3rd/Main	Traffic Signal	C/22.1	CB/19.6
		0.62	0.58
	NEB	0.81	0.72
	SWB	0.14	0.18
	SEBLTTH	0.66	0.66
	SEBTHRT	0.67	(0.66
Fort/Washington/Robbins	Traffic Signal	B/15.8	B/14.1
		0.51	0.44

TABLE 10
Intersection Operations Review – 2035 No Build

Intersection	Traffic Control / Lane Group	AM 2035 No Build[b] LOS/Delay (sec) v/c	PM 2035 No Build[b] LOS/Delay (sec) v/c
	NBLT	0.09	0.07
	NBTHRT	0.54	0.53
	SBLT	0.09	0.11
	SBTHRT	0.37	0.37
	EBLT	0.39	0.39
	EBTHRT	0.77	0.78
	WBLT	0.79	0.69
	WBTHRT	0.14	0.50
2nd/Fort	TWSC	D/29.5	D/31.9
		0.07	0.11
	SBTH	0.01	0.01
	SBRT	0.00	0.00
	NEBLT	0.07	0.11
	NEBRT	0.02	0.02
	NWBLT	0.01	0.04
	NWBTH	0.01	0.01
2nd/State	TWSC	***E/37.2***	***E/37.2***
		0.13	0.19
	NEBLT	0.07	0.16
	NEBTH	0.03	0.06
	NEBRT	0.01	0.02
	SWBLT	0.02	0.19
	SWBTH	0.13	0.03
	SWBLT	0.01	0.04
	NWBLT	0.02	0.02
	NWBTH	0.01	0.01
	NWBRT	0.00	0.00
	SEBLT	0.01	0.01
	SEBTH	0.00	0.01
	SEBRT	0.00	0.00

TABLE 10
Intersection Operations Review – 2035 No Build

Intersection	Traffic Control / Lane Group	AM 2035 No Build[b] LOS/Delay (sec) v/c	PM 2035 No Build[b] LOS/Delay (sec) v/c
2nd/Idaho	TWSC	C/20.5	C/17.6
		0.28	0.13
	NEBLT	0.01	0.02
	NEBTH	0.28	0.03
	SWBTH	0.18	0.13
	SWBRT	0.03	0.10
	NWBLT	0.02	0.04
	NWBTH	0.01	0.00
	NWBRT	0.00	0.00
2nd/Main	TWSC	***F/55.3***	***E/47.9***
		0.58	0.57
	NEBTH	0.03	0.03
	NEBRT	0.02	0.02
	SWBLT	0.58	0.57
	SWBTH	0.03	0.00
	SEBLT	0.07	0.01
	SEBTH	0.01	0.01
	SEBRT	0.00	0.00
1st/Fort/State	Traffic Signal	C/25.0	C/28.4
		0.67	0.69
	SBLT	0.84	0.90
	SBTH	0.17	0.35
	NEBLT	0.35	0.46
	NEBTH	0.56	0.84
	NWBLT	0.55	0.38
	NWBTH	0.97	0.68
	NWBRT	0.51	0.48
	SEBLT	0.79	0.12
	SEBTH	0.56	0.82
1st/Jefferson	AWSC	B/11.7	***E/37.3***
		NR	NR
1st/Bannock	AWSC	A/8.1	A/9.1
		NR	NR

TABLE 10
Intersection Operations Review – 2035 No Build

		AM	PM
	Traffic Control	**2035 No Build[b] LOS/Delay (sec)**	**2035 No Build[b] LOS/Delay (sec)**
Intersection	**Lane Group**	**v/c**	**v/c**
1st/Idaho	Traffic Signal	A/8.6	B/12.9
		0.26	0.33
	NEB	0.29	0.17
	SWB	0.47	0.26
	NWBTL	0.28	0.47
	NWBTR	0.28	0.48)
1st/Main	Traffic Signal	A/7.0	B/15.8
		0.37	0.45
	SWBLT	0.78	0.25
	SEBLT	0.40	0.69
	SEBTH	0.40	0.69
Fort/Reserve	Roundabout (Signal)	D/30.9 (B/19.1)	B/15.0 (B/19.9)
		0.73 (0.60)	0.58 (0.61)
	NBTH	0.53 (0.75)	0.58 (0.68)
	NBRT	0.53 (0.76)	0.58 (0.74)
	WBLT	0.73 (0.39)	0.49 (0.54)
	WBRT	0.73 (0.74)	0.49 (0.75)
	SEBLT	0.40 (0.58)	0.44 (0.70)
	SEBTH	0.40 (0.38)	0.44 (0.35)
Ave B/Jefferson	Traffic Signal	C/27.7	D/38.9
		0.57	0.75
	NEBLT	0.57	0.92
	NEBTH	0.60	0.83
	NEBRT	0.60	0.85
	SWBLT	0.79	0.83
	SWBTH	0.46	0.60
	SWBRT	0.46	0.60
	NWBTH	0.59	0.79
	NWBRT	0.40	0.11
	SEB	0.60	0.95

TABLE 10
Intersection Operations Review – 2035 No Build

Intersection	Traffic Control / Lane Group	AM 2035 No Build[b] LOS/Delay (sec) v/c	PM 2035 No Build[b] LOS/Delay (sec) v/c
Ave B/Bannock	TWSC	***F/195.7***	***F/468.7***
		0.54	0.27
	NEBLT	0.13	0.26
	NEBTH	0.01	0.02
	NEBRT	0.00	0.00
	SWBLT	0.03	0.06
	SWBTH	0.01	0.01
	SWBRT	0.00	0.00
	NWBLT	0.54	0.00
	NWBTH	0.00	0.00
	NWBRT	0.04	0.04
	SEBRT	0.10	0.23
Ave B/Broadway/Warm Springs/Main	Traffic Signal	D/44.5	D/49.8
		0.69	0.81
	EBLT	0.21	0.39
	EBTH	0.61	0.98
	EBRT	0.94	0.63
	WBLT	0.85	0.73
	WBTH	0.00	0.58
	WBRT	0.00	0.89
	NEBLT	0.78	0.60
	NEBTH	0.80	0.87
	NEBRT	0.25	0.34
	SWBLT	0.60	0.77
	SWBTH	0.74	0.72
	SWBRT	0.21	0.08
Broadway/Front/Parkcenter	Traffic Signal	D/47.3	D/ 47.3
		0.86	0.84
	NBLT	0.97	0.93
	NBTH	0.48	0.64
	SBTH	0.47	0.78
	SBRT	***1.08***	0.90
	NWBLT	0.08	0.21
	NWBTH	0.91	0.98
	NWBRT	0.98	0.93

TABLE 10
Intersection Operations Review – 2035 No Build

		AM	PM
	Traffic Control	2035 No Build[b] LOS/Delay (sec)	2035 No Build[b] LOS/Delay (sec)
Intersection	Lane Group	v/c	v/c

NOTES:

Results noted are for the A.M. and P.M. peak hours

Bold italics indicated where minimum LOS D threshold exceeded

TWSC = Two-way stop-controlled intersection

AWSC = All-way stop-controlled intersection

[a] Existing network with 2024 total traffic plus CIP improvements at Warm Springs and Front Street and DBIP.

[b] Existing network with 2035 total traffic plus CIP improvements at Warm Springs and Front Street and DBIP.

Under 2035 No Build traffic conditions the LOS threshold is exceeded at seven intersections, however at each of these locations resultant v/c ratios are well below threshold limits therefore no further improvements are recommended at these locations. Additionally, the SB RT v/c thresholds is exceeded at Broadway Avenue and Front Street. Recommended improvements at this locations includes development of a SB RT turn lane in combination with a shared SBTHRT lane. Alternatively, a channelized SB right-turn lane would allow free flow operations and accommodate a pedestrian refuge island.

7.5 Level-of-Service for 2035 Total (with Project) Conditions

Roadway Segment LOS

Table 11 summarizes ACHD's LOS standards as opposed to 2035 Total traffic conditions for roadway segments within the study area.

TABLE 11

Roadway Segment Review – 2035 Total

Roadway	From	To	Functional Classification	No. of Through Lanes	Left-Turn Treatment	Threshold Volume		2035 Total – AM			2035 Total – PM		
						LOS D	LOS E	Pk Dir	Volume	LOS	Pk Dir	Volume	LOS
Broadway	Front	Wm Spgs	Minor Arterial	2	Median Control	1620	1860	NB	1548	< D	SB	1794	E
Ave B	Wm Spgs	Bannock	Minor Arterial	2	Median Control	1620	1860	NB	1408	< D	NB	1633	E
Ave B	Bannock	Jefferson	Minor Arterial	2	Continuous	1540	1770	NB	1408	< D	NB	1633	E
Fort	Jefferson	Reserve	Minor Arterial	2	Continuous	1540	1770	NWB	1546	E	NWB	1635	E
Fort	Reserve	1st Street	Minor Arterial	2	Continuous	1540	1770	NWB	1731	E	NWB	1530	< D
Fort	1st Street	2nd Street	Collector	1	Unrestricted	530	660	NWB	828	F	NWB	810	F
Fort	2nd Street	Robbins	Collector	1	Unrestricted	530	660	NWB	833	F	NWB	799	F
Fort	Robbins	3rd Street	Collector	1	Unrestricted	530	660	NWB	655	E	NWB	789	F
Fort	3rd Street	4th Street	Collector	1	Unrestricted	530	660	NWB	604	E	NWB	804	F
State	1st Street	2nd Street	Minor Arterial	1	Unrestricted	720	880	WB	804	E	WB	812	E
State	2nd Street	3rd Street	Minor Arterial	1	Unrestricted	720	880	WB	797	E	WB	848	E
State	3rd Street	4th Street	Minor Arterial	1	Unrestricted	720	880	WB	778	E	WB	903	F
State	4th Street	5th Street	Minor Arterial	1	Unrestricted	720	880	WB	787	E	WB	923	E
Idaho	Ave B	1st Street	Minor Arterial	2	Unrestricted	1540	1770	WB	730	< D	WB	778	< D
Idaho	1st Street	2nd Street	Minor Arterial	2	Unrestricted	1540	1770	WB	616	< D	WB	647	< D
Main	Ave B	1st Street	Minor Arterial	3	Unrestricted	2370	2660	EB	917	< D	EB	1402	< D
Main	1st Street	2nd Street	Minor Arterial	2	Unrestricted	1540	1770	EB	941	< D	EB	1203	< D
Main	2nd Street	3rd Street	Minor Arterial	2	Unrestricted	1540	1770	EB	880	< D	EB	959	< D
Main	3rd Street	4th Street	Minor Arterial	2	Unrestricted	1540	1770	EB	838	< D	EB	909	< D
Main	4th Street	5th Street	Minor Arterial	2	Unrestricted	1540	1770	EB	901	< D	EB	919	< D
Reserve	Fort	Krall	Collector	1	Unrestricted	530	660	SB	195	< D	NB	365	< D

Under 2035 Total traffic conditions, several roadway segments exceed LOS D threshold conditions, including Broadway Avenue, Avenue B, and Fort Street from Front Street to 1st Street and the continuation of State Street. Median control and channelized left turns at major intersections should be extended along Avenue B and Fort Street from Bannock Street to 1st Street. Additionally, median control and channelized left-turn lanes should be implemented along State Street from 1st Street to 5th Street. While this condition will not totally mitigate LOS constraints, it is viewed as more practical than adding additional through lane capacity as all associated intersections are generally operating at or above v/c threshold conditions with the recommended improvements.

Intersection LOS

The 2035 total traffic conditions, with the proposed development, are summarized in Table 12. These conditions assume the vacation of Jefferson Street as previously proposed.

TABLE 12
Intersection Operations Review – 2035 Total

Intersection	Traffic Control	AM 2035 Total[b] LOS/Delay (sec)	PM 2035 Total[b] LOS/Delay (sec)
5th/Fort/Hayes	Traffic Signal	D/46.4	D/38.1
		0.67	0.61
	SBL	0.01	0.02
	SBTHRT	0.71	0.44
	NEBLT	0.12	0.75
	NEBTHRT	0.86	0.23
	SWBLT	0.13	0.19
	SWBRT	0.14	0.62
	NWBLT	0.82	0.91
	NWBTHRT	0.63	0.68
	SEB	0.84	0.77
4th/Fort	TWSC	***D/30.9***	***E/35.9***
		0.06	0.05
	NBLT	0.04	0.02
	NBTH	0.01	0.01
	NEBLT	0.06	0.05
	NEBRT	0.03	0.02
	SEBTH	0.01	0.01
	SEBRT	0.00	0.00
4th/Washington	TWSC	B/11.3	B/11.8
		0.07	0.06
	NEBLT	0.05	0.05
	NEBTH	0.01	0.01

TABLE 12
Intersection Operations Review – 2035 Total

Intersection	Traffic Control	AM 2035 Total[b] LOS/Delay (sec)	PM 2035 Total[b] LOS/Delay (sec)
	NEBRT	0.01	0.06
	SWBLT	0.01	0.00
	SWBTH	0.07	0.04
	SWBRT	0.01	0.01
	NWBLT	0.00	0.04
	NWBTH	0.00	0.00
	NWBRT	0.00	0.00
	SEBLT	0.02	0.00
	SEBTH	0.00	0.00
	SEBRT	0.00	0.00
4th/State	TWSC	***F/99.1***	***F/318.7***
		0.28	0.74
	NEBLT	0.20	0.74
	NEBTH	0.28	0.36
	NEBRT	0.02	0.02
	SWBLT	0.00	0.56
	SWBTH	0.12	0.27
	SWBRT	0.05	0.33
	NWBLT	0.01	0.09
	NWBTH	0.01	0.01
	NWBRT	0.00	0.00
	SEBLT	0.01	0.04
	SEBTH	0.01	0.01
	SEBRT	0.00	0.00
4th/Main	TWSC	***D/32.4***	***E/43.4***
		0.24	0.25
	NEBTH	0.24	0.25
	NEBRT	0.03	0.11
	SWBLT	0.11	0.22
	SWBTH	0.06	0.09
	SEBLT	0.03	0.04
	SEBTH	0.01	0.01

TABLE 12
Intersection Operations Review – 2035 Total

Intersection	Traffic Control	AM 2035 Total[b] LOS/Delay (sec)	PM 2035 Total[b] LOS/Delay (sec)
	SEBRT	0.00	0.00
3rd/Fort	TWSC	D/32.9	***E/35.4***
		0.06	0.13
	NBLT	0.06	0.00
	NBTH	0.01	0.01
	SBTH	0.01	0.01
	SBRT	0.00	0.00
	NEBLT	0.02	0.13
	NEBRT	0.01	0.05
3rd/State	TWSC	***F/1000.0***	***F/300.9***
		1.11	***1.00***
	NEBLT	0.21	***1.00***
	NEBTH	***1.11***	0.22
	NEBRT	0.02	0.07
	SWBLT	0.00	0.35
	SWBTH	0.19	0.20
	SWBRT	0.03	0.19
	NWBLT	0.02	0.08
	NWBTH	0.01	0.01
	NWBRT	0.00	0.00
	SEBLT	0.07	0.01
	SEBTH	0.01	0.01
	SEBRT	0.00	0.00
3rd/Main	Traffic Signal	C/22.0	B/19.2
		0.78	0.72
	NEB	0.78	0.72
	SWB	0.20	0.18
	SEBLTTH	0.71	0.67
	SEBTHRT	0.71	0.67
Fort/Washington/Robbins	Traffic Signal	B/15.1	B/14.9
		0.79	0.78
	NBLT	0.13	0.09
	NBTHRT	0.79	0.68

TABLE 12
Intersection Operations Review – 2035 Total

Intersection	Traffic Control	AM 2035 Total[b] LOS/Delay (sec)	PM 2035 Total[b] LOS/Delay (sec)
	SBLT	0.17	0.14
	SBTHRT	0.53	0.47
	EBLT	0.33	0.39
	EBTHRT	0.69	0.78
	WBLT	0.72	0.69
	WBTHRT	0.13	0.50
2nd/Fort	TWSC	***E/41.6***	***F/55.2***
		0.14	0.28
	SBTH	0.01	0.01
	SBRT	0.00	0.00
	NEBLT	0.14	0.28
	NEBRT	0.02	0.03
	NWBLT	0.01	0.04
	NWBTH	0.01	0.01
2nd/State	TWSC	***F/88.3***	***F/ 96.9***
		0.36	0.45
	NEBLT	0.25	0.45
	NEBTH	0.09	0.18
	NEBRT	0.03	0.05
	SWBLT	0.03	0.36
	SWBTH	0.36	0.11
	SWBRT	0.02	0.06
	NWBLT	0.03	0.02
	NWBTH	0.01	0.01
	NWBRT	0.00	0.00
	SEBLT	0.01	0.01
	SEBTH	0.01	0.01
	SEBRT	0.00	0.00
2nd/Idaho	TWSC	D/27.8	D/30.4
		0.35	0.45
	NEBLT	0.02	0.04
	NEBTH	0.33	0.04

TABLE 12
Intersection Operations Review – 2035 Total

Intersection	Traffic Control	AM 2035 Total[b] LOS/Delay (sec)	PM 2035 Total[b] LOS/Delay (sec)
	SWBTH	0.35	0.45
	SWBRT	0.04	0.13
	NWBLT	0.02	0.04
	NWBTH	0.01	0.01
	NWBRT	0.00	0.00
2nd/Main	TWSC	***F/166.3***	***F/264.3***
		1.10	***1.42***
	NEBTH	0.04	0.03
	NEBRT	0.02	0.02
	SWBLT	***1.10***	***1.42***
	SWBTH	0.03	0.00
	SEBLT	0.07	0.01
	SEBTH	0.01	0.01
	SEBRT	0.00	0.00
1st/Fort/State	Traffic Signal	***E/59.8***	***F/81.1***
		0.87	0.96
	SBLT	***1.24***	***1.39***
	SBTHRT	0.19	0.25
	NEBLT	0.25	0.57
	NEBTHRT	0.86	***1.32***
	NWBLT	***1.07***	0.60
	NWBTH	0.89	0.85
	NWBRT	0.48	0.52
	SEBLT	0.85	0.20
	SEBTHRT	0.59	0.67
1st/Jefferson	AWSC	A/8.3	A/8.1
		NR	NR
1st/Bannock	AWSC	A/8.3	A/8.4
		NR	NR
1st/Idaho	Traffic Signal	B/13.4	B/14.6
		0.36	0.40
	NEB	0.14	0.18
	SWB	0.28	0.31

TABLE 12
Intersection Operations Review – 2035 Total

Intersection	Traffic Control	AM 2035 Total[b] LOS/Delay (sec)	PM 2035 Total[b] LOS/Delay (sec)
	NWBLTTH	0.53	0.59
	NWBTHRT	0.53	0.59
1st/Main	Traffic Signal	B/14.4	B/19.0
		0.42	0.50
	SWB	0.26	0.27
	SEBLT	0.62	0.78
	SWBTH	0.62	0.78
Fort/Reserve	Roundabout (Signal)	D/33.7 (C/22.0)	D/30.3 (C/25.4)
		0.66 (0.71)	0.81 (0.78)
	NBLT	0.66 (0.83)	0.81 (0.86)
	NBRT	0.66 (0.83)	0.81 (0.90)
	WBLT	0.66 (0.04)	0.66 (0.48)
	WBTH	0.66 (0.82)	0.66 (0.86)
	SEBTH	0.39 (0.79)	0.62 (0.86)
	SEBRT	0.39 (0.48)	0.62 (0.54)
Ave B/Jefferson	Traffic Signal	D/45.6	D/53.6
		0.83	0.89
	NEBLT	0.00	0.00
	NEBTH	0.93	0.99
	NEBRT	0.94	***1.03***
	SWBLT	0.97	***1.03***
	SWBTH	0.30	0.37
	SWBRT	0.30	0.37
	NWBLTTH	0.52	0.63
	NWBRT	0.98	0.96
Ave B/Bannock	TWSC	***F/542.1***	***F/2322.7***
		1.09	0.31
	NEBLT	0.15	0.31
	NEBTH	0.02	0.02
	NEBRT	0.00	0.00
	SWBLT	0.03	0.07
	SWBTH	0.01	0.01

TABLE 12
Intersection Operations Review – 2035 Total

Intersection	Traffic Control	AM 2035 Total[b] LOS/Delay (sec)	PM 2035 Total[b] LOS/Delay (sec)
	SWBRT	0.00	0.00
	NWBLT	***1.09***	0.00
	NWBTH	0.00	0.00
	NWBRT	0.05	0.04
	SEB	0.12	0.28
Ave B/Broadway/Warm Springs/Main	Traffic Signal	D/44.9	D/53.5
		0.73	0.89
	EBLT	0.38	0.60
	EBTH	0.89	0.97
	EBRT	0.48	0.71
	WBLT	0.80	0.93
	WBTH	0.50	0.57
	WBRT	0.88	0.89
	NEBLT	0.69	0.79
	NEBTH	0.73	0.93
	NEBRT	0.19	0.34
	SWBLT	0.72	0.78
	SWBTH	0.64	0.86
	SWBRT	0.28	0.26
Broadway/Front/Parkcenter	Traffic Signal	D/ 42.6	D/54.7
		0.75	0.89
	NBLT	0.91	***1.00***
	NBTH	0.68	0.72
	SBTH	0.66	0.90
	SBTHRT	0.74	0.98
	SBRT	0.74	***1.00***
	NWBLT	0.08	0.22
	NWBTH	0.83	0.99
	NWBRT	0.90	0.95

NOTES:
Results noted are for the A.M. and P.M. peak hours
Bold italics indicated where minimum LOS D threshold exceeded

TWSC = Two-way stop-controlled intersection

AWSC = All-way stop-controlled intersection
[a] Existing network with 2024 total traffic plus CIP improvements at Warm Springs and Front Street and DBIP.
[b] Existing network with 2035 total traffic plus CIP improvements at Warm Springs and Front Street and DBIP.

Under 2035 Total traffic conditions the LOS threshold is exceeded at ten intersections. No v/c issues are exhibited at six of these locations however at four of these locations v/c thresholds are exceeded. At 3rd Street and State Street and 2nd Street and Main Street individual movement v/c ratios exceed 1.00. Traffic signal warrants were reviewed at these intersections and are expected to be met under this scenario. As a result, it is recommended that traffic signals be considered to replace the current two-way, stop-controlled conditions at these locations. At 1st Street/Fort Street/State Street, the heavy SEB LT movement contributes to operational problems, therefore, an additional SEB LT lane is recommended to mitigate this issue. At Avenue B and Jefferson Street, the NEBRT and SWBLT v/c ratios exceed 1.00. This intersection can be improved to acceptable conditions by accommodating an exclusive NB right-turn lane. Finally, at Avenue B and Bannock Street the NWBLT exhibits problematic v/c conditions in the A.M. peak hour while remaining movements at this intersection operate favorably. This is a common problem at two-way stop-controlled intersections at approaches to heavily travelled roadways. In this case either the left-turn movement could be prohibited, or it could be allowed knowing that excessive delay will be present.

SECTION 8

Mitigation Measures

8.1 Roadway System

As noted previously, several roadway segment and intersection locations are anticipated to exhibit poor traffic operations under existing and future traffic conditions without additional capacity enhancements. Tables 13 and 14 reflect 2035 total traffic operations with full mitigation for all roadway segments and intersections. These tables indicate all improvements previously recommended and the scenario in which they are needed.

TABLE 13

Roadway Segment Review – 2035 Total

Roadway	From	To	Functional Classification	No. of Through Lanes	Left-Turn Treatment	Threshold Volume		2035 Total - AM			2035 Total - PM		
						LOS D	LOS E	Pk Dir	Volume	LOS	Dir	Volume	LOS
Broadway	Front	Wm Springs	Minor Arterial	2	Median Control	1620	1860	NB	1548	< D	SB	1794	E
2035 No Build improvements: Median control, channelized left turns at major intersections.													
Ave B	Wm Spgs	Bannock	Minor Arterial	2	Median Control	1620	1860	NB	1408	< D	NB	1633	E
2035 Build improvements: Median control, channelized left turns at major intersections.													
Ave B	Bannock	Jefferson	Minor Arterial	2	Median Control	1620	1860	NB	1408	< D	NB	1633	E
2035 Total improvements: Median control, channelized left turns at major intersections.													
Fort	Jefferson	Reserve	Minor Arterial	2	Median Control	1620	1860	NWB	1546	< D	NWB	1635	E
2035 Total improvements: Median control, channelized left turns at major intersections.													
Fort	Reserve	1st Street	Minor Arterial	2	Median Control	1620	1860	NWB	1731	E	NWB	1530	< D
2035 Total improvements: Median control, channelized left turns at major intersections.													
Fort	1st Street	2nd Street	Collector	1	Unrestricted	530	660	NWB	828	F	NWB	810	F
Existing improvements: WB LT turn lane Fort Street at 2nd Street													
Fort	2nd Street	Robbins	Collector	1	Unrestricted	530	660	NWB	833	F	NWB	799	F
Fort	Robbins	3rd Street	Collector	1	Unrestricted	530	660	NWB	655	E	NWB	789	F
Fort	3rd Street	4th Street	Collector	1	Unrestricted	530	660	NWB	604	E	NWB	804	F
Existing improvements: WB LT turn lane Fort Street at 4th Street													
State	1st Street	2nd Street	Minor Arterial	1	Median Control	760	920	WB	804	E	WB	812	E

TABLE 13

Roadway Segment Review – 2035 Total

Roadway	From	To	Functional Classification	No. of Through Lanes	Left-Turn Treatment	Threshold Volume		2035 Total - AM			2035 Total - PM		
						LOS D	LOS E	Pk Dir	Volume	LOS	Dir	Volume	LOS
2024TIT Total Improvements: Intersection left-turn accommodations on State Street. 2035 Total Improvements: Median control, channelized left turns at major intersections.													
State	2nd Street	3rd Street	Minor Arterial	1	Median Control	760	920	WB	797	E	WB	848	E
2024 Total Improvements: Intersection left-turn accommodations on State Street. 2035 Total Improvements: Median control, channelized left turns at major intersections.													
State	3rd Street	4th Street	Minor Arterial	1	Median Control	760	920	WB	778	E	WB	903	E
2024 Total Improvements: Intersection left-turn accommodations on State Street. 2035 Total Improvements: Median control, channelized left turns at major intersections.													
State	4th Street	5th Street	Minor Arterial	1	Median Control	760	920	WB	787	E	WB	923	F
2024 Total Improvements: Intersection left-turn accommodations on State Street. 2035 Total Improvements: Median control, channelized left turns at major intersections.													
Idaho	Ave B	1st Street	Minor Arterial	2	Unrestricted	1540	1770	WB	730	< D	WB	778	< D
Idaho	1st Street	2nd Street	Minor Arterial	2	Unrestricted	1540	1770	WB	616	< D	WB	647	< D
Main	Ave B	1st Street	Minor Arterial	3	Unrestricted	2370	2660	EB	917	< D	EB	1402	< D
Main	1st Street	2nd Street	Minor Arterial	2	Unrestricted	1540	1770	EB	941	< D	EB	1203	< D
Main	2nd Street	3rd Street	Minor Arterial	2	Unrestricted	1540	1770	EB	880	< D	EB	959	< D
Main	3rd Street	4th Street	Minor Arterial	2	Unrestricted	1540	1770	EB	838	< D	EB	909	< D
Main	4th Street	5th Street	Minor Arterial	2	Unrestricted	1540	1770	EB	901	< D	EB	919	< D
Reserve	Fort	Krall	Collector	1	Unrestricted	530	660	SB	195	< D	NB	365	< D

TABLE 14
Intersection Operations Review – 2035 Total with Full Mitigation

Intersection	Traffic Control	AM 2035 Total[b] LOS/Delay (sec)	PM 2035 Total[b] LOS/Delay (sec)	Proposed Mitigation
5th/Fort/Hayes	Traffic Signal	D/46.4	D/38.1	None
		0.67	0.61	
	SBLT	0.01	0.02	
	SBTH	0.71	0.44	
	NEBLT	0.12	0.75	
	NEBTHRT	0.86	0.23	
	SWBLT	0.13	0.19	
	SWBRT	0.14	0.62	
	NWBLT	0.85	0.91	
	NWBTHRT	0.63	0.68	
	SEB	0.84	0.77	
4th/Fort	TWSC	D/30.9	***E/35.9***	*NWB left-turn pockets existing*
		0.06	0.05	
	NBLT	0.04	0.02	
	NBTH	0.01	0.01	
	NEBLT	0.06	0.05	
	NEBRT	0.03	0.02	
	SEBTH	0.01	0.01	
	SEBRT	0.00	0.00	
4th/Washington	TWSC	B/11.3	B/11.8	None
		0.07	0.06	
	NEBLT	0.05	0.05	
	NEBTH	0.01	0.01	
	NEBRT	0.01	0.06	
	SWBLT	0.01	0.00	
	SWBTH	0.07	0.04	
	SWBRT	0.01	0.01	
	NWBLT	0.00	0.04	
	NWBTH	0.00	0.00	
	NWBRT	0.00	0.00	
	SEBLT	0.02	0.00	
	SEBTH	0.00	0.00	
	SEBRT	0.00	0.00	
4th/State	TWSC	**F/99.2**	***F/318.7***	*Left-turn pockets on State St 2024*
		0.28	0.74	
	NEBLT	0.20	0.74	
	NEBTH	0.28	0.36	
	NEBRT	0.02	0.02	

TABLE 14
Intersection Operations Review – 2035 Total with Full Mitigation

Intersection	Traffic Control	AM 2035 Total[b] LOS/Delay (sec)	PM 2035 Total[b] LOS/Delay (sec)	Proposed Mitigation
	SWBLT	0.00	0.56	
	SWBTH	0.12	0.27	
	SWBRT	0.05	0.33	
	NWBLT	0.01	0.09	
	NWBTH	0.01	0.01	
	NWBRT	0.00	0.00	
	SEBLT	0.01	0.04	
	SEBTH	0.01	0.01	
	SEBRT	0.00	0.00	
4th/Main	TWSC	D/32.4	***E/43.4***	
		0.24	0.25	
	NEBTH	0.24	0.25	
	NEBRT	0.03	0.11	
	SWBLT	0.11	0.22	
	SWBTH	0.06	0.09	
	SEBLT	0.03	0.04	
	SEBTH	0.01	0.01	
	SEBRT	0.00	0.00	
3rd/Fort	TWSC	D/32.9	***E/35.4***	None
		0.06	0.13	
	NBLT	0.06	0.00	
	NBTH	0.01	0.01	
	SBTH	0.01	0.01	
	SBRT	0.00	0.00	
	NELT	0.02	0.13	
	NERT	0.01	0.05	
3rd/State	Traffic Signal (Roundabout)	B/11.4 (B/14.7) 0.61 (0.82)	B/13.1 (B/12.7) 0.62 (0.76)	*Traffic Signal (Roundabout) 2035 and left-turn pockets on State St 2024*
	NEB	0.56 (0.21)	0.74 (0.18)	
	SWB	0.17 (0.07)	0.58 (0.28)	
	NWBLT	0.03 (NA)	0.16 (NA)	
	NWB(LT)THRT	0.68 (0.82)	0.72 (0.76)	
	SEBLT	0.16 (NA)	0.03 (NA)	
	SEB(LT)THRT	0.56 (0.58)	0.48 (0.53)	
3rd/Main	Signal	C/22.0	B/19.2	None
		0.62	0.58	

TABLE 14
Intersection Operations Review – 2035 Total with Full Mitigation

Intersection	Traffic Control	AM 2035 Total[b] LOS/Delay (sec)	PM 2035 Total[b] LOS/Delay (sec)	Proposed Mitigation
	NEB	0.78	0.72	
	SWB	0.20	0.18	
	SEBLT	0.71	0.67	
	SEBRT	0.71	0.67	
Fort/Washington/Robbins	Signal	B/15.1	B/14.9	None
		0.59	0.54	
	NBLT	0.13	0.09	
	NBTHRT	0.79	0.68	
	SBLT	0.17	0.14	
	SBTHRT	0.53	0.47	
	EBLT	0.33	0.39	
	EBTHRT	0.69	0.78	
	WBLT	0.72	0.69	
	WBTHRT	0.13	0.50	
2nd/Fort	TWSC	***E/41.6***	***F/55.2***	*NWB left turn pockets existing*
		0.14	0.28	
	SBTH	0.01	0.01	
	SBRT	0.00	0.01	
	NEBLT	0.14	0.28	
	NEBRT	0.02	0.03	
	NWBLT	0.01	0.04	
	NWBTH	0.01	0.01	
2nd/State	TWSC	**F/83.8**	**F/92.2**	*Left-turn pockets on State St 2024*
		0.24	0.43	
	NEBLT	0.24	0.43	
	NEBTH	0.09	0.18	
	NEBRT	0.03	0.05	
	SWBLT	0.03	0.35	
	SBWTH	0.34	0.10	
	SWBRT	0.02	0.06	
	NWBLT	0.03	0.02	
	NWBTH	0.01	0.01	
	NWBRT	0.00	0.00	
	SEBLT	0.01	0.01	
	SEBTH	0.01	0.01	
	SEBRT	0.00	0.00	
2nd/Idaho	TWSC	D/27.8	D/30.4	None
		0.35	0.45	

TABLE 14
Intersection Operations Review – 2035 Total with Full Mitigation

Intersection	Traffic Control	AM 2035 Total[b] LOS/Delay (sec)	PM 2035 Total[b] LOS/Delay (sec)	Proposed Mitigation
	NEBLT	0.02	0.04	
	NEBTH	0.33	0.04	
	SWBTH	0.35	0.45	
	SWBRT	0.04	0.13	
	NWBLT	0.02	0.04	
	NWBTH	0.01	0.01	
	NWBRT	0.00	0.00	
2nd/Main	Traffic Signal	B/12.1	B/15.4	*Traffic Signal 2035*
		0.47	0.55	
	NEB	0.03	0.02	
	SWB	0.56	0.65	
	SEB	0.56	0.66	
1st/Fort/State	Traffic Signal	D/31.4	D/38.5	*Added second SB LTL 2035*
		0.71	0.81	
	SBLT	0.79	0.85	
	SBTHRT	0.23	0.30	
	NEBLT	0.25	0.40	
	NEBTHRT	0.86	0.93	
	NWBLT	0.89	0.68	
	NWBTH	0.81	0.89	
	NWBRT	0.48	0.57	
	SEBLT	0.55	0.26	
	SEBTHRT	0.54	0.71	
1st/Jefferson	AWSC	A/8.3	A/8.1	None
		NR	NR	
1st/Bannock	AWSC	A/8.3	A/8.4	None
		NR	NR	
1st/Idaho	Traffic Signal	B/13.4	B/14.6	None
		0.36	0.40	
	NEB	0.14	0.18	
	SWB	0.28	0.31	
	NWBLTTH	0.53	0.59	
	NWBTHRT	0.53	0.59	
1st/Main	Traffic Signal	B/14.4	B/19.0	None
		0.42	0.50	
	SWB	0.26	0.27	
	SEBLT	0.62	0.78	
	SEBTH	0.62	0.78	

TABLE 14
Intersection Operations Review – 2035 Total with Full Mitigation

Intersection	Traffic Control	AM 2035 Total[b] LOS/Delay (sec)	PM 2035 Total[b] LOS/Delay (sec)	Proposed Mitigation
Fort/Reserve	Roundabout (Signal)	D/33.7 (C/22.0)	D/30.3 (C/25.4)	*Roundabout (or Signal) existing*
		0.66 (0.71)	0.81 (0.78)	
	NBLT	0.66 (0.83)	0.81 (0.86)	
	NBRT	0.66 (0.83)	0.81 (0.90)	
	WBLT	0.66 (0.04)	0.66 (0.48)	
	WBTH	0.66 (0.82)	0.66 (0.86)	
	EBTH	0.39 (0.79)	0.62 (0.86)	
	EBRT	0.39 (0.48)	0.62 (0.54)	
Avenue B/Jefferson	Traffic Signal	D/36.2	D/36.7	*NBR turn pocket 2035*
		0.77	0.80	
	NEBLT	0.00	0.00	
	NEBTH	0.89	0.91	
	NEBRT	0.34	0.43	
	SWBLT	0.92	0.90	
	SWBTH	0.31	0.37	
	SWBRT	0.31	0.37	
	NWBLTTH	0.47	0.60	
	NWBRT	0.88	0.93	
Avenue B/Bannock	TWSC	C/16.1	C/18.1	*WBL Restricted 2035*
		0.15	0.31	
	NEBLT	0.15	0.31	
	NEBTH	0.02	0.02	
	NEBRT	0.00	0.00	
	SWBLT	0.03	0.07	
	SWBTH	0.01	0.01	
	SWBRT	0.00	0.00	
	NWB	0.05	0.04	
	SEB	0.12	0.28	
Avenue B/Broadway/Warm Springs/Main	Traffic Signal	D/45.2	D/53.5	None
		0.74	0.89	
	EBLT	0.37	0.60	
	EBTH	0.89	0.97	
	EBRT	0.48	0.71	
	WBLT	0.80	0.93	
	WBTH	0.50	0.57	
	WBRT	0.88	0.89	
	NEBLT	0.71	0.79	
	NEBTH	0.74	0.93	

TABLE 14
Intersection Operations Review – 2035 Total with Full Mitigation

Intersection	Traffic Control	AM 2035 Total[b] LOS/Delay (sec)	PM 2035 Total[b] LOS/Delay (sec)	Proposed Mitigation
	NEBRT	0.19	0.34	
	SWBLT	0.72	0.78	
	SWBTH	0.63	0.86	
	SWBRT	0.28	0.26	
Broadway/Front/Park Center	Signal	D/42.3	D/54.7	*Shared Southbound TH/RT 2035*
		0.75	0.89	
	NBLT	0.91	**1.00**	
	NBTH	0.68	0.72	
	SBTH	0.66	0.90	
	SBTHRT	0.74	0.98	
	SBRT	0.74	**1.00**	
	NWBLT	0.08	0.22	
	NWBTH	0.83	0.99	
	NWBRT	0.89	0.95	

While some roadway segments are expected to exceed LOS thresholds, all associated intersections operate below v/c thresholds. All recommended improvements, as noted previously, are illustrated in Figure 30. Improvements are generally limited to traffic signalization and intersection configuration measures. Alternative intersection forms were evaluated at certain locations that merit mitigation improvements. It should be noted that at these locations, other solutions were also found to be workable. Improvements beyond a conventional signalized intersection may offer reduced vehicular delay and improved operations, but should be considered within the context of the local transportation system. Further review and discussions related to these locations is expected.

FIGURE 30
St. Luke's' Mitigation Plan

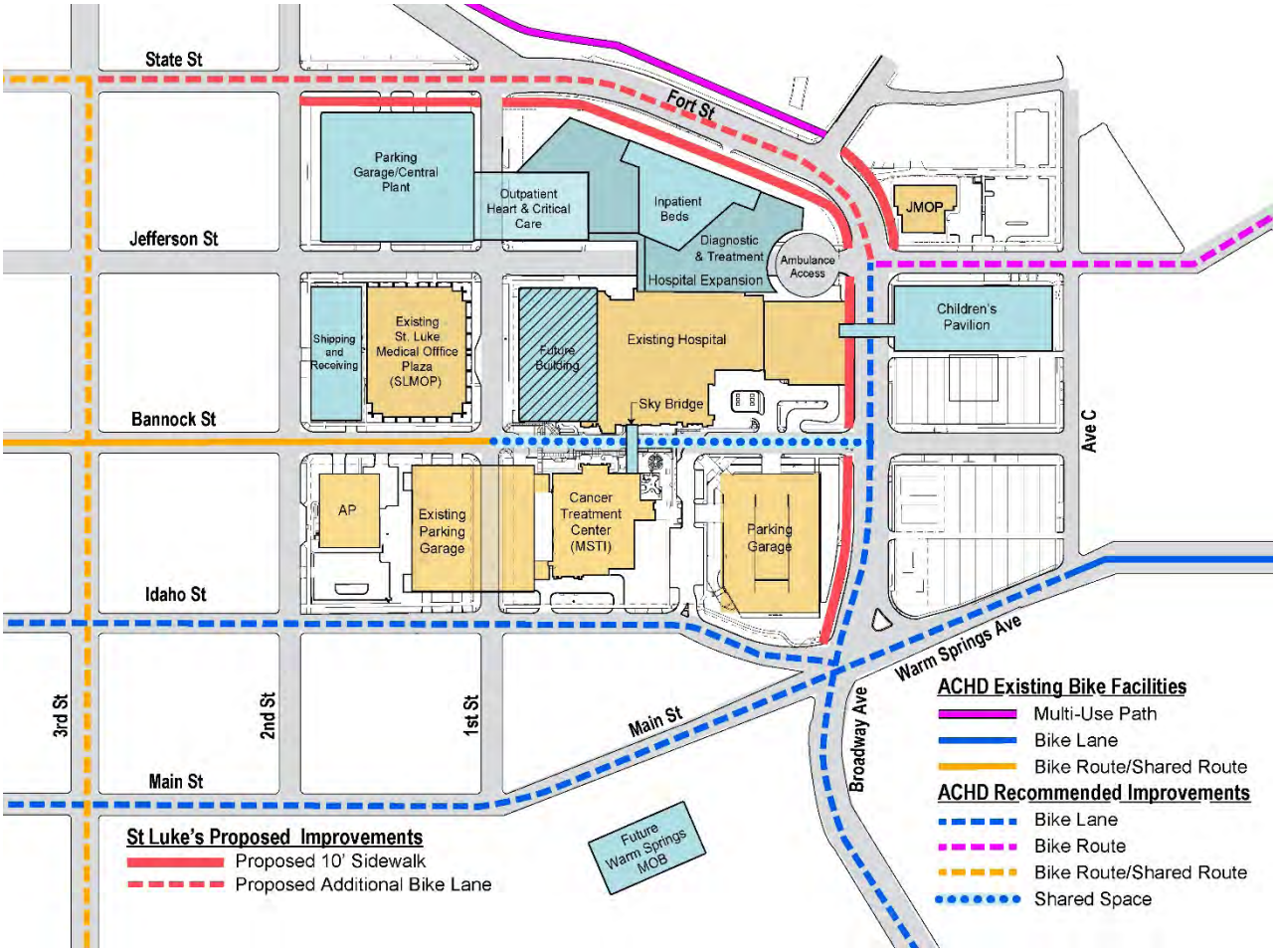
8.2 Bicycle and Pedestrian System

Unlike vehicular traffic, bicycle and pedestrian traffic is not typically measured by LOS or any other standard metric. This creates challenges for measuring the impact of change as well as for developing appropriate mitigation. The St. Luke's team relied on the following measures to understand the impacts and to develop mitigation strategies:

- Downtown Boise Implementation Plan – the team participated in public meetings, reviewed comments and summaries provided from meetings, talked with plan developers, and reviewed final approved plan. The team met with ACHD staff to discuss proposed changes to the updated DBIP in order to reflect the most current information in this TIS.
- City of Boise Comprehensive Plan and Subdivision Ordinance – the team reviewed applicable sections of these two documents. Sections included information on connectivity, especially using micro paths.
- Site specific observations – the team gathered additional pedestrian and bicycle count information Appendix F), and at the same time observed common activities throughout the St. Luke's facility area; team members often engaged cyclists and pedestrians in conversation to better understand travel patterns and reasons for those patterns.
- Professional experience – the team has drawn on its own experience from various similar projects around the world to help round out ideas and opportunities for this location. Members have also researched other cities efforts and master plans.

Integrating the findings and goals of the DBIP, Boise City Comp Plan and Subdivision Ordinance with the needs and growth plans of the St. Luke's facility has been the key to creating a workable solution. Potential bike and pedestrian mitigation opportunities that integrate the updated DBIP proposed improvements along with the City's micro path theme are shown on Figure 31.

FIGURE 31
Integrated Future Bike Facilities



While the adopted DBIP identified conversion of Jefferson Street to a two-way street and development of bike lanes in each direction through the St. Luke's facility did not fit with the proposed facility layout of the St. Luke's hospital, the modifications in the updated DBIP do. Figure 31 shows an integrated bike facilities plan incorporating the needs of the St. Luke's facility growth with those identified in the updated DBIP's future planned bike facilities. The updated DBIP, City micro paths, and the St. Luke's facility plans mesh well together.

As illustrated in Figure 32 the proposed 10-foot sidewalk that traverses along Fort Street north of the hospital and connects to State Street provides an opportunity to improve cyclist and pedestrian safety by providing bike lanes along State Street connecting the Fort and Avenue B area to the 3rd Street bicycle facilities, as well as providing a wide pedestrian walkway. The DBIP's Bicycle Network identifies East Fort Street from Avenue B continuing on State Street to 8th Street as a "bike route/shared route." The proposed alternative connection maintains the integrity of the DBIP Bicycle Network.

FIGURE 32
Fort Street 10-Foot Sidewalk and Bike Lane (looking East)

The updated DBIP identifies State Street and the Idaho and Main Street couplet as the main east-west bicycle facilities. With regard to the State Street area, the St. Luke's mitigation plan proposes diverting bicycle traffic around Jefferson and onto State Street, where it will then tie into the proposed shared bike space west of 3rd Street. Within the St. Luke's sphere of influence, the St. Luke's mitigation plan extends a 10-foot sidewalk and adjacent 5-foot bike lane concept along State Street to 2nd Street. The 10-foot sidewalk is dropped there, as St. Luke's does not own property beyond 2nd Street, but the 5-foot bike lanes are proposed to continue to 3rd Street where cyclists could use the 3rd Street shared route to travel north or south as needed to reach the Idaho Street bike lane system with very little out-of-direction travel.

Similarly, users on the more southerly side of the East End and the St. Luke's campus, can directly access the Idaho Street/Main Street bike path couplet across the Warm Springs and Broadway intersection. Access to these east – west bike facilities (either State Street or the Idaho/Main couplet) are only separated by three blocks. East-west bound cyclists will continue to enjoy excellent connectivity between the East End and downtown along ACHD's existing and proposed bike facilities.

In addition to the proposed 10-foot sidewalk and 5-foot bike lanes along Fort and State Streets to support east-west connectivity, St. Luke's mitigation proposes to include the same 10-foot sidewalk on the west side of Avenue B from Warm Springs to Jefferson Street to promote improved north-south connectivity. Additionally, 5-foot bike lanes are proposed on both sides of Avenue B throughout this area. Broadway and Avenue B were identified in the original DBIP process as a high priority location for bicycle improvement. See Figure 33 for rendering of the proposed pathway system on Avenue B to help accommodate cyclists as well as pedestrians.

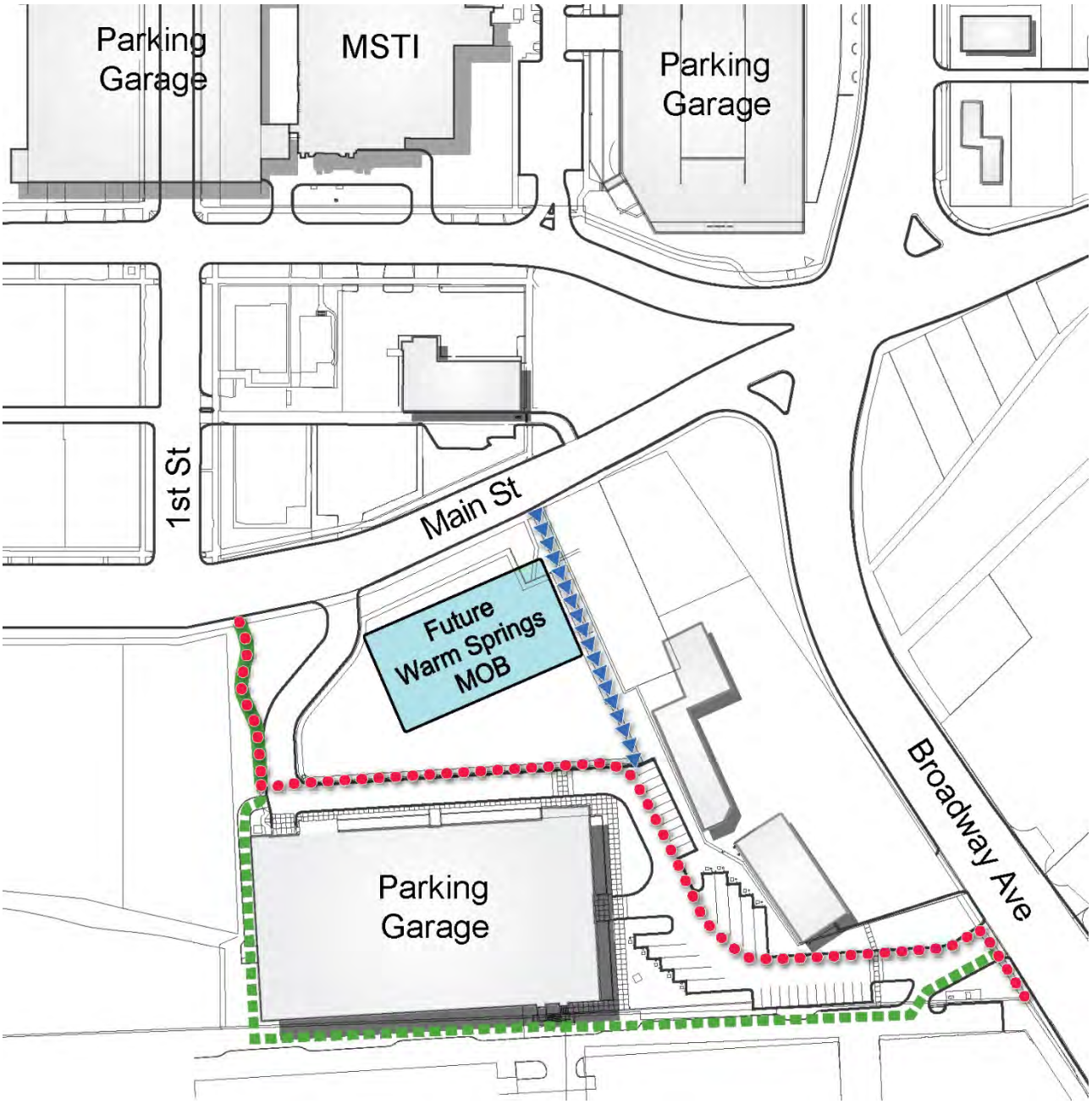
FIGURE 33
Avenue B Proposed Pedestrian and Bicycle Improvements (looking North)

An extension of this north-south connectivity is provided via a proposed micro path linking the DBIP's Broadway Avenue bike/pedestrian improvements with the St. Luke's area and downtown core. The proposed micro path connects to the wide sidewalk on the west side of Broadway just north of the Idaho Water Center and directs users through the St. Luke's parking garage and future Warm Springs Medical Office Building site to the intersection of Main and 1st Streets or possibly the signalized crosswalk on the east side of the new facility. See Figure 34 for a schematic layout of potential route for a micro path in this area. There are several options available for implementation of this type of connection; these can be further evaluated as the project progresses.

Safety is a high priority to St. Luke's in the development of mitigation improvements. St. Luke's primary goal is to move bicycle and pedestrian traffic efficiently and safely. Additionally, access should be comfortable and convenient, and meet the needs of the various types of users. To this end, St. Luke's has conducted an extensive amount of outreach to understand the concerns and desires of all of the different types of users from very young to very old. Input from this outreach has resulted in more detailed investigation into the use of two-way paths, or cycle tracks. While two-way paths provide additional safety on the path itself, connections back to conventional bike lanes or shared routes can be challenging because cyclist movements are coming from different directions than normal. See Appendix G for figures showing cross sections of the various 10-foot sidewalk, bike lane, and cycle track options. Right-of-way requirements are identified in these figures.

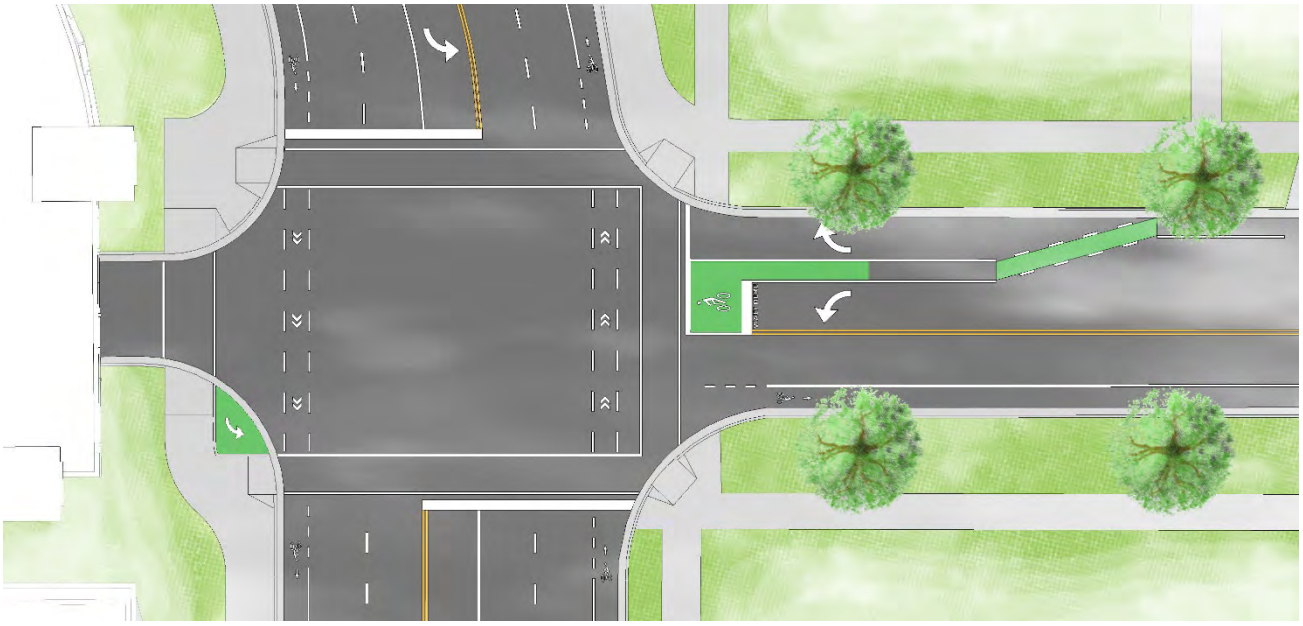
While the two-way cycle track was evaluated and still remains a possible mitigation solution, after much discussion with ACHD and City of Boise staff, it was determined that more familiar bike lanes along with a wide sidewalk would be more appropriate. The 10-foot-wide sidewalk is generally intended for pedestrian use, but it is recognized that young cyclist or those uncomfortable riding in traffic will have adequate space to travel on the sidewalk with pedestrians. If cycle tracks are reconsidered at a future date, mitigation of the safety concerns around intersection connectivity will be necessary.

FIGURE 34
Schematic Layout of Potential Route for Micro Path



At the Jefferson Street intersection, additional safety improvements are proposed as illustrated in Figure 35. At this intersection, a storage area is proposed for cyclists waiting for the light to change. Because Jefferson Street to the west of the intersection would be for ambulance access only, that crossing becomes less congested. “Green box” waiting areas are provided on both sides of Avenue B for cyclists.

FIGURE 35
Proposed Avenue B and Jefferson Street Bicycle Access



8.3 Bicycle and Pedestrian System Timing

The St. Luke's team will coordinate planning and construction of improvements in the downtown Boise facility area as the updated DBIP progresses through the public involvement and adoption stages, and as the St. Luke's planning progresses and construction scheduling solidifies.

SECTION 9

Findings and Recommendations

The Master Plan process that St. Luke's Boise is undertaking proposes extensive facility improvements to enhance the medical center's current operations and meet future regional healthcare needs.

The proposed development of St. Luke's Boise facility and vacation of Jefferson Street could be implemented with minimal impacts to the adjacent transportation system. Mitigation measures should include planned capacity and system enhancements at the locations previously noted.

With the proposed hospital development, St. Luke's is able to achieve objectives associated with the medical center Master Plan. At the same time, it is St. Luke's intent to work with the community to establish the following benefits:

- Enhanced traffic operations
- Improved bicycle and pedestrian connectivity and safety
- Enhanced hospital services conveniently located to transit routes
- Area amenities including streetscape improvements and aesthetic treatments
- Localized improvements that fit within the context of future planning in the Military Reserve and Veteran's Administration area

The proposed development would yield few negative impacts, which can be mitigated or avoided altogether. As noted in the Executive Summary, the mitigation activities provided in this document should be viewed as examples, simply proving that mitigation is possible. Final mitigation solutions should come from a collaborative effort of design team, agencies, neighborhoods, and other stakeholders to design the most appropriate mitigations for the site.

Beyond the important need of meeting the healthcare needs in the future, expansion of the St. Luke's downtown Boise facility will create added community benefit for years to come, including these local benefits:

- Substantial local economic development investments, including potentially $1 billion in total local economic benefit
- Advancement of ACHD capital improvement projects and other transportation system infrastructure
- Approximately 400 new jobs to support the expanded facility when construction related to the Master Plan is fully completed
- Improved safety, efficiency, and usability in the Master Plan area, including best-practice public transportation and non-motor vehicle commuting opportunities
- Downtown hospital expansion consistent with the Mayor's livability goal and the City's vision for developing the Military Reserve area
- Increased related growth and economic opportunities in the surrounding area

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Appendix A
Parking Demand Analysis, St. Luke's, Boise, Idaho Prepared by Walker Parking Consultants, November 4, 2013

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Appendix B
Traffic Count Summaries, ITD ATR Traffic Volumes, and License Plate Survey

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Appendix C
Survey Responses

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Appendix D
COMPASS Traffic Projections (2012, 2015, 2035)

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Appendix E
Traffic Analysis Summaries

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Appendix F
Bicycle Sections: Options and Right-of-way Impacts

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Appendix G
Cross Sections of the Various 10-Foot Sidewalk, Bike Lane, and Cycle Track Options

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Avenue B Lane Reduction Traffic Operations Review

PREPARED FOR: Jeff Hull/St. Luke's
PREPARED BY: Robert Beckman/CH2M HILL
COPIES TO: Mark Bowen/CH2M HILL
Betsy Roberts/CH2M HILL
DATE: December 15, 2014

This Technical Memorandum has been developed in response to review comments from City of Boise staff on the St. Luke's Health System's Boise, Idaho Facility Master Plan submittal, requesting an evaluation of the impacts of a lane reduction of Avenue B and a segment of Fort Street located between Jefferson and First Street. This "road diet" concept would reduce the number of lanes on Avenue B (and Fort Street) from the current five-lane section to a three-lane section from Warm Springs Avenue to the intersection of First Street/Fort Street/State Street to accommodate bicycle and pedestrian facilities and better enable crossings of Avenue B. Desirably, this modification would divert traffic away from Avenue B and make efficient use of other facilities such as Idaho Street, Main Street, and north-south streets west of the hospital. The purpose of this technical memorandum is to evaluate the feasibility of this proposed action and its likely impact on the adjacent transportation network.

I. Reduced Avenue B Roadway Section

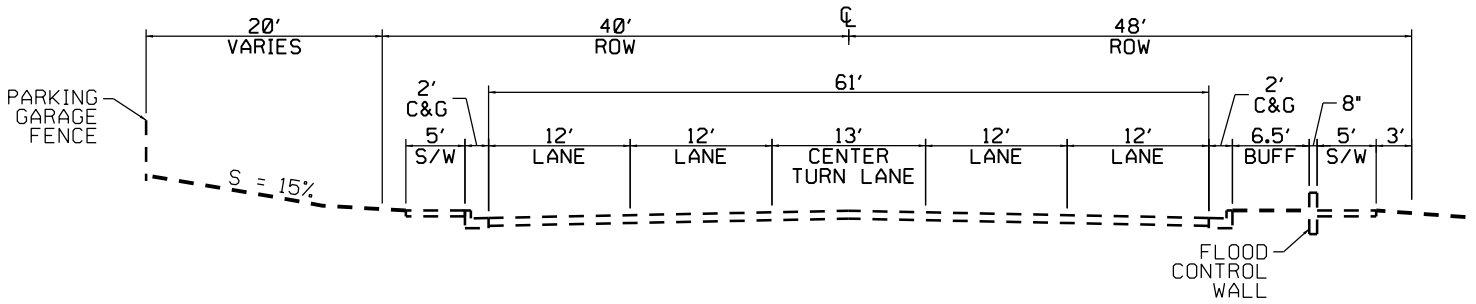
The existing cross section along Avenue B consists of five lanes with two lanes in each direction and a center two-way-left-turn-lane (TWLTL). Sidewalks widths range from 5 feet to 10 feet and are continuous along both sides of the road. On-street bike lanes are not accommodated. Existing right-of-way ranges from 80 feet to 90 feet.

The reduced Avenue B section would consist of three total lanes with one travel lane in each direction and a center TWLTL. The reduced section would accommodate 5 feet for bike lanes in either direction and additional space for landscaping and pedestrians facilities within existing right-of-way. A typical section comparing the existing to the reduced Ave B section is provided in Figure 1. The reduced Avenue B section assumes that the western edge (hospital side) of the roadway is held intact, although variations to this width modification are certainly an option.

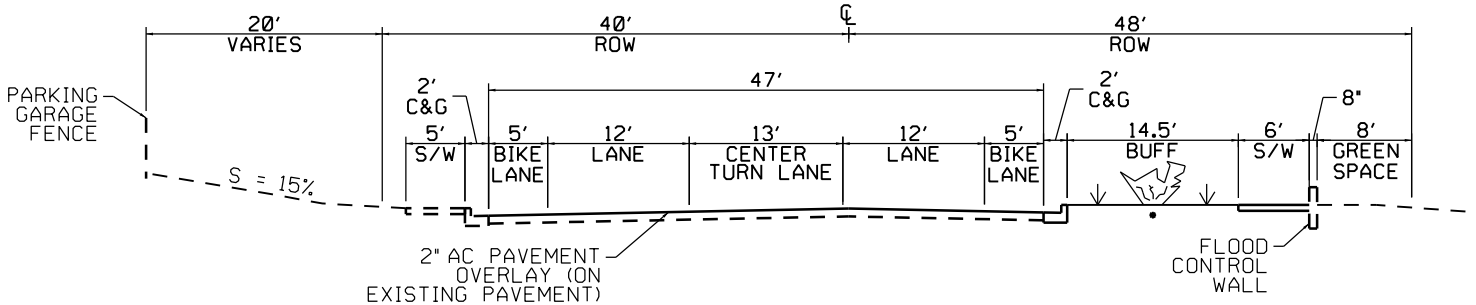
II. Traffic Forecasts

In order to effectively model the impacts of this proposed change, the Community Planning Association of Southwest Idaho (COMPASS) was consulted. Originally, the COMPASS 2035 travel demand model was utilized to test this network change, as this is consistent with forecasts used for the previously developed Traffic Impact Study (TIS). Preliminary results occurring due to this network change produced very little redistribution of traffic away from Avenue B.

Upon further discussion, COMPASS suggested that the recently adopted 2040 travel demand model be used to more accurately reflect this proposed network change. The 2040 model is more robust, includes more detailed network connectivity in the hospital vicinity, and reflects newly programmed roadway improvements such as the approved Downtown Boise Implementation Plan (DBIP). This subsequent review yielded results more consistent with initial expectations. In general, fairly significant traffic volume reductions were observed along Broadway Avenue, Avenue B, Fort Street, and State Street from Myrtle Street to 6th Street. On the other hand, traffic volume increases were noted along several other downtown corridors around this section, including Myrtle Street, Front Street, 9th Street, Idaho Street, Main Street, 5th Street and 6th Street. Figure 2 illustrates these trends in comparison of these two scenarios.



1 AVENUE B EXISTING TYPICAL SECTION (WARM SPRINGS TO BANNOCK)
FIG 1 1"=10'



2 AVENUE B PROPOSED 3-LANE TYPICAL SECTION (WARM SPRINGS TO BANNOCK)
FIG 1 1"=10'

• REMOVE 14' EXISTING PAVEMENT

FIGURE 1
TYPICAL SECTIONS

CH2MHILL

Legend:

- Significant (>100 VPH) Traffic Volume Increase Expected[1]
- Significant (>100 VPH) Traffic Volume Decrease Expected[1]

Notes:

1 Based on COMPASS 2040 Travel Demand Model, which includes programmed network improvements, approved DBIP, and Avenue B lane reduction

FIGURE 2
Traffic Redistribution Trends
Avenue B Lane Reduction Impacts

In order to forecast total traffic conditions (with the St. Luke's facility expansion) site traffic volumes, as determined from the previous TIS evaluation, were added to the 2040 COMPASS provided raw link volume forecasts. This data is summarized in Table 1. Raw data from COMPASS for the 2040 base network, the 2040 Avenue B lane reduction network, and the difference comparison between these two alternatives is provided in the Appendix.

Intersection turn movement volumes were developed for the Avenue B lane reduction scenario by using the Furness trip distribution model which is based on the methodology described in the National Cooperative Highway Research Program (NCHRP) Report 255. This standard process is used for post-processing of modeled traffic volumes to effectively arrive at forecast peak hour conditions. In order to accomplish this task, raw existing PM peak hour counts from Ada County Highway District (ACHD) were used as the initial input into the model, along with the entering and exiting peak segment volumes at each intersection from the 2040 Avenue B lane reduction model. This methodology then uses an iterative process whereby the original turn movement distribution is used to extrapolate to final forecast turn movement volumes. Once the basic 2040 forecast intersection turn movement volumes were computed, 2035 site generated traffic volumes as established in the TIS were added in order to forecast total peak hour traffic conditions with the proposed hospital expansion. Further post-processing, balancing, and traffic volume adjustment was not completed. Total peak hour intersection turn movement volumes with the Avenue B lane reduction are depicted in Figure 3.

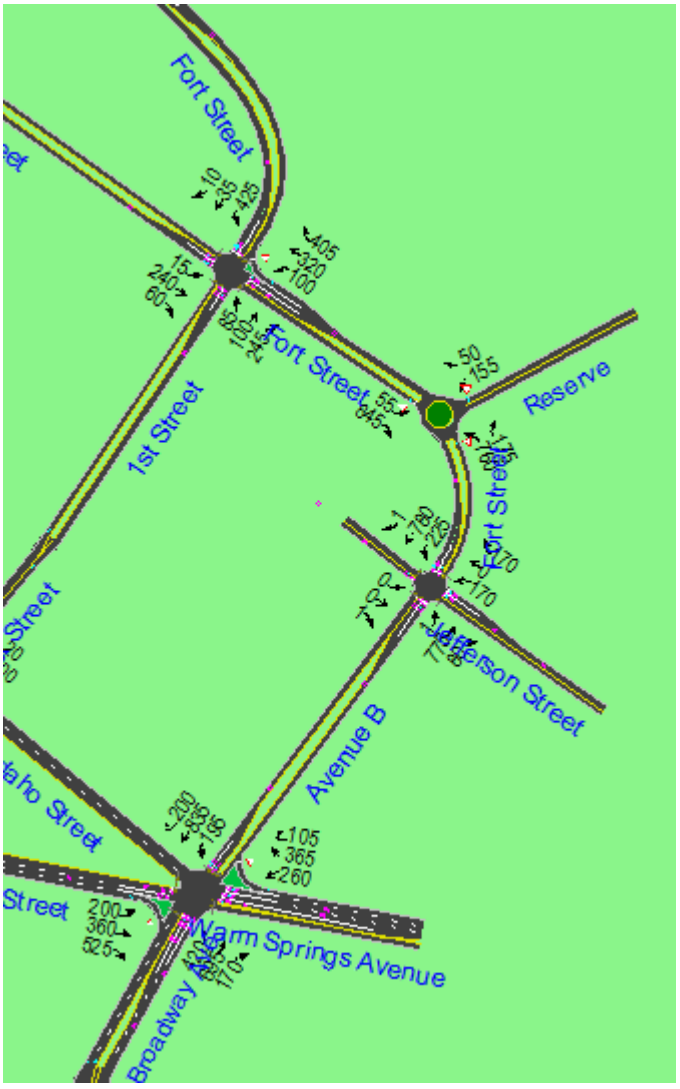


FIGURE 3
Total Peak Hour Traffic with Avenue B Lane Reduction

III. Traffic Operations Review

The traffic operations review consisted of both a roadway segment review and an intersection capacity evaluation. The roadway segment review extends well outside the bounds of the initial TIS and compares ACHD threshold volumes for various functional classifications and lane arrangements. For this evaluation, total segment volumes are comprised of the 2040 COMPASS forecast raw link volumes for each scenario (base network vs. Avenue B lane reduction), plus St. Luke's site generated traffic volumes. Threshold volumes for the 2040 St. Luke's network reflect proposed mitigation measures as established in the TIS (including median control and left-turn accommodations). Based on the current *ACHD Policy Manual*, the minimum acceptable LOS for a roadway segment is LOS E for principal arterials and LOS D for minor arterials. Table 1 summarizes this evaluation.

This review indicates that although Avenue B is restricted to three lanes, significant travel demand still remains along this corridor. Under this scenario, poor level-of-service (LOS) and volume to capacity (v/c) ratios nearing or exceeding capacity is prevalent from the intersection of Broadway Avenue and Front Street, throughout the reduced three-lane section, to the intersection of First Street/Fort Street/State Street. In comparison, of the 47 roadway segments reviewed within the St. Luke's vicinity, only three reflect

Table 1
St. Luke's Traffic Review, Ave B Lane Reduction
22-Oct-14
Roadway Segment Review - 2040

								2040 Base Network							2040 Reduced Ave B			
			Functional	No. Thru	Left-Turn	ACHD Threshold Volume						No. Thru	Left-Turn	ACHD Threshold Volume					
Roadway	From	To	Classification	Lanes	Treatment	LOS D	LOS E	Pk Dir	*Volume	Est. v/c	LOS	Lanes	Treatment	LOS D	LOS E	Pk Dir	*Volume	Est. v/c	LOS
Broadway	Myrtle	Front	Princ Arterial	3	Median Control	2560	2790	SB	1742	0.62	< D	3	Median Control	2560	2790	NB	1455	0.52	< D
Broadway	Front	Wm Spgs	Minor Arterial	2	Median Control	1620	1860	SB	1908	1.03	F	2	Continuous	1540	1770	SB	1723	0.97	F
Ave B	Wm Spgs	Bannock	Minor Arterial	2	Median Control	1620	1860	SB	1625	0.87	E	1	Continuous	720	880	SB	1130	1.28	F
Ave B	Bannock	Jefferson	Minor Arterial	2	Median Control	1620	1860	NB	1370	0.74	< D	1	Continuous	720	880	NB	857	0.97	E
Fort	Jefferson	Reserve	Minor Arterial	2	Median Control	1620	1860	NWB	1290	0.69	< D	1	Continuous	720	880	NWB	994	1.13	F
Fort	Reserve	1st Street	Minor Arterial	2	Median Control	1620	1860	NWB	1142	0.61	< D	1	Continuous	720	880	NWB	849	0.96	E
State	1st Street	2nd Street	Minor Arterial	1	Median Control	760	920	WB	614	0.67	<D	1	No LT Lane	550	690	WB	414	0.60	< D
State	2nd Street	3rd Street	Minor Arterial	1	Median Control	760	920	WB	625	0.68	<D	1	No LT Lane	550	690	WB	459	0.67	< D
State	3rd Street	4th Street	Minor Arterial	1	Median Control	760	920	WB	630	0.68	<D	1	No LT Lane	550	690	WB	459	0.67	< D
State	4th Street	5th Street	Minor Arterial	1	Median Control	760	920	WB	688	0.75	<D	1	No LT Lane	550	690	WB	513	0.74	< D
State	5th Street	6th Street	Minor Arterial	1	Median Control	760	920	WB	741	0.81	<D	1	No LT Lane	550	690	WB	657	0.95	E
Idaho	Ave B	1st Street	Minor Arterial	2	One-Way + Park	1320	1700	WB	583	0.34	< D	2	One-Way + Park	1320	1700	WB	771	0.45	< D
Idaho	1st Street	2nd Street	Minor Arterial	2	One-Way + Park	1320	1700	WB	1189	0.70	< D	2	One-Way + Park	1320	1700	WB	1293	0.76	< D
Idaho	2nd Street	3rd Street	Minor Arterial	2	One-Way + Park	1320	1700	WB	1183	0.70	< D	2	One-Way + Park	1320	1700	WB	1214	0.71	< D
Idaho	3rd Street	4th Street	Minor Arterial	2	One-Way + Park	1320	1700	WB	1198	0.70	< D	2	One-Way + Park	1320	1700	WB	1232	0.72	< D
Idaho	4th Street	5th Street	Minor Arterial	2	One-Way + Park	1320	1700	WB	1245	0.73	< D	2	One-Way + Park	1320	1700	WB	1291	0.76	< D
Idaho	5th Street	6th Street	Minor Arterial	3	One-Way + Park	1980	2550	WB	1032	0.40	< D	3	One-Way + Park	1980	2550	WB	972	0.38	< D
Main	Ave B	1st Street	Minor Arterial	3	One-Way	1980	2550	EB	747	0.29	< D	3	One-Way	1980	2550	EB	813	0.32	< D
Main	1st Street	2nd Street	Minor Arterial	2	One-Way + Park	1320	1700	EB	940	0.55	< D	2	One-Way + Park	1320	1700	EB	1008	0.59	< D
Main	2nd Street	3rd Street	Minor Arterial	2	One-Way + Park	1320	1700	EB	934	0.55	< D	2	One-Way + Park	1320	1700	EB	1002	0.59	< D
Main	3rd Street	4th Street	Minor Arterial	2	One-Way + Park	1320	1700	EB	919	0.54	< D	2	One-Way + Park	1320	1700	EB	988	0.58	< D
Main	4th Street	5th Street	Minor Arterial	2	One-Way + Park	1320	1700	EB	942	0.55	< D	2	One-Way + Park	1320	1700	EB	1011	0.59	< D
Main	5th Street	6th Street	Minor Arterial	2	One-Way + Park	1320	1700	EB	1243	0.73	< D	2	One-Way + Park	1320	1700	EB	1420	0.84	E
6th Street	State	Jefferson	Minor Arterial	3	One-Way + Park	1980	2550	SB	478	0.19	< D	3	One-Way + Park	1980	2550	SB	673	0.26	< D
6th Street	Jefferson	Bannock	Minor Arterial	3	One-Way + Park	1980	2550	SB	751	0.29	< D	3	One-Way + Park	1980	2550	SB	972	0.38	< D
6th Street	Bannock	Idaho	Minor Arterial	2	One-Way + Park	1320	1700	SB	993	0.58	< D	2	One-Way + Park	1320	1700	SB	1280	0.75	< D
6th Street	Idaho	Main	Minor Arterial	2	One-Way + Park	1320	1700	SB	901	0.53	< D	2	One-Way + Park	1320	1700	SB	1165	0.69	< D
5th Street	State	Jefferson	Minor Arterial	2	One-Way + Park	1320	1700	NB	657	0.39	< D	2	One-Way + Park	1320	1700	NB	824	0.48	< D
5th Street	Jefferson	Bannock	Minor Arterial	2	One-Way + Park	1320	1700	NB	819	0.48	< D	2	One-Way + Park	1320	1700	NB	1090	0.64	< D
5th Street	Bannock	Idaho	Minor Arterial	2	One-Way + Park	1320	1700	NB	869	0.51	< D	2	One-Way + Park	1320	1700	NB	1130	0.66	< D
5th Street	Idaho	Main	Minor Arterial	2	One-Way + Park	1320	1700	NB	656	0.39	< D	2	One-Way + Park	1320	1700	NB	812	0.48	< D
Front	Broadway	Ave A	Princ Arterial	5	One-Way	4250	5280	WB	1802	0.34	< D	5	One-Way	4250	5280	WB	1891	0.36	< D
Front	Ave A	3rd Street	Princ Arterial	5	One-Way	4250	5280	WB	2191	0.41	< D	5	One-Way	4250	5280	WB	2291	0.43	< D
Front	3rd Street	5th Street	Princ Arterial	5	One-Way	4250	5280	WB	2130	0.40	< D	5	One-Way	4250	5280	WB	2230	0.42	< D
Front	5th Street	Capitol	Princ Arterial	5	One-Way	4250	5280	WB	3660	0.69	< D	5	One-Way	4250	5280	WB	3695	0.70	< D
Front	Capitol	9th Street	Princ Arterial	5	One-Way	4250	5280	WB	4147	0.79	< D	5	One-Way	4250	5280	WB	4170	0.79	< D
Myrtle	Broadway	Ave A	Princ Arterial	5	One-Way	4250	5280	EB	2177	0.41	< D	5	One-Way	4250	5280	EB	2348	0.44	< D
Myrtle	Ave A	3rd Street	Princ Arterial	5	One-Way	4250	5280	EB	2248	0.43	< D	5	One-Way	4250	5280	EB	2430	0.46	< D
Myrtle	3rd Street	5th Street	Princ Arterial	5	One-Way	4250	5280	EB	2157	0.41	< D	5	One-Way	4250	5280	EB	2339	0.44	< D
Myrtle	5th Street	Capitol	Princ Arterial	5	One-Way	4250	5280	EB	2649	0.50	< D	5	One-Way	4250	5280	EB	2803	0.53	< D
Myrtle	Capitol	9th Street	Princ Arterial	5	One-Way	4250	5280	EB	2822	0.53	< D	5	One-Way	4250	5280	EB	2987	0.57	< D
9th Street	State	Jefferson	Minor Arterial	3	One-Way	1980	2550	SB	1111	0.44	< D	3	One-Way	1980	2550	SB	1194	0.47	< D
9th Street	Jefferson	Bannock	Minor Arterial	3	One-Way	1980	2550	SB	1010	0.40	< D	3	One-Way	1980	2550	SB	1178	0.46	< D
9th Street	Bannock	Idaho	Minor Arterial	3	One-Way	1980	2550	SB	944	0.37	< D	3	One-Way	1980	2550	SB	1089	0.43	< D
9th Street	Idaho	Main	Minor Arterial	3	One-Way	1980	2550	SB	1501	0.59	< D	3	One-Way	1980	2550	SB	1629	0.64	< D
9th Street	Main	Front	Minor Arterial	3	One-Way	1980	2550	SB	1976	0.77	< D	3	One-Way	1980	2550	SB	2108	0.83	E
9th Street	Front	Myrtle	Minor Arterial	3	One-Way	1980	2550	SB	2047	0.80	E	3	One-Way	1980	2550	SB	2204	0.86	E

RED = LOS D threshold exceeded, v/c approacing or exceeding capacity

* Includes estimated St. Luke's site generated traffic along Broadway, Avenue B, Fort, and State. Other locations produce insignificant site traffic volumes

One-way capacities based upon COMPASS provided thresholds

poor LOS conditions under the proposed St. Luke's network, while nine operationally deficient locations are noted under the Avenue B lane reduction scenario.

In order to further assess conditions along the Avenue B corridor, an intersection capacity analysis review completed in accordance with current *Highway Capacity Manual* procedures. Level of Service for signalized intersections is defined in terms of control delay. Delay is a measure of driver discomfort and frustration, fuel consumption, and lost travel time. Specifically, level-of-service criteria are stated in terms of the average control delay per vehicle for a 15-minute analysis period. The average control delay is estimated for each lane group and aggregated for each approach and for the intersection as a whole.

Delay is a complex measure and is dependent on a number of variables, including the quality of progression, the cycle length, the green time ratio, and the volume-to-capacity (v/c) ratio for the lane group or approach in question. Various levels of delay are assigned letter performance grades, described as follows in Table 2.

TABLE 2
Level of Service Criteria for Signalized Intersections

Level of Service	Traffic Flow Characteristics
A	Level of service A describes operations with very low delay, for example, less than 10.0 seconds per vehicle. This occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.
B	Level of service B describes operations with delay in the range of 10.1 to 20.0 seconds per vehicle. This generally occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.
C	Level of service C describes operations with delay in the range of 20.1 to 35.0 seconds per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear in this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.
D	Level of service D describes operations with delay in the range of 35.1 to 55.0 seconds per vehicle. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle length, or high v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	Level of service E describes operations with delay in the range of 55.1 to 80.0 seconds per vehicle. This is considered to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent occurrences.
F	Level of service F describes operations with delay in excess of 80.0 seconds per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with oversaturation, I.e., when arrival flow rates exceed the capacity of the intersection. It may also occur at high v/c ratios (those over 1.00) with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

Source: Highway Research Board, *Highway Capacity Manual*, Special Report No. 209, 2000

Additionally, the v/c ratio are computed for signalized intersections. According to *ACHD Policy*, The maximum acceptable *overall* intersection v/c ratio is 0.90. The *overall* intersection v/c ratio for roundabouts and unsignalized intersections is undefined by the *Highway Capacity Manual.* The maximum acceptable *lane group* v/c ratio for signalized and unsignalized intersections is 1.0, and 0.85 for roundabouts. As indicated, this review is primarily focused along the Broadway Avenue, Avenue B and Fort Street Corridor, as much of the redistribution of traffic extends outside of the original TIS study area where detailed review has not

been completed and direct comparisons cannot be achieved. The primary intersections analyzed under this comparison include:

1. Broadway Avenue/Warm Springs Avenue/Avenue B
2. Avenue B and Jefferson Street
3. Fort Street and Reserve Street – Roundabout control assumed per TIS conclusions
4. First Street/Fort Street/State Street

This analysis compares 2035 total traffic conditions as generated in the previously prepared TIS to the 2040 Avenue B lane reduction scenario. While this is not a direct (apples to apples) comparison in most cases the raw link volumes for the base network are higher in the 2035 model than the 2040 model in this vicinity, and significantly higher in the vicinity of Broadway Avenue/Warm Springs Avenue/Avenue B. Therefore, the 2035 forecast is viewed as a conservative assessment for comparison purposes. Table 3 summarizes these results while detailed operational reports are included in the Appendix.

TABLE 3
Intersection Traffic Operations Comparison

Broadway/Ave B/Warm Springs	**2035 St. Luke's Network**	**2040 Reduced Ave B**
Control Type	Traffic Signal	Traffic Signal
LOS	D	F
Intersection Delay (s)	53.5	176.9
Maximum v/c	0.97	1.65
95% Queue Length NEBT (ft)	785	1328
95% Queue Length SWBT (ft)	619	1576
Jefferson/Ave B		
Control Type	Traffic Signal	Traffic Signal
LOS	D	E
Intersection Delay (s)	36.7	60.2
Maximum v/c	0.93	0.90
95% Queue Length NEBT (ft)	715	1282
95% Queue Length SBT (ft)	210	462
Fort/Reserve		
Control Type	*Roundabout	**Roundabout
LOS	C	E
Intersection Delay (s)	16.4	48.9
Maximum v/c	0.81	1.05
95% Queue Length NWB (ft)	235	450
95% Queue Length SEB (ft)	115	550
First/Fort/State		
Control Type	Traffic Signal	Traffic Signal
LOS	D	C
Intersection Delay (s)	38.5	25.3
Maximum v/c	0.89	0.82
95% Queue Length NWBT (ft)	720	244
95% Queue Length SEBT (ft)	484	154

*Based on SIDRA multi-lane review
** Based on HCS single-lane review

Under the Avenue B lane reduction scenario, three of four intersections reviewed exhibit very poor LOS E/F conditions and v/c ratios near or over capacity. Further at these locations, through traffic queues are much longer than those projected under the proposed St. Luke's network and will likely extend well beyond adjacent intersections resulting in further congestion during peak hour conditions. A more detailed review using traffic simulation software (SimTraffic 8) reveals intersection queues are unable to clear at every cycle resulting in residual queues which build to excessive lengths. Figure 4 illustrates this condition where the southbound queue extends from Warm Springs Avenue, through Jefferson Street, Reserve Street and west of First Street.

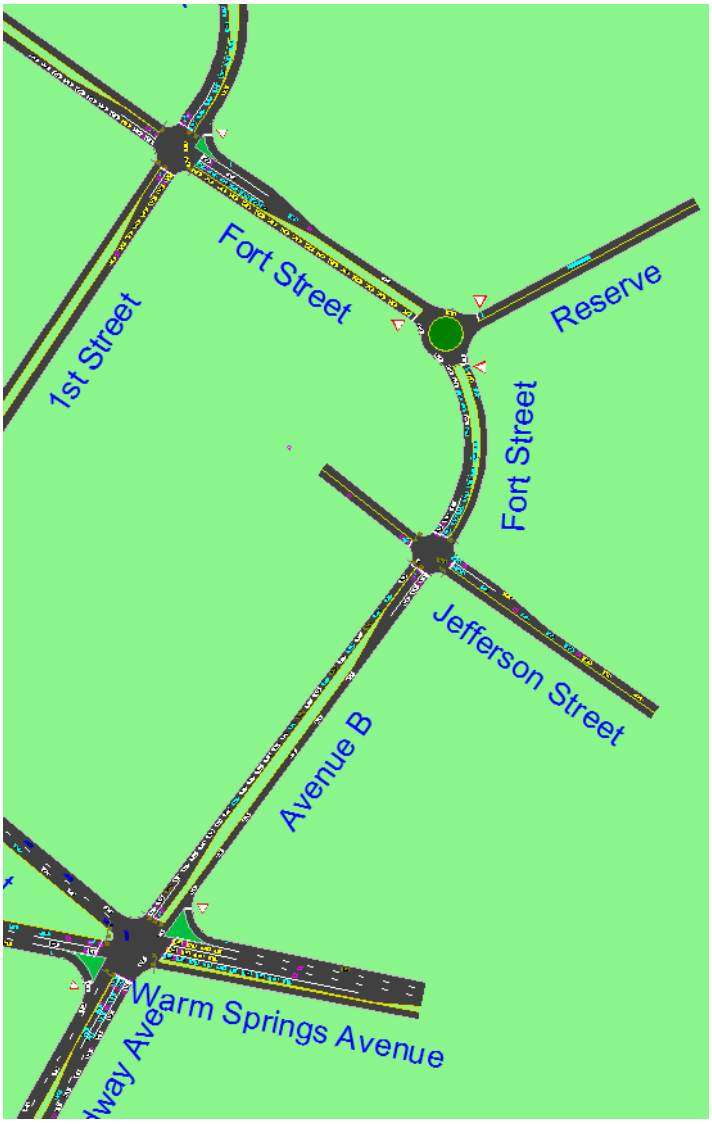


FIGURE 4
Avenue B Lane Reduction SB Queuing

The only intersection expected to perform better under the Avenue B lane reduction scenario is First Street/Fort Street/State Street as this intersection configuration generally remains unchanged and benefits from the redistribution of traffic away from this location. This benefit is likely to also be observed further west on State Street to 5th Street.

IV. Other Potential Impacts and Deficiencies

Perhaps the most critical need in the vicinity of a hospital is efficient ingress and egress in order to provide timely response to emergency needs. Just the increase in control delay at each intersection under the Avenue B lane reduction scenario will add nearly 3 minutes of travel time from the intersection of Broadway Avenue/Avenue B/Warm Springs Avenue to the intersection of First Street/Fort Street/State Street. This increase in travel time does not necessarily account for further congestion resulting from excess vehicular queueing between intersections that may further impede travel. Travel time increases from Reserve Street and Fort Street to the primary access at Avenue B and Jefferson Street would be nearly 1 minute. In the opposite direction, travel time would increase approximately 2 ½ minutes from the Warm Springs and Avenue B to Avenue B and Jefferson Street.

Further impacts related to air quality and fuel consumptions can also be expected with increased congestion. This may be a concern related to patients with respiratory ailments. Vehicle idling is a significant source of air pollution (source: USEPA, 2008. National Idle Reduction Campaign). The EPA estimates that an idling vehicle produces about 4.8 grams of carbon monoxide per minute of idling (source: US EPA, 2000. Air Quality Criteria for Carbon Monoxide). The proximity of the Avenue B lane reduction corridor, directly adjacent to St. Luke's Hospital, is likely to negatively affect air quality due to increased congestion and vehicular delay.

Again, impacts outside the immediate St. Luke's study area have not been evaluated; however, the redistribution of traffic as modeled by COMPASS shows increased travel demand along several downtown corridors. In order to accommodate this additional traffic and to facilitate circulation around the Avenue B reduced lane segment, it is likely that additional capacity in the form of auxiliary turn lanes will be needed. A high level assessment based purely on assumed needs to accommodate the redistributed traffic volumes is illustrated in Figure 5.

One of the potential advantages under a road diet configuration is the reduced street width that pedestrians must cross. At uncontrolled intersections, where cross walks or other traffic control devices are not present, pedestrians must seek out adequate gaps in the traffic stream which are safe for crossing. At a normal pedestrian walking speed of 4ft/s, a gap of at least 11.75s in traffic is required for a pedestrian to make a safe crossing across the reduced Avenue B section. This compares to a gap of 15.25s for pedestrians to cross the current five lane section. Under significant congestion it is expected that pedestrian crossing opportunities will be limited, due to fewer acceptable gaps in the traffic stream, especially during peak hour conditions. Similarly, it is expected that it will be difficult for bicyclists to cross or merge into traffic during periods of increased congestion in order to make turns from the bicycle lanes. This may negatively influence safety as pedestrians and bicyclists become frustrated and are more willing to take inherent risks in accepting less than desirable gaps in order to merge or cross conflicting traffic.

Legend:

- Poor LOS, High Volume/Capacity Ratio Roadway Segment[1]
- Poor LOS, High Volume/Capacity Ratio Intersection[1]
- ExistingVehicle Movement
- Proposed Improvement
- Significant (>100 VPH) Traffic Volume Increase Expected[2]
- Significant (>100 VPH) Traffic Volume Decrease Expected[2]

Notes:

1 Generally in range of LOS E/F and V/C ratio >0.90

2 Based on COMPASS 2040 Travel Demand Model, which includes programmed network improvements, approved DBIP, and Avenue B lane reduction

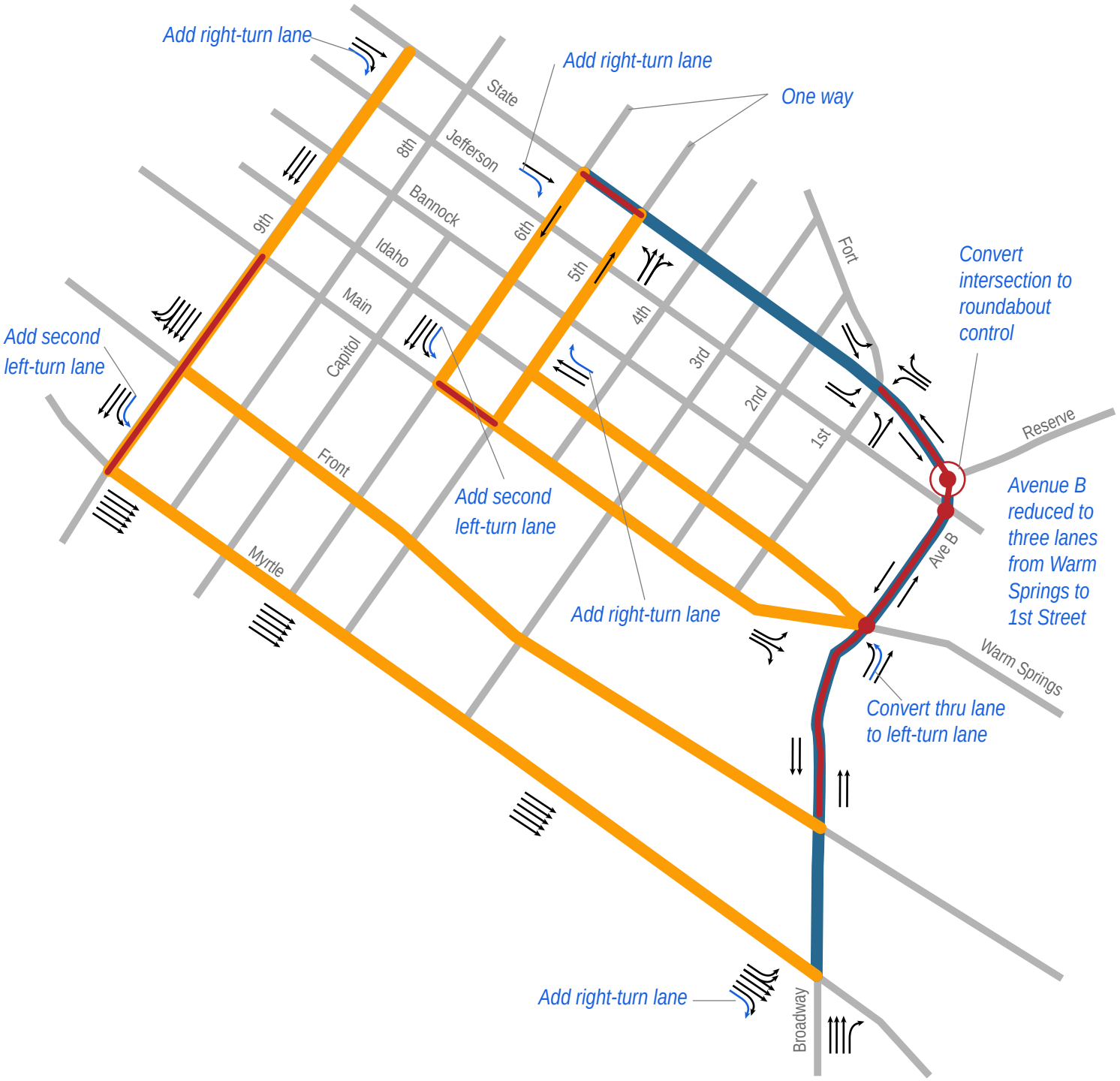


FIGURE 5
Deficiencies/Roadway Improvement Needs
Avenue B Lane Reduction Impacts

V. Conclusions

A detailed operational analysis has concluded that the Avenue B lane reduction will adversely impact traffic operations along Broadway Avenue, Avenue B, and Fort Street. Roadway segments and intersections are expected to operate poorly, resulting in overcapacity conditions, excess queueing, congestion, and significant vehicular delay. Additional travel time due to intersection delay will also negatively impact emergency vehicle response times in this vicinity. Anticipated conditions will further result in increased fuel consumption and probable air quality impacts within this corridor. Additionally, the re-distribution of traffic is expected to add traffic volume to several downtown streets which may require capacity enhancements to accommodate increased demand.

2040 forecast total daily volumes along Avenue B and Fort Street are expected to range from 28,500 to 29,500 vpd. Research has shown that ideal “road diet” candidates are in the range of 12,000 to 18,000 vpd, with an upper acceptable threshold of about 20,000 vpd (source: *Road Diets Fixing the Big Roads, Burden and Lagerwey, March 1999*). These thresholds are well exceeded under the Avenue B lane reduction scenario.

The only notable benefits achieved under this scenario include slightly improved traffic operations at First Street/Fort Street/State Street and reduced pedestrian crossing width, however with the level of congestion expected it is anticipated that acceptable gaps for pedestrian crossings at uncontrolled intersections such as Bannock Street will be very limited.

In summary, the Avenue B lane reduction scenario is expected to exhibit the following poor performance conditions within the limits of the reduced lane configuration:

- LOS E/F, with v/c ratios near or over capacity
- Excessive vehicular delay/congestion
- Significant vehicular queuing
- Increased travel time
- Air quality impacts

Due to the limited benefit achieved under the Avenue B lane reduction scenario coupled with the many significant negative impacts associated with this proposal, it is our strong opinion that implementation of a lane reduction (road diet) is not an appropriate engineering solution at this location.

Appendix

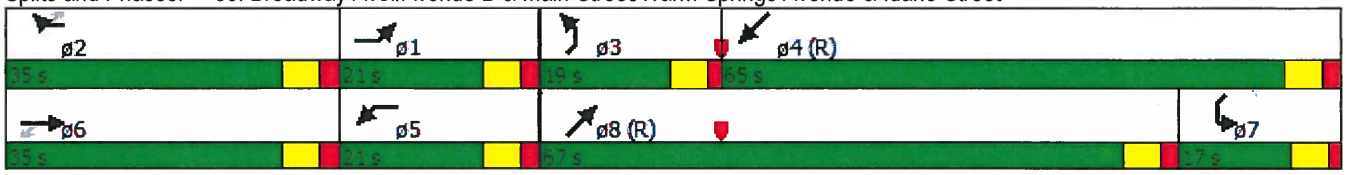
Lane Group	EBL	EBT	EBR	WBL	WBR	WBR2	NEL	NET	NER	SWL	SWT	SWR2
Lane Configurations												
Volume (vph)	200	360	525	260	365	105	420	695	170	195	835	200
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Lane Width (ft)	15	12	13	10	13	12	10	12	12	11	12	12
Storage Length (ft)	0		0	326	0		123		0	67		
Storage Lanes	0		0	1	0		1		0	1		
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.88	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.970			0.971	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1895	1814	1593	1608	3299	1542	3120	1759	0	1666	1761	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1895	1814	1593	1608	3299	1542	3120	1759	0	1666	1761	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			226			160		11			113	
Link Speed (mph)		25						35			30	
Link Distance (ft)		748						422			771	
Travel Time (s)		20.4						8.2			17.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	217	391	571	283	397	114	457	755	185	212	908	217
Shared Lane Traffic (%)												
Lane Group Flow (vph)	217	391	571	283	397	114	457	940	0	212	1125	0
Enter Blocked Intersection	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lane Alignment	Left	Left	Right	Left	Right	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		15						20			20	
Link Offset(ft)		0						0			0	
Crosswalk Width(ft)		16						16			16	
Two way Left Turn Lane												
Headway Factor	0.91	1.04	0.99	1.13	0.99	1.04	1.13	1.04	1.04	1.08	1.04	1.04
Turning Speed (mph)	15		9	15	9	9	15		9	15		9
Number of Detectors	3	3	2	3	3	2	3	4		3	3	
Detector Template	Left	Thru 30	Right	Left	Thru 30	Right	Left	Thru		Left	Thru 30	
Leading Detector (ft)	56	206	21	56	206	21	56	246		56	206	
Trailing Detector (ft)	-1	-1	-1	-1	-1	-1	-1	-1		-1	-1	
Detector 1 Position(ft)	-1	-1	-1	-1	-1	-1	-1	-1		-1	-1	
Detector 1 Size(ft)	6	6	6	6	6	6	6	6		6	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)	15	15	15	15	15	15	15	15		15	15	
Detector 2 Size(ft)	6	6	6	6	6	6	6	6		6	6	
Detector 2 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 3 Position(ft)	50	200		50	200		50	120		50	200	
Detector 3 Size(ft)	6	6		6	6		6	6		6	6	
Detector 3 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	

Lane Group	EBL	EBT	EBR	WBL	WBR	WBR2	NEL	NET	NER	SWL	SWT	SWR2
Detector 3 Channel												
Detector 3 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 4 Position(ft)								240				
Detector 4 Size(ft)								6				
Detector 4 Type								Cl+Ex				
Detector 4 Channel												
Detector 4 Extend (s)								0.0				
Turn Type	Prot	NA	Perm	Prot	Prot	Perm	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2						
Detector Phase	1	6	6	5	2	2	3	8		7	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	6.0	4.0		4.0	4.0	
Minimum Split (s)	10.0	35.0	35.0	10.0	35.0	35.0	11.5	34.0		9.5	37.0	
Total Split (s)	21.0	35.0	35.0	21.0	35.0	35.0	19.0	67.0		17.0	65.0	
Total Split (%)	15.0%	25.0%	25.0%	15.0%	25.0%	25.0%	13.6%	47.9%		12.1%	46.4%	
Maximum Green (s)	15.0	29.0	29.0	15.0	29.0	29.0	13.5	61.0		11.5	59.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.5	2.0		1.5	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	5.5	6.0		5.5	6.0	
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	3.5	3.5	3.0	3.5	3.5	3.0	2.0		2.0	2.0	
Recall Mode	None	None	None	None	None	None	None	C-Max		None	C-Max	
Walk Time (s)		5.0	5.0		5.0	5.0		5.0			5.0	
Flash Dont Walk (s)		24.0	24.0		24.0	24.0		23.0			26.0	
Pedestrian Calls (#/hr)		0	0		0	0		0			0	
Act Effct Green (s)	19.5	29.0	29.0	15.0	24.5	24.5	13.5	61.0		11.5	59.0	
Actuated g/C Ratio	0.14	0.21	0.21	0.11	0.18	0.18	0.10	0.44		0.08	0.42	
v/c Ratio	0.82	1.04	1.12	1.65	0.69	0.28	1.52	1.22		1.56	1.39	
Control Delay	82.9	111.0	107.9	352.4	60.4	3.6	289.9	151.7		324.3	215.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.1	
Total Delay	82.9	111.0	107.9	352.4	60.4	3.6	289.9	151.7		324.3	215.1	
LOS	F	F	F	F	E	A	F	F		F	F	
Approach Delay		104.3						196.9			232.4	
Approach LOS		F						F			F	
Queue Length 50th (ft)	196	~384	~425	~372	194	0	~302	~1064		~271	~1308	
Queue Length 95th (ft)	#386	#590	#659	#557	248	17	#418	#1328		#438	#1576	
Internal Link Dist (ft)		668						342			691	
Turn Bay Length (ft)				326			123			67		
Base Capacity (vph)	264	375	509	172	683	446	300	772		136	807	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	16	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.82	1.04	1.12	1.65	0.58	0.26	1.52	1.22		1.56	1.42	

Intersection Summary	
Area Type:	Other

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 99 (71%), Referenced to phase 4:SWT and 8:NET, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.65
Intersection Signal Delay: 176.9 Intersection LOS: F
Intersection Capacity Utilization 122.1% ICU Level of Service H
Analysis Period (min) 15
Description: Count Date: 8/31/2010
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 65: Broadway Ave./Avenue B & Main Street/Warm Springs Avenue & Idaho Street



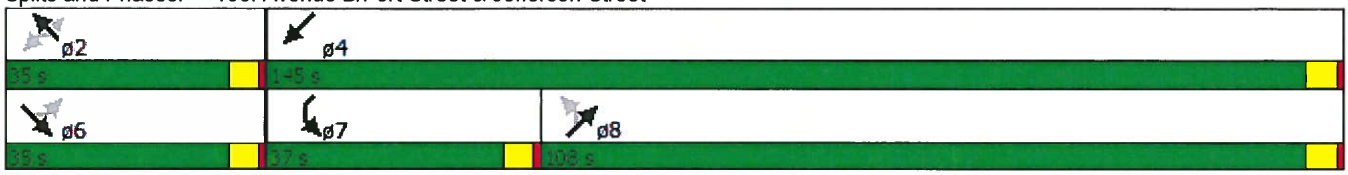
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	0	1	170	0	170	1	775	80	225	780	1
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Lane Width (ft)	12	12	12	12	12	10	12	12	14	12	13	12
Storage Length (ft)	0		0	0		80	85		0	65		0
Storage Lanes	0		0	0		1	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865				0.850		0.986				
Flt Protected					0.950		0.950			0.950		
Satd. Flow (prot)	0	1569	0	0	1723	1439	1723	1788	0	1723	1874	0
Flt Permitted					0.757		0.347			0.950		
Satd. Flow (perm)	0	1569	0	0	1373	1439	629	1788	0	1723	1874	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		264				101		5				
Link Speed (mph)		35			30			30			30	
Link Distance (ft)		216			427			771			368	
Travel Time (s)		4.2			9.7			17.5			8.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	1	185	0	185	1	842	87	245	848	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1	0	0	185	185	1	929	0	245	849	0
Enter Blocked Intersection	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.13	1.04	1.04	0.95	1.04	0.99	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	3	4		3	4	2	3	3		3	3	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru 30		Left	Thru 30	
Leading Detector (ft)	56	246		56	246	21	56	206		56	206	
Trailing Detector (ft)	-1	-1		-1	-1	-1	-1	-1		-1	-1	
Detector 1 Position(ft)	-1	-1		-1	-1	-1	-1	-1		-1	-1	
Detector 1 Size(ft)	6	6		6	6	6	6	6		6	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)	15	15		15	15	15	15	15		15	15	
Detector 2 Size(ft)	6	6		6	6	6	6	6		6	6	
Detector 2 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 3 Position(ft)	50	120		50	120		50	200		50	200	
Detector 3 Size(ft)	6	6		6	6		6	6		6	6	
Detector 3 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Detector 3 Channel												
Detector 3 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 4 Position(ft)		240			240							
Detector 4 Size(ft)		6			6							
Detector 4 Type		Cl+Ex			Cl+Ex							
Detector 4 Channel												
Detector 4 Extend (s)		0.0			0.0							
Turn Type		NA		Perm	NA	Perm	Perm	NA		Prot	NA	
Protected Phases		6			2			8		7	4	
Permitted Phases	6			2		2	8					
Detector Phase	6	6		2	2	2	8	8		7	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Minimum Split (s)	25.0	25.0		30.0	30.0	30.0	25.0	25.0		9.0	25.0	
Total Split (s)	35.0	35.0		35.0	35.0	35.0	108.0	108.0		37.0	145.0	
Total Split (%)	19.4%	19.4%		19.4%	19.4%	19.4%	60.0%	60.0%		20.6%	80.6%	
Maximum Green (s)	30.0	30.0		30.0	30.0	30.0	103.0	103.0		32.0	140.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0			5.0	5.0	5.0	5.0		5.0	5.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	2.0	2.0		2.5	2.5	2.5	2.0	2.0		2.0	2.0	
Recall Mode	Max	Max		None	None	None	Max	Max		None	Max	
Walk Time (s)	8.0	8.0		10.0	10.0	10.0	8.0	8.0			8.0	
Flash Dont Walk (s)	12.0	12.0		15.0	15.0	15.0	12.0	12.0			12.0	
Pedestrian Calls (#/hr)	0	0		0	0	0	0	0			0	
Act Effct Green (s)		30.0			30.0	30.0	106.5	106.5		28.5	140.0	
Actuated g/C Ratio		0.17			0.17	0.17	0.59	0.59		0.16	0.78	
v/c Ratio		0.00			0.81	0.57	0.00	0.88		0.90	0.58	
Control Delay		0.0			98.1	38.3	17.0	42.7		107.1	10.1	
Queue Delay		0.0			0.0	0.0	0.0	47.8		0.0	0.0	
Total Delay		0.0			98.1	38.3	17.0	90.5		107.1	10.1	
LOS		A			F	D	B	F		F	B	
Approach Delay		0.0			68.2			90.4			31.8	
Approach LOS		A			E			F			C	
Queue Length 50th (ft)		0			214	92	1	930		284	367	
Queue Length 95th (ft)		0			#349	185	4	#1282		#418	462	
Internal Link Dist (ft)		136			347			691			288	
Turn Bay Length (ft)						80	85			65		
Base Capacity (vph)		481			228	324	371	1059		306	1457	
Starvation Cap Reductn		0			0	0	0	220		0	0	
Spillback Cap Reductn		0			0	0	0	0		0	0	
Storage Cap Reductn		0			0	0	0	0		0	0	
Reduced v/c Ratio		0.00			0.81	0.57	0.00	1.11		0.80	0.58	

Intersection Summary	
Area Type:	Other

Cycle Length: 180
Actuated Cycle Length: 180
Natural Cycle: 110
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 60.2 Intersection LOS: E
Intersection Capacity Utilization 88.5% ICU Level of Service E
Analysis Period (min) 15
Description: PM Peak Hour Count Date: 07/12/2000
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 106: Avenue B/Fort Street & Jefferson Street



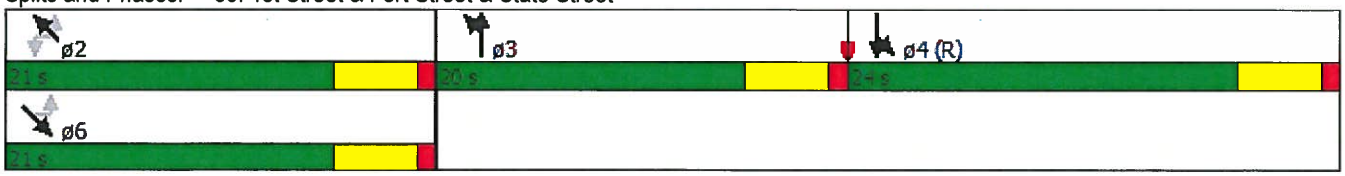
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	85	100	245	425	35	10	15	240	60	100	320	405
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Lane Width (ft)	11	14	12	12	16	12	12	14	12	12	13	14
Storage Length (ft)	50		0	85		0	62		0	120		120
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.894			0.966			0.970				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1666	1730	0	1723	1986	0	1723	1877	0	1723	1874	1644
Flt Permitted	0.950			0.950			0.298			0.338		
Satd. Flow (perm)	1666	1730	0	1723	1986	0	540	1877	0	613	1874	1644
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		176			11			18				440
Link Speed (mph)		25			30			30			30	
Link Distance (ft)		670			757			1183			508	
Travel Time (s)		18.3			17.2			26.9			11.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	92	109	266	462	38	11	16	261	65	109	348	440
Shared Lane Traffic (%)												
Lane Group Flow (vph)	92	375	0	462	49	0	16	326	0	109	348	440
Enter Blocked Intersection	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.08	0.95	1.04	1.04	0.88	1.04	1.04	0.95	1.04	1.04	0.99	0.95
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	3	3		3	3		3	3		3	3	2
Detector Template	Left	Thru 25		Left	Thru 30		Left	Thru 30		Left	Thru 30	Right
Leading Detector (ft)	56	156		56	206		56	206		56	206	21
Trailing Detector (ft)	-1	-1		-1	-1		-1	-1		-1	-1	-1
Detector 1 Position(ft)	-1	-1		-1	-1		-1	-1		-1	-1	-1
Detector 1 Size(ft)	6	6		6	6		6	6		6	6	6
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)	15	15		15	15		15	15		15	15	15
Detector 2 Size(ft)	6	6		6	6		6	6		6	6	6
Detector 2 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 3 Position(ft)	50	150		50	200		50	200		50	200	
Detector 3 Size(ft)	6	6		6	6		6	6		6	6	
Detector 3 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Detector 3 Channel												
Detector 3 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	Perm
Protected Phases	3	3		4	4			6			2	
Permitted Phases							6			2		2
Detector Phase	3	3		4	4		6	6		2	2	2
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	20.0	20.0		19.0	19.0		21.0	21.0		21.0	21.0	21.0
Total Split (s)	20.0	20.0		24.0	24.0		21.0	21.0		21.0	21.0	21.0
Total Split (%)	30.8%	30.8%		36.9%	36.9%		32.3%	32.3%		32.3%	32.3%	32.3%
Maximum Green (s)	15.0	15.0		19.0	19.0		16.0	16.0		16.0	16.0	16.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead	Lead		Lag	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Recall Mode	None	None		C-Max	C-Max		None	None		None	None	None
Walk Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Flash Dont Walk (s)	10.0	10.0		9.0	9.0		11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	11.7	11.7		23.1	23.1		15.1	15.1		15.1	15.1	15.1
Actuated g/C Ratio	0.18	0.18		0.36	0.36		0.23	0.23		0.23	0.23	0.23
v/c Ratio	0.31	0.82		0.75	0.07		0.13	0.72		0.77	0.80	0.61
Control Delay	24.3	28.7		28.4	8.8		10.5	19.6		59.4	38.9	6.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	24.3	28.7		28.4	8.8		10.5	19.6		59.4	38.9	6.6
LOS	C	C		C	A		B	B		E	D	A
Approach Delay		27.8			26.5			19.2			25.5	
Approach LOS		C			C			B			C	
Queue Length 50th (ft)	31	71		181	12		3	108		40	128	0
Queue Length 95th (ft)	65	#168		#354	11		m4	#154		#117	#244	63
Internal Link Dist (ft)		590			677			1103			428	
Turn Bay Length (ft)	50			85			62			120		120
Base Capacity (vph)	384	534		612	713		132	475		150	461	736
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.24	0.70		0.75	0.07		0.12	0.69		0.73	0.75	0.60

Intersection Summary	
Area Type:	Other
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 6 (9%), Referenced to phase 4:SBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	

Maximum v/c Ratio: 0.82
Intersection Signal Delay: 25.3 Intersection LOS: C
Intersection Capacity Utilization 84.1% ICU Level of Service E
Analysis Period (min) 15
Description: PM Peak Hour Count Date: 05/24/2005
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 63: 1st Street & Fort Street & State Street

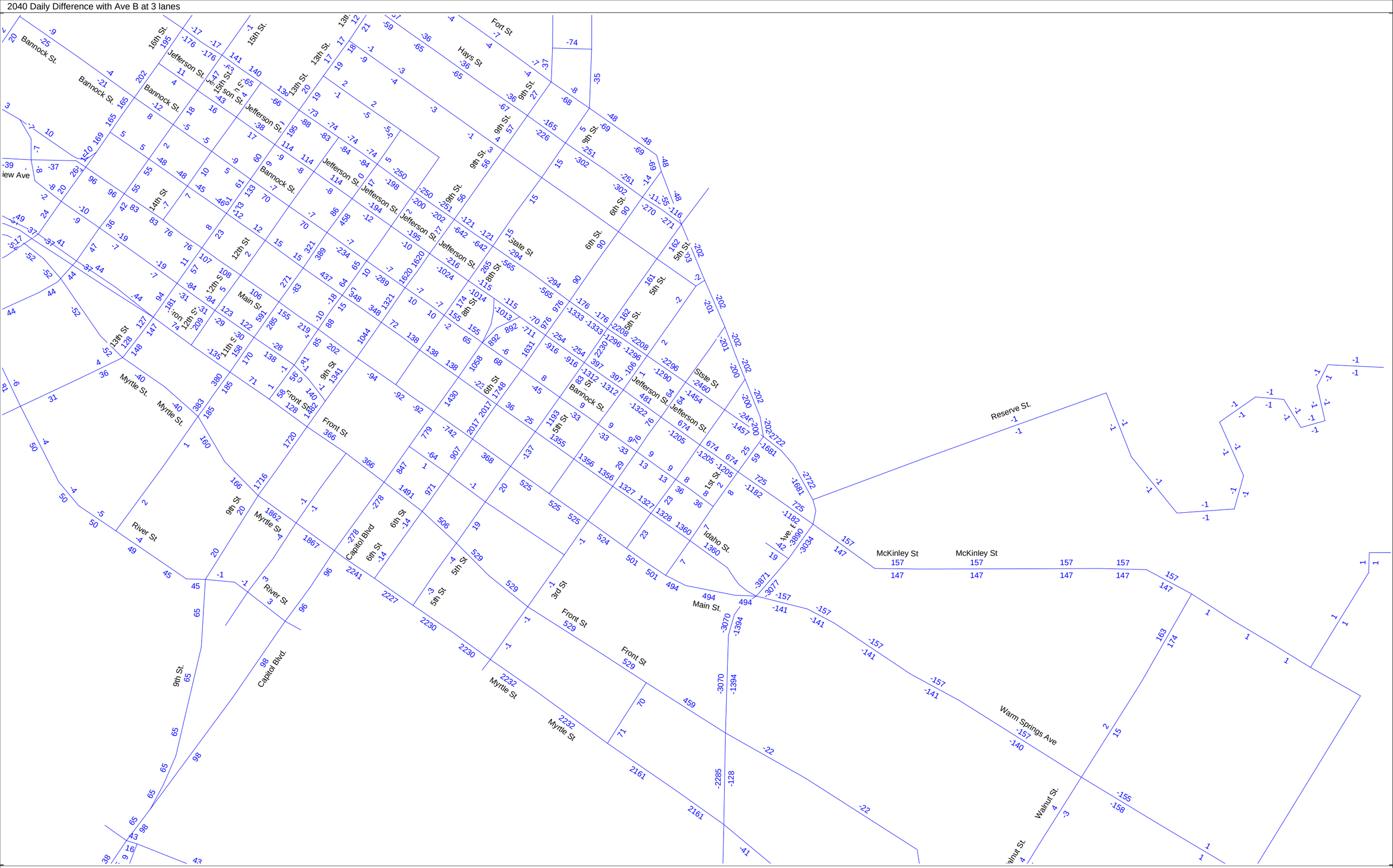


Intersection	
Intersection Delay, s/veh	48.9
Intersection LOS	E

Approach	WB	NB	SE
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	222	1016	978
Demand Flow Rate, veh/h	226	1037	997
Vehicles Circulating, veh/h	843	61	171
Vehicles Exiting, veh/h	255	1107	898
Follow-Up Headway, s	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	16.2	42.2	63.3
Approach LOS	C	E	F

Lane	Left	Left	Left
Designated Moves	LR	LR	LR
Assumed Moves	LR	LR	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193
Entry Flow, veh/h	226	1037	997
Cap Entry Lane, veh/h	486	1063	952
Entry HV Adj Factor	0.982	0.980	0.981
Flow Entry, veh/h	222	1016	978
Cap Entry, veh/h	478	1042	934
V/C Ratio	0.465	0.975	1.047
Control Delay, s/veh	16.2	42.2	63.3
LOS	C	E	F
95th %tile Queue, veh	2	18	22

2040 Daily Difference with Ave B at 3 lanes



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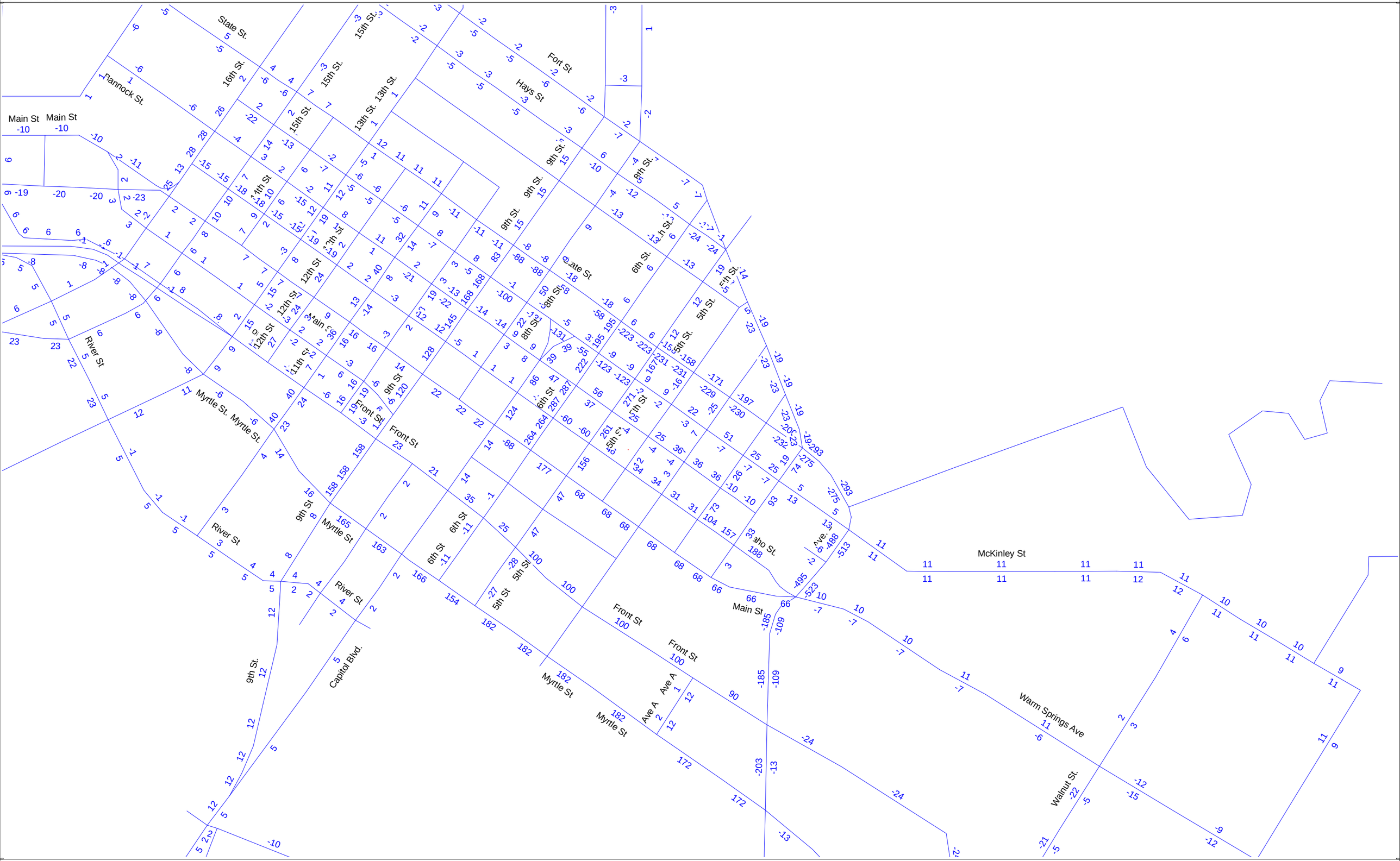
2040 Peak Difference with Ave B at 3 lanes



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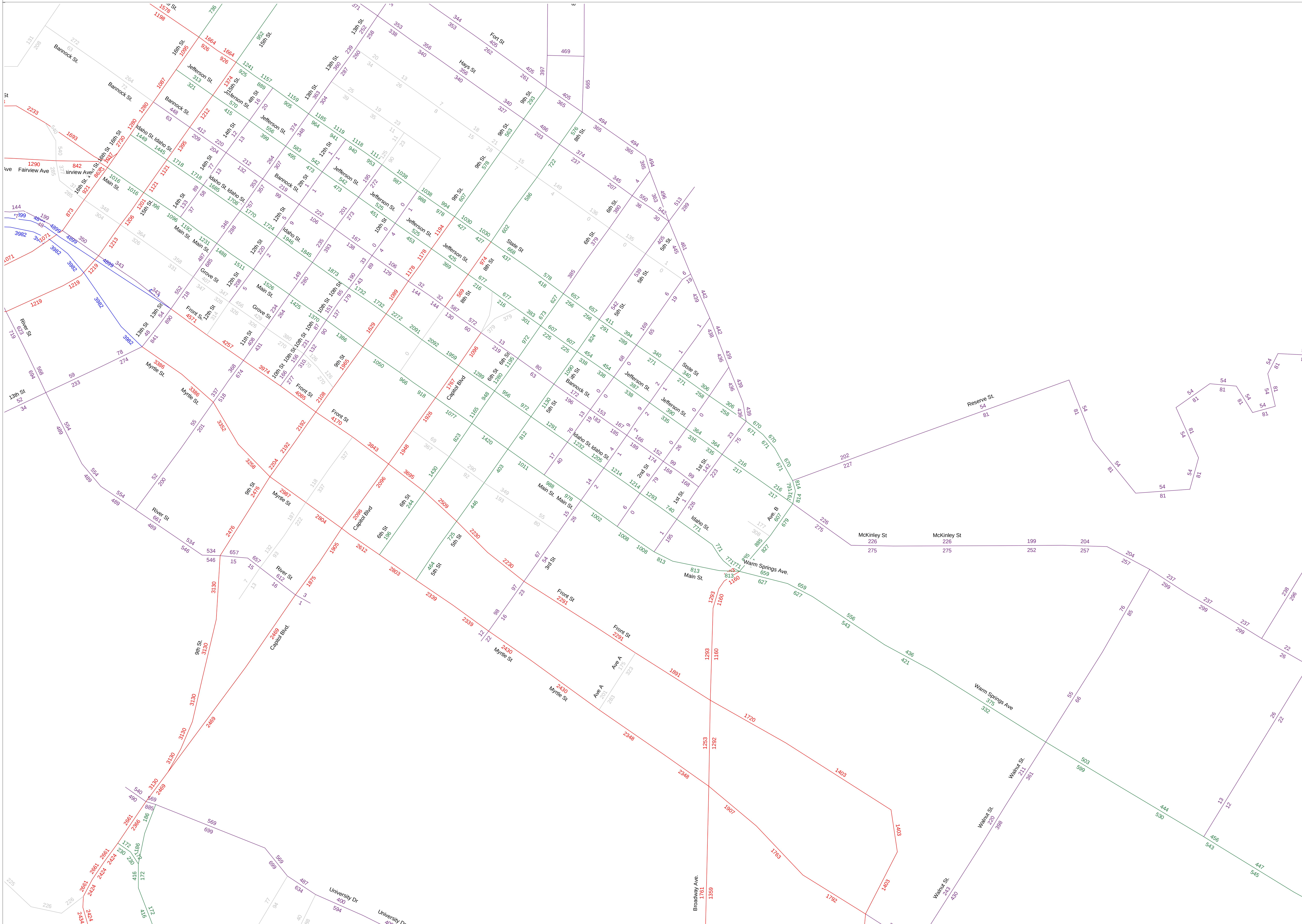
2040 Peak Hour: 2040 Demographics on 2040 CIM Funded Network, St Luke's Project, Ave B reduced to 3 lanes from Warm Springs to Fort St/State St
8/28/2014



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2040 Peak Hour: 2040 Demographics on 2040 CIM Funded Network - St Luke's Project
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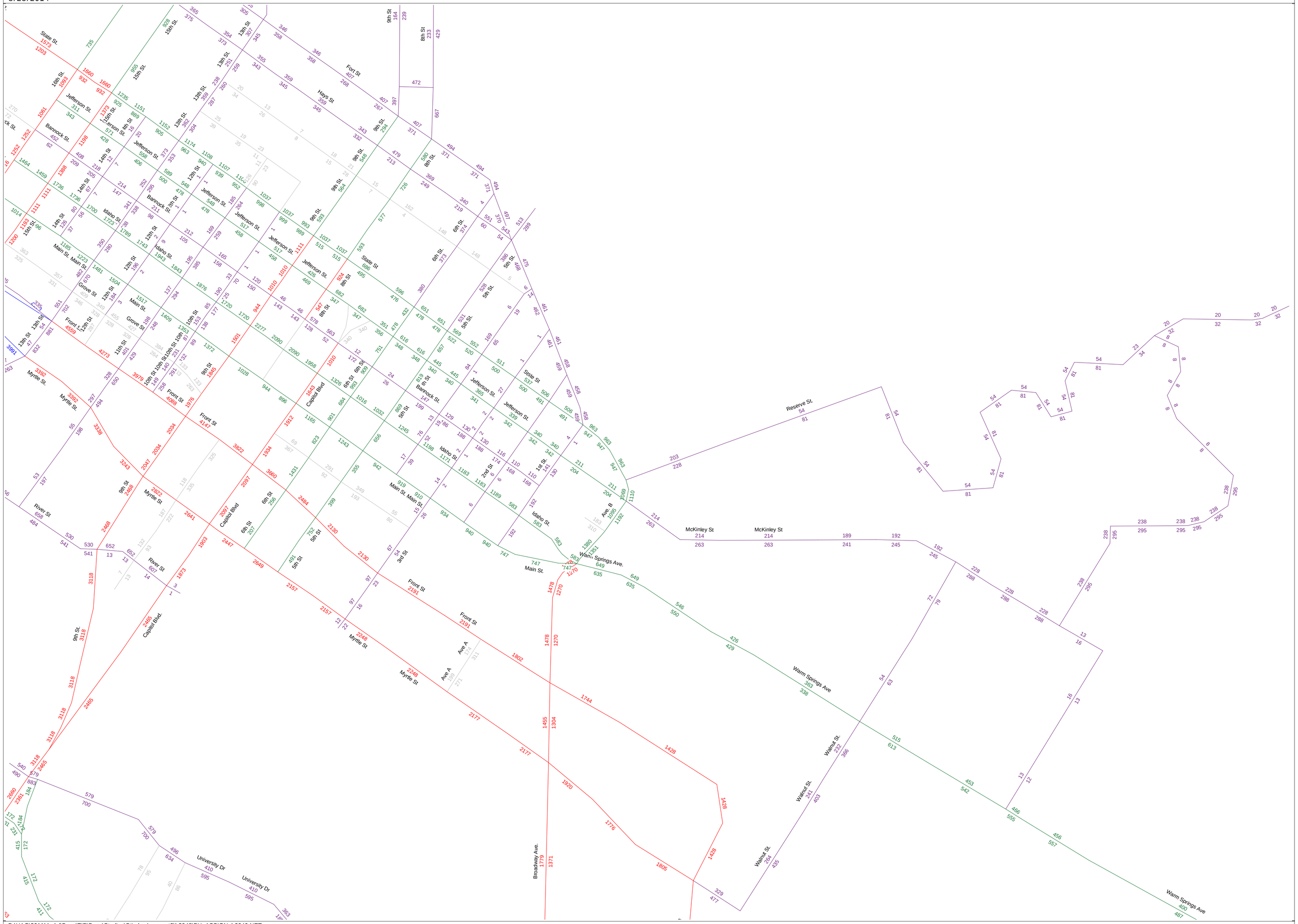

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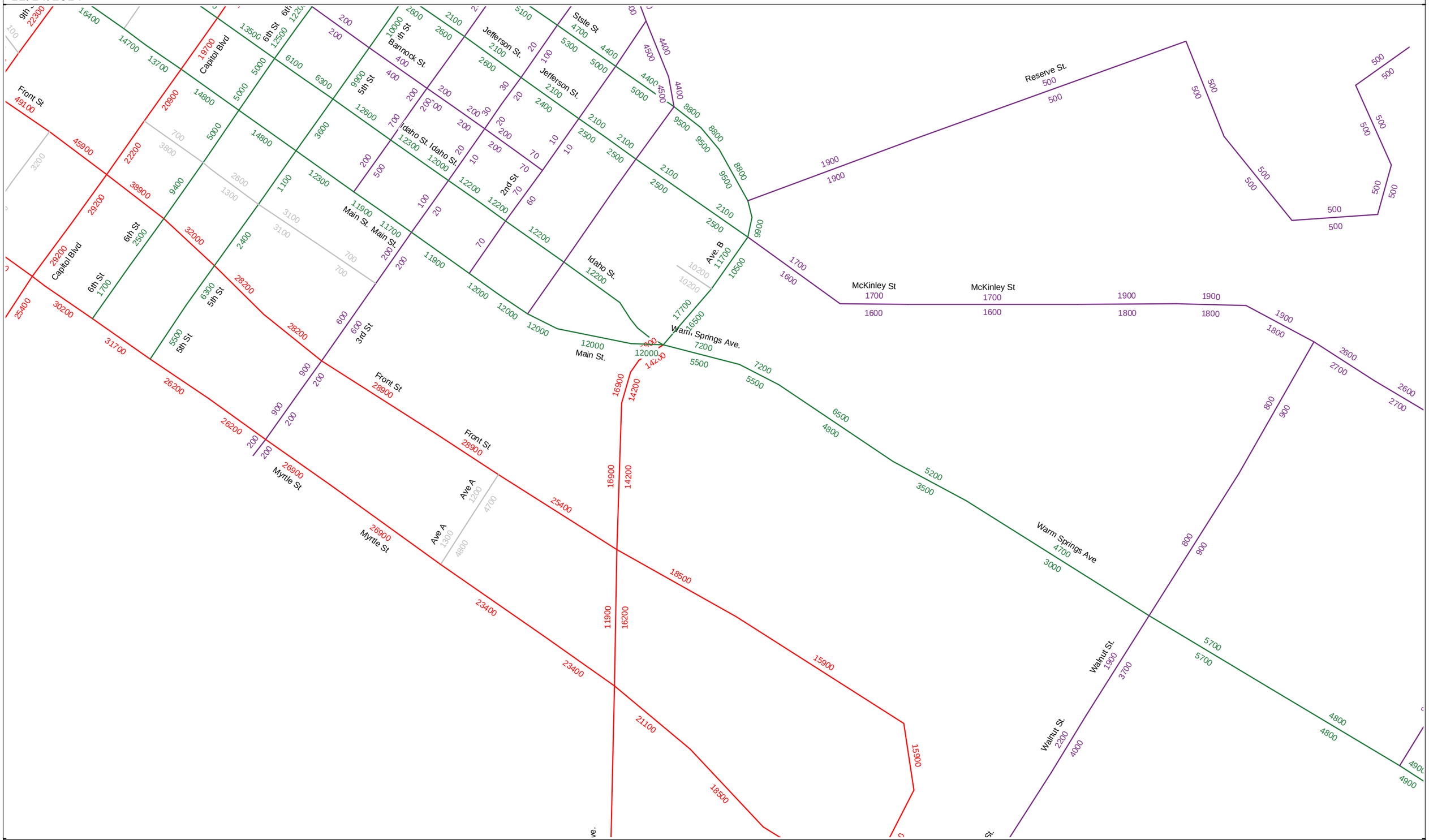
12/14/2014



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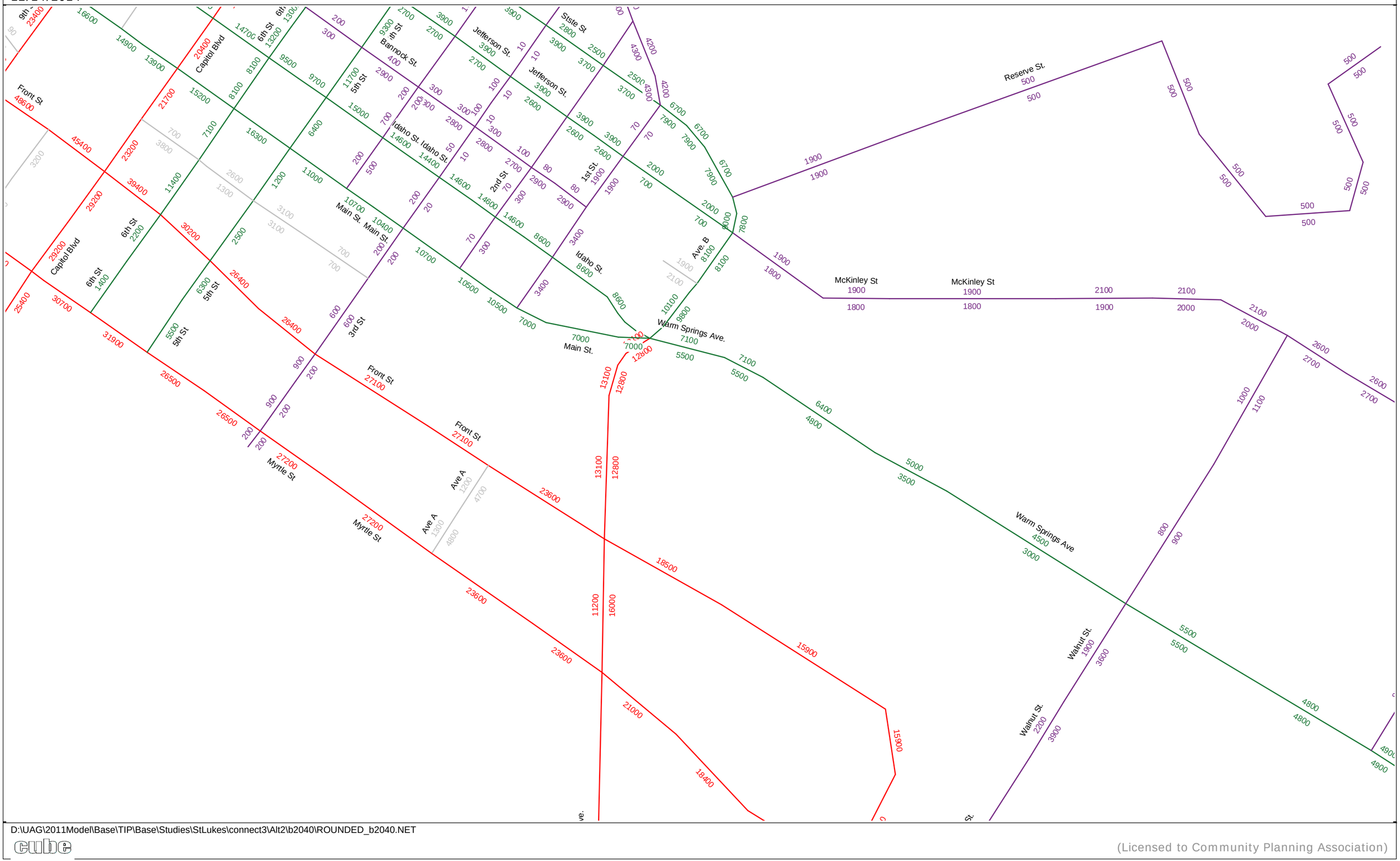
12/14/2014



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PARKING DEMAND ANALYSIS UPDATE

ST. LUKE'S BOISE MEDICAL CENTER

BOISE, IDAHO

Prepared for:
St. Luke's Medical Center

AUGUST 21, 2014

WALKER
PARKING CONSULTANTS

WALKER PARKING CONSULTANTS
5350 S. Roslyn Street, Suite 220
Greenwood Village, CO 80111

Voice: 303.694.6622
Fax: 303.694.6667
www.walkerparking.com

August 21, 2014

Mr. Jeff Hull, AIA
Director of Architecture, Construction, and Real Estate
St. Luke's Health System
190 East Bannock Street
Boise, Idaho 83712

Re: *Parking Demand Analysis Update*
St. Luke's Boise Medical Center
Boise, Idaho

Dear Mr. Hull:

Walker Parking Consultants is pleased to present the following *Parking Demand Analysis Update* for St. Luke's Boise Medical Center in Boise, Idaho. This report contains our independent review of the projected future parking needs for the hospital campus based on new build-out program assumptions from the revised Master Plan.

Please note that the earlier version of this report was submitted in November 2013 and contained parking survey data collected in July 2013. This report is based on the same baseline survey counts, and may not reflect current conditions for the campus if any major changes have been made to the parking system over the last 13 months.

Conclusions reached in this analysis are based on various assumptions provided by the Hospital and the planning team. These assumptions and their limitations are discussed in the attached report.

We appreciate the opportunity to be of service to you and St. Luke's Health System. Please do not hesitate to contact us with any questions.

Sincerely,

WALKER PARKING CONSULTANTS

Jeremiah J. Simpson
Parking Consultant

Enclosure

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LIST OF FIGURES

AUGUST 21, 2014

EXECUTIVE SUMMARY

St. Luke's Medical Center has hired Walker Parking Consultants to prepare a *Parking Demand Analysis Update* for their main campus, located in downtown Boise. This report addresses the existing parking needs for the Hospital using two different approaches:

1. Parking spaces required by City Code, and
2. Parking spaces needed based on the observed current usage (with an appropriate adjustment for the design day).

This analysis also provides a review of the Hospital's Master Plan and projects possible future parking needs based on the revised 2030 build-out horizon, per the scenario labeled 6A-2 in Appendix B.

Parking Required by Code

Parking required for the campus may be subject to some interpretation, as different buildings may be located outside of the overlay zone, and/or may fall under older code standards or variances which have been grandfathered in. Based on Walker's interpretation of Title 11, we conclude the following:

- The existing campus includes a total of 3,206 parking spaces located in lots and garages within the study area (see Figure 4); this figure excludes an estimated 528 public on-street spaces located within 1-2 blocks from the campus;
- The off-street parking capacity is compared to an estimated minimum code requirement of 1,319 parking spaces (see Figure 6)
- The estimated code requirement for the Hospital includes roughly 474 parking spaces that are located outside of the "core" hospital zone and includes parking at various clinics, medical office buildings, and ancillary support facilities; each of these facilities is assumed to meet their own code requirement on site.

Parking Recommended based on Usage

To determine existing parking usage, Walker conducted a campus-wide parking occupancy survey on Wednesday, July 10, 2013. Results were compared to historical parking occupancy data from 2001 and 2005. The survey day results were also adjusted based on Hospital-provided statistics (for the 2013 calendar year) to model an appropriate deign day, which is defined as the 95th percentile day in terms of overall campus activity.

Based on this analysis, Walker concludes that the existing system has an effective surplus of roughly 213 spaces for the core campus and 394 parking spaces overall (see Figure 10). This surplus excludes any overflow capacity available on the streets surrounding the campus. The calculated effective parking sufficiency by user group is listed below:

- Core hospital employee parking = 85 space surplus
- Core hospital visitor/patient parking = 128 space surplus
- Ancillary lots (all) = 181 space surplus

Clearly, parking for the core hospital zone - which includes the Hospital itself, Anderson Medical Plaza, St. Luke Medical Office Plaza, and St. Luke's Mountain States Tumor Institute - has less overall sufficiency that the ancillary buildings. Though not currently showing a deficit of parking, employee parking facilities for the core hospital are close to the effective capacity.

If the Hospital experiences future growth, additional parking supplies will likely be needed.

Projected Future Parking Needs

Walker reviewed the build-out plan for the campus, including the proposed Master Plan and capital projects projected through 2030 based on the revised program scenario labeled 6A-2. Based on assumptions provided by the architect and planning team, Walker recommends that the following parking capacity be added to the campus to support projected growth.

Projected Parking Needs	2013 Design Day Parking Needed	Growth Factor	2030 Projected Parking Need	Core Campus Inventory	New Spaces Needed
Main Campus Hospital Employees	1,006	1.57	1,581		
Main Campus Patient/Visitor	418	1.30	542		
Estimated Main Campus MOBs	1,095	1.00	1,095		
Sub-Total:	2,519		3,218	2,732	486
Ancillary Facilities (new MOBs)			**New Demand**	**Impact on Supply**	**Net Impact**
Children's Pavilion (1)	85,000 SF		340	246	94
First Street Medical Office Plaza	105,000 SF		420	-83	503
Warm Springs MOB	100,000 SF		400	-42	442
TOTAL New Spaces Recommended =			**4,378**	2,853	**1,525**

1. The Children's Pavilion will displace an estimated 28 cars from the Jefferson Plaza overflow lot but will add 274 garage spaces; therefore, the net impact on the supply is shown as +246.

The total parking recommendation of **1,525 new spaces** includes parking demand displaced by the three proposed MOB buildings and also factors in the new parking levels added for the new Children's Pavilion building. It is anticipated that some user groups may need to be reassigned within the hospital's parking system to accommodate the First Street Medical Office Plaza and the Warm Springs MOB in adjacent parking garages.

1,525 total new parking spaces are recommended for the campus to accommodate a project total demand for around 4,378 spaces on a typical 2030 design day. City code requirements for the Master Plan would require an estimated 1,970 spaces at the minimum (per Figure 14).

AUGUST 21, 2014

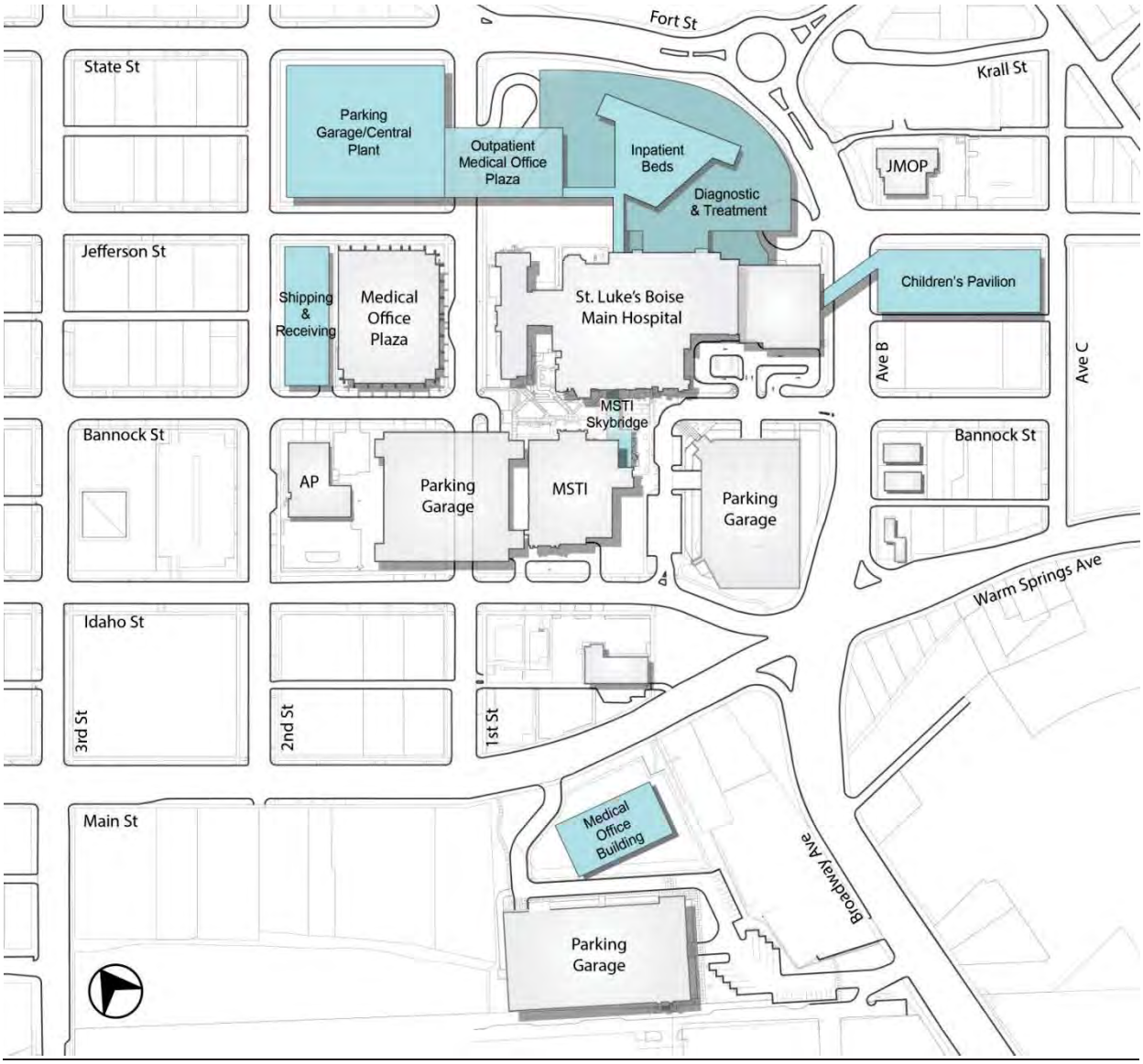
INTRODUCTION

BACKGROUND

St. Luke's Boise Medical Center ("St. Luke's Boise") is a 389-bed full service hospital located at 190 East Bannock Street in downtown Boise, Idaho. The downtown location is considered the flagship campus for the St. Luke's Health System.

St. Luke's Boise is currently updating its master plan to include a major expansion located mostly to the north of the existing hospital core. The master plan update is being prepared by a team headed by Hummel Architects. The current Master Plan concept (at full build-out) is depicted below.

Figure 1: St. Luke's Boise Medical Center – Proposed Master Plan



Source: Hummel Architects, 2014

Campus growth projections have been established by the planning team through 2024, 2030, and 2034. The scenario labeled as 6A-2 in the Appendix, reflects a refined plan for 2030 (including feedback received from various stakeholders) and will be the basis for this parking demand analysis.

Part of the proposed hospital expansion would include a new parking garage, which is expected to accommodate roughly 200 new parking stalls for employees and staff and roughly 700 to 900 new patient/visitor parking stalls. This garage would be located north of Jefferson Street and be developed in conjunction with the new central plant.

According to the planning team, St. Luke's Boise is currently parked sufficiently to meet local (City of Boise) municipal code requirements. However, some evidence suggests that the minimum parking requirements may not be sufficient to accommodate all of the visitor, patient, and staff parking needs at peak conditions.

In the past, the hospital has received some complaints about staff parking in nearby residential neighborhoods either out of convenience or due to lack of supply on site. Future projected growth on the campus may also increase the need for additional parking supplies in the future.

To help recommend a specific size the new garage, and refine the proposed allocation of spaces, the Hospital has asked Walker to prepare a parking demand analysis. This study is intended to evaluate the design day need for parking spaces (based on our July 2013 baseline parking counts) and also project parking needs through the 2030 planning horizon based on scenario 6A-2, provided in Appendix B.

DEFINITION OF TERMS

Several terms are used in this report that may have unique meanings when used for parking analysis and planning. To help clarify these terms, definitions are presented below.

- **Adequacy** - The difference between the "effective" parking supply and the parking demand.
- **Demand Ratio** - The ratio of the number of parked vehicles observed, compared to a reference number. For example, if there are 1,000 full-time equivalent employees (FTE's) and a peak parking occupancy of 400 employee vehicles, the demand ratio is 0.40 (400/1,000) per FTE.
- **Design Day** – A day that represents the level of activity that the parking system is designed to accommodate. This level of activity is typically set as the 90th to 95th percentile in terms of combined daily patient visits and employee activity. A parking system designed to handle the absolute peak level of demand typically results in too many parking spaces that remain unused most of the time. (Note that when conditions do exceed the design day, some of the excess parking demand is typically accommodated within the effective supply cushion by filling the last few available parking spaces; other solutions can include expanded use of valet or other options for these few dates.)
- **Effective Supply** - The total supply of parking spaces, adjusted to reflect an appropriate "cushion" needed to facilitate proper traffic flow, reduce driver waiting times, and limit circulation issues within the parking system. The effective supply cushion also typically accounts for spaces that may be temporarily unavailable due to maintenance, snow removal, or other disruptions. The effective supply varies by user group and type of parking, but typically is set at 85% to 95% of the total number of spaces. The adjustment factor is known as the **effective supply factor**. (At conditions that exceed the design day, the last 5% to 15% of spaces may be used for parking, though this is not ideal from a traffic standpoint or for typical day-to-day use).
- **Inventory** - The total number of marked parking spaces within the study area. Illegal parking spaces, motorcycle stalls, and loading zones are typically not counted.

- **Minimum Code Requirements** - The amount of parking required by zoning ordinance for the campus as set by the local municipality. In some cases, code requirements may be similar to the actual parking demand, while in other cases, code requirements do not accurately reflect the demand for a number of different reasons. (For example, a City may allow reductions to their code requirements or even incidentally "cap" or limit the requirement in order to encourage greater development density.)
- **Optimum Utilization Factor** - A forward-looking adjustment that is applied to the calculated demand for parking, in order to estimate the future design day spaces needed in order to operate at the desired efficiency. This factor is often simplified as the inverse of the effective supply factor (i.e., 1.0 divided by the 85% to 95% effective supply adjustment).
- **Parking Demand** - The number of spaces required by various user groups and visitors to the subject property. Parking demand is compared with effective supply to determine the adequacy of a parking system.
- **Parking Generation** - The peak accumulation of parked vehicles generated by the land uses present under any given set of conditions. Note that parking generation differs substantially from "trips", as parking demand represents the accumulation of vehicles at a peak hour, rather than a total in-bound and out-bound activity over a given period.
- **Patron or User** - Any individual parking in the study area.
- **Peak Hour** - The peak hour represents the busiest hour of the day for parking demand. On a medical campus, this usually occurs between the hours of 9:00 AM and 3:00 PM on a Monday, Tuesday, Wednesday, or Thursday when staffing and outpatient activity is the highest.
- **Survey Day** - The day that occupancy counts within a study area are recorded. This day should represent a typical busy day. Walker's occupancy surveys for this study were collected on Wednesday, July 10, 2013.

EXISTING PARKING NEEDS

This section of the report defines the study area and addresses the existing parking needs for St. Luke's Boise using two different approaches:

1. Parking spaces required by City Code, and
2. Parking spaces needed based on the observed usage in July 2013 (with an appropriate adjustment for the design day).

STUDY AREA

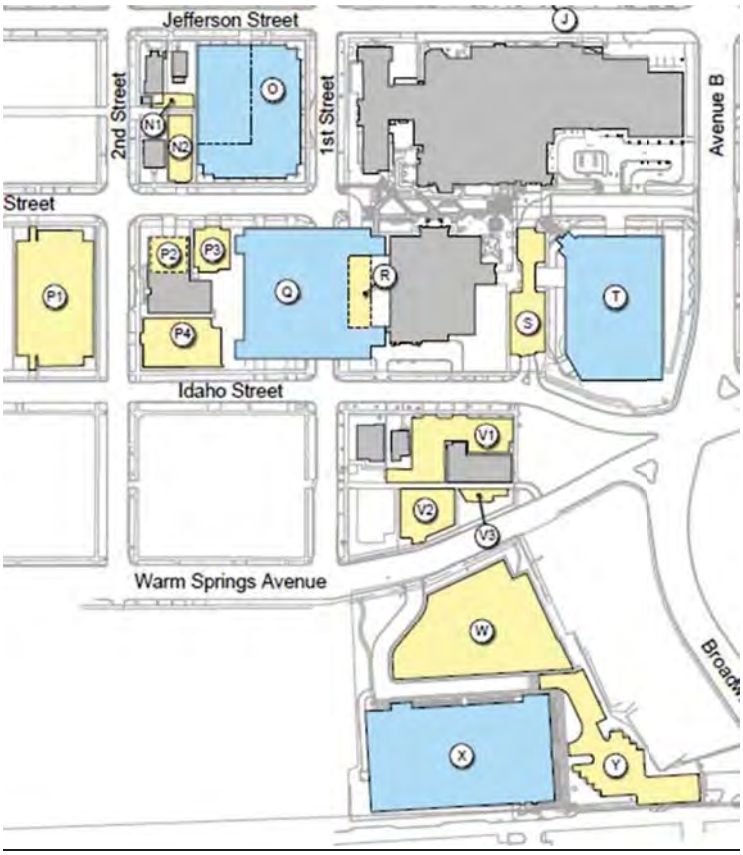
The study area for this project includes all off-street parking associated with the St. Luke's Boise campus, plus any St. Luke's clinics, support buildings, and/or medical office buildings (MOB's) located within 1 to 3 blocks of the main hospital building. The Figure on the following page shows the study area for this project. Please see Appendix A for a larger version of this map.

On-street parking located within the study area is included in our occupancy survey in order to gauge current usage of these spaces and determine how much impact the Hospital may have on the streets surrounding the campus. However, on-street spaces are not included for the calculation of "code requirements" since these stalls are not owned by the Hospital, and are managed by the City of Boise as part of the public right of way.

Several sub-areas are defined for the purposes of this analysis. The first is the "Core" zone which includes parking facilities that serve the main hospital building, including the Visitor Garage, South Tower Garage, and Warm Springs employee lot and employee garage. The core zone also includes several hospital adjacent buildings such as Anderson Medical Plaza, St. Luke Medical Office Plaza ("SLMOP"), and St. Luke's Mountain States Tumor Institute ("MSTI"). These buildings are closely grouped together adjacent to the main building and may share some of the same parking resources, especially the South Tower Garage.

All other facilities within the study area are considered to be within the "Ancillary" zone. These buildings include additional stand-alone MOB's, clinics, and St. Luke's support services, such as Little Luke's Day Care, Information Technology, Human Resources, etc. Each of these buildings is typically self-parked with small to medium parking lots on site. Many of the ancillary services occupy buildings that may have been converted from another use such as single family housing.

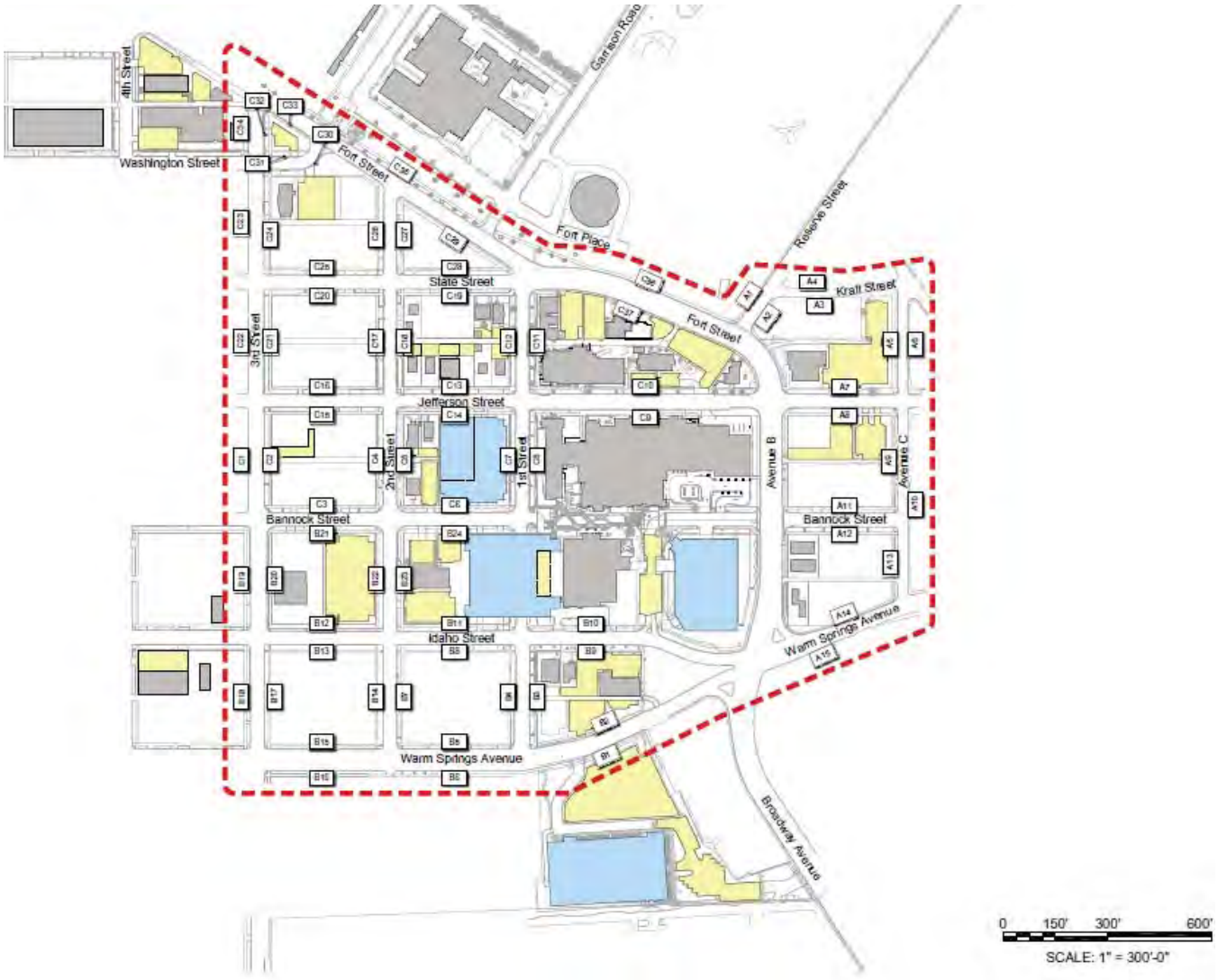
Figure 2: Core Hospital Sub-Zone



Source: Walker Parking Consultants, 2013

Parking needs and code requirements for the main Hospital and for the ancillary buildings are calculated separately, as discussed in the following sections.

Figure 3: Study Area for Parking Surveys



Source: Walker Parking Consultants, 2013

PARKING INVENTORY AVAILABLE

The following figure provides a breakdown of the parking inventory available within each sub-zone based on Walker's parking occupancy survey which was conducted on Wednesday, July 10, 2013. Please see Appendix A for a more complete breakdown of the inventories.

Note that the data collected previously does not reflect any changes that have been made to the parking system over the last 13 months. Similarly, parking inventories within a hospital system tend to be somewhat fluid over time. Surface parking lots are often modified through restriping or realignment and/or by acquiring new property. Surface lots also can be removed periodically to make room for new

building construction. For this reason, current parking counts on the St. Luke's Boise campus may not match exactly to surveys conducted in past years.

Figure 4: Parking Inventory Available (as of 07/10/2013)

Survey Date: Wednesday, July 10, 2013		
Facility or Building Name	Space Type (1)	Inventory
Core Facilities Only	Employee Sub-total	1,748
	Patient/visitor Sub-Total	984
Ancillary Facilities Only	All Parking	474
Street Parking	All Groups	528
TOTALS:		3,734

**Source: Walker Parking Consultants, 2013*

The total parking supply available for the main building and other core facilities for our 2013 baseline count is roughly 2,732 parking spaces. Ancillary buildings are supported by roughly 474 parking spaces. Street parking, which is used in part by St. Luke's visitors and staff, includes an estimated 528 spaces within a 1-2 block walking distance. The total parking operated by St. Luke's Boise for code purposes is 3,206 total spaces.

PARKING REQUIRED BY CODE

To evaluate the parking required for the campus, Walker conducted limited research into the City of Boise municipal code, specifically Title 11 which covers zoning. The following sites were used for our primary research:

http://cityclerk.cityofboise.org/city-code/
www.cityofboise.org/pds
http://cobgispublic.cityofboise.org

As with other urban campuses, the precise parking required for St. Luke's Boise may be subject to some interpretation, as different buildings may have been developed with specific parking variances or waivers, and/or may fall under older standards which have been grandfathered in. In addition, a few of the Hospital's ancillary buildings including the Jefferson Medical Office Plaza (JMOP) are located within a different zoning and overlay district than the main buildings.

Assuming that the entire campus is evaluated under current Title 11 requirements, Walker concludes the following:

- Most of the core campus is zoned "H-SD" which is described in the code to include hospital uses, MOB's, residential, and other uses allowed by Conditional Use Permit;
- Most of the core campus and ancillary buildings are located within the P-3 District overlay (see map included in the Figure below);
- Based on the above, we estimate that the following P-3 standards would apply:

Figure 5: Hospital Code Requirements for Parking (per Title 11)

CHAPTER 11-07: Development and Design Standards
Section 11-07-03: Off-street Parking and Loading Standards
Subsection 2: Table of Off-street Parking Requirements

Table 11-07.1 Off-Street Parking Requirements

GFA = Gross floor area

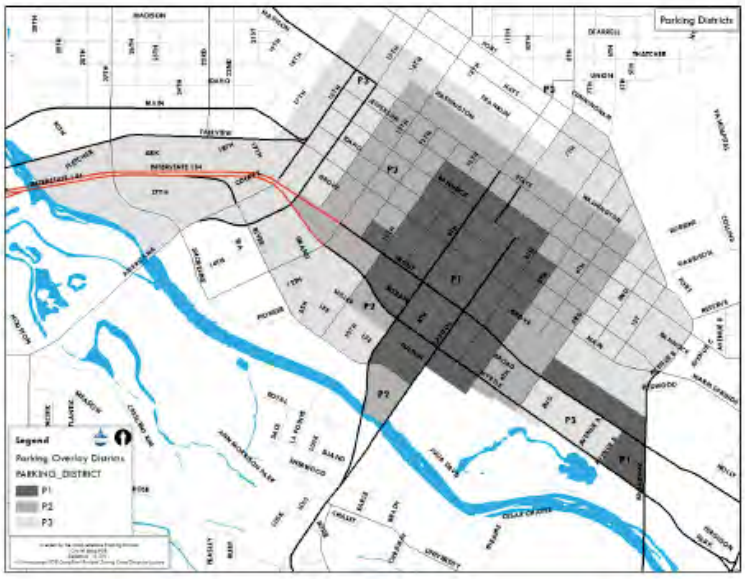
Land Use	Unit of Measure	General	P-1 District	P-2 District	P-3 District
Health Care					
Hospital, Sanatorium	Per bed	1.0	0	0.66	0.8
Laboratory, Medical/Dental	*	*	*	*	*
Medical Research Facility	*	*	*	*	*
Office, Medical	Per 300 s.f.	1.0	0	0.66 1st floor; 0.25 other floors	0.8 1st floor; 0.5 other floors
Optician	Per 200 s.f.	1.0	0	0.66 1st floor, 0.25 other floors	0.66 1st floor, 0.25 other floors
Out-Patient Services	*	*	*	*	*

NOTE:
* The Director shall determine the parking space requirements, which shall be as for a use that has similar traffic-generating characteristics.

CHAPTER 11-05: Overlay and Specific Plan Districts
Section 11-05-05: Parking Reduction Overlay Districts
Subsection 2: Map and Boundaries

2. MAP AND BOUNDARIES

A. Map



Source: City of Boise, various references, 2013

The Figure below shows Walker's interpretation of code standards for St. Luke's Boise based on the previous table and discussion. For this analysis, we assume that buildings within the ancillary zone are considered stand-alone sites and are self-parked to meet code standards for each building on-site.

Figure 6: St. Luke's Boise - Estimated Required Parking (per Title 11)

Facility or Building Name	Building Types	Existing Program Summary	Code Standard	Estimated Spaces Required per Code	Actual Inventory
Core Facilities (1)	Main Hospital	389 beds	0.8 per bed	311	
	Mountain States Tumor Institute (MSTI)	179,512 SF	For MOB: 0.8 per 300 SF first	317	
	Anderson Medical Plaza	40,824 SF	floor + 0.5 per 300 SF	75	
	St. Luke's Medial Office Plaza (SLMOP)	53,359 SF	additional floors	142	
				845	2,732
Ancillary Facilities	MOB's / Clinics / Offices	varied (2)	varied (2)	474	474
TOTALS:				1,319	3,206

1. For this analysis we assume that Anderson Medical Plaza, MSTI, and SLMOP are all calculated as MOB's even through they may contain some research, laboratory, and/or core hospital functions. The number of floors and square footages per floor are estimated for these buildings based on total square footage and project site plans.

2. Assume that each ancillary building (including clinics, MOB's and hospital support offices) is self-parked, and that the current inventory of spaces is equal to or greater than the required spaces.

**Source: Walker Parking Consultants, 2013*

In total, we estimate that the St. Luke's Boise campus should provide a minimum of 1,319 spaces to address the minimum code requirements. As stated in the introduction, the available parking supply exceeds the minimum required per code, though supplies may not entirely address the demand generated at peak times.

PARKING NEEDS BY EXISTING USAGE

An alternative method to calculate parking needs for the campus would be to study existing usage and make adjustments (as necessary) to model design day conditions.

To this end, Walker staff conducted parking occupancy counts on the campus and surrounding streets on Wednesday, July 10, 2013. According to Hospital staff, Wednesdays are typically one of the busier days of the week for the campus. This observation is supported by past occupancy survey data (last collected in 2005) that shows a Wednesday peak day for overall hospital activity.

The observed parking inventory and occupancy information is provided on the summary table below with a detailed breakdown of this data included in Appendix A.

Figure 7: St. Luke's Parking Supply and Demand (as of 07/10/2013)

Survey Date: Wednesday, July 10, 2013			Observed Occupancies:			By Percentage:		
Facility or Building Name	Space Type	Inventory	11:00 AM	1:00 PM	3:00 PM	11:00 AM	1:00 PM	3:00 PM
All (by Space Type)	ADA	117	55	59	56	47%	50%	48%
	Employee / Staff	1,722	1,439	1,476	1,325	84%	86%	77%
	Patient / Visitor / Valet	1,014	660	713	722	65%	70%	71%
	Physician only	80	55	50	55	69%	63%	69%
	Other reserved + off-site	255	138	141	142	54%	55%	56%
	Other (special designation)	18	11	12	10	61%	67%	56%
TOTALS:		3,206	2,358	2,451	2,310	74%	76%	72%
All Groups	On-Street Parking	528	361	360	337	68%	68%	64%

**Source: Walker Parking Consultants, 2013*

Discussion

Peak parking occupancies were observed at 1:00 pm on the survey day, when approximately 76% of the available parking lot and garage spaces were occupied. On-street parking surrounding the campus was slightly less utilized (at 68%); at least some of these spaces are used by hospital visitors and employees. Street parking is primarily controlled through time limits and/or residential permit zones, though roughly 130 uncontrolled street spaces do exist within the study area.

Based on general observations of pedestrian activity, we estimate that roughly 25% to 50% of the 360 cars parking on-street within the study area may be associated with the Hospital or one of the ancillary buildings. (Parking along Jefferson Street to the east, for example, is clearly used by hospital and/or MOB employees for overflow parking).

The majority of the parking spaces in lots and garages are designated by signage and intended to serve just one building or user group. The one major exception is the 724-space South Tower Garage which serves both employees and hospital visitors for the main building along with some demand from MSTI and the two adjacent MOB's.

Since user groups are mixed together in the South Tower Garage, it becomes difficult to precisely identify faculty/staff versus patient/visitor parking demand. For the purpose of this analysis, we have identified the parking on the ramps as available for employees and parking on the flat areas as available for visitors. (Note that this is how the Hospital has the parking designated in their inventories and in materials given to employees). However, it is clear from utilization observations, that this separation of employee and visitor spaces in the garage is not actively enforced and likely not readily apparent to most visitors.

The table on the next page provides a facility-by-facility breakdown of the parking demand and provides a slightly better picture of localized parking surpluses and deficits. Highlighted cells indicate occupancies that may be at or above the recommended effective supply threshold. These are the areas of campus where visitors may perceive there to be a shortage of available parking at certain times.

Figure 8: St. Luke's Parking Supply and Demand by Facility (as of 07/10/2013)

				Observed Occupancies:			By Percentage:		
Map ID	Type	Facility or Building Name	Inventory	11:00 AM	1:00 PM	3:00 PM	11:00 AM	1:00 PM	3:00 PM
A1	Lot	Finance - front	21	16	14	15	76%	67%	71%
A2	Lot	Finance - back	12	7	8	8	58%	67%	67%
B	Lot	Marketing and PR	11	10	4	5	91%	36%	45%
C	Lot	IT Center	15	14	14	13	93%	93%	87%
D1	Lot	BCDC	32	16	15	19	50%	47%	59%
D2	Lot	PFS Triangle	10	11	11	11	110%	110%	110%
E1	Lot	Ortho Nero	7	6	6	6	86%	86%	86%
E2	Lot	Women's Life	8	4	3	5	50%	38%	63%
F1	Lot	Health Foundation	6	5	5	4	83%	83%	67%
F2	Lot	Little Luke's II	4	1	1	-	25%	25%	0%
F3	Lot	Surgical Services	7	7	6	5	100%	86%	71%
F4	Lot	Social Work Department	6	3	4	3	50%	67%	50%
F5	Lot	Health Solutions	5	5	4	4	100%	80%	80%
G	Lot	Employee Health	19	12	17	16	63%	89%	84%
H1	Lot	Family Medicine Health - west	17	9	6	13	53%	35%	76%
H2	Lot	Family Medicine Health - east	6	3	1	4	50%	17%	67%
I	Lot	Construction Office	31	21	27	16	68%	87%	52%
J	Lot	Human Resources	10	3	3	7	30%	30%	70%
K1	Lot	JMOP - north	69	49	36	53	71%	52%	77%
K2	Lot	JMOP - annex	27	23	21	23	85%	78%	85%
L	Lot	Bariatric Nutrition / Dentistry	29	6	7	3	21%	24%	10%
M	Lot	Boise Heart Clinic	11	2	2	3	18%	18%	27%
N1	Lot	Bishop Foote / Ancillary House	5	3	4	3	60%	80%	60%
N2	Lot	Little Luke's	10	2	2	2	20%	20%	20%
O	Garage	SLMOP - level 1	189	145	143	143	77%	76%	76%
P1	Lot	Anderson Plaza - west	97	46	44	45	47%	45%	46%
P2	Garage	Anderson Plaza - basement	26	13	12	14	50%	46%	54%
P3	Lot	Anderson Plaza - east	15	13	12	13	87%	80%	87%
P4	Lot	Anderson Plaza - south	20	6	6	9	30%	30%	45%
Q	Garage	South Tower Garage	724	459	481	443	63%	66%	61%
R	Lot	MSTI	23	23	28	9	100%	122%	39%
S	Lot	Avenue A	28	23	18	22	82%	64%	79%
T	Garage	Visitor Garage	403	319	392	390	79%	97%	97%
U	Lot	Education Annex / Hospice	22	18	20	21	82%	91%	95%
V1	Lot	Idaho Professional Building - front	45	11	17	14	24%	38%	31%
V2	Lot	Idaho Professional bldg - back	23	16	16	15	70%	70%	65%
V3	Lot	Idaho Professional bldg - back	6	-	-	-	0%	0%	0%
W	Lot	Construction Lot	45	42	42	41	93%	93%	91%
X	Garage	Warm Springs Garage	1,131	998	1,007	900	88%	89%	80%
Y	Lot	Warm Springs Lot	31	7	10	12	23%	32%	39%
TOTALS:			**3,206**	**2,377**	**2,469**	**2,332**	**74%**	**77%**	**73%**

**Source: Walker Parking Consultants, 2013*

DESIGN DAY ADJUSTMENTS (2013)

Given that the survey day may have been somewhat less busy than a typical design day, Walker has adjusted our occupancy counts using the following two factors to arrive at a projection of current parking needs:

- Design Day Adjustment
- Effective Supply Adjustment

A number of items including employee and visitor populations were requested from the Hospital in order to assign a design day adjustment and later to calculate for future growth. Results from the request for information were mixed. The Hospital does maintain detailed statistics for the St. Luke's Health network. However, physicians and employees listed in the database may only be on site at the St. Luke's Boise campus for part of the time.

In addition, many of the St. Luke's associated MOB's, clinic, and other ancillary buildings are leased and occupied by outside groups. In these instances, only a limited amount of employee and patient data was made available for this study.

The footnotes below each table provide some discussion on the hospital statistics that were used to arrive at each adjustment. For this analysis, each adjustment has been applied based on zone and general user group (see earlier discussion) rather than by facility since several of the parking facilities tend to mix employee and visitor parking demand together.

Design Day (Hospital Activity) Adjustment

Based upon the population data provided by St. Luke's Boise, the survey day was in line with annual averages for the 2013 calendar year but somewhat lower than typical busy conditions. An adjustment to the observed parking demand is appropriate in order to model conditions that may be expected on a typical design day, representing the 95th percentile of Hospital activity.

Based on our analysis, Walker has applied an adjustment of 7% to the survey day parking demand. See the figure below for extrapolation of the adjustment ratio.

Figure 9: Design Day Adjustments (for 2013 Calendar Year)

Hospital Activity Data	On Survey Day 07/10/2013	Peak Design Day (95th Percentile Day)	Design Day Adjustment	Source
Total Licensed Beds	389	389	-	1
Average "Patient Days"	261	286	1.10	2
Outpatient Visits (not including MOB visits)	457	482	1.05	3
MOB Visits	No data	No data	-	4
ED Registrations	112	96	-	5
95th Percentile Adjusment (weighted)			1.07	

1. Per hospital website: http://www.stlukesonline.org/boise/about_us/general_facts.php

2. "Patients Days" and "ED Registrations" per St. Luke's internal dashboard showing daily statistics for July 10. Calendar year data was not available for these statistics; therefore the design day is calibrated based on the average of the "last 8 similar days" for inpatient activity.

3. Outpatient data was supplied by the Hospital for April 2012 through August 2013 (514 total days). Daily outpatient visits ranged from 89 to 745 per day. The 95th percentile date was identified from the data, with 482 outpatient visits on that day.

4. MOB (medical office building) data was not available for this study as buildings such as Anderson Plaza and SLMOP contain a mix of tenants, many not directly affiliated with the Hospital. See discussion in the text.

5. ED registrations were higher on the survey day than the comparable daily statistics (and was also ahead of goal when compared to monthly and yearly budgets); therefore no design day adjustment was taken for ED registrations, assuming that the survey day was already representative of relatively busy conditions.

Source: Walker Parking Consultants, 2013

Effective Supply Adjustment

In addition to the Design Day Adjustment, an Effective Supply Adjustment was also applied in order to project a ratio of future parking spaces needed for current and future populations. The following adjustments were used:

- Patient/Visitor, Valet, and ADA Parking Spaces = A 12% adjustment (1.12) to allow for proper circulation and reduce the difficulty in finding a space. Patients and visitors typically need a larger cushion than other user groups that are more familiar with the parking system such as full time employees. This grouping takes in to account the number of ADA compliant parking spaces that are required, despite their typical low usage rates. The ADA spaces are off-set by the valet parking which can be used to 100% of capacity (and sometimes more) to accommodate overflow visitor demand.
- Shared Employee and Visitor = A 7% adjustment (1.07) has been assigned to the on-Street capacity and the ancillary lots where employees and visitors are usually mixed together. Employees can generally be assigned parking with only a modest cushion (5%) of spaces. However, adjustments for the stand-alone buildings need to be somewhat greater to account for the possible mixing of employees and visitor populations.
- Employee, Physicians, and Other Assigned = A 5% adjustment (1.05) to reduce circulation time and replace spaces that may be temporarily unavailable. This will also allow for some loss of efficiency since this is a smaller supply of spaces. We understand that Physicians are often on-site

only for part of the time. Therefore a larger over-assignment factor is typically recommended for this user group, though only a small cushion is needed for unreserved employee spaces.

DESIGN DAY PARKING SUFFICIENCY (2013)

The table below shows the projected parking sufficiency on a typical 2013 design day for St. Luke's Boise given the current supply and parking demand (observed) and incorporating the two adjustments discussed above.

Figure 10: Design Day Parking Sufficiency (based on 2013 Statistics)

Facility or Building Name	Space Type	Observed Parking Demand 11:00 AM	Design Day Adjustment (1)	Projected Design Day Demand	Optimum Utilization Adjustment (2)	Recommended Design Day Spaces	Available Inventory	Effective Surplus / Deficit
Core Facilities Only	Employee Sub-total	1,481	1.07	1,584	1.05	1,663	1,748	85
	Patient/visitor Sub-Total	714	1.07	764	1.12	856	984	128
	Sub-Total:					***2,519***	***2,732***	***213***
Ancillary Facilities Only	All Parking	256	1.07	274	1.07	293	474	181
Street Parking	All Groups	360	-	360	1.07	385	528	143
		2,811		2,982		3,197	3,734	537

1. From Previous Table.
2. See discussion of these adjustments in the text.

Source: Walker Parking Consultants, 2013

The column on the far right of the table demonstrates that the current St. Luke's Boise parking supply is sufficient to meet the current demand, indicating an approximate effective surplus of 537 total parking spaces, if the on-street capacity is included. Without the on-street supply, the system would have an effective sufficiency of 394 stalls.

This analysis assumes that most employees typically do use the designated ramp areas of the South Tower Garage exclusively (rather than some of the visitor spaces). If not, some of the user group analysis may be slightly skewed in terms of sufficiency, though the overall supply conclusions are still valid.

Given the results above, the core campus parking is likely more of a concern than ancillary facilities. It is possible that there are some very busy days when core campus employee parking facilities may be running close to capacity (90% filled or more) and may appear "full." On these days, employees likely fill the street parking as a first overflow option along with using more spaces in the South Tower Garage.

FUTURE PARKING NEEDS

This section of the report addresses the projected future parking needs for the St. Luke's Boise campus given the build-out and master plan assumptions provided by the architect.

MASTER PLAN PROJECTIONS (MAIN CAMPUS)

To calculate future parking needs for the campus, Walker requested a breakdown of population growth projections for the 2030 planning horizon. As with the baseline (existing population) data, specific inpatient, outpatient, and employee projections were difficult to establish.[1] Instead, the future demand for parking is analyzed in this section of the report based on square footage and other physical program assumptions provided in Appendix B. Our calculations are based on the refined 2030 program scenario labeled as 6A-2.

The following Figure provides a summary of the growth scenarios provided for the main campus with some adjustments and explanation provided.

Figure 11: Projected Main Campus Growth Assumptions

Facility or Building Name	Areas	Existing Program Summary		2030 Projection (Scenario 6A-2)		Increase % Adjustment	Program Elements Included	Note
Core Facilities	Main Hospital	389	beds	478	beds	1.23	Inpatient Care and Surgery only	(1)
	Clinical & Patient Areas	66,152	SqFt.	90,160	SqFt.	1.36	ED, Women's Services, Therapy & Rehab, Outpatient Clinics	(2)
	Laboratories & Support Areas	142,925	SqFt.	256,280	SqFt.	1.79	Admin. Offices, Health Info., Pharmacy, Special Services, Support Services, H&V, Diagnostic Radiology & Laboratory	(3)
	Guest / Employee Services	29,644	SqFt.	51,460	SqFt.	1.74	Entrance/Lobby, Admission Center, Public Facilities, Food Services	(4)
	Departmental Gross Area	***539,348***	***SqFt.***	***847,810***	***SqFt.***	***1.57***		
Core Campus MOB's	MSTI, SLMOP, Anderson	273695	SqFt.	273,695	SqFt.	1.00	see discussion in text	(5)
Ancillary Facilities	Other MOB's / Clinics / Offices	-		-		-	see discussion in text	(6)

1. See Appendix B. Includes areas that are generally considered "inpatient" including the Inpatient Care unit and Surgery. Growth calculations are based on the increase in total beds rather than the increase in square footage for these services. However, the square footage for both units is included in the "Departmental Gross Area" subtotal in order to be consistent with the program data in the Appendix.

2. Includes areas that will generate both employee and patient parking demand apart from the inpatient care areas included in the previous line item; this includes service area such as the Emergency Department, Women's Service's, etc. that are being expanded or being relocated backfilled with similar uses.

3. Includes areas such as the administrative offices, support laboratories, etc. that may account for overall growth in employee parking, but likely do not substantially impact visitor/patient needs.

4. Includes areas such as the admission center and food services that are primarily intended to provide services for existing patients, visitors, and employees without generating additional parking demand.

5. No growth is anticipated for the existing Main Campus MOB's (MSTI, SLMOP, and Anderson), except to expand the tenant-occupied areas within the South Tower (MSTI). Certain tenants are being moved out of this building and consolidated into a new Ancillary MOB. The vacant space will be backfilled with similar tenants. See Additional discussion in text.

6. The movement of services out of existing South Tower and into new facilities requires some additional explanation and analysis and is addressed in the next section of the report.

Source: Walker Parking Consultants, 2014

[1] Population growth factors, such as the projected growth in FTE's, projected daily bed census, outpatient visits, etc. are typically more accurate predictors of future parking needs than future square footage. However, for this analysis, only program square footages were available.

Based on the table above, Walker has applied the following adjustment factors to calculate the future St. Luke's Boise campus parking needs for the main campus only:

- **Main Camus Employees = 1.57**

This is equivalent to the weighted average growth rate for all Hospital departmental square footages. We assume that the increase in laboratory and support services and in inpatient care areas will lead to an increase need for staffing at the Hospital. Since all three service areas generate employee parking demand, it is reasonable to use the weighted growth factor for all departments.

- **Main Campus Patients/Visitors = 1.30**

This factor reflects the average growth rate between the inpatient bed capacity and the remaining clinical and patient areas. The growth in patient visitor demand is expected to be somewhat lower than the growth in employee demand based on the program square footage provided.

- **Main Campus MOB Employees and Visitors = 1.00**

Though some services are moving out of the South Tower (see discussion below) the overall MOB square footage within the main campus boundary is expected to remain roughly the same as the 2013 baseline conditions. In order to not double count demand for the three MOB's (MISTI, SLMOP, and Anderson), which is not separated out in the parking system, future parking demand projections will back out the demand estimate for the MOB buildings first and then calculate hospital employee and patient growth on the remaining demand.

The table below provides a summary of the future growth in parking demand based on the above growth factors and our assumptions (as discussed) for the core campus only.

Figure 12: Projected 2030 Adjustment Factors (Main Campus Only)

Projected Weighted Growth	From Demand Analysis	2030 Projected Increase		2030 Demand Projection
Main Campus Hospital Employees	1,006	1.57		1,581
Main Campus Patient/Visitor	418	1.30		542
Estimated Main Campus MOB Demand (1)	1,095	1.00		1,095
Sub-Total:	2,519			3,218
Total Core Campus projected 2030 Parking Demand				**3,218**

1. Existing design day parking needs for the campus are calculated slightly differently on this table than previously. This is to avoid double counting parking demand generated by Anderson Plaza, MSTI, and SLMOP which were previously included, but not expected to increase in parking needs at the same rate as the main Hospital. MOB demand is calculated at 4.0/1,000 for the design day. The sub-total of 2,519 is the same as the sub-total on Figure 10.

Source: Walker Parking Consultants, 2013

ADDITIONAL ANCILLARY MOB PARKING

In addition to the Hospital itself, certain program additions are anticipated as part of the Master Plan expansion. These additions include the following elements:

New Children's Pavilion MOB

A new 85,000 SF medical office building is planned for the southeast corner of Avenue B and Jefferson Street. This building will accommodate some of the services being moved out of the South Tower (MISTI building), with the existing square footage on the main campus expected to be backfilled with new tenants and some decompression of existing services. The new Children's pavilion will accommodate most of its own parking demand on-site with 274 parking spaces being provided below-grade beneath the building. However, the building footprint will displace the existing surface lot (labeled Lot L in Walker's inventory), and the existing overflow lot for the Jefferson Office Plaza (labeled Lot K2).

The following parking demand impacts are projected for this building, including parking demand displaced; an industry standard ratio of 4.0/1,00 for MOB parking demand is assumed:

New Demand (85,000 SF x 4.0/1,000) =	340 spaces
Peak hour Demand Displaced =	28 vehicles
Less new parking provided on-site =	274 stalls
Net Impact On campus Parking =	**94 spaces**

New First Street Medical Office Plaza

This building is a new 3-level, 105,000 SF building (with roughly 35K per level), which will house the Hospital's outpatient heart and critical care unit. As with the Children's Pavilion, any services moving to this new building from the main campus will be backfilled with similar tenants. This new MOB will be located directly north of the main hospital at 1st and Jefferson and will be parked primarily within the new proposed campus parking garage.

Though the building displaces only a small amount of surface parking spaces directly, it will connect (via a sky bridge) to the new garage and the new inpatient tower for the hospital. Combined, these three buildings will displace a number of small surface parking lots including facilities on the Walker inventories labeled F1-F5, E1-E2, G, H1-H2, I and J. The total impact for the combined demand displaced is estimated below.

New Demand (105,000 SF x 4.0/1,000) =	420 spaces
Peak hour Demand Displaced =	83 vehicles
Less new parking provided on-site =	0 stalls
Net Impact On campus Parking =	**503 spaces**

New Warm Springs MOB

This building is a proposed new 100,000 SF medical office building that is included in the mid-range build-out projections for the campus. Conceptually, the footprint may displace a good portion of the employee lot (labeled Lot w) which is located just south of Warm Springs Avenue and north of the Hospital's existing employee parking garage.

If no new parking is provided on site than the new MOB would most likely be parked in the existing employee garage, with some of the Hospital's employee's relocated to the new parking structure on

the north side of campus to make room for new MOB employees and visitors. The net impact from this building, including the displaced vehicles from Lot W is shown below.

New Demand (100,000 SF x 4.0/1,000) =	400 spaces
Peak hour Demand Displaced =	42 vehicles
Less new parking provided on-site =	0 stalls
Net Impact On campus Parking =	**442 spaces**

All three MOB projects combined, along with the displacement from the new bed tower and diagnostic and treatment center for the main hospital, will generate a projected need for 1,179 net new parking spaces.

TOTAL PROJECTED FUTURE DESIGN DAY PARKING NEEDS

Future parking needs for the St. Luke's Boise campus are calculated and summarized below using the adjustment factors presented previously for the 2030 planning horizon (based on the growth scenario labeled 6A-2)

The resulting totals at the bottom of the chart represent the total number of new parking spaces needed, and do include the spaces added and displaced by the three MOB projects and the new bed tower.

Figure 13: Recommended Parking for the 2030 Design Day Needs

Projected Parking Needs	2013 Design Day Parking Needed	Growth Factor	2030 Projected Parking Need	Core Campus Inventory	New Spaces Needed
Main Campus Hospital Employees	1,006	1.57	1,581		
Main Campus Patient/Visitor	418	1.30	542		
Estimated Main Campus MOBs	1,095	1.00	1,095		
Sub-Total:	2,519		3,218	2,732	486
Ancillary Facilities (new MOBs)			**New Demand**	**Impact on Supply**	**Net Impact**
Children's Pavilion (1)	85,000 SF		340	246	94
First Street Medical Office Plaza	105,000 SF		420	-83	503
Warm Springs MOB	100,000 SF		400	-42	442
TOTAL New Spaces Recommended =			**4,378**	2,853	**1,525**

1. The Children's Pavilion will displace an estimated 28 cars from the Jefferson Plaza overflow lot but will add 274 garage spaces; therefore, the net impact on the supply is shown as +246.

Source: Walker Parking Consultants, 2013

Based on Walker's analysis, we would recommend providing at least **1,525 new parking stall**s in the proposed new garage to support the Master Plan through full build-out.

MASTER PLAN PARKING REQUIRED BY CODE

The final Figure in this report shows the City's requirement for parking, per the Title 11 code standards discussed previously in this analysis.

The code standards are well below the parking need projected based on our analysis of the design day. Therefore, Walker recommends that the client develop parking facilities per the recommendations on Figure 13, rather than the calculated code requirements.

Figure 14: Code Required Parking Spaces (Title 11) for the 2030 Master Plan

Facility or Building Name	Building Types	Existing Program Summary	Existing Spaces Required per Code	2030 Program Summary	2030 Spaces Required per Code
Core Facilities	Main Hospital	389 beds	311	478 beds	382
	Anderson, MSTI, SLMOP	273,695 SF	534	273,695 SF	534
			845		916
Ancillary Facilities	Existing MOB's / Clinics / Offices (1)	varied	474	varied	474
	New Children's Pavilion	-	-	85,000 SF	170
	New First Street MOP	-	-	105,000 SF	210
	New Warm Springs MOB	-	-	100,000 SF	200
TOTALS:			1,319		1,970

1. Assume that each existing ancillary building (including clinics, MOB's and hospital support offices) is self-parked, and that the current inventory of spaces is equal to or greater than the required spaces.

City requirements for MOB is 0.8 per 300 SF first floor + 0.5 per 300 SF additional floors; we assume all three new buildings will be roughly 3-4 floors.

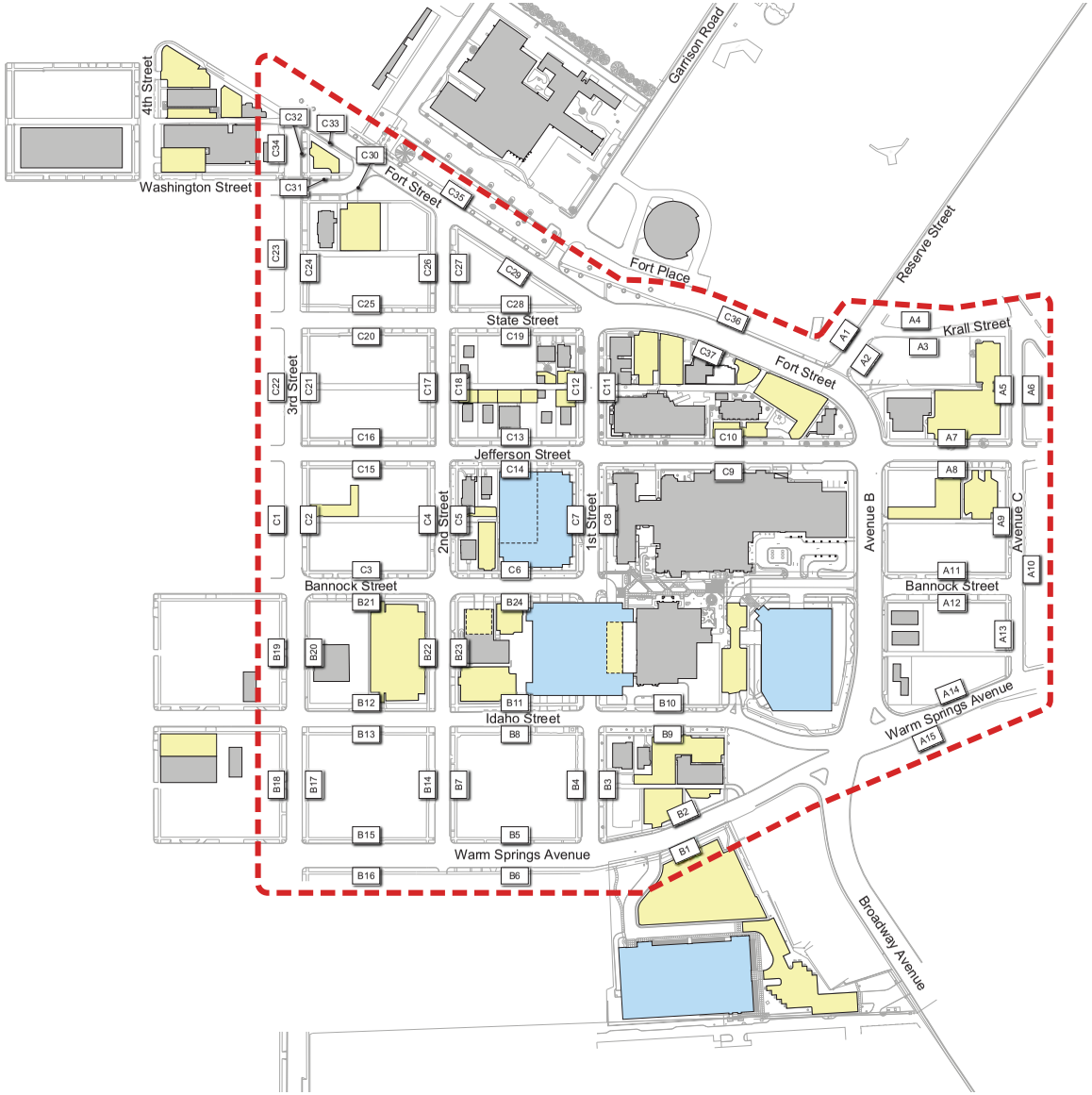
Source: Walker Parking Consultants, 2013

APPENDIX A: PARKING INVENTORY AND OCUPANCY DATA

WALKER
PARKING CONSULTANTS

ST. LUKE'S CAMPUS PARKING ANALYSIS
BOISE CAMPUS VICINITY MAP

WALKER PARKING CONSULTANTS



PARKING MAP

Legend
- C1 Curb Face Number
- Building
- Parking Lot
- Parking Structure
- Study Limits

0 150' 300' 600'

SCALE: 1" = 300'-0"

PROJECT NORTH

St. Luke's Boise Medical Center
On-Street Parking Inventory/Occupancy Data

Wednesday, July 10, 2013

ID	Street/Location	Space Type	Inventory	11:00 AM	1:00 PM	3:00 PM
A1	First Quarter of Reserve St. West Side	No Parking	-	-	-	-
A2	First Quarter of Reserve St. East Side	No Parking	-	-	-	-
A3	Krall st. South Side	Time Limited Residential Zone	9	9	7	7
A4	Krall st. North Side	Time Limited Residential Zone	4	0	0	0
A5	Ave. C West Side From Krall St. to Jefferson St.	No Parking	-	-	-	-
A6	Ave. C East Side to Jefferson St.	Time Limited	7	7	7	5
A7	North Side of Jefferson St. from Ave. B to Ave. C	No Parking	-	-	-	-
A8	South Side of Jefferson St. from Ave B. to Ave. C	Time Limited	6	0	3	1
A9	West Side of Ave. C from Jefferson St. to Banncock St.	Time Limited	10	2	3	3
A10	East Side of Ave. C from Jefferson St. to Warm Spring Ave.	No Parking	-	-	-	-
A11	North Side of Banncock St. from Ave. B to Ave. C	Residential Permit Zone	12	5	6	9
A12	South Side of Banncock St. from Ave. B to Ave. C	Residential Permit Zone	14	9	11	9
A13	West Side of Ave. C from Banncock St. to Warm Springs Ave.	Time Limited Residential Zone	7	5	1	2
A14	North Side of Warm Springs Ave. from Ave. B to Ave. C	No Parking	-	-	-	-
A15	South Side of Warm Springs Ave. from Ave. B to Ave. C	Time Limited Residential Zone	8	6	6	4
B1	South Side of Warm Springs Ave. from First St. to Ave. B	No Parking	-	-	-	-
B2	North Side of Warm Springs Ave. from First St. to Ave. B	No Parking	-	-	-	-
B3	East Side of First St. from Idaho St. to Warm Springs Ave.	Time Limited	6	5	3	1
B4	West Side of First St. from Idaho St. to Warm Springs Ave.	Time Limited	6	2	4	4

St. Luke's Boise Medical Center
On-Street Parking Inventory/Occupancy Data

Wednesday, July 10, 2013

ID	Street/Location	Space Type	Inventory	11:00 AM	1:00 PM	3:00 PM
B5	North Side of Warm Springs Ave. from First St. to Second St.	Time Limited Residential Zone	12	3	5	2
B6	South Side of Warm Springs Ave. from First St. to Second St.	Time Limited Residential Zone	7	4	5	5
B7	East Side of Second St. From Idaho St. to Warm Springs Ave.	Time Limited Residential Zone	12	4	4	2
B8	South Side of Idaho St. from Second St. to First St.	Time Limited	10	10	9	7
B9	South Side of Idaho St. from First St. to Ave. B	Time Limited	6	6	5	5
B10	North Side of Idaho St. from First St. to Ave. B	Unrestricted	3	2	3	2
B11	North Side of Idaho St. from Second St. to First St.	Unrestricted	8	8	7	6
B12	North Side of Idaho St. from Third St. to Second St.	Unrestricted	10	9	8	8
B13	South Side of Idaho St. from Third St. to Second St.	Unrestricted	11	11	11	9
B14	West Side of Second St. From Idaho St. to Warm Springs Ave.	Unrestricted	11	10	10	8
B15	North Side of Warm Springs Ave. from Third St. to Second St.	Unrestricted	13	12	12	12
B16	South Side of Warm Springs Ave. from Third St. to Second St.	Time Limited	9	9	7	8
B17	East Side of Third St. From Idaho St. to Warm Springs Ave.	Unrestricted	12	11	11	11
B18	West Side of Third St. From Idaho St. to Warm Springs Ave.	Time Limited	9	8	9	4
B19	West Side of Third St. From Banncock to Idaho St.	Time Limited	9	5	4	6
B20	East Side of Third St. From Banncock to Idaho St.	Unrestricted	6	5	5	4
B21	South Side of Banncock St. from Third St. to Second. St.	Unrestricted	7	7	7	6

St. Luke's Boise Medical Center
On-Street Parking Inventory/Occupancy Data

Wednesday, July 10, 2013

ID	Street/Location	Space Type	Inventory	11:00 AM	1:00 PM	3:00 PM
B22	West Side of Second St. From Banncock to Idaho St.	Time Limited	12	5	3	7
B23	East Side of Second St. From Banncock to Idaho St.	Time Limited	5	3	3	3
B24	South Side of Banncock St. from Second. St. to First St.	Time Limited	6	3	4	4
C1	West Side of Third St. from Jefferson St. to Banncock St.	Time Limited Residential Zone	8	7	7	7
C2	East Side of Third St. from Jefferson St. to Banncock St.	Unrestricted				
C3	North Side of Banncock St. from Third St. to Second. St.	Time Limited	11	4	7	5
C4	West Side of Second St. from Jeffereson St. to Banncock St.	Time Limited Residential Zone	10	5	5	4
C5	East Side of Second St. from Jeffereson St. to Banncock St.	Time Limited Residential Zone	10	5	5	7
C6	North Side of Banncock St. from Second. St. to First St.	Time Limited	9	8	8	4
C7	West Side of First St. from From Jefferson St. to Banncock St.	Time Limited	6	5	6	5
C8	East Side of First St. from From Jefferson St. to Banncock St.	Time Limited	11	4	6	8
C9	South Side of Jefferson St. from First St. to Ave. B	Time Limited	15	9	14	13
C10	North Side of Jefferson St. from First St. to Ave. B	Time Limited	15	10	14	12
C11	East Side of First St. from Fort St. to Jefferson St.	Time Limited	4	3	4	4
C12	West Side of First St. from Fort St. to Jefferson St.	Unrestricted	5	4	2	4
C13	North Side of Jefferson St. from Second St. to First St.	Time Limited	13	10	11	11
C14	South Side of Jefferson St. from Second St. to First St.	Time Limited	8	3	6	6

St. Luke's Boise Medical Center
On-Street Parking Inventory/Occupancy Data

Wednesday, July 10, 2013

ID	Street/Location	Space Type	Inventory	11:00 AM	1:00 PM	3:00 PM
C15	South Side of Jefferson St. from Third St. to Second St.	Time Limited Residential Zone	12	2	4	6
C16	North Side of Jefferson St. from Third St. to Second St.	Time Limited Residential Zone	12	6	5	5
C17	West Side of Second St. from State St. to Jefferson St.	Time Limited Residential Zone	10	8	5	5
C18	East Side of Second St. from State St. to Jefferson St.	Time Limited Residential Zone	10	3	4	4
C19	South Side of State St. from Second St. to First St.	Time Limited	4	3	2	2
C20	South Side of State St. from Third St. to Second St.	Time Limited	11	8	6	6
C21	East Side of Third St. from State St. to Jefferson St.	Unrestricted	10	10	10	9
C22	West Side of Third St. from State St. to Jefferson St.	Unrestricted	10	9	9	8
C23	West Side of Third St. from Washington St. to State St.	Unrestricted	10	10	10	10
C24	East Side of Third St. from Washington St. to State St.	Time Limited	10	10	10	9
C25	North Side of State St. from Third St. to Second St.	Time Limited	12	9	3	4
C26	West Side of Second St. from Fort St. to State St.	Time Limited Residential Zone	7	6	3	4
C27	East Side of Second St. from Fort St. to State St.	Unrestricted	6	5	3	3
C28	North Side of State St. from Second St. to First St.	Time Limited	4	2	0	0
C29	South Side of Fort St. from Second St. to First St.	No Parking	-	-	-	-
C30	South Side of Washington St. from Third St. to Second St.	No Parking	-	-	-	-
C31	North Side of Washington St. from Third St. to Second St.	No Parking	-	-	-	-

St. Luke's Boise Medical Center
On-Street Parking Inventory/Occupancy Data

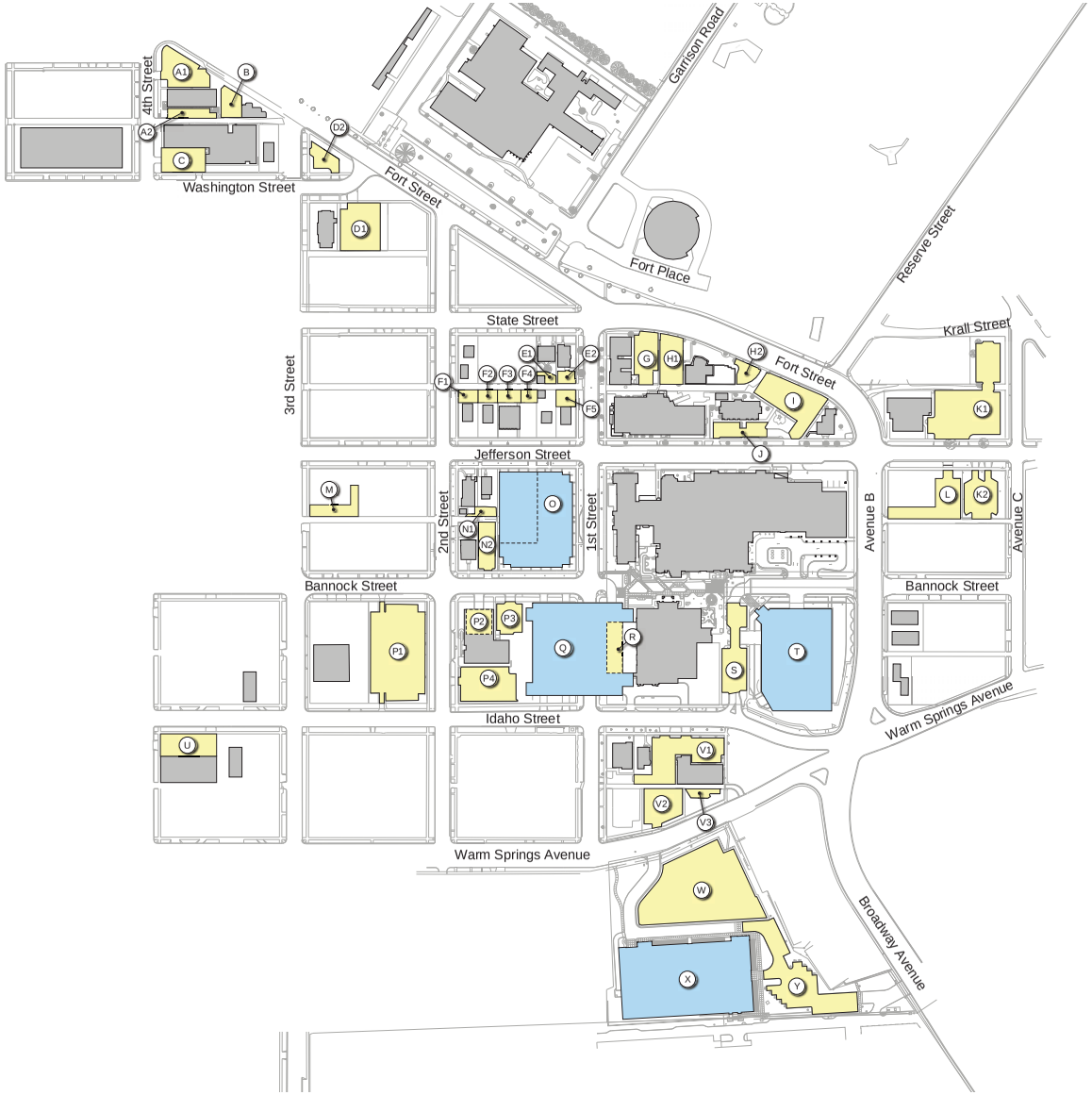
Wednesday, July 10, 2013

ID	Street/Location	Space Type	Inventory	11:00 AM	1:00 PM	3:00 PM
C32	East Side of Third St. from Washington St. to Fort St.	Unrestricted	1	1	1	1
C33	South Side of Fort St. from Third St. to Washington St.	No Parking				
C34	West Side of Third St. from Washington St. to Fort St.	Unrestricted	3	3	3	3
C35	North Side of Fort St. from Third St. to First St.	Unrestricted	4	4	4	4
C36	North Side of Fort St. from First St. to Ave. B	No Parking	-	-	-	-
C37	South Side of Fort St. from First St. to Ave. B	No Parking	-	-	-	-

TOTALS:	528	361	360	337

ST. LUKE'S CAMPUS PARKING ANALYSIS
BOISE CAMPUS VICINITY MAP

WALKER PARKING CONSULTANTS



PARKING MAP

Legend
- M1 Parking Lot Number
- Building
- Parking Lot
- Parking Structure

0 150' 300' 600'

SCALE: 1" = 300'-0"

PROJECT NORTH

St. Luke's Boise Medical Center

Parking Inventory Data

Survey Date: Wednesday, July 10, 2013

Map ID	Type	Facility or Building Name	Building Address	Space Type	Inventory	Notes
A1	Lot	Finance - front	373 W. Fort	reserved	19	stand-alone office
				ADA	2	
A2	Lot	Finance - back	373 W. Fort	customer and tenant	12	off alley
B	Lot	Marketing and PR	305 W. Fort	reserved	11	stand-alone office
C	Lot	IT Center	316 W. Washington	unmarked	14	stand-alone office
				ADA	1	
D1	Lot	BCDC	247 W. Washington	patient/visitor	30	stand-alone MOB; spaces off alley not included
				ADA	2	
D2	Lot	PFS Triangle	na	BCDC employee only	10	across from BCDC
E1	Lot	Ortho Nero	111 W. State	reserved - back	5	stand-alone office; parking off alley; count includes 2 physician only spaces in front
				reserved - front	2	
E2	Lot	Women's Life	103 W. State	reserved (various)	7	stand-alone office; parking off alley
				ADA	1	
F1	Lot	Health Foundation	190 W. Jefferson	reserved	6	stand-alone office; parking off alley
F2	Lot	Little Luke's II	174 W. Jefferson	drop-off only	3	stand-alone office; parking off alley
				ADA	1	
F3	Lot	Surgical Services	166 W. Jefferson	unmarked	7	stand-alone office; parking off alley
F4	Lot	Social Work Department	108 W. Jefferson	staff only	6	stand-alone office; parking off alley
F5	Lot	Health Solutions	102 W. Jefferson	reserved	5	stand-alone office; parking off alley
G	Lot	Employee Health	414 N. First	reserved (various)	18	stand-alone office; loading areas off of alley not included
				ADA	1	
H1	Lot	Family Medicine Health - west	121 E. Fort	tenant only	15	stand-alone clinic
				ADA	2	
H2	Lot	Family Medicine Health - east	121 E. Fort	patient/visitor	6	
I	Lot	Construction Office	214 E. Jefferson	Family Med only	5	stand-alone office; count includes 3 un-signed spaces; loading space by dumpster not included
				construction only	26	
J	Lot	Human Resources	148 E. Jefferson	HR only	8	stand-alone office
				ADA	2	
K1	Lot	JMOP - north	300 E. Jefferson	patient/visitor	55	stand-alone MOB
				ADA	14	
K2	Lot	JMOP - annex	na	staff only	27	across from JMOP
L	Lot	Bariatric Nutrition / Dentistry for Children	305 E. Jefferson	tenant only	28	stand-alone clinic
				ADA	1	
M	Lot	Boise Heart Clinic	287 W. Jefferson	unmarked	9	stand-alone clinic
				ADA	2	
N1	Lot	Bishop Foote / Ancillary House	115 W. Jefferson	unmarked	5	stand-alone office / residence
N2	Lot	Little Luke's	124 W. Bannock	reserved	9	stand-alone daycare
				ADA	1	
O	Garage	SLMOP - level 1	333 N. First	patient/visitor	32	
				ADA	3	MOB connected to main hospital; attached garage (partial footprint) with roof parking
		SLMOP - level 2		patient/visitor	33	
				ADA	2	
		SLMOP - roof		physician only	5	On roof: 2-3 end bay spaces not striped and not included in count; some spaces too small to be used effectively; some vehicles parked over lines
				employee	111	
				ADA	3	
P1	Lot	Anderson Plaza - west	na	patient/visitor	93	across from Anderson Plaza; 3 spaces obstructed by dumpster
				ADA	4	
P2	Garage	Anderson Plaza - basement	222 N. 2nd	physician only	25	Stand-alone MOB; on-street visitor spaces by building included in on-street inventory
				ADA	1	
P3	Lot	Anderson Plaza - east	222 N. 2nd	unmarked	15	
P4	Lot	Anderson Plaza - south	222 N. 2nd	unmarked	16	Striping faded, inventory is estimated
				ADA	4	
Q	Garage	South Tower Garage	na	patient/visitor (flat)	353	
				employee (ramp)	361	
				ADA	10	
R	Lot	MSTI	na	patient/visitor	12	Lot below South Tower Garage
				emergency vehicle	7	
				ADA	4	
S	Lot	Avenue A	na	physician only	15	Adjacent to visitor garage
				security	1	
				patient/visitor	7	
				ADA	5	
T	Garage	Visitor Garage	na	patient/visitor	329	
				physician only	29	
				reserved	11	
				valet	13	
				ADA	21	

St. Luke's Boise Medical Center

Parking Inventory Data

Survey Date: Wednesday, July 10, 2013

Map ID	Type	Facility or Building Name	Building Address	Space Type	Inventory	Notes
U	Lot	Education Annex / Hospice	325 Idaho	patient/visitor	20	stand-alone office
				ADA	2	
V1	Lot	Idaho Professional Building - front	125 Idaho	unmarked	41	stand-alone office; striping faded, lot count estimated
				ADA	4	
V2	Lot	Idaho Professional bldg - back	125 Idaho	unmarked	23	
V3	Lot	Idaho Professional bldg - back	125 Idaho	physician only	6	
W	Lot	Construction Lot	na	employee / contractor	45	North of garage; partially gravel
X	Garage	Warm Springs Garage	na	employee	1,107	
				ADA	24	
Y	Lot	Warm Springs Lot	na	employee	24	lot east of garage; spaces roped off during 11 am count
				RV	7	
TOTALS:					**3,206**	**-**

St. Luke's Boise Medical Center

Parking Occupancy Data

Survey Date: Wednesday, July 10, 2013

					Observed Occupancies:			By Percentage:		
Map ID	Type	Facility or Building Name	Space Type	Inventory	11:00 AM	1:00 PM	3:00 PM	11:00 AM	1:00 PM	3:00 PM
A1	Lot	Finance - front	reserved	19	16	14	15	84%	74%	79%
			ADA	2	-	-	-	0%	0%	0%
A2	Lot	Finance - back	customer and tenant	12	7	8	8	58%	67%	67%
B	Lot	Marketing and PR	reserved	11	10	4	5	91%	36%	45%
C	Lot	IT Center	unmarked	14	14	14	13	100%	100%	93%
			ADA	1	-	-	-	0%	0%	0%
D1	Lot	BCDC	patient/visitor	30	16	15	19	53%	50%	63%
			ADA	2	-	-	-	0%	0%	0%
D2	Lot	PFS Triangle	BCDC employee only	10	11	11	11	110%	110%	110%
E1	Lot	Ortho Nero	reserved - back	5	5	5	4	100%	100%	80%
			reserved - front	2	1	1	2	50%	50%	100%
E2	Lot	Women's Life	reserved (various)	7	3	3	4	43%	43%	57%
			ADA	1	1	-	1	100%	0%	100%
F1	Lot	Health Foundation	reserved	6	5	5	4	83%	83%	67%
F2	Lot	Little Luke's II	drop-off only	3	-	-	-	0%	0%	0%
			ADA	1	1	1	-	100%	100%	0%
F3	Lot	Surgical Services	unmarked	7	7	6	5	100%	86%	71%
F4	Lot	Social Work Department	staff only	6	3	4	3	50%	67%	50%
F5	Lot	Health Solutions	reserved	5	5	4	4	100%	80%	80%
G	Lot	Employee Health	reserved (various)	18	12	17	15	67%	94%	83%
			ADA	1	-	-	1	0%	0%	100%
H1	Lot	Family Medicine Health - west	tenant only	15	7	6	13	47%	40%	87%
			ADA	2	2	-	-	100%	0%	0%
H2	Lot	Family Medicine Health - east	patient/visitor	6	3	1	4	50%	17%	67%
I	Lot	Construction Office	Family Med only	5	5	2	5	100%	40%	100%
			construction only	26	16	25	11	62%	96%	42%
J	Lot	Human Resources	HR only	8	2	2	5	25%	25%	63%
			ADA	2	1	1	2	50%	50%	100%
K1	Lot	JMOP - north	patient/visitor	55	41	32	45	75%	58%	82%
			ADA	14	8	4	8	57%	29%	57%
K2	Lot	JMOP - annex	staff only	27	23	21	23	85%	78%	85%
L	Lot	Bariatric Nutrition / Dentistry	tenant only	28	6	6	3	21%	21%	11%
			ADA	1	-	1	-	0%	100%	0%
M	Lot	Boise Heart Clinic	unmarked	9	2	2	3	22%	22%	33%
			ADA	2	-	-	-	0%	0%	0%
N1	Lot	Bishop Foote / Ancillary House	unmarked	5	3	4	3	60%	80%	60%
N2	Lot	Little Luke's	reserved	9	2	2	2	22%	22%	22%
			ADA	1	-	-	-	0%	0%	0%
O	Garage	SLMOP - level 1	patient/visitor	32	27	22	20	84%	69%	63%
			ADA	3	-	3	2	0%	100%	67%
		SLMOP - level 2	patient/visitor	33	14	16	24	42%	48%	73%
			ADA	2	1	1	1	50%	50%	50%
		SLMOP - roof	physician only	5	5	5	4	100%	100%	80%
			employee	111	97	95	92	87%	86%	83%
			ADA	3	1	1	-	33%	33%	0%
P1	Lot	Anderson Plaza - west	patient/visitor	93	46	44	45	49%	47%	48%
			ADA	4	-	-	-	0%	0%	0%
P2	Garage	Anderson Plaza - basement	physician only	25	13	12	14	52%	48%	56%
			ADA	1	-	-	-	0%	0%	0%
P3	Lot	Anderson Plaza - east	unmarked	15	13	12	13	87%	80%	87%
P4	Lot	Anderson Plaza - south	unmarked	16	6	6	9	38%	38%	56%
			ADA	4	-	-	-	0%	0%	0%
Q	Garage	South Tower Garage	patient/visitor (flat)	353	204	203	195	58%	58%	55%
			employee (ramp)	361	252	274	243	70%	76%	67%
			ADA	10	3	4	5	30%	40%	50%
R	Lot	MSTI	patient/visitor	12	14	17	6	117%	142%	50%
			emergency vehicle	7	3	4	2	43%	57%	29%
			ADA	4	6	7	1	150%	175%	25%
S	Lot	Avenue A	physician only	15	12	7	11	80%	47%	73%

St. Luke's Boise Medical Center

Parking Occupancy Data

Survey Date: Wednesday, July 10, 2013

					Observed Occupancies:			By Percentage:		
Map ID	Type	Facility or Building Name	Space Type	Inventory	11:00 AM	1:00 PM	3:00 PM	11:00 AM	1:00 PM	3:00 PM
			security	1	1	1	1	100%	100%	100%
			patient/visitor	7	6	5	5	86%	71%	71%
			ADA	5	4	5	5	80%	100%	100%
T	Garage	Visitor Garage	patient/visitor	329	262	326	327	80%	99%	99%
			physician only	29	25	26	26	86%	90%	90%
			reserved	11	5	6	7	45%	55%	64%
			valet	13	9	13	13	69%	100%	100%
			ADA	21	18	21	17	86%	100%	81%
U	Lot	Education Annex / Hospice	patient/visitor	20	18	19	19	90%	95%	95%
			ADA	2	-	1	2	0%	50%	100%
V1	Lot	Idaho Professional Building - front	unmarked	41	10	16	12	24%	39%	29%
			ADA	4	1	1	2	25%	25%	50%
V2	Lot	Idaho Professional bldg - back	unmarked	23	16	16	15	70%	70%	65%
V3	Lot	Idaho Professional bldg - back	physician only	6	-	-	-	0%	0%	0%
W	Lot	Construction Lot	employee / contractor	45	42	42	41	93%	93%	91%
X	Garage	Warm Springs Garage	employee	1,107	990	999	891	89%	90%	80%
			ADA	24	8	8	9	33%	33%	38%
Y	Lot	Warm Springs Lot	employee	24	-	3	5	0%	13%	21%
			RV	7	7	7	7	100%	100%	100%

TOTALS:				**3,206**	**2,377**	**2,469**	**2,332**	**74%**	**77%**	**73%**

St. Luke's Boise Medical Center

Parking Occupancies by Facility

Survey Date: Wednesday, July 10, 2013

				Observed Occupancies:			By Percentage:		
Map ID	Type	Facility or Building Name	Inventory	11:00 AM	1:00 PM	3:00 PM	11:00 AM	1:00 PM	3:00 PM
A1	Lot	Finance - front	21	16	14	15	76%	67%	71%
A2	Lot	Finance - back	12	7	8	8	58%	67%	67%
B	Lot	Marketing and PR	11	10	4	5	91%	36%	45%
C	Lot	IT Center	15	14	14	13	93%	93%	87%
D1	Lot	BCDC	32	16	15	19	50%	47%	59%
D2	Lot	PFS Triangle	10	11	11	11	110%	110%	110%
E1	Lot	Ortho Nero	7	6	6	6	86%	86%	86%
E2	Lot	Women's Life	8	4	3	5	50%	38%	63%
F1	Lot	Health Foundation	6	5	5	4	83%	83%	67%
F2	Lot	Little Luke's II	4	1	1	-	25%	25%	0%
F3	Lot	Surgical Services	7	7	6	5	100%	86%	71%
F4	Lot	Social Work Department	6	3	4	3	50%	67%	50%
F5	Lot	Health Solutions	5	5	4	4	100%	80%	80%
G	Lot	Employee Health	19	12	17	16	63%	89%	84%
H1	Lot	Family Medicine Health - west	17	9	6	13	53%	35%	76%
H2	Lot	Family Medicine Health - east	6	3	1	4	50%	17%	67%
I	Lot	Construction Office	31	21	27	16	68%	87%	52%
J	Lot	Human Resources	10	3	3	7	30%	30%	70%
K1	Lot	JMOP - north	69	49	36	53	71%	52%	77%
K2	Lot	JMOP - annex	27	23	21	23	85%	78%	85%
L	Lot	Bariatric Nutrition / Dentistry	29	6	7	3	21%	24%	10%
M	Lot	Boise Heart Clinic	11	2	2	3	18%	18%	27%
N1	Lot	Bishop Foote / Ancillary House	5	3	4	3	60%	80%	60%
N2	Lot	Little Luke's	10	2	2	2	20%	20%	20%
O	Garage	SLMOP - level 1	189	145	143	143	77%	76%	76%
P1	Lot	Anderson Plaza - west	97	46	44	45	47%	45%	46%
P2	Garage	Anderson Plaza - basement	26	13	12	14	50%	46%	54%
P3	Lot	Anderson Plaza - east	15	13	12	13	87%	80%	87%
P4	Lot	Anderson Plaza - south	20	6	6	9	30%	30%	45%
Q	Garage	South Tower Garage	724	459	481	443	63%	66%	61%
R	Lot	MSTI	23	23	28	9	100%	122%	39%
S	Lot	Avenue A	28	23	18	22	82%	64%	79%
T	Garage	Visitor Garage	403	319	392	390	79%	97%	97%
U	Lot	Education Annex / Hospice	22	18	20	21	82%	91%	95%
V1	Lot	Idaho Professional Building - front	45	11	17	14	24%	38%	31%
V2	Lot	Idaho Professional bldg - back	23	16	16	15	70%	70%	65%
V3	Lot	Idaho Professional bldg - back	6	-	-	-	0%	0%	0%
W	Lot	Construction Lot	45	42	42	41	93%	93%	91%
X	Garage	Warm Springs Garage	1,131	998	1,007	900	88%	89%	80%
Y	Lot	Warm Springs Lot	31	7	10	12	23%	32%	39%
TOTALS:			**3,206**	**2,377**	**2,469**	**2,332**	**74%**	**77%**	**73%**

St. Luke's Boise Medical Center

Parking Occupancy Data - by user group

Survey Date: Wednesday, July 10, 2013			Observed Occupancies:			By Percentage:		
Facility or Building Name	Space Type	Inventory	11:00 AM	1:00 PM	3:00 PM	11:00 AM	1:00 PM	3:00 PM
All (by Space Type)	ADA	117	55	59	56	47%	50%	48%
	employee / staff	1,722	1,439	1,476	1,325	84%	86%	77%
	patient / visitor / valet	1,014	660	713	722	65%	70%	71%
	physician only	80	55	50	55	69%	63%	69%
	other reserved + off-site	255	138	141	142	54%	55%	56%
	Other (special designation)	18	11	12	10	61%	67%	56%
TOTALS:		3,206	2,358	2,451	2,310	74%	76%	72%

All Groups	On-Street Parking	528	361	360	337	68%	68%	64%

St. Luke's Boise Medical Center
Parking Occupancies - Core Area Only
Survey Date: Wednesday, July 10, 2013

Garages = O, Q, T, X
Lots = P1 - P4, R, S
Warm Springs Lots = W, Y

					Observed Occupancies:			By Percentage:		
Map ID	Type	Facility or Building Name	Space Type	Inventory	11:00 AM	1:00 PM	3:00 PM	11:00 AM	1:00 PM	3:00 PM
O	Garage	SLMOP - level 1	patient/visitor	32	27	22	20	84%	69%	63%
			ADA	3	-	3	2	0%	100%	67%
		SLMOP - level 2	patient/visitor	33	14	16	24	42%	48%	73%
			ADA	2	1	1	1	50%	50%	50%
		SLMOP - roof	physician only	5	5	5	4	100%	100%	80%
			employee	111	97	95	92	87%	86%	83%
			ADA	3	1	1	-	33%	33%	0%
P1	Lot	Anderson Plaza - west	patient/visitor	93	46	44	45	49%	47%	48%
			ADA	4	-	-	-	0%	0%	0%
P2	Garage	Anderson Plaza - basement	physician only	25	13	12	14	52%	48%	56%
			ADA	1	-	-	-	0%	0%	0%
P3	Lot	Anderson Plaza - east	unmarked	15	13	12	13	87%	80%	87%
P4	Lot	Anderson Plaza - south	unmarked	16	6	6	9	38%	38%	56%
			ADA	4	-	-	-	0%	0%	0%
Q	Garage	South Tower Garage	patient/visitor (flat)	353	204	203	195	58%	58%	55%
			employee (ramp)	361	252	274	243	70%	76%	67%
			ADA	10	3	4	5	30%	40%	50%
R	Lot	MSTI	patient/visitor	12	14	17	6	117%	142%	50%
			emergency vehicle	7	3	4	2	43%	57%	29%
			ADA	4	6	7	1	150%	175%	25%
S	Lot	Avenue A	physician only	15	12	7	11	80%	47%	73%
			security	1	1	1	1	100%	100%	100%
			patient/visitor	7	6	5	5	86%	71%	71%
			ADA	5	4	5	5	80%	100%	100%
T	Garage	Visitor Garage	patient/visitor	329	262	326	327	80%	99%	99%
			physician only	29	25	26	26	86%	90%	90%
			reserved	11	5	6	7	45%	55%	64%
			valet	13	9	13	13	69%	100%	100%
			ADA	21	18	21	17	86%	100%	81%
W	Lot	Construction Lot	employee / contractor	45	42	42	41	93%	93%	91%
X	Garage	Warm Springs Garage	employee	1,107	990	999	891	89%	90%	80%
			ADA	24	8	8	9	33%	33%	38%
Y	Lot	Warm Springs Lot	employee	24	-	3	5	0%	13%	21%
			RV	7	7	7	7	100%	100%	100%
TOTALS:				**2,732**	**2,094**	**2,195**	**2,041**	**77%**	**80%**	**75%**

Survey Date: Wednesday, July 10, 2013			Observed Occupancies:			By Percentage:		
Facility or Building Name	Space Type	Inventory	11:00 AM	1:00 PM	3:00 PM	11:00 AM	1:00 PM	3:00 PM
Core Facilities Only	ADA	81	41	50	40	51%	62%	49%
(by Space Type)	employee / staff	1,648	1,381	1,413	1,272	84%	86%	77%
	patient / visitor / valet	903	601	664	657	67%	74%	73%
	physician only	74	55	50	55	74%	68%	74%
	other reserved	11	5	6	7	45%	55%	64%
	Other (special designation)	15	11	12	10	73%	80%	67%
TOTALS:		2,732	2,094	2,195	2,041	77%	80%	75%

Inventory Data Provided by SLRMC

1/28/2005	TOTAL		Surface	Covered	Handicap
Warm Springs Garage	1155		24	1131	24
IPB South	29				
IPB North	46				4
South Tower garage ramps	317				
South Tower garage flats	413				11
APMB East	15				
APMB Sub	25				2
APMB Short Term Parking	5				2
APMB South	22				2
HON Lot	100				4
Old Education Bldg	22				2
IT Building at 316 Washington	16				1
373 W Fort Street	33				1
PFS Triangle	10				
BCDC	30				2
Foundation	6				
Little Luke's II	6				1
Obenchain Bldg	13				
Women's Challenge (old HR)	5				1
Credit Union	4				1
Women's Life	5				
414 N First	21				1
121 Fort Street	31				2
CS Plant	5				
Construction	32				
Human Resources	11				2
JMOP North	79				5
JMOP South	27				
Little Luke's I	16				1
SLMOP Level I	35				3
SLMOP Level II	35				2
SLMOP Level III	107				1
MSTI	19				7
Bannock Patient/Vis	433				20
Avenue A	28				5
Totals	3156				107

APPENDIX B: MASTER PLAN PROJECTIONS

WALKER
PARKING CONSULTANTS

Preliminary Space Budgeting

ST LUKE'S DOWNTOWN MASTERPLAN

Program Elements

Boise Downtown Hospital (Existing)		6A-2	2024 (34.7% growth from 2012)	2030 (57.1% growth from 2012, 16.7% from 2024)	2034 (71.5% growth from 2012, 27.3% from 2024)	Existing	8/6/2014 9:39
Component	**Elements**						**Comments**
Hospital Administrative Offices		23920	41935	48938	53383	31810	
Health Information		3100	7922	9245	10085	6009	
Emergency Department		29500	34770	40590	44321	22058	
Pharmacy		13270	7605	9556	10429	6137	
Entrance/Lobby		10000	7773	9071	9895	5896	
Admission Center		6130	6946	8106	8842	5269	
Public Facilities						0	
Food Services		35330	24361	28429	28502	18479	
Special Services		15510	8781	10247	11178	6661	Morgue, Guest Quarters, Sleep Lab
Women's Services		46610	43475	50735	55344	32979	L&D, Ante Partum, Breast Diag
Support Services		73220	9489	11074	12079	7198	Environmental Services, Secuity, Clinical Eng, Mat Management
Inpatient Care Units		294720	277843	311328	333651	229656	Does not include non-conforming bed upgrades
	Patient Care Unit Med/Surg/Tele/ICU		248	276	294	212	
	Patient Care Unit OB		60	68	73	53	Does not include nursery bassinets
	Patient Care Unit Peds		46	52	55	39	
	Patient Care Unit PICU		11	12	13	12	
	Patient Care Unit NICU		51	59	66	66	Existing NICU beds are 2 & 3 beds per room. 2030 & 2034 are estimated.
	Total Beds	478	416	467	501	389	
Therapy Services & Rehab		5070	7251	8462	9231	5500	PT, Speech, Occ Ther
Surgery		155190	81560	92200	102040	70971	
	Surgical Suite (1080:1) or 4/day @ 270 days/year		20	23	25	17	
	Endo (2160:1) or 8/day @ 270 days/year		5	5	6	4	
	Central Sterile						
Outpatient Clinics		8980	7402	8638	9423	5615	Pre-Surg & Chest Pain Clinics
H&V Non Invasive Diagnostics		16670	28575	33347	36376	21031	Holter, Echo/Treadmill/TEE/Doppler, PV Lab, EKG, Coronary Obs, Support
H&V Invasive/Procedure		36840	35720	41685	45472	15449	Cath Lab, CV OR, EP, Central Sterile, Special Procedures
Diagnostic Radiology		47750	37995	44340	48368	28720	
Diagnostic Laboratory		26000	26247	31232	34141	19910	What portion is on/off site?
Central Plant, Freestanding Building			39549	46154	50346	30000	Not Included in Main Hosp Total.
						30000	
	Power Plant						
	Fac/Maint						
	Laundry						
	Purchasing						
	Security						
Total Area	Department Gross Area	847810	695651	797224	862760	539348	Does not include MSTI or Central Plant
	Circulation @ 20%	169600	139100	159400	172600	85004	
	Mechanical @ 10%	84780	69570	79720	86280	54975	
	Total	**1102190**	**904321**	**1036344**	**1121640**	**679327**	
Total New SF Needed:		**422863**	**224994**	**357017**	**442313**		

***This number is based off using ALL existing sf**
The "real" number of new SF in Option 6A-2 is ~650,000sf

South Tower (Existing)

Component	Elements						Comments
Medical Oncology (MSTI)		143000	87750	102404	111706	51797	Infusion, Rad/Med/Ped Onc, Surgical, Physics, Admin/Support.
Pediatric & Women's Clinics			0	0	0	81000	This will increase if Women's Clinics stay beyond 2024
Education		27000	27000	27000	27000	27000	Assumes this function will not move by 2034
Total Used Area		170000	114750	129404	138706	159797	170,000 SF Available

Central Plant (New)

Component	Elements						Comments
Central Plant		48000	39549	46154	50346	30000	

Preliminary Space Budgeting

ST LUKE'S DOWNTOWN MASTERPLAN

Program Elements

Boise Downtown Hospital (Existing)

Component	Elements	6A-2	2024 (34.7% growth from 2012)	2030 (57.1% growth from 2012, 16.7% from 2024)	2034 (71.5% growth from 2012, 27.3% from 2024)	Existing	Comments
Support Services			9489	11074	12079	7198	
Total Area			49038	57228	62425	37198	

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Childrens Specialty Center (New)

Component	Elements	
Childrens Services	85,000 sf entitled for new building, desired program ranges from 125-150,000	85000

Clinics (New)

Component	Elements
H&V Clinics	50-85,000 sf needed depending on amount of non-invasive cardiology in clinic vs hospital (presently all non-invasive shown in hospital).
Women's Clinics	0-40,000 sf needed depending on amount to remain in South Tower, if "hospital within a hospital" concept is desired and the total growth and expansion required.
Ortho/Neuro Clinics	0-10,000 sf needed depending on amount to remain at hospital 10th floor, if "hospital within a hospital" concept is desired and the total growth and expansion required.

New Parking based on 2030 max estimates

Component	Elements		
New Hospital Tower	357,000 sf = 630 Stalls		
H&V & Women's Clinics	125,000 sf + 45,000 sf shell (some of this may be used for Ortho/Neuro) = 569 Stalls	105000	3 Levels of MOB
Childrens Specialty	85,000 sf = 274 Stalls		

Existing Non Conforming Beds by Unit:

- **4 South** (Medical Oncology - 24 beds - Non-conforming size, seismic concerns.
- **3 East** ICU - 16 beds - Non-conforming size, seismically acceptable.
- **3 South** CCU - 16 beds - Non-conforming size, 7 beds no windows, seismic concerns.
- **2 West** Antepartum Care - 13 beds - Seismic concerns, size concerns.
- **2 East** Med-Surg - 12 beds - Non-conforming size, seismically acceptable.

Net Non-conforming/concern Beds = 81

All bed units 4-9 East are conforming per code sf & seismically acceptable, however the room shape is problematic.

NICU beds are presently semi private (which is conforming per code).

Architectural Survey

for St. Luke's Boise Medical Center

Specific Study Area - between Bannock St. to State St, Boise, Idaho

July 2014

St. Luke's Boise Medical Center 190 East Bannock Street Boise, Idaho 83712

St Luke's

PLATFORM ARCHITECTURE . DESIGN

1008 s. johnson street boise, idaho 83705 t: 891.9082 f: 343.6489 www.platformarch.com

PURPOSE

This architectural survey is an effort to determine if selected properties within a defined study area of W. Bannock to W. State Street between N. Ave. B and N. Second Street are potentially historically significant and worth more detailed survey efforts. The study area included 16 properties.

BACKGROUND INFORMATION

The study area is part of the original Boise City Townsite, recorded in 1867, an area extending from Fort Street on the north to Front Street on the south, from First Street on the east to Sixteenth Street on the west. Several national historic districts have been established within the original Townsite. Immediate to the study block area is the State Street Historic District. Established in 1978, the district is generally bound by W. State Street on the north to W. Jefferson to the south and N. Second Street on the east to N. Third Street on the west. The area was considered significant based on its association with persons and architects/ architecture important to the history of Boise.

In May of 1997 the Boise City Planning Department and the Boise City Historic Commission retained the services of Donna Hartmans of Arrow Rock Architects to perform a reconnaissance level survey of a study area bounded on the north by Fort Street, on the south by Jefferson Street, on the east by First Street, and on the west by Sixteenth Street. The purpose of the survey was to determine which properties were historically significant and to propose boundaries for a potential locally designated historic district. Established in 2004 the Hays Street Historic District comprises almost a twenty-two block area within the surveyed area. The properties within the100 block study area were within the survey boundaries but were not included in the formation of the historic district. All of the properties within the study area are classified as “contributing in a potential district” with the exception of 111 and 115 W. State Street and 414 N. 2nd which are classified as “non-contributing.” Properties located at 115 and 121 W. Jefferson Street, 124 W. Bannock and 214 E. Jefferson Street were not included in the 1997 survey.

Boise City defines an historic property as “a district, site, building, structure or object that is eligible or listed on the National Register of Historic Places”. The term contributing is defined as “a contributing building, site, structure or object adds to the historic architectural qualities, historic associations, or archeological values for which a property is significant because (a) it was present during the period of significance, and possesses historic integrity reflecting its character at that time or is capable of yielding important information about the period, or (b) it individually meets the National Register eligibility criteria”. The term noncontributing is defined as “a noncontributing building, site, structure or object may possess characteristics that make it important to the overall historic character of the district such as, but not limited to, mass, scale, streetscape features, setbacks or proximity to contributing structures. A building, site, structure or object within a district may be noncontributing because (a) it was not present during the period of significance, (b) due to alterations, disturbances, additions, or other changes, it no longer possesses historic integrity reflecting its character at that time or is incapable of yielding important information about the period, or (c) it does not individually meet the National Register eligibility criteria”.

The National Register of Historic Places is an official listing of historically significant sites and properties throughout the country. It is maintained by the National Park Service, U.S. Department of the Interior. To be considered eligible, a property must meet the National Register Criteria for Evaluation. This involves examining the property’s age, integrity, and significance.

- Age and Integrity. Is the property old enough to be considered historic (generally at least 50 years old) and does it still look much the way it did in the past?
- Significance. Is the property associated with events, activities, or developments that were important in the past? With the lives of people who were important in the past? With significant architectural history, landscape history, or engineering achievements? Does it have the potential to yield information through archeological investigation about our past? Does it possess the integrity of location, design, setting, materials, workmanship, feeling and association?

PROCESS OF EVALUATION

This architectural survey involved evaluation of information contained in the 1997 survey report and existing conditions through field work conducted along the streets systematically in a property-by-property fashion. Field work involved a visual observation of the individual properties to determine if physical changes had occurred since the earlier survey work that could potentially change the property's significance and integrity. An interior review of a building was performed if the exterior integrity of the building was relatively intact. Research was conducted on properties not included in the 1997 survey through examination of Sanborn Fire Insurance Maps, building permits and resources available at the State Archives.

DETERMINATION

Of the properties within the study area all have achieved consideration for historic eligibility based on the 50 years or older criteria with the exception of the previous mentioned properties which were classified as noncontributing in the 1997 survey based on an age of less than 50 years. Those properties (111 and 115 W. State Street) are still not eligible based on the 50-year consideration.

Although the Aldecoa House, located at 190 W. Jefferson, was originally constructed between 1912-1949, thus satisfying the 50 years or older criteria, the property was moved from its original location (212 E. Idaho Street) to its current location during the mid-1980's. Typically properties that are moved are not considered eligible. They may become eligible for consideration once they have achieved the 50-year mark in their current location.

For a property to be considered historically significant it must not only be shown to be significant under the National Register criteria, but it also must have integrity. Determining integrity is based on the judgment of the consultant as the evaluation of integrity is sometimes a subjective decision. Integrity is the ability of a property to convey its significance. Historic context is the basis for judging the significance of a property. A property must represent a significant part of history, architecture, archeology, engineering, or culture of an area, and it must have the characteristics that make it a good representative of properties associated with that aspect of the past.

The sixteen properties located within the study area are located within the boundaries of the original Boise City Townsite of 1867. The study area is identified as Block 61 of the 140 block plat. The historic context of this particular block area is the residential development pattern that occurred after the 1890's. This pattern of development was not isolated to this particular block but typical to surrounding blocks as well. The development of the original platted townsite for residential purposes is integral to the understanding of the history of Boise, but does not represent and important aspect or event of its history.

The study area and surrounding neighborhood historically was developed as residential uses; single-family residences and apartment houses were prevalent throughout the area with residents of varied socio-economic levels. Over the past 40 years the greater neighborhood has seen a shift from primarily residential to office and business type uses. Many of the existing houses were simply converted into offices or were demolished to provide for new construction (111 and 115 W. State, 166 W. Jefferson). As part of the change to a commercial use, the setting and character of the area was altered; large parking areas were provided off of the alleys, side and back yards were modified and in some cases parking lots were developed in the front of the property as well as street patterns altered (adjacent to 214 E. Jefferson). All of which diminish, and in some cases demolished, the residential character original to the area. There are several structures that maintain residential uses (412 and 414 N. 2nd and 117 W. State). Current zoning of the study block is H-S (Health Service) with surrounding blocks zoned as R-O (Residential Office) and R-3 (Multi-Family). The residential setting and feeling associated historically with this area is no longer existent and potential development and uses allowed under the current zoning classifications do not support the retention or increase in residential uses.

The property at 124 W. Bannock may be worth additional study as it is associated with the J.O. Jordan, a predecessor to the Jordan-Wilcomb Construction Company. J.O. Jordan was founded in the early 20th century and during their early years in business they constructed houses designed within their own company which

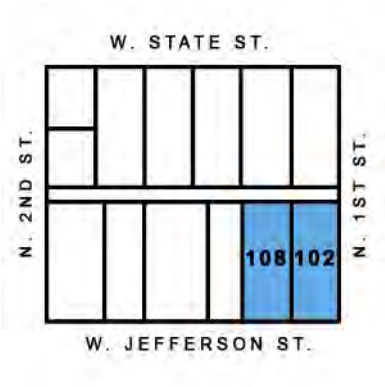
were based on plan books published during that time. They went on to become a major construction firm contributing to the built environment of present day Boise, constructing significant structures like the Egyptian Theater, schools for Boise School District and St. Mary's Catholic Church are just a few.

Based on previously published information and research completed during this survey, there is no indication the properties within the study area were associated with an important person in Boise's history. None of the properties are known to be associated with or designed by one of Boise's noted architects or architectural firms. Architecturally, the study area consists of modest examples of particular architectural styles; Queen Anne, Bungalow and Colonial Revival. The detailing and character is common throughout the older neighborhoods of Boise. The exterior character remains essentially intact for most of the properties but with the conversion from a residential to office use the interiors have been remodeled to where very little of the original architectural character, arrangement of spaces, surface materials exists. There are exceptions, as the Bishop Foote House has retained much of the historic character and features in the interior of the main floor.

It is judged by the consultant that the historic context associated with the study area is not considered significant to the history of Boise. Several properties within the study area reflect the historic architectural character of the development period to which they are associated with but are not exceptional examples of a particular architectural style or work designed by an important architect. Although these structures may retain much of its character and detailing, the use, site and setting is no longer associated with the historical residential use of the property.

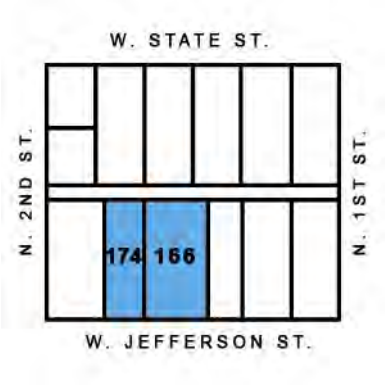
SURVEY RESULTS

Field work conducted indicates that it appears the properties have not changed from the documented information contained in the 1997 survey. The following brief summary of each property is based on information contained in the 1997 survey and recent field notes taken through examination of the exterior and, in some cases, interiors of each structure located with in the survey perimeter. Properties located at 115 and 121 W. Jefferson, 412 and 414 N. 2nd, 124 W. Bannock and 214 E. Jefferson were not part of the 1997 original survey. Research of these properties included review of the Sanborn Fire Insurance Maps, building permits and available resources at the State Archives.



102 W. Jefferson St.
Estimated date of construction is between 1893-1903. The Queen Anne structure with its irregular shaped floor plan and façade with exterior materials consisting of a stone foundation, stucco walls does not appear to have been altered since the 1997 survey. Some original architectural ornamentation remains intact, in particular the coppercrest along the central roof ridge and exterior light fixtures. The interior of the structure has experienced several remodels over the years to accommodate its current office use.

108 W. Jefferson St.
The 1997 survey indicates the estimated date of construction prior to 1893. The simple side-gabled structure with its small footprint and rectangular shape is typical to hall-and-parlor type homes built during the estimated period of construction. The interior of the structure has undergone several modifications to accommodate the office function uses.



166 W. Jefferson St.

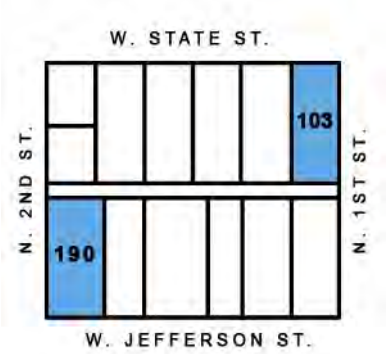
Constructed in the mid-1980's, the modest, single-story brick structure has not achieved the 50 years or older criteria to be considered eligible for historical significance.

174 W. Jefferson St (1997 Survey indicates an original address of 118 W. Jefferson St.)

Estimated date of construction is 1937. The Tudor Revival structure originally contained a number of residential units and currently provides day care services for the hospital. The exterior architectural integrity remains but the site and interior have been altered to accommodate the current use.

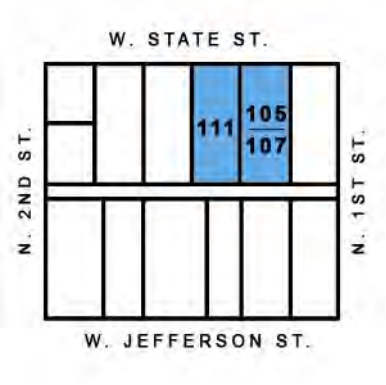
190 W. Jefferson St. – Domingo Aldecoa House

Estimated date of construction is between1912-1949. House was originally constructed at 212 E. Idaho as a bungalow style and then remodeled in 1928 to a Spanish (Basque) style. In the mid-1980's the property was moved to it current location. In the interior, some of the architectural elements from the 1928 remodel still exist, such as built in millwork and an upstairs bath. Yet the majority of the structure has been modified to accommodate the current use.



103 W. State St.

Constructed in 1914, the property is a good example of a craftsman bungalow, retaining many of the characteristic detailing throughout the exterior (low-pitched gable roof, exposed roof rafters, decorative gable braces) and the interior (open living area, built-ins, box-beam ceilings).

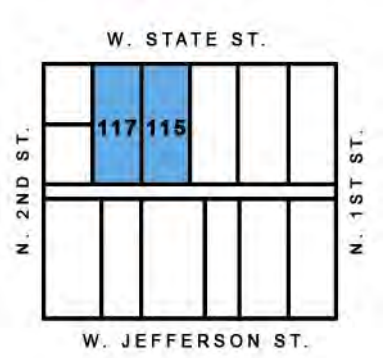


105 and 107 W. State St.

Constructed between 1912-1949, the Craftsman stucco structure retains much of its original architectural character. The structure was originally constructed as a duplex. It appears the duplex is intact. The interior of #105 has been significantly modified to accommodate its current use.

111 W. State St.

Constructed in the mid-1970's, the modest, single-story brick structure has not achieved the 50 years or older criteria to be considered eligible for historical significance.

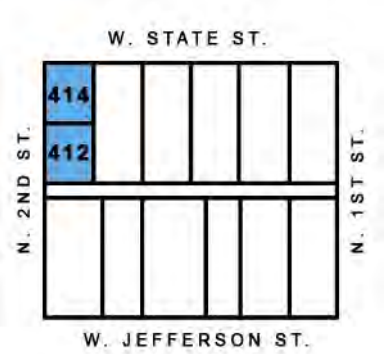


115 W. State St.

Constructed in the mid-1960's, the modest, single-story brick structure has not achieved the 50 years or older criteria to be considered eligible for historical significance.

117 W. State St.

Constructed in the 1936, the Minimal Traditional stucco structure was built as a multi-family dwelling and still operates that way today. The garage structure in the back appears to be original to the property.

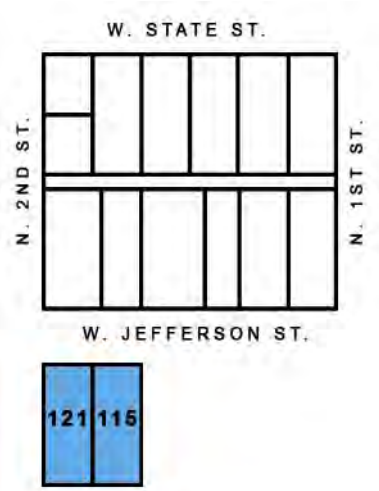


412 N. 2nd Street.

Constructed between1903-1936, the one and one-half story structure represents the iconic gable-front shaped house found throughout Boise's older neighborhoods. The property continues to operate as a residential unit.

414 N. 2nd Street.

Constructed between1903-1936, the structure reflects characteristic elements of the Queen Anne style; various roof shapes in combination, irregular plan and various window shapes and bays. The porch was enclosed in the late 1940's.

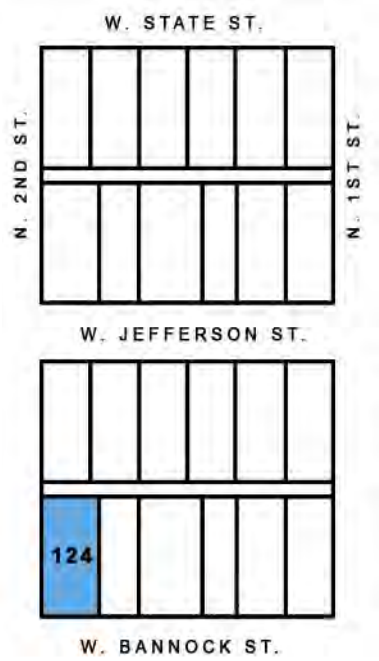


115 W. Jefferson Street.- Christmas Card House

County records indicate the house was constructed in 1913. The structure exhibits many characteristics of the American Foursquare, a popular style during the early to mid-1900's; two-story box shape, low hipped roof with deep overhangs, accentuated front door. There have been several alterations to the property over the past 50 years; rear porch was enclosed for a kitchen expansion, a new covered rear porch constructed and accessible ramp added to the front. The first floor interior was altered at some point with much of the original features and finishes now removed. The upstairs retains much of the original layout, features and trim.

121 W. Jefferson Street – Bishop Foote Guest House

City records indicate the house was construction is 1935. The architectural style can be most characterized as a minimal Tudor; steep roof, fluted chimney, brick construction, large panes of glass. Exterior changes have been minimal and generally limited to the rear of the structure. Due to the current use of the building access was limited on the interior. The first floor retains much of the original layout, features and trim. The kitchen has been updated.

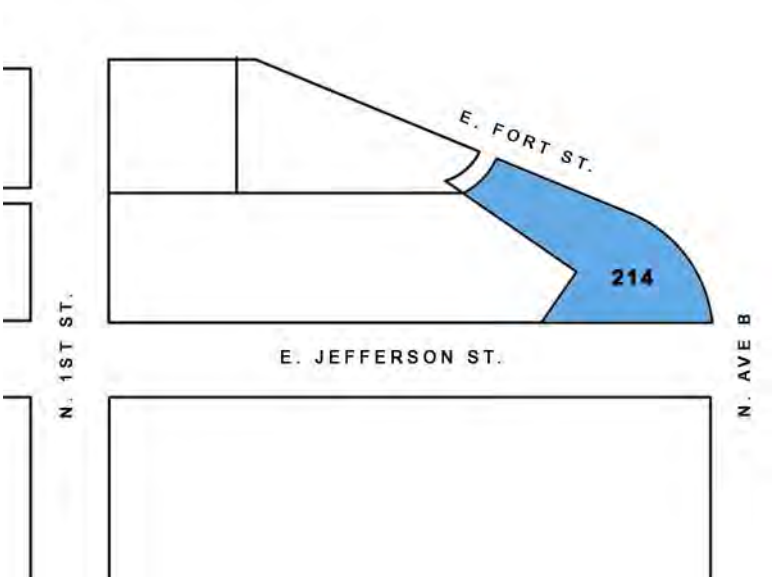


124 W. Bannock.- Little Luke's

City records indicate this house was constructed in 1924 by the contractor J.O. Jordan, which is still in existence today as Jordan-Wilcomb Construction Inc. (believed to be Idaho's oldest construction firm still in operation today). The architectural style is Colonial Revival characterized by classical details; Ionic columns, accentuated front door with decorative pediment and symmetrical façade. Exterior changes have been minimal and generally limited to the rear of the structure. The interior arrangement of spaces appears to be original, the stair has been removed and alterations taken place over the years to accommodate the non-residential use. The upstairs attic which was remodeled in 1948 appears to retain much of the original character.

214 E. Jefferson St.

Constructed in 1910, the property is a good example of a Craftsman bungalow, retaining many of the characteristic detailing throughout the exterior (low-pitched gable roof, exposed roof rafters, decorative gable braces, full-width porch with distinctive massive square columns). Exterior changes have been minimal and generally limited to the rear of the structure with additions occurring in the 1950's-1960's. The building stopped being used as a single-family residence in the 1970's, since then, the interior has been significantly modified over the years to accommodate the various changes in use. Very little of the original interior character exists with the exception of the fireplace and a few door casings.



Books

Hart, Arthur A. Historic Boise, an Introduction to the Architecture of Boise, Idaho 1863-1938 Boise, Idaho: Historic Preservation Commission, 1979

McAlester, Virginia and Lee. A Field Guide to American Houses. New York: Alfred A. Knopf, Inc. 1982

Wells, Merle. Boise, An Illustrated History. Woodland Hills, California: Windsor Publications, Inc. 1982

Attebery, Jennifer Eastman. Building Idaho, An Architectural History. Moscow, Idaho: University of Idaho Press. 1991

Survey, Reports, and National Register Nominations located at the Idaho State Historic Preservation Office, Boise, ID

Hartmans, Donna. Near North End Reconnaissance Survey. Boise City Historic Preservation Commission, May 1997

Hibbard, Don. State Street Historic District. National Register Nomination, 1978

Documents and Records located at City Hall, Boise, ID

Boise City Building Permits, 1910-1950, microfilm: Boise City Planning and Zoning Department

Documents and Records located at the Idaho State Archives, Boise, ID

Sanborn Fire Insurance Maps: 1893, 1903, 1912, 1949 and 1956

R. L. Polk & Co.'s Boise City and Ada County Directory: 1903-1956

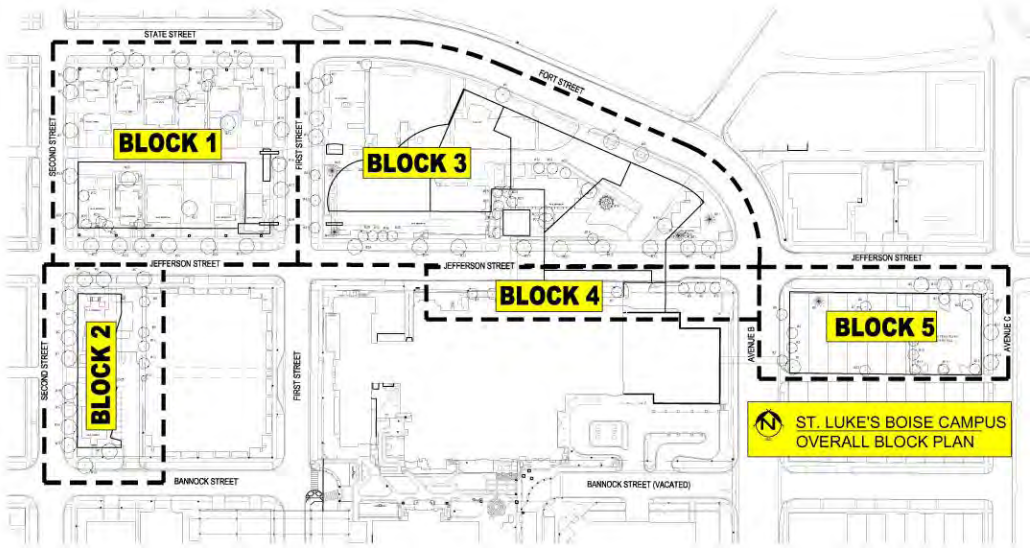
BOISE MASTER CAMPUS PLAN
PLANT REVIEW
ST. LUKE'S HEALTH SYSTEM, BOISE

During the fourth week of July, 2013, a visit to the Boise Campus and specifically the areas owned by SLHS and that will be impacted by the Master Campus Plan was conducted. The visit was to review all trees and provide a preliminary assessment for the health and desirability of those trees. Final assessment will need to be provided by an approved Arborist for the health of all existing trees four inch caliper and greater trees per the Landscape Ordinance adopted earlier this year (Chapter 11-07-05.2.F).

The preliminary review was for all trees, both in the Right of Way that are City owned and the ones located on private property but fall within the Landscape Ordinance. Any trees to be removed and are assessed as healthy and desirable will require mitigation per Ordinance and any new trees planted within the Right of Way will require a permit for planting from the Boise City Forester to insure compliance with tree species and specific planting locations. There are no fees for permits and should be obtained at least one week prior to planting.

A review with a landscape contractor to determine the cost for relocating any trees which are healthy, desirable, and that were of the caliper which could be relocated was also conducted. Estimated transplanting costs are noted for individual trees which could be relocated. It is also noted that any plant material determined to be capable of relocation should be done during the proper season (after leaves have fallen in autumn or before leafing out in spring). Also any plant material dug should be relocated to a 'permanent' location immediately and not stored for future relocation.

No shrub plantings are listed unless there are some that could be dug up buy SLHS personnel desiring smaller plant material. Transplanting shrubs is generally not cost effective due to labor cost to dig, temporary storage and maintenance, then planting again.



Attached are plans locating each property and numbered plantings listed.

Block 1, bordered by Second Street on the west, State Street on the north, First Street on the east, and Jefferson Street on the south. Starting at mid block on Second Street working clockwise.

412 Second St.
#1. 36" Catalpa in good condition and should be retained even though it is not the most desirable street tree.

General note; all trees noted to be retained should be protected during construction per Boise City Forester's recommendations.

414 Second St.
#2. 36" Silver Maple in fair condition and should be retained due to size.

General note; Silver Maples are week wooded and not considered to be the most desirable species for street tree planting in the city of Boise. The Boise City Forester will place a lesser value on Silver Maples over other species (such as Lindens or Norway Maples), therefore, if there are options to remove this species over another for construction purposes, remove the Silver Maples.

#3. 48" Silver Maple in fair to poor condition, should be pruned and retained if possible because of size.
#4. 18" Black Walnut in Fair to good to fair condition (tree on property boundary between 414 Second and 117 State Street). May not require any mitigation due to species.

Black Walnuts have been dying out throughout the City during the past few years so this may not be a desirable tree to retain.

117 W. State St.
#5. 12" Linden in good condition, retain if possible.
#6. 24" Silver Maple in good condition, retain if possible because of size and condition.

115 W. State St.
No trees at this address.

111 W. State St.
#7. Multi stem and multiple 8"-10" Paper Birch in good condition. Surprisingly in good condition. May require some mitigation.

Most Paper Birch have serious insect and bore problems in the City and these are not a desirable species.

#8. 18" Ash in good condition, retain if possible because of size and condition.
#9. 8" Japanese Maple in good condition. Estimated transplant cost $1500.

In addition to the noted trees, there are approximately 40 small Boxwood shrubs and 4 Laurels that could be relocated by individuals desiring this plant material.

105 W. State St.
#10. 10" Hawthorn could be moved. Estimated transplant cost $1500.
#11. 12" Norway Maple in good condition, retain if possible because of size and condition.
#12. 48" Sycamore in good condition and will require some mitigation.

In addition to the noted trees, there are 2 Hydrangea (on standards) and 4 Mugo Pine that could be relocated by others.

103 W. State St.
#13. 18" Sweetgum in poor condition, and could be replaced with an under-planting of a more desirable species.

General note; Under-planting is the process of planting a new tree near an existing tree that will be removed in a few years and allowing the new tree to establish a few years before the existing one is removed.

#14. 48" Silver Maple in poor condition, and could be replaced with an under-planting of a more desirable species (may be outside future construction limits) or planted after construction is completed in this area.
#15. 48" Silver Maple in fair to poor condition, and could be replaced with an under-planting of a more desirable species (may be outside future construction limits) or planted after construction is completed in this area.


#14 48" Silver Maple

102 W. Jefferson St.
#16. 24" Black Locust in fair condition and may not require any mitigation if removed.

This is also not a desirable street tree. This species is very susceptible to bores.

#17. 48" Silver Maple in fair to poor condition and may not require any mitigation if removed.
#18. 12" Gingko in good condition and will require some mitigation if removed.
#19. 3" Oak, recently planted and should be retained.

In addition to the noted trees, there are 9 – 10 Ivory Halo Dogwoods and 1 Mugo Pine that could be relocated by others.

108 W. Jefferson St.
#20. 12" Linden in good condition that should be retained
#21. 24" Silver Maple in good condition and may require some mitigation.

In addition to the noted trees, there are 7 – 8 Roses that could be relocated by others.

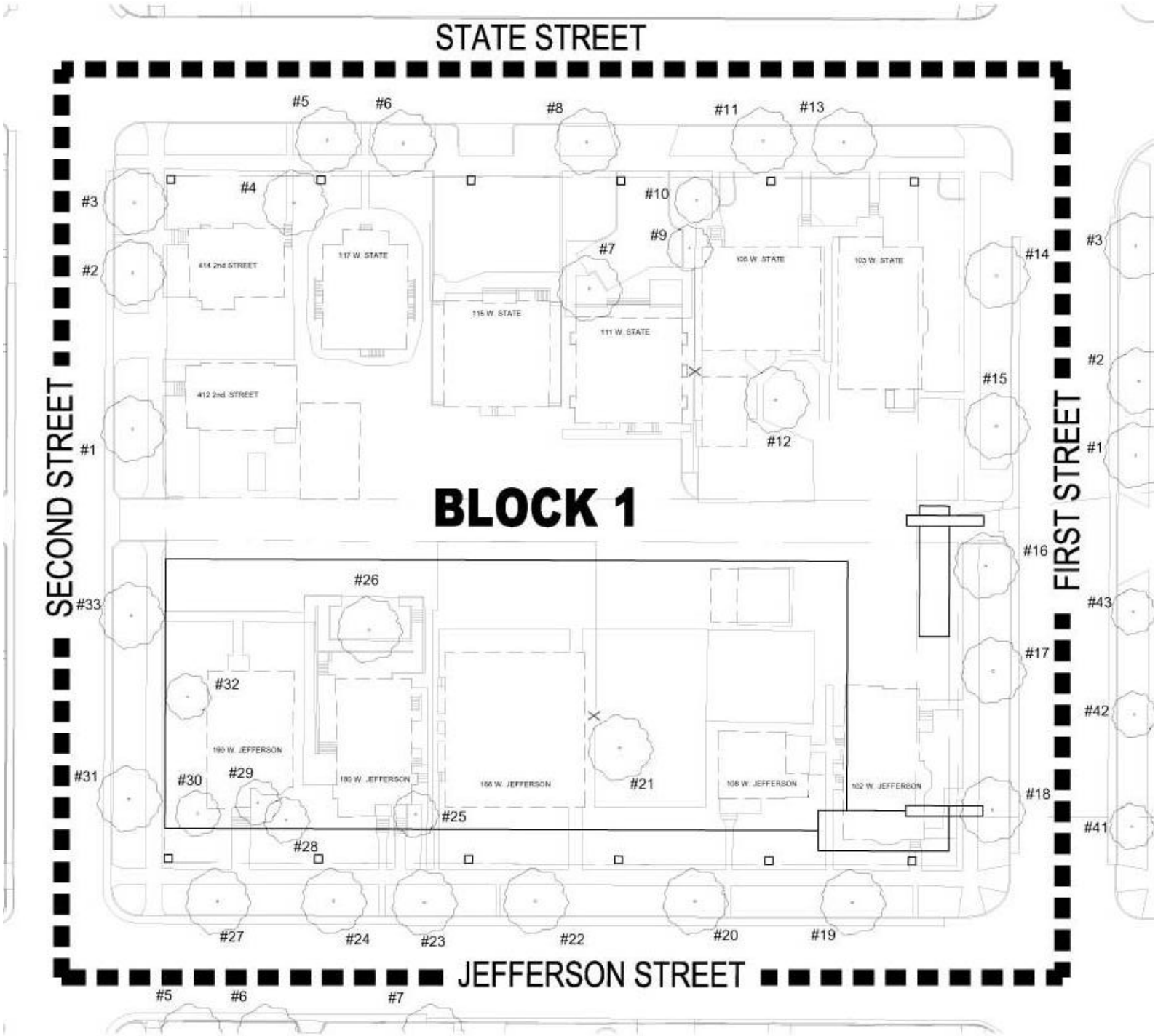
166 W. Jefferson St.
#22. 12" Linden in good condition and should be retained.

180 W. Jefferson St.
#23. 24" Sycamore in good condition and should be retained.
#24. 30" Sycamore in good condition and should be retained.
#25. 6" Japanese Maple in good condition that could be moved.
Estimated transplant cost $800.
#26. 36" White Oak in good condition. This will require some mitigation.

In addition to the noted trees, there are 6-7 Lime mound Spirea's and 1 Yew that could be relocated by others.

190 W. Jefferson St.
#27. 15" Norway Maple in fair condition. Needs to be pruned and should be retained.
#28. 4" Flowering Dogwood in fair to poor condition and may not require any mitigation.
#29. 10" Japanese Maple in fair condition that could be moved. One side is not well developed since it was planted to close to building but could re relocated in similar situation. Estimated transplant cost $1280.
#30. 10" Flowering Dogwood in good to fair condition that could be relocated. Estimated transplant cost $1500 and needs pruning of dead material.
#31. 24" Norway Maple in good condition and should be retained.
#32. 15" Cherry in poor condition and should be removed.
#33. 36" Sycamore in good condition and should be retained.

In addition to the noted trees, there are 4-5 Limemound Spirea that could be relocated by others.


STATE STREET
SECOND STREET
FIRST STREET
JEFFERSON STREET
BLOCK 1
#1
#2
#3
#4
#5
#6
#7
#8
#9
#10
#11
#12
#13
#14
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#16
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#31
#32
#33
#41
#42
#43
414 2nd STREET
412 2nd STREET
117 W. STATE
115 W. STATE
111 W. STATE
105 W. STATE
103 W. STATE
190 W. JEFFERSON
180 W. JEFFERSON
166 W. JEFFERSON
108 W. JEFFERSON
102 W. JEFFERSON

Block 2, bordered by Second Street on the west, Jefferson Street on the north, existing Out-Patient Surgery Center (to remain) on the east, and Bannock Street on the south. Starting at mid block on Second Street working clockwise.

121 W. Jefferson St.

#1. 24" Silver Maple in poor condition should be removed. This could be replaced with an under-planting of a more desirable species or planted after construction is completed in this area.
#2. 4" Elm in good condition. Recently planted and should be retained.
#3. 4" Elm in good condition. Recently planted and should be retained.
#4. 6" Tulip Tree in good condition and should be retained.
#5. 8" Norway Maple in good condition and should be retained.
#6. 8" Honey Locust in good condition and should be retained.

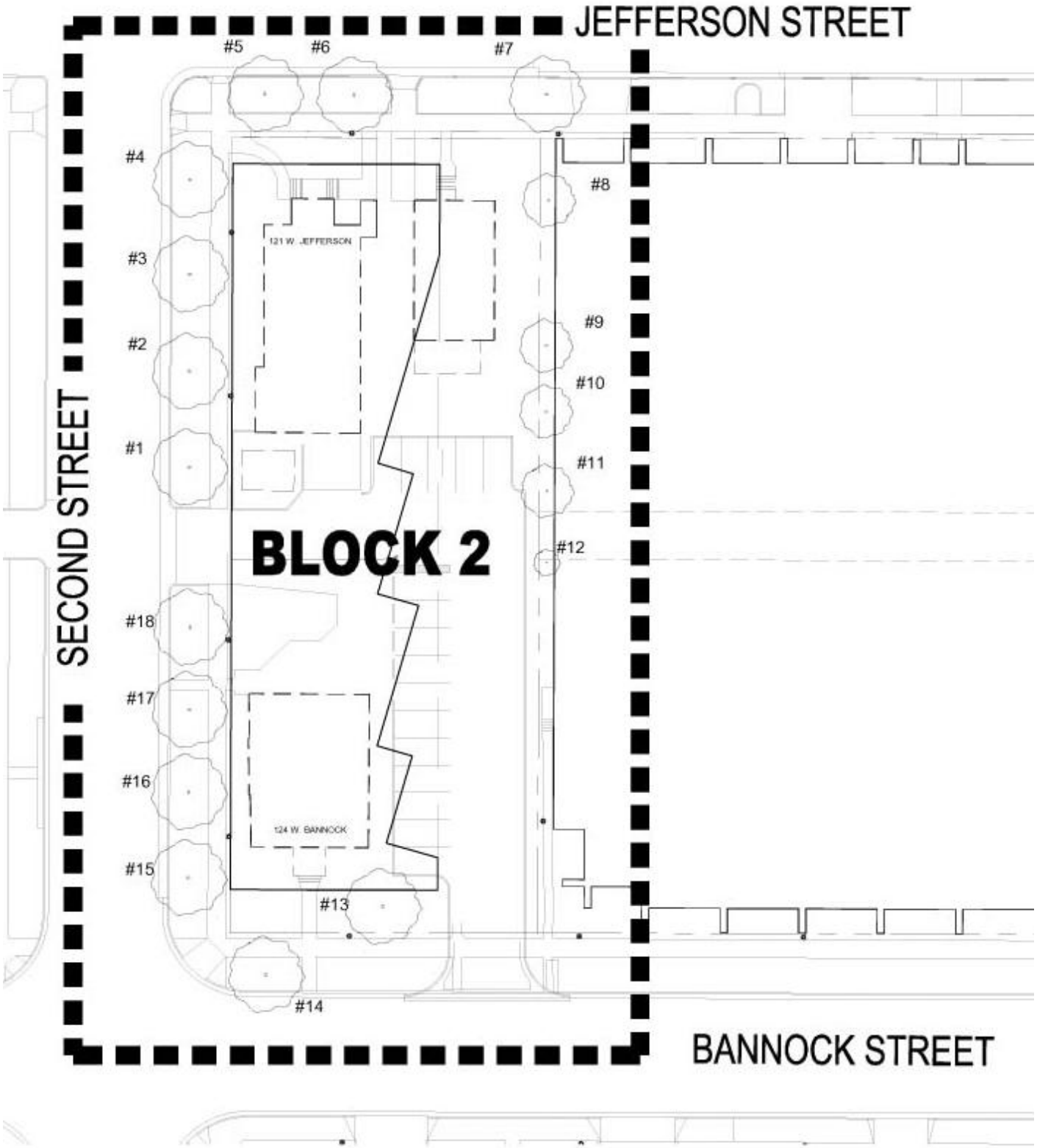
Trees adjacent to the Out-Patient Surgery Center but effected by Master Plan and Construction

This landscape area may be completely replaced during construction.

#7. 48" Elm in poor condition. May not be within limits of future construction and, therefore, may be retained. This could also be replaced with an under-planting of a more desirable species or planted after construction is completed in this area.
#8. 12" Columnar Oak in poor condition and should be removed. May not require mitigation.
#9. 10" Columnar Oak in poor condition and should be removed. May not require mitigation.
#10 18" Hawthorn in poor condition and should be removed. May not require mitigation.
#11. 20" Columnar Oak in poor condition and should be removed. May not require mitigation.
#12. 25' tall Columnar Arborvitae in good condition and should be retained. May require mitigation.

124 W. Bannock St.

#13. 48" Elm in fair to poor condition and will be removed. May require mitigation.
#14. 30" Silver Maple in fair to poor condition and should be retained. This could be replaced with an under-planting of a more desirable species or planted after construction is completed in this area.
#15. 8" Linden in good condition and should be retained.
#16. 36" Silver Maple in fair to poor condition and should be retained. This could be replaced with an under-planting of a more desirable species or planted after construction is completed in this area.
#17. 6" Ash in fair condition and should be retained.
#18. 8" Ash in fair condition and should be retained.


JEFFERSON STREET
#5
#6
#7
#4
#8
121 W. JEFFERSON
#3
#9
#2
#10
#1
#11
BLOCK 2
#12
SECOND STREET
#18
#17
#16
124 W. BANNOCK
#15
#13
#14
BANNOCK STREET

Block 3, bordered by First Street on the west, Fort Street on the north and east, and Jefferson Street on the south. Starting at mid block on First Street working clockwise.

414 First St.

#1. 24" Linden in fair condition and should be retained (may be outside future construction limits). Needs some dead wood pruned to regain shape.
#2. 20" Linden in fair to poor condition, replace with under-planting (may be outside future construction limits) or planted after construction is completed in this area.
#3. 18" Sweetgum in good condition and should be retained (may be outside future construction limits).
#4. 8" Japanese Maple in fair to good condition that could be moved. Estimated transplant cost $1500.
#5. 12" Black Locust in poor condition and needs to be removed and may not require any mitigation if removed

In addition to the noted trees, there are 8-10 Roses, some clump grasses (Pampas and Blue Oat), and some Hostas that could be relocated by others.

121 E. Fort St.

#6. 20" Sweetgum in fair to poor condition and should be replaced with an under-planting of a more desirable species during construction.

In addition to the noted trees, there are 10-12 Roses, 10-12 Boxwood, and 12-15 Daylily on the north and east sides of the building that could be relocated by others.

214 Jefferson St.

#7. 24" Honey Locust in fair to poor condition. replace with under-planting or planted after construction is completed in this area. May require mitigation if removed.
#8. 15" Honey Locust in good condition and should be retained. May require mitigation if removed.
#9. 18' tall by 10' diameter White Fir that could be moved. Estimated transplant cost $1500.
#10. 10" Honey Locust in good condition and should be saved. Could also be moved. Estimated transplant cost $1250.
#11. 48" Silver Maple in fair to good condition and should be retained because of size and condition. May require mitigation if removed.
#12. 4" Japanese Maple in poor condition and should be removed. May not require mitigation if removed.
#13. 18" Koster Blue Spruce in poor condition and should be removed. May not require mitigation if removed.
#14. 10" Norway Maple in good condition that could be moved. Estimated transplant cost $1250. May require mitigation if removed.
#15. 8" Norway Maple in poor condition and should be removed. May not require mitigation if removed.

In addition to the noted trees, there are 9-10 Spirea and 1-2 Mugo Pine at the sign on the corner of Jefferson and E. Fort and that could be relocated by others.

148 Jefferson St.

#16. Giant Sequoia, some discussion about moving this tree has taken place in the past. SLHS will need to contact tree transplant specialist such as Environmental Design or Senna Tree C. for estimated moving cost. May require mitigation if removed.

#17. 24" White Oak in fair to good condition. If Giant Sequoia is moved this will have to be removed prior. May require mitigation if removed.

#18. 36" Honey Locust in fair to poor condition and should be removed. May require some mitigation.

#19. 12" Hawthorn in poor condition and should be removed. May not require mitigation if removed.

#20. 3" Ash, newly planted and could be relocated. Estimated transplant cost $500.

#21. 24" Honey Locust in good condition may require mitigation if removed..

#22 & #23. 2 - 15" Honey Locust (each) in fair to poor condition and should be removed. May require mitigation if removed.

#24. 4" Hornbeam in good condition that could be moved. Estimated transplant cost $600.

#25, #26, & #27. 3 - 12" Hornbeams in fair condition may require mitigation if removed.

#28 & #29. 2 – 12" Flowering Pear in poor condition and should be removed. May not require mitigation if removed.

#30, #31, & #32. 3 - 12"–18" Crabapple in fair to poor condition and will be removed. May require mitigation.

In addition to the noted trees, there are 5-6 Roses, 18-20 Kelsey Dogwood, 2 clump Feather Grasses, and 10-12 Daylily north of the Sequoia that could be relocated by others.

140 Jefferson St.

#33. 18" Norway Maple in fair condition and should be retained.

34. 6" Hornbeam in good condition that could be retained or moved. May not be the most desirable street tree. Estimated transplant cost $1200.

#35, #36, #37, & #38. 4 - 5" Hornbeams, # 37 and # 38 in good condition that could be moved. Estimated transplant cost $600 (each). #35 and # 36 in fair to poor condition that should be removed. May not require mitigation if removed.

#39. 18" Norway Maple in good condition and should be retained if possible.

#40. 18" Koster Blue Spruce in fair to poor condition. May not require mitigation if removed.

#41, #42, & #43. 3 - 20" Flowering Pear in good to fair condition and should be retained if possible. May require mitigation if removed.

#44. 12' Spruce in good condition and could be moved easily. Estimated transplant cost $600.

In addition to the noted trees, there are approximately 25 Spirea on the west side of the building that could be relocated by others.

FORT STREET
BLOCK 3
BLOCK 3
JEFFERSON STREET
FIRST STREET

Block 4, south side of Jefferson Street - north side of existing SLHS Hospital effected by Master Plan.

#1. 10" Crabapple in fair to good condition and should remain (probably not affected by construction).
#2. 6" Flowering Pear in poor condition and should be removed and replaced after construction (probably not affected by construction).
#3. 6" Crabapple in fair to poor condition and will be removed. May not require mitigation.
#4. 5" Crabapple in poor condition and will be removed. May not require mitigation.
#5. 6" Crabapple in fair condition and will be removed. May not require mitigation.
#6. 6" Crabapple in fair condition and will be removed. May not require mitigation.
#7. 8" Flowering Pear in fair to good condition and will be removed. May require mitigation.
#8, #9, & #10. 3 – 8" Columnar Oak in good condition and should be retained. May require mitigation if removed.

BLOCK 3
BLOCK 4
JEFFERSON STREET
AVENUE B
#1
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#3
#4
#5
#6
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#11
#12
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Block 5, north half of the block bordered by Avenue B on the west, Jefferson Street on the north, and Avenue C on the east. Starting at mid block on Avenue B working clockwise.

305 E. Jefferson St. and Existing SLHS Parking

#1. 15" Norway Maple in fair to poor condition and will be removed. May not require mitigation.
#2. 8" Crabapple in poor condition and should be removed. May not require mitigation.
#3 & #4. 2 – 20" Flowering Pear (both multi-stem) in fair to good condition, and will be removed. May require mitigation.
#5. 8" Crabapple in fair condition and will be removed. May require mitigation.
#6. Weeping Blue Atlas Cedar (10'-12' spread) and could be relocated. Estimated transplant cost $ 400.
#7. 2" Smoke Tree in poor condition and will be removed.
#8. 8" Norway Maple in fair condition and will be removed. May require mitigation.
#9. 20" Elm in fair condition and should be retained.
#10. 6" Ash in fair condition and should be retained. Needs pruning of dead material.
#11 & #12. 2 – 48" Elm in fair condition. These could be replaced with under-plantings of a more desirable species or planted after construction is completed in this area.
#13 & #14. 2 – 15" Ash in fair to good condition and should be retained. May require mitigation if removed
#15. 8" Hawthorn in fair to good condition and will be removed. It may require mitigation.
#16, #17, #18, & #19. 4 – 5" Hawthorn, all in poor condition and will be removed. It may not require mitigation.
#20. 8" Tree of Heaven (multi-stem) and will be removed. Not a desirable tree and, therefore, may not require mitigation.
#21 & #22. 2 - 6" Hawthorn in fair to poor condition and will be removed. May not require mitigation
#23. 20" Crabapple in fair to good condition and will be removed. It may require mitigation.

JEFFERSON STREET
AVENUE C
AVENUE B
BLOCK 5
305 E. JEFFERSON
EXISTING SLHS
PARKING
#1
#2
#3
#4
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#6
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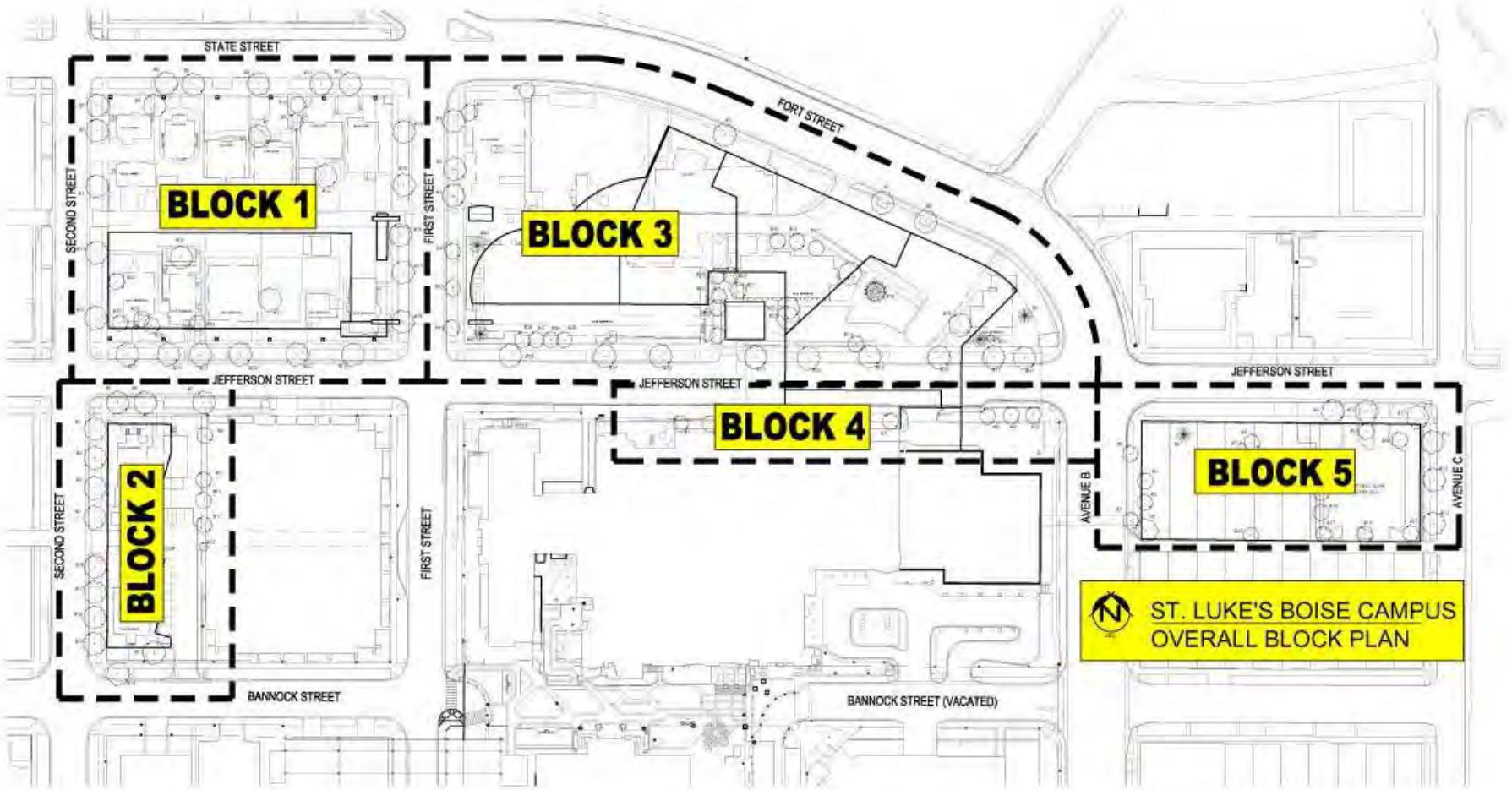
STATE STREET
FORT STREET
SECOND STREET
FIRST STREET
BLOCK 1
BLOCK 3
JEFFERSON STREET
JEFFERSON STREET
JEFFERSON STREET
BLOCK 4
BLOCK 5
BLOCK 2
SECOND STREET
FIRST STREET
AVENUE B
AVENUE C
BANNOCK STREET
BANNOCK STREET (VACATED)
ST. LUKE'S BOISE CAMPUS
OVERALL BLOCK PLAN