Lewis Clark Valley

METROPOLITAN PLANNING ORGANIZATION

PROFESSIONAL ENGINEER
REGISTERED
12490
STATE OF IDAHO
NATHAN CLEAVER

12.10.2014

# corridor solutions

*for all modes of transportation and streetscape*

## Main and "D" Corridor Study

**Approved** December 10, 2014

KELLER associates

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# Table of Contents

Executive Summary ..... ES-1

Description of Issues ..... 1

What was discovered ..... 1

What the public said ..... 3

Potential Solutions ..... 5

Short-Term Common Improvements ..... 5

Long-Term Concept 1 – One-Way Couplet Enhancements ..... 11

Long-Term Concept 2 – Two-Way Street Conversion ..... 16

Long-Term Concept 3 – One Lane on Main Street / Two-Way on D ..... 20

Long-Term Concept 4 – Pedestrian Mall ..... 25

Public Opinion of Solutions ..... 29

Recommendations ..... 35

Appendix

A – Cost Estimates

B – Traffic Simulation Results

C – Existing Conditions Technical Memorandum

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# Executive Summary

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## Introduction

**Why this study was proposed**

Downtown Lewiston streets and utility infrastructure are aging and require reconstruction in the future. Replacement of these systems should be completed based on a comprehensive plan to minimize future construction revisions. The plan should address all modes of transportation in the corridor (cars and trucks, transit, bicycles, and pedestrians). In addition, streetscape needs (sidewalks, medians, lights, landscaping, and sidewalk furnishings) should be incorporated into the plan.

The purpose of this study is to guide future infrastructure improvements on Main Street and D Street. The existing traffic was analyzed under 2014 and projected 2040 traffic conditions. Short-term solutions are recommended for immediate implementation. These include improvements to streetscape, public transit, and pedestrian and bicycle facilities. Four long-term concepts were evaluated under projected 2040 conditions for future implementation. These should be considered and analyzed after the short-term improvements have been implemented. Each concept features a unique traffic pattern that may significantly influence downtown businesses and community vitality.

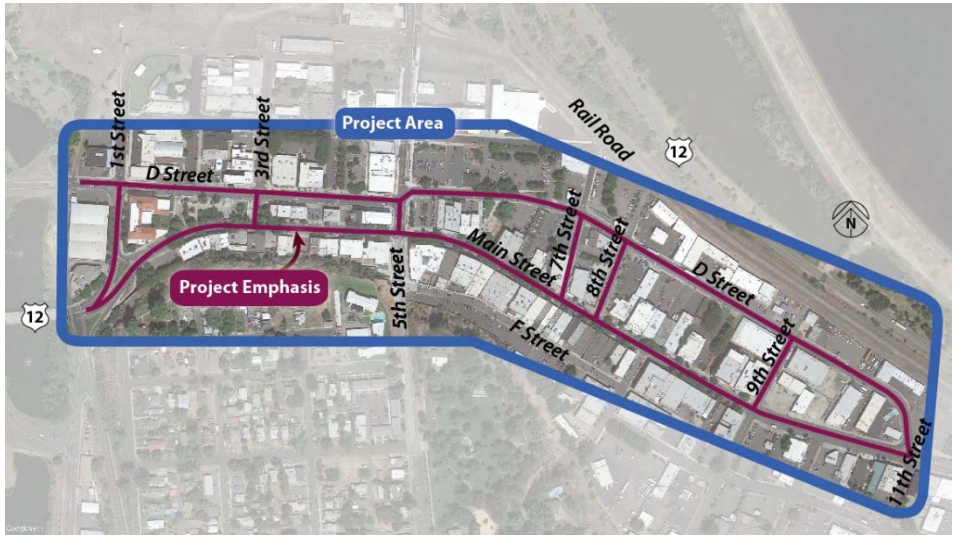



*Figure 1: Study Area*

## Study Area

The study area (shown in Figure 1) stretches from 1st Street to 11th Street along the Main Street and D Street corridors.

## Existing Issues

The consultant team analyzed the area for deficiencies and held public meetings on August 19th and September 25th, 2014 to obtain public opinion of the issues. The following primary issues were identified:

- A more pedestrian-friendly downtown is desired
- Some existing pedestrian paths do not meet Americans with Disabilities Act (ADA) standards
- The streetscape on Main Street is cluttered
- Many Main Street restaurants have attractive outdoor seating areas, but they leave little room for pedestrian travel
- Main Street trees are overgrown and cover storefronts and cast shadows over the roadway, sidewalks and pedestrian crossings
- Excessive vehicle speeds occur on both Main and D Streets
- Neither Main Street nor D Street have bike lanes and do not accommodate bicyclists well
- The mid-block crossings are a safety concern
- D Street between 7th and 11th Streets is industrial land use and unappealing to pedestrians
- A comprehensive vision of downtown has not been established

## Short-Term Common Improvements

Short-term solutions to existing issues are recommended in Figure 2 to reduce vehicle speeds and improve the streetscape and service to pedestrians, bicyclists, and public transit.

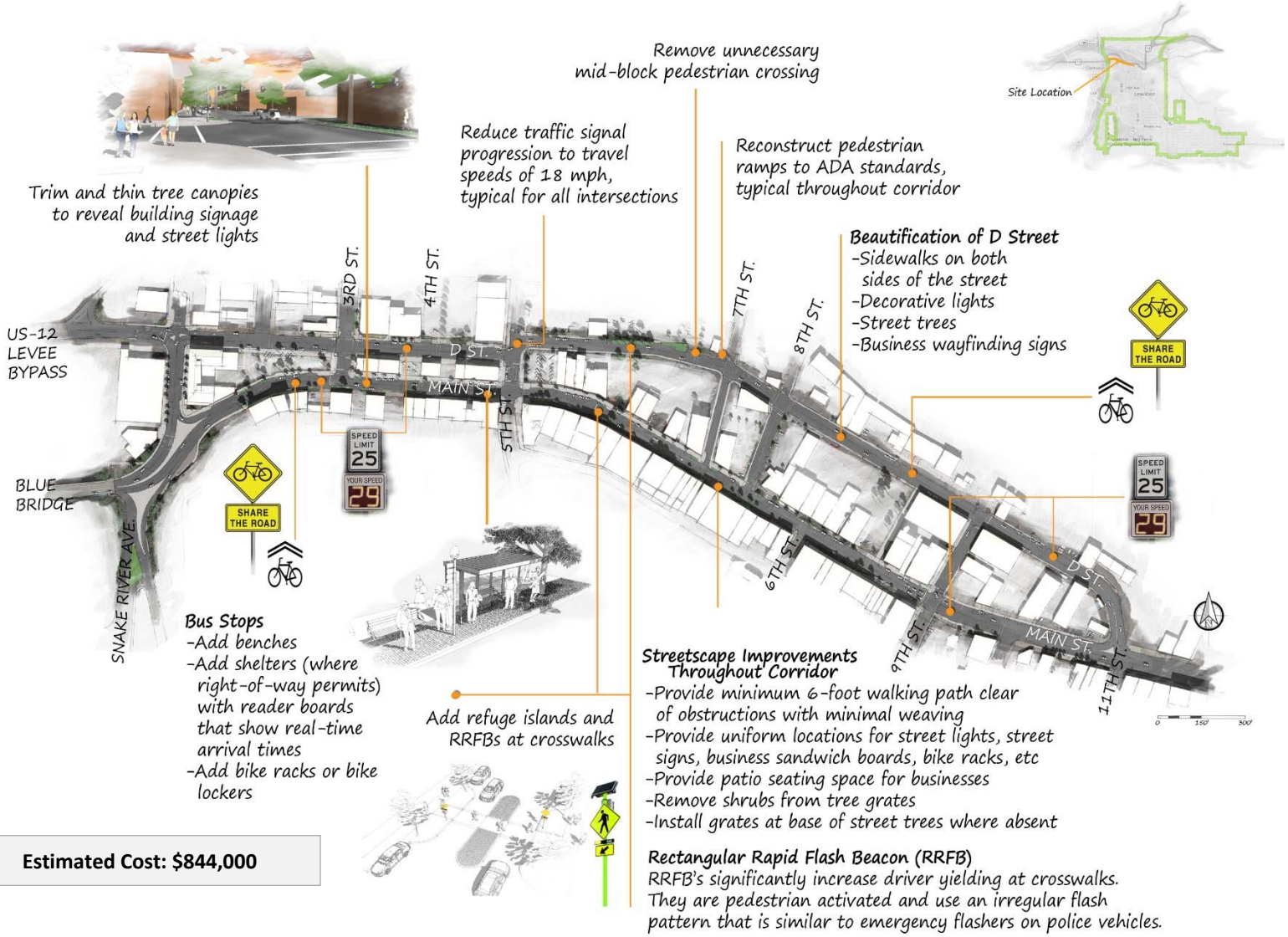



*Figure 2: Short-Term Common Improvements*

**Advantages:**

- **Lowest cost concept**
- **Improves traffic flow and safety at 1st/D and Main/11th/D intersections**
- **May discourage speeding downtown**

**Disadvantages:**

- **Possible increased delay to westbound Levee Bypass traffic**
- **Possible loss of up to eight parking stalls**

**Estimated Cost: $250,000**

**Public Favorability: Favorable**

## Long-Term Concept 1 – One-Way Couplet Enhancements

Concept 1 would enhance the existing one-way couplet at the east and west ends of the corridor. Improvements include:

- Extending the eastbound through merge lane at the Main/11th/D intersection
- Constructing a concrete lane divider at the beginning of D Street
- Implementing dual westbound left turn lanes at the 1st/D intersection

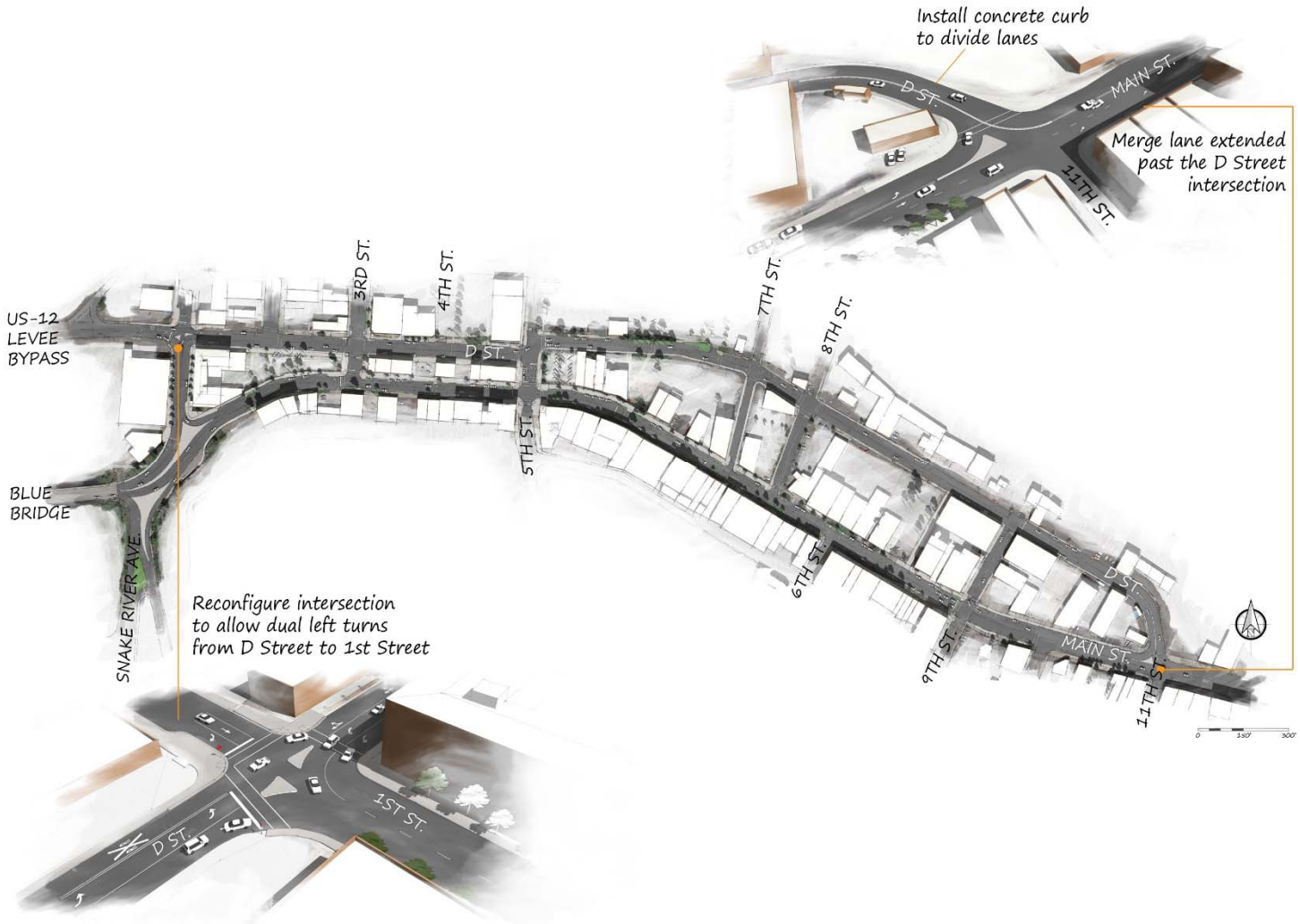
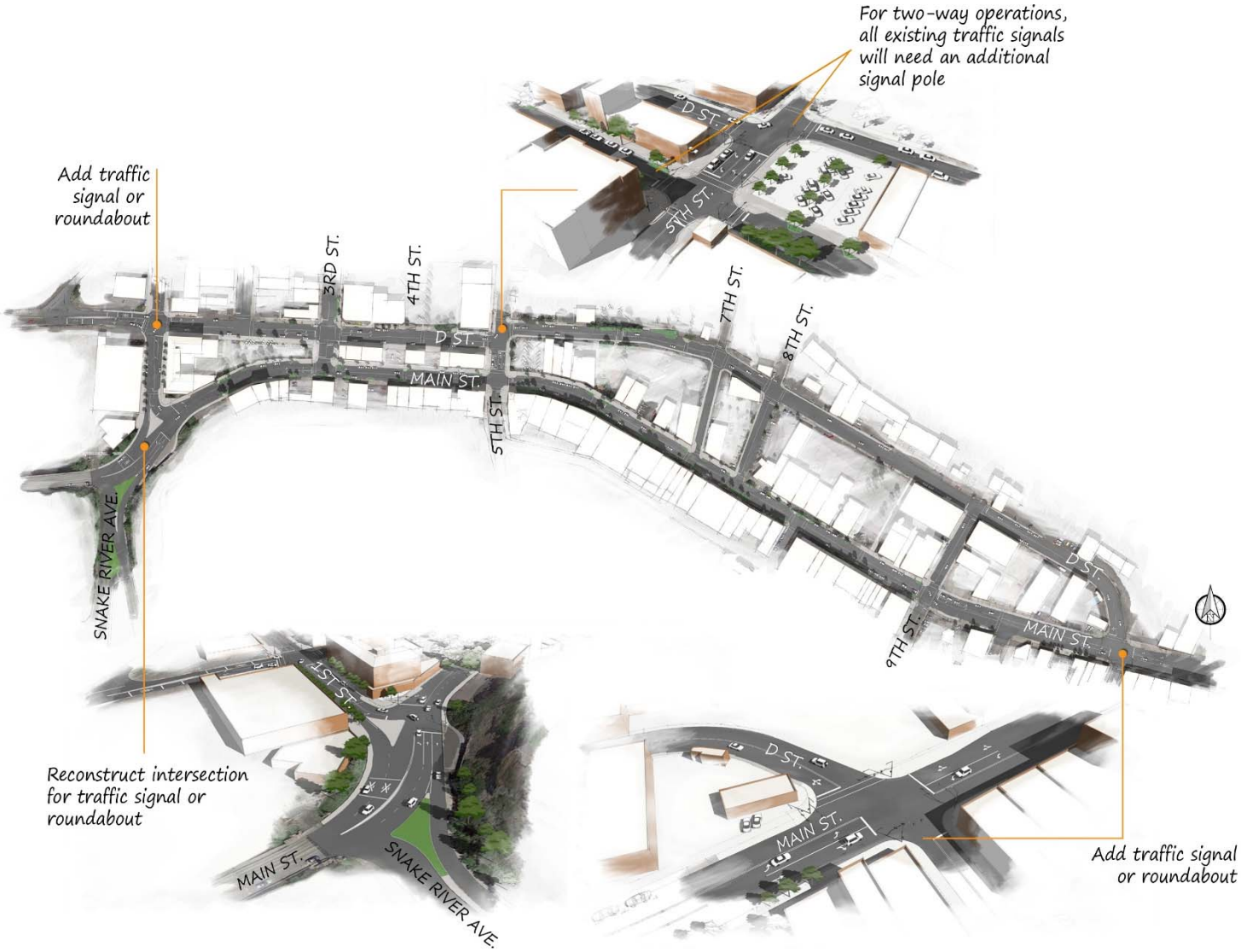



*Figure 3: Concept 1 Summary Sketch*

## Long-Term Concept 2 – Two-Way Street Conversion

Concept 2 converts the one-way system to two-way traffic on both Main and D Streets. All existing one-way traffic signals would need to be upgraded for two-way operations. Also, two-way traffic necessitates installation of traffic signals or roundabouts at 1st/Main, 1st/D, and Main/11th/D intersections. Figure 4 shows a summary of improvements.




**Advantages:**

- **May improve business access**
- **Improved mid-block crossing safety**

**Disadvantages:**

- **High cost**
- **Possible Main Street traffic congestion**
- **Reduced D Street business drive-by traffic**

**Estimated Cost: $5,887,000**

**Public Favorability: Somewhat Favorable**

*Figure 4: Concept 2 Summary Sketch*

**Advantages:**

- **Potential for downtown business growth**
- **Pedestrian friendly**
- **Increased street parking capacity**

**Disadvantages:**

- **Possible D Street traffic congestion**
- **Potential business traffic diverted away from downtown**
- **Reduced Main Street business drive-by traffic**

**Estimated Cost: $3,908,000**

**Public Favorability: Most Favorable**

## Long-Term Concept 3 – One Lane on Main Street / Two-Way on D Street

Concept 3 would convert D Street from one-way to two-way traffic. Main Street remains a one-way street but narrows to one lane from 3rd to 9th Street (or 5th to 9th if desired). The lane removal adds space for diagonal parking. Two-way traffic on D Street necessitates traffic signals or roundabouts at the 1st/D and Main/11th/D intersections and upgrade of signals to two-way operations. The additional parking and pedestrian appeal of narrowing Main Street to one lane can facilitate business growth. However, this traffic pattern could also be detrimental to downtown businesses because it increases congestion and diverts traffic away from downtown.

Figure 5 shows a summary of the proposed improvements.

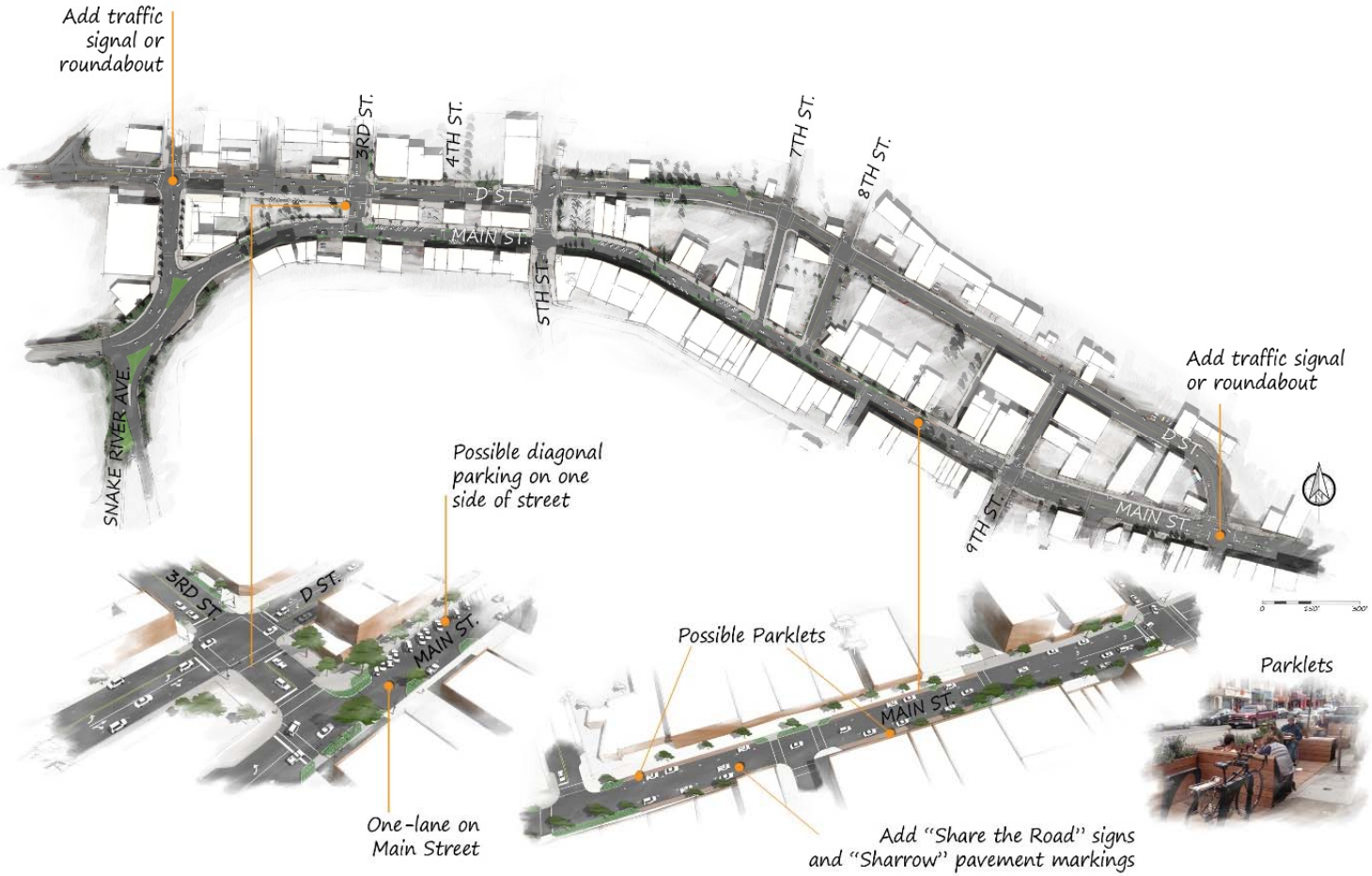
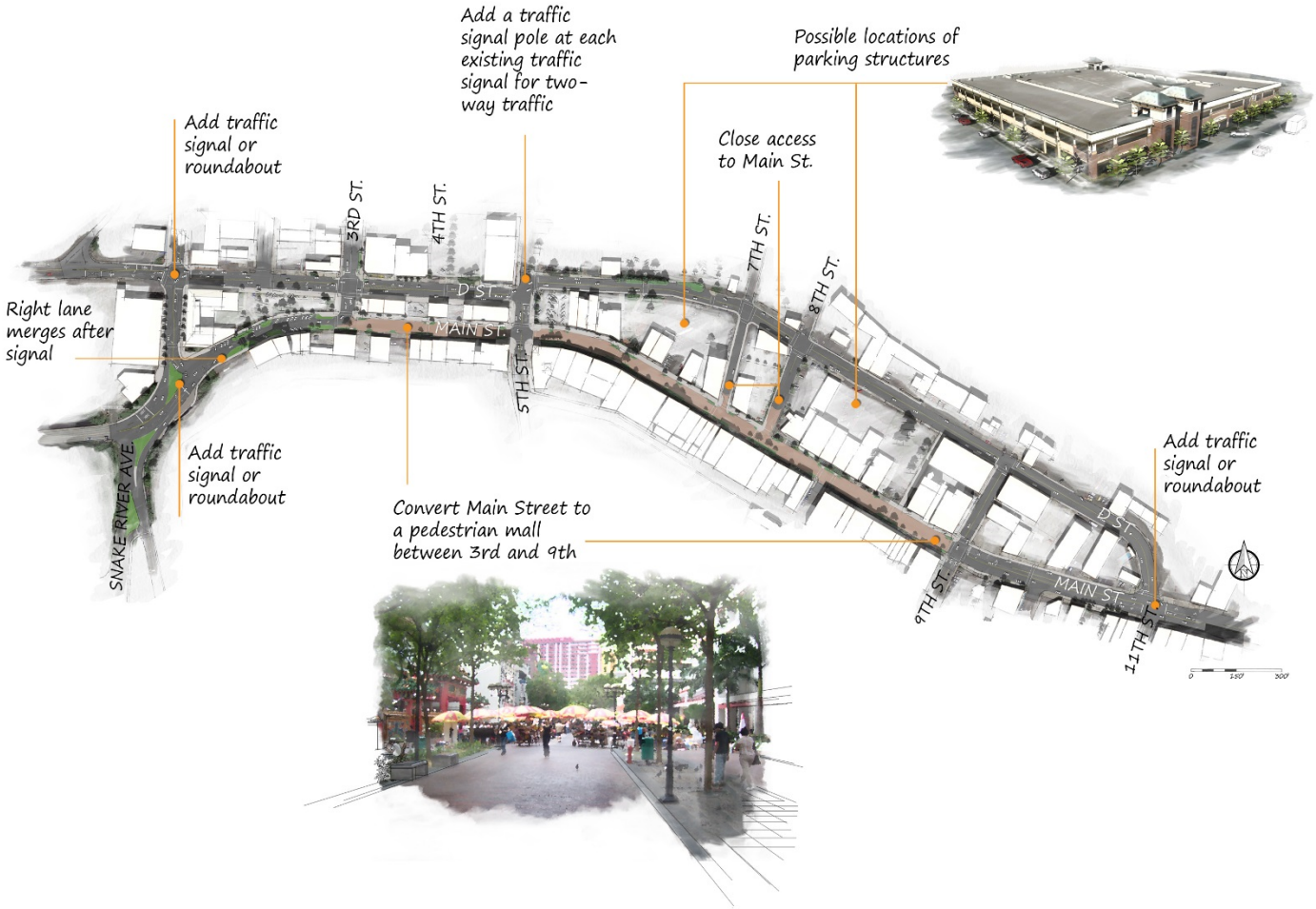



*Figure 5: Concept 3 Summary Sketch*

## Long-Term Concept 4 – Pedestrian Mall

Concept 4 includes plans to prohibit vehicle traffic on Main Street from 3rd to 9th Streets to create a pedestrian mall. Parking structures can make up for lost street parking on Main Street. D Street would be converted from one-way to two-way operation. Two-way streets require installation of traffic signals or roundabouts at the 1st/D and Main/11th/D intersections and upgrade of signals to two-way operations. The pedestrian mall should be supported by public transit and adequate parking to ensure its success.

Figure 6 shows a summary of the proposed improvements.




**Advantages:**

- **Pedestrian friendly**
- **Possible downtown revitalization if implemented properly**
- **Possible increased commercial business on D Street**

**Disadvantages:**

- **Highest estimated cost**
- **Likely traffic congestion in downtown**
- **Diverts most traffic away from downtown**
- **Most unpredictable outcome of all concepts**

**Estimated Cost: $11,530,000 (Includes parking structure)**

**Public Favorability: Least Favorable**

*Figure 6: Concept 4 Summary Sketch*

## Concept Traffic Implications

Table 1 shows 2040 Average Daily Traffic (ADT) projections for all concepts and the Do Nothing condition. Concept 1, which maintains the current traffic circulation, is projected to have no effect to the travel patterns in downtown. Concept 2 has a slight negative effect to traffic on Main Street with slightly higher volumes. However, it has a significantly negative effect on D Street with a large volume reduction which could be detrimental to businesses that rely on pass-by traffic.

*Table 1: Projected 2040 ADT for Each Concept*

| | | DO NOTHING | CONCEPT 1 | CONCEPT 2 | CONCEPT 3 | CONCEPT 4 |
|---|---|---|---|---|---|---|
| MAIN STREET | EASTBOUND ADT | 10,400 | 10,400 | 4,800 | 3,100 | 0 |
| | WESTBOUND ADT | 0 | 0 | 6,600 | 0 | 0 |
| | TOTAL ADT | 10,400 | 10,400 | 11,400 | 3,100 | 0 |
| | ADT CHANGE: | | 0 | 1,000 | -7,300 | -10,400 |
| | **% ADT CHANGE:** | | **0%** | **10%** | **-70%** | **-100%** |
| D STREET | EASTBOUND ADT | 0 | 0 | 1,200 | 1,700 | 4,000 |
| | WESTBOUND ADT | 9,000 | 9,000 | 1,600 | 7,500 | 5,000 |
| | TOTAL ADT | 9,000 | 9,000 | 2,800 | 9,200 | 9,000 |
| | ADT CHANGE: | | 0 | -6,200 | 200 | 0 |
| | **% ADT CHANGE:** | | **0%** | **-69%** | **2%** | **0%** |
| LEVEE BYPASS | EASTBOUND ADT | 3,600 | 3,600 | 7,100 | 7,500 | 7,800 |
| | WESTBOUND ADT | 5,000 | 5,000 | 4,600 | 5,000 | 4,700 |
| | TOTAL ADT | 8,600 | 8,600 | 11,700 | 12,500 | 12,500 |
| | ADT CHANGE: | | 0 | 3,100 | 3,900 | 3,900 |
| | **% ADT CHANGE:** | | **0%** | **36%** | **45%** | **45%** |
| TOTALS | EASTBOUND ADT | 14,000 | 14,000 | 13,100 | 12,300 | 11,800 |
| | WESTBOUND ADT | 14,000 | 14,000 | 12,800 | 12,500 | 9,700 |
| | TOTAL ADT | 28,000 | 28,000 | 25,900 | 24,800 | 21,500 |
| | ADT CHANGE: | | 0 | -2,100 | -3,200 | -6,500 |
| | **% ADT CHANGE:** | | **0%** | **-8%** | **-11%** | **-23%** |

Concept 3 may cause D Street congestion. It reduces traffic volumes on Main Street, which could be detrimental to businesses that rely on pass-by traffic. Concept 4 reduces traffic in the area by 23%, but maintains the same ADT on D Street. Concept 4 will also introduce significant congestion at the 1st/D/Bypass intersection.

## Evaluation Matrix

The evaluation matrix, shown below in Table 2, evaluates each solution alternative by its effect on eight considerations: traffic, pedestrians, bicyclists, parking, public transit, streetscape, public favorability, and estimated cost.

*Table 2: Solution Evaluation Matrix*

| | SHORT-TERM | LONG-TERM | | | |
|---|---|---|---|---|---|
| | **COMMON IMPROVEMENTS** | **CONCEPT 1** | **CONCEPT 2** | **CONCEPT 3** | **CONCEPT 4** |
| **TRAFFIC** | + | + | – | – – | – – – |
| **PEDESTRIANS** | + | o | + | + + | + + + |
| **BICYCLISTS** | + | o | o | + | + |
| **PARKING** | o | o | o | + + | – |
| **PUBLIC TRANSIT** | + | o | o | o | o |
| **STREETSCAPE** | + | o | o | o | + |
| **PUBLIC FAVORABILITY** | Favorable | Favorable | Somewhat Favorable | Most Favorable | Least Favorable |
| **ESTIMATED COST** | $0.84 Million | $0.25 Million | $5.89 Million | $3.90 Million | $11.53 Million |

+ = positive effect
o = minimal or no effect
– = negative effect

## Recommendations

1. **Implement short-term Common Improvements.**

   Implementation can begin immediately. The total cost of these improvements is estimated at $844,000 but costs can be divided into smaller work packages. See the Potential Solutions section starting on Page 5 for improvement justifications and details. Improvements include:

   - Install radar speed signs at four locations along the corridor:
     - Main Street between 1st and 3rd Streets
     - Main Street between 9th and 10th Streets
     - D Street between 7th and 8th Streets
     - D Street between 9th and 10th Streets
   - Set signal progression timing for 18 mph on Main and D Streets
   - Install Rectangular Rapid Flashing Beacons (RRFBs) and refuge islands at mid-block crossings between 5th and 7th Streets on both Main and D Streets
   - Upgrade sidewalks and ramps to comply with Public Right-of-Way Accessibility Guidelines (PROWAG)
   - Extend Lewiston Transit bus service later in the evenings and on weekends
   - Construct bus shelter with benches and bike racks or lockers on Main Street immediately west of 5th Street (where right-of-way allows)
   - Create an online real-time bus arrival system with message boards and smartphone access info at bus stops
   - Install business wayfinding signs on both Main and D Streets
   - Install “Share the Road” signs, “sharrow” pavement markings, and bike racks for bicyclists on Main and D Streets
   - Develop a tree replacement plan
   - Main Street – Establish continuous 6-foot wide walking path by removing empty planters, excess signs, and other obstructions
   - Main Street – Trim tree canopies to reveal business signage and expose street lights and signals
   - Main Street – Install grates at the base of street trees where absent
   - D Street – Construct continuous sidewalks, install street lights, and plant street trees from 5th to 11th Streets
   - D Street – Remove unnecessary mid-block crossing 100 feet west of 7th Street

2. **Conduct public and business outreach to determine future vision of downtown Lewiston.**

   The public input gathered in this study was not significant enough to justify the large-scale traffic pattern changes proposed in the concepts. The proposed traffic changes could have major positive or negative implications on downtown business and vitality. Therefore, this proposed public outreach study should gather input from hundreds of Lewiston residents. Public opinion, and especially downtown business opinion, should be heavily considered when choosing the best solution.

   The recommended budget for the public outreach study is $50,000. The effects of the Common Improvements should be analyzed to determine if further upgrades are needed. Long-term Concepts 1, 2, and 3 can be used as starting points for the study solutions. Concept 4 is not recommended due to low public favorability and high cost.

3. **Implement most publicly favorable long-term concept.**

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# Description of Issues

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## Description of Issues

This section of the report describes existing conditions and issues on the Main and D Street corridor. Issues were identified by both the consultant team and Lewiston residents. See the Technical Memorandum in Appendix C for a complete discussion of existing conditions. Figure 8 shows a summary of identified issues.

**What was discovered**

**Traffic**

- Excessive speeds at the beginning and ends of the corridor on both Main and D Streets

**Pedestrians**

- Planters, patio seating, signs, and other obstructions constrict sidewalk walking path
- Continuous flashing amber pedestrian mid-block signals do not effectively warn drivers of crossing pedestrians
- Some pedestrian ramps and sidewalks do not comply with the Americans with Disabilities Act (ADA) requirements
- D Street sidewalks are discontinuous from 5th to 11th Streets

**Bicyclists**

- Absence of designated bike lanes or shared use signs on both Main and D Streets
- Bicyclists resort to riding on sidewalks, which is prohibited
- Lack of bike racks outside 5th Street

**Parking**

- Overall downtown parking capacity is adequate
- Certain sections of street parking stalls fill up before others

**Public Transit**

- 6 am to 7 pm weekday service; no weekend service
- Absence of bus stop amenities on Main and D Streets

**Streetscape**

- Overgrown tree canopies on Main Street cover storefronts and block motorists' line-of-site
- Tree grate shrubs on Main Street are overgrown and some tree grates are missing
- East D Street is devoid of streetscape amenities and unappealing for commercial development
- Some street trees are aging and will require replacement

*Figure 7: Bicyclist Riding on Sidewalk*

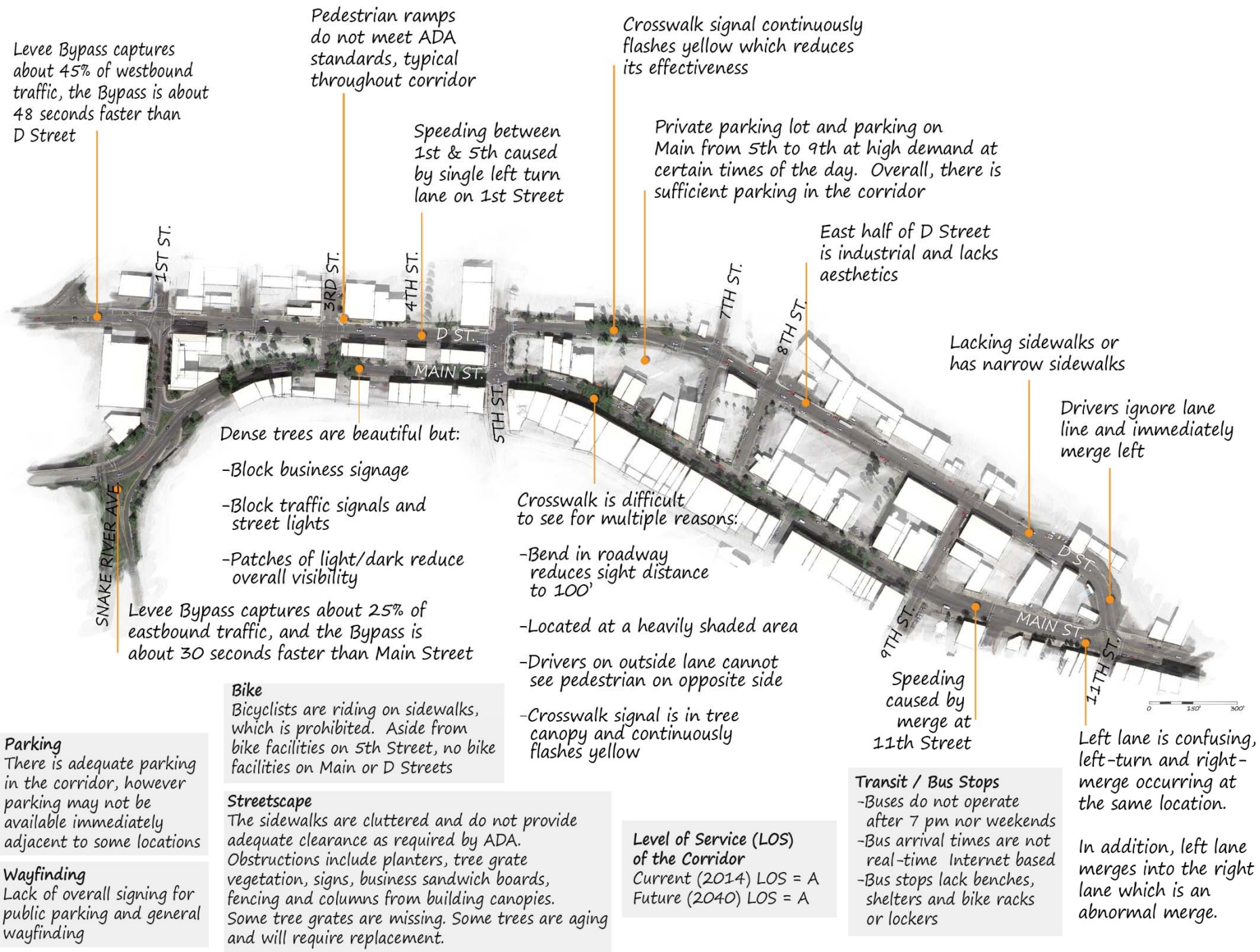



*Figure 8: Summary of Existing Conditions and Issues*

## What the public said

A public meeting was held at the Lewiston Library on August 19, 2014 from 3:30 pm to 6:30 pm. The purpose of the meeting was to gather input from the public to identify issues that can be addressed within the existing right-of-way of Main and D Streets.

A total of 45 individuals signed in and 28 comment forms were collected during the meeting. Three additional comments were received via email.

**Question 1 Summary**: What are 3 of your main concerns about the Main and D corridor?

The top response received related to pedestrian friendliness of the downtown area. Eighteen responses ranked this as their number one priority, while excess speed in the corridor ranked second. The "Other" category includes improvement cost, blocked line-of-sight due to street parking, lack of benches, and concerns that fall outside the study area and scope. Responses are summarized in Figure 9.

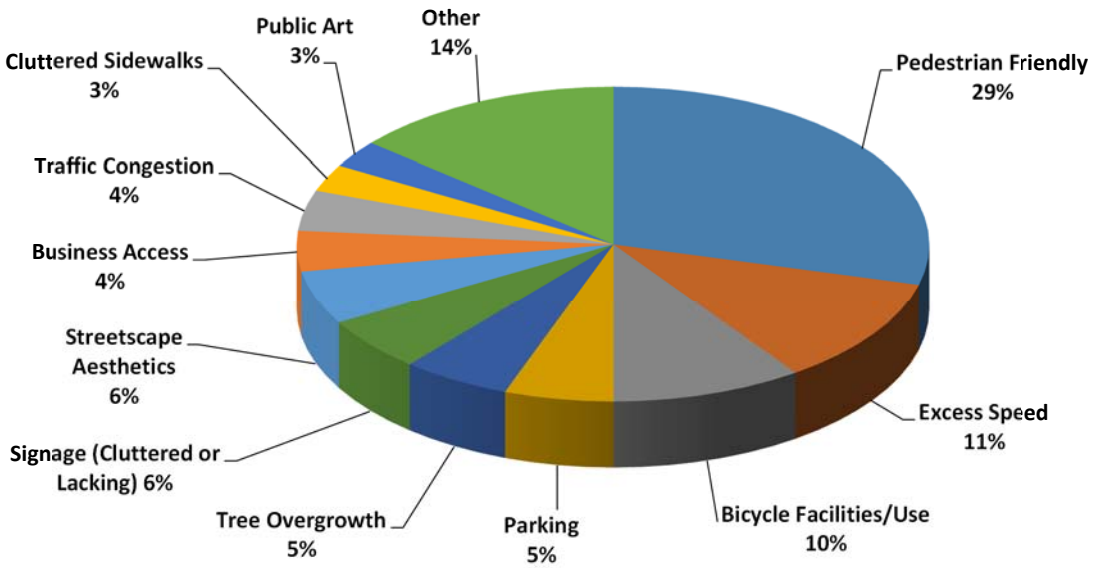
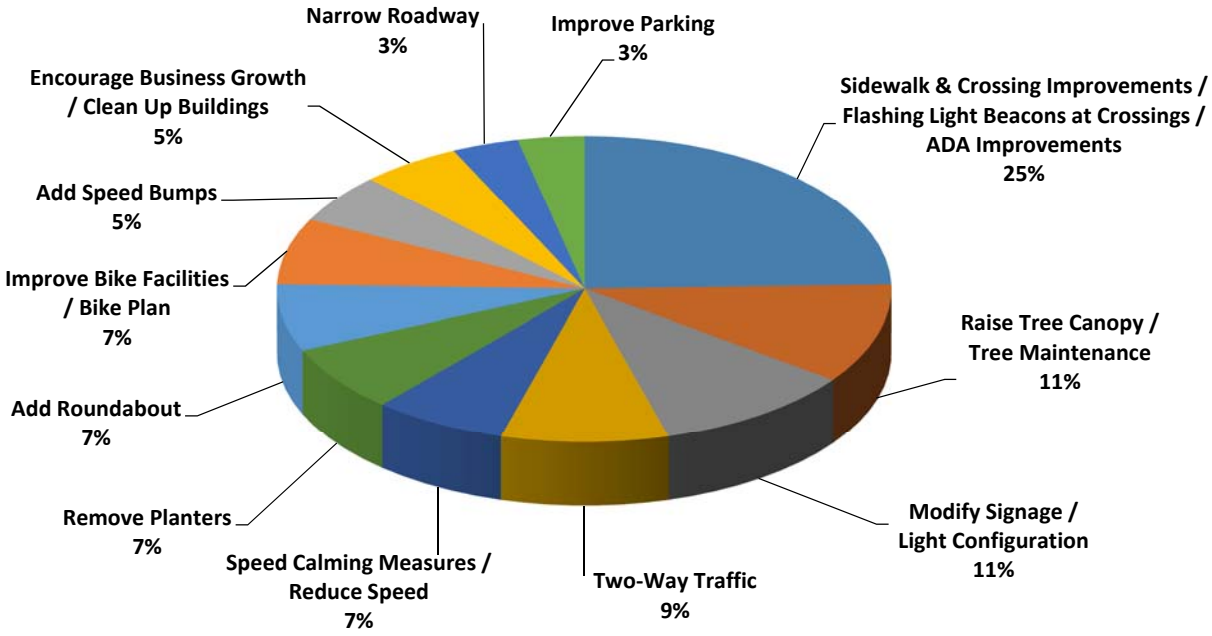



*Figure 9: Primary Concerns from Aug. 19, 2014 Open House*

**Question 2 Summary**: What are your suggestions / solutions to the concerns you identified above (in Question 1)?

Responses paralleled the ranking of Question 1. Many felt that improving pedestrian crossings with flashing beacons, lowering speed limits and improving ADA accessibility would enhance the walkability of the downtown area. Responses are summarized in Figure 10.

*Figure 10: Suggested Solutions from Aug. 19, 2014 Open House*



# Potential Solutions

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## Short-Term Common Improvements

This section describes the recommended short-term improvements (summarized in Figure 11). These improvements can be implemented immediately and in smaller work packages. Improvements are sorted into six categories as follows:

- Traffic
- Pedestrians
- Bicyclists
- Parking
- Public Transit
- Streetscape

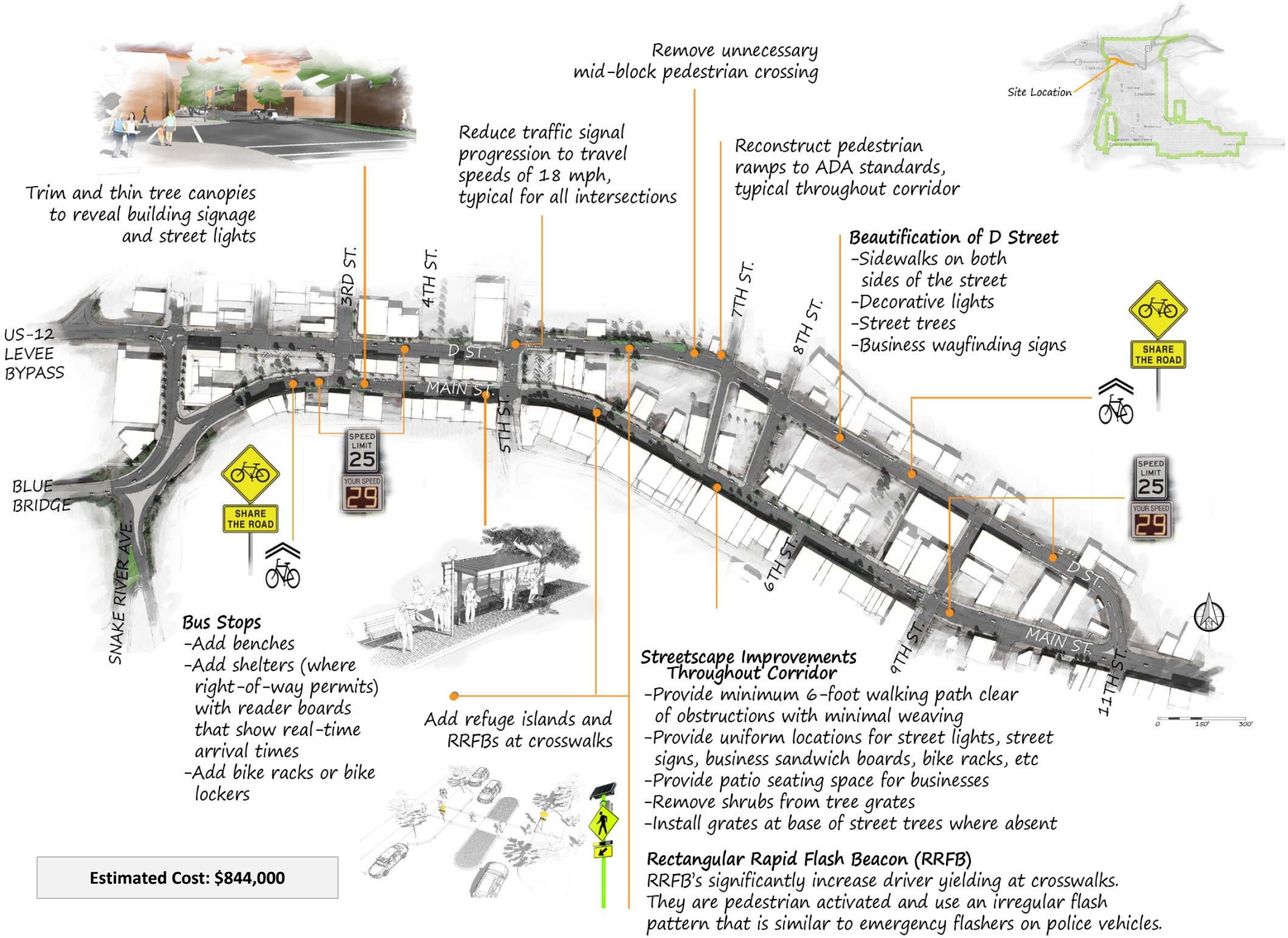



*Figure 11: Summary of Short-Term Common Improvements*

## Traffic

**Issues:**

- Excessive speeds at the beginning and ends of the corridor on both Main and D Streets. Speeding was a prominent concern of the public and was observed by the consultant team.

**Solutions:**

- Install radar speed signs (shown in Figure 12) at four locations along the corridor:
  - Main Street between 1st and 3rd Streets
  - Main Street between 9th and 10th Streets
  - D Street between 7th and 8th Streets
  - D Street between 9th and 10th Streets

  Vehicle speeds downstream of the radar speed signs should be measured every 6 months to evaluate long-term effectiveness.

- Set PM peak hour signal progression timing for 18 mph on both Main and D Streets. Signs stating the signal progression speed can be placed on signal poles at each intersection.

  This progression speed is roughly equal to the simulated average travel speed through the corridor with optimum signal timings and coordination under 2014 PM peak hour traffic conditions. Eighteen (18) miles per hour signal progression still allows drivers to travel at the 25 mph speed limit under certain scenarios. For example, Main Street vehicles crossing 3rd Street at the *end* of the green interval can progress through 9th Street at a constant 25 mph without being slowed by a red light. Therefore, 18 mph signal progression should provide traffic calming without significantly impeding natural traffic flow.

*Figure 12: Radar Speed Sign*

## Pedestrians

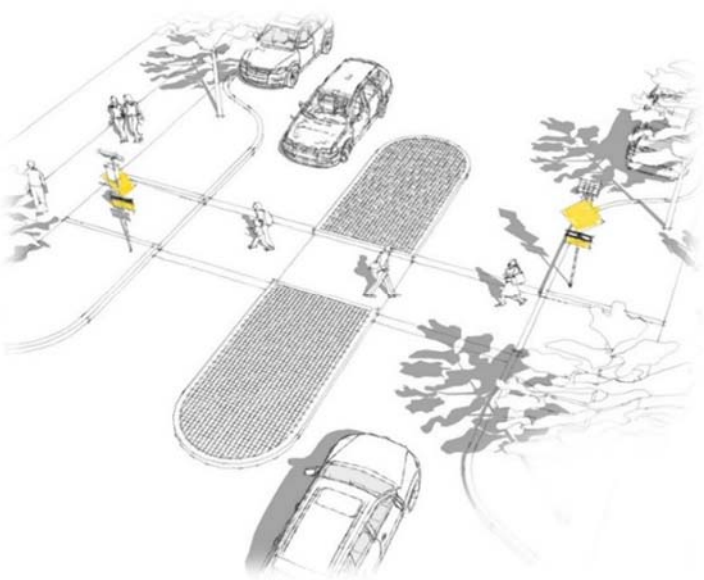
**Issues:**

- Existing continuous flashing amber signals do not effectively warn drivers of crossing pedestrians.
- Pedestrians are at risk when crossing two-lane one-way streets; vehicles in the near lane can hide pedestrians from view of drivers in the outside lane.
- Some pedestrian ramps and sidewalks do not comply with the Americans with Disabilities Act (ADA) requirements.
- D Street sidewalks are discontinuous from 5th to 11th Streets.

**Solutions:**

- Remove continuous flashing amber signals and install pedestrian-activated Rectangular Rapid Flashing Beacons (RRFBs) and refuge islands at mid-block crossings between 5th and 7th Streets on both Main and D Streets. The RRFBs (shown in Figure 13) should effectively signal both lanes to stop traffic. The refuge islands allow pedestrians to cross only one lane of traffic at a time. Care should be taken to avoid damaging underground vaults beneath Main Street during construction of the refuge islands.
- Remove the unnecessary D Street mid-block crossing 100 feet west of 7th Street. The crossing is very close to the intersection and has no recent pedestrian-related crash history.
- Upgrade all pedestrian ramps and paths to comply with PROWAG. Care should be taken during construction to avoid damaging underground vaults beneath Main Street.
- Construct continuous sidewalks on D Street. Sidewalks should be at least 5 feet wide to comply with PROWAG, but preferably 6 feet wide. These improvements are planned to be addressed with D Street sidewalk plans included in the 2015 Downtown Infrastructure Repair and Replacement Project (DIRRP).

*Figure 13: Crosswalk with RRFB and Refuge Island*



## Bicyclists

**Issues:**

- There are no designated bike lanes or shared use signs on either Main or D Streets.
- Absence of bike racks outside 5th Street corridor.

**Solutions:**

- Install "Share the Road" signs (shown in Figure 14) on Main Street between 1st and 3rd Streets and on D Street between 11th and 9th Streets. "Share the Road" signs instruct bicyclists to ride on the roadway and motorists to watch for bicyclists.
- Paint "sharrow" pavement markings (shown in Figure 15) according to the Manual on Uniform Traffic Control Devices (MUTCD) along Main and D Streets. These carry the same meaning as "Share the Road "signs.
- Install bike racks at a maximum of 250 foot intervals along Main and D Streets.

*Figure 14: "Share the Road" Sign*

## Parking

Parking recommendations vary per concept and are detailed later in this chapter.

## Public Transit

**Issues:**

- Limited hours of operation; no weekend service
- Absence of bus stop amenities on Main Street

**Solutions:**

- Extend Lewiston Transit bus service later in the evenings and on weekends
- Construct a bus shelter with benches and bike racks or lockers on Main Street immediately west of 5th Street (where right-of-way allows). This location corresponds with the #4 stop on the Lewiston Transit West Route.
- Create an online real-time bus arrival system with message boards and smartphone access info at stops. These should improve comfort and convenience of public transit and encourage ridership.

*Figure 15: Shared Lane Marking*

## Streetscape

**Issues:**

- Planters, patio seating, signs, and other obstructions constrict sidewalk walking path and block motorists' line-of-sight
- Overgrown tree canopies on Main Street (shown in Figure 16) cover storefronts and block motorists' line-of-site
- Some street trees are aging and will require replacement
- Tree grate shrubs on Main Street are overgrown and some grates are absent
- East D Street is devoid of streetscape amenities and unappealing for commercial development

**Solutions:**

- Designate a straight, continuous walking path on sidewalks. This walkway should be clear of signs, patio seating, trash receptacles, benches, and other obstructions. A 6-foot walkway is recommended; a 5-foot width is compliant with PROWAG.
- Install business wayfinding signs on Main and D Streets. These should de-clutter sidewalks by moving information from sidewalk flip-boards to organized signs at the beginning of each block. The City should permit the signs; downtown businesses that desire representation on the signs should be responsible for installation and maintenance costs.
- Trim tree canopies on Main Street.
- Develop tree replacement plan.
- Trim shrubs in tree grates and install tree grates where absent.
- Beautify east D Street. This involves installing decorative lights and planting street trees.

*Figure 16: Overgrown Tree Canopies*

## Long-Term Concept 1 – One-Way Couplet Enhancements

Concept 1 recommends roadway geometry improvements at the Main/11th/D and 1st/D intersections. These improvements (summarized below in Figure 17) are:

- A concrete lane divider at the beginning of D Street
- Extending the eastbound through merge lane at the Main/11th/D intersection
- Dual westbound left turn lanes at the 1st/D intersection

Traffic flow should be similar to 2040 Do Nothing conditions with minor improvements. Of the four concepts, Concept 1 provides the best traffic flow and progression through downtown Lewiston. See Appendix A and B for cost estimate and traffic analysis reports.

**Advantages:**

- **Lowest cost concept**
- **Improves traffic flow and safety at 1st/D and Main/11th/D intersections**
- **May discourage speeding downtown**

**Disadvantages:**

- **Possible increased delay to westbound Levee Bypass traffic**
- **Possible loss of up to eight parking stalls**

**Estimated Cost: $250,000**

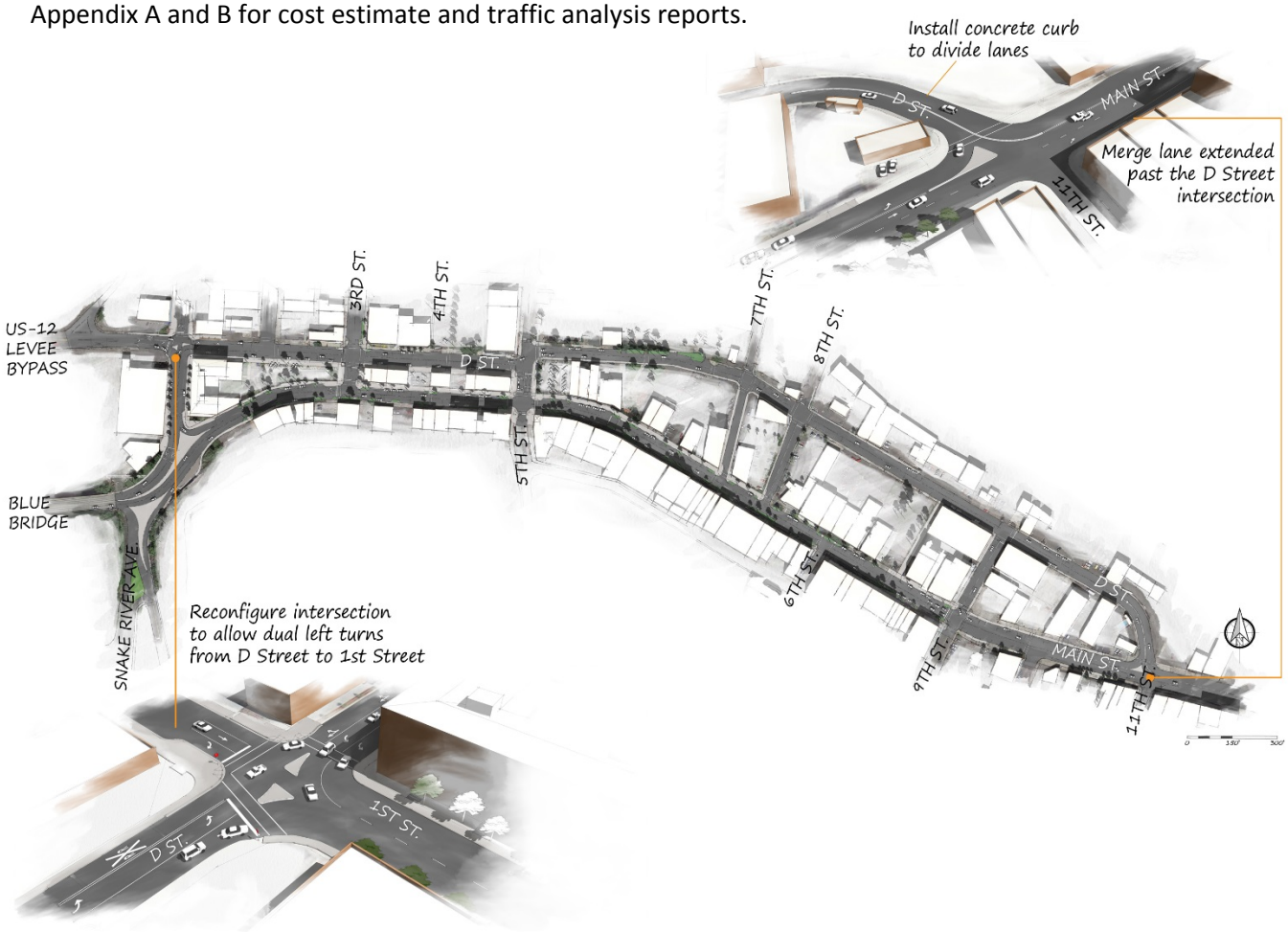



*Figure 17: Summary of Concept 1 Improvements*

## 1st/D Intersection Improvements

### Dual Left Turn Lanes

Currently, the majority of westbound vehicles on D Street turn left at 1st Street, frequently resulting in vehicles speeding in order to merge into the left lane before 1st Street. Adding dual westbound left turn lanes removes the need to speed up and merge left before turning left at the intersection.

### Levee Bypass Traffic

The eastbound right turn lane traffic (from the Levee Bypass) can be converted to stop or yield control. If this does not adequately serve demand, a slip lane can be added to 1st Street by removing parking on the west side of the street.

A concept sketch of these improvements is shown in Figure 18.

*Figure 18: 1st/D Intersection Improvements*

## Main/11th/D Intersection Improvements

### Concrete Curb

A concrete curb is recommended between lanes at the beginning of D Street. This prevents vehicles from immediately changing lanes after turning right from Main Street onto D Street.

### Extend Merge Lane

The existing configuration of the eastbound approach of Main/11th/D requires drivers to simultaneously decide between a) turning left at the intersection and b) continuing straight and merging. This can be a strain on the mental workload of drivers and may be a factor in previous accidents at the intersection. Extending the through merge lane past 11th Street should allow drivers more time to merge safely.

This improvement requires lane configuration and roadway geometry changes to the intersection island and pavement markings on Main Street between 11th and 12th Streets. The center left turn lane should be eliminated to make room for the extended merge lane. The center concrete curb should be removed and reconstructed north of its existing position. The merge lane can terminate either a) mid-block between 11th and 12th Streets or b) at 12th Street as a right-turn only lane onto 12th Street. The latter option may necessitate removal of two parking stalls on the south side of Main Street immediately west of 12th Street, which is already a congested parking area.

A summary of these improvements is shown in Figure 19.

*Figure 19: Main/11th/D Intersection Improvements*

## Traffic Analysis

Operational analyses of Concept 1 under 2040 traffic conditions estimated corridor directional average daily traffic (ADT), average intersection delays, and intersection level of service (LOS).

Directional 2040 ADT projections for Main Street, D Street, and the Levee Bypass were estimated using the LCVMPO's QRS II travel demand forecast model to modify existing traffic counts. The 2040 design year is consistent with the horizon year for LCVMPO's long-range transportation plan. ADT was measured across a screenline oriented immediately east and parallel to 8th Street. Concept 1 ADT projections for 2040 were assumed to not change from 2040 Do Nothing conditions. Table 3 shows ADT projections for 2040 Do Nothing conditions and Concept 1.

*Table 3: 2040 ADT Projections for Do Nothing and Concept 1*

| | | DO NOTHING | CONCEPT 1 |
|---|---|---|---|
| MAIN STREET | EASTBOUND ADT | 10,400 | 10,400 |
| | WESTBOUND ADT | 0 | 0 |
| | TOTAL ADT | 10,400 | 10,400 |
| | ADT CHANGE: | | 0 |
| | **% ADT CHANGE:** | | **0%** |
| D STREET | EASTBOUND ADT | 0 | 0 |
| | WESTBOUND ADT | 9,000 | 9,000 |
| | TOTAL ADT | 9,000 | 9,000 |
| | ADT CHANGE: | | 0 |
| | **% ADT CHANGE:** | | **0%** |
| LEVEE BYPASS | EASTBOUND ADT | 3,600 | 3,600 |
| | WESTBOUND ADT | 5,000 | 5,000 |
| | TOTAL ADT | 8,600 | 8,600 |
| | ADT CHANGE: | | 0 |
| | **% ADT CHANGE:** | | **0%** |
| TOTALS | EASTBOUND ADT | 14,000 | 14,000 |
| | WESTBOUND ADT | 14,000 | 14,000 |
| | TOTAL ADT | 28,000 | 28,000 |
| | ADT CHANGE: | | 0 |
| | **% ADT CHANGE:** | | **0%** |

These ADT projections show a relatively even split in vehicle traffic between Main Street, D Street, and the Levee Bypass. The one-way couplet configuration encourages slightly more traffic on Main Street than D Street. The Bypass carries more traffic westbound than eastbound. Eastbound access to the Bypass is not intuitive (Bypass exit is on the right side of Main Street and loops under the Blue Bridge), which may give the false impression that the Bypass is slower.

Concept 1 changes should result in small improvements in vehicle level of service (LOS). Operational analyses show that the existing corridor should continue operating with little to no congestion under 2040 traffic volumes, with average LOS A and B at all intersections. Operational analyses of Concept 1 under 2040 traffic volumes show mostly positive changes from Do Nothing conditions. Comparisons of delay and LOS are shown in Table 4.

*Table 4: Concept 1 Intersection and Corridor LOS*

| | 2040 DO NOTHING | | | 2040 CONCEPT 1 | | |
|---|---|---|---|---|---|---|
| **INTERSECTION** | DELAY (s) | ATS (mph) | LOS | DELAY (s) | ATS (mph) | LOS |
| **MAIN STREET** | | | | | | |
| 1st | 1.8 | - | A | 4.1 | - | A |
| 3rd | 10.9 | - | B | 2.7 | - | A |
| 5th | 5.3 | - | A | 8.7 | - | A |
| 9th | 7.7 | - | A | 9.2 | - | A |
| 11th / D Street | 2.6 | - | A | 2.2 | - | A |
| 13th | 15.2 | - | B | 8.5 | - | A |
| EB Corridor | - | 16.4* | C | - | 17.6* | C |
| **D STREET** | | | | | | |
| 1st | 5.0 | - | A | 9.6 | - | A |
| 3rd | 11.7 | - | B | 4.9 | - | A |
| 5th | 9.8 | - | A | 10.9 | - | B |
| 9th | 11.2 | - | B | 7.3 | - | A |
| WB Corridor | - | 16.4* | C | | 18.4* | C |

* Corridor LOS determined by average travel speed (ATS) over free-flow speed.

LOS A = Free flow
LOS B = Reasonably free flowing
LOS C = Stable flow
LOS D = Approaching unstable flow
LOS E = Unstable flow (at capacity)
LOS F = Forced or breakdown flow

Four intersections experience improvement from in LOS. D and 5th experiences a decrease in LOS; however the decrease is misleading without considering delay in seconds, which is on the border between LOS A and B in both cases. Corridor LOS shows that stable flow is expected through both Main and D Streets under 2040 Do Nothing and Concept 1 conditions.

**Advantages:**

- **May improve business access**
- **Improved mid-block crossing safety**

**Disadvantages:**

- **High cost**
- **Possible Main Street traffic congestion**
- **Reduced D Street business drive-by traffic**

**Estimated Cost: $5,887,000**

## Long-Term Concept 2 – Two-Way Street Conversion

Concept 2 converts the one-way system to two-way traffic on both Main and D Streets. All existing one-way traffic signals would need to be upgraded for two-way operations. Also, two-way traffic necessitates installation of traffic signals or roundabouts at 1st/Main, 1st/D, and Main/11th/D intersections. These changes are expected to increase traffic volumes and congestion on Main Street. Traffic volumes on D Street will likely decrease. The combination of these factors may be detrimental to downtown businesses even though two-way streets improve business access and pedestrian safety. See Appendix A and B for cost estimate and traffic analysis reports.

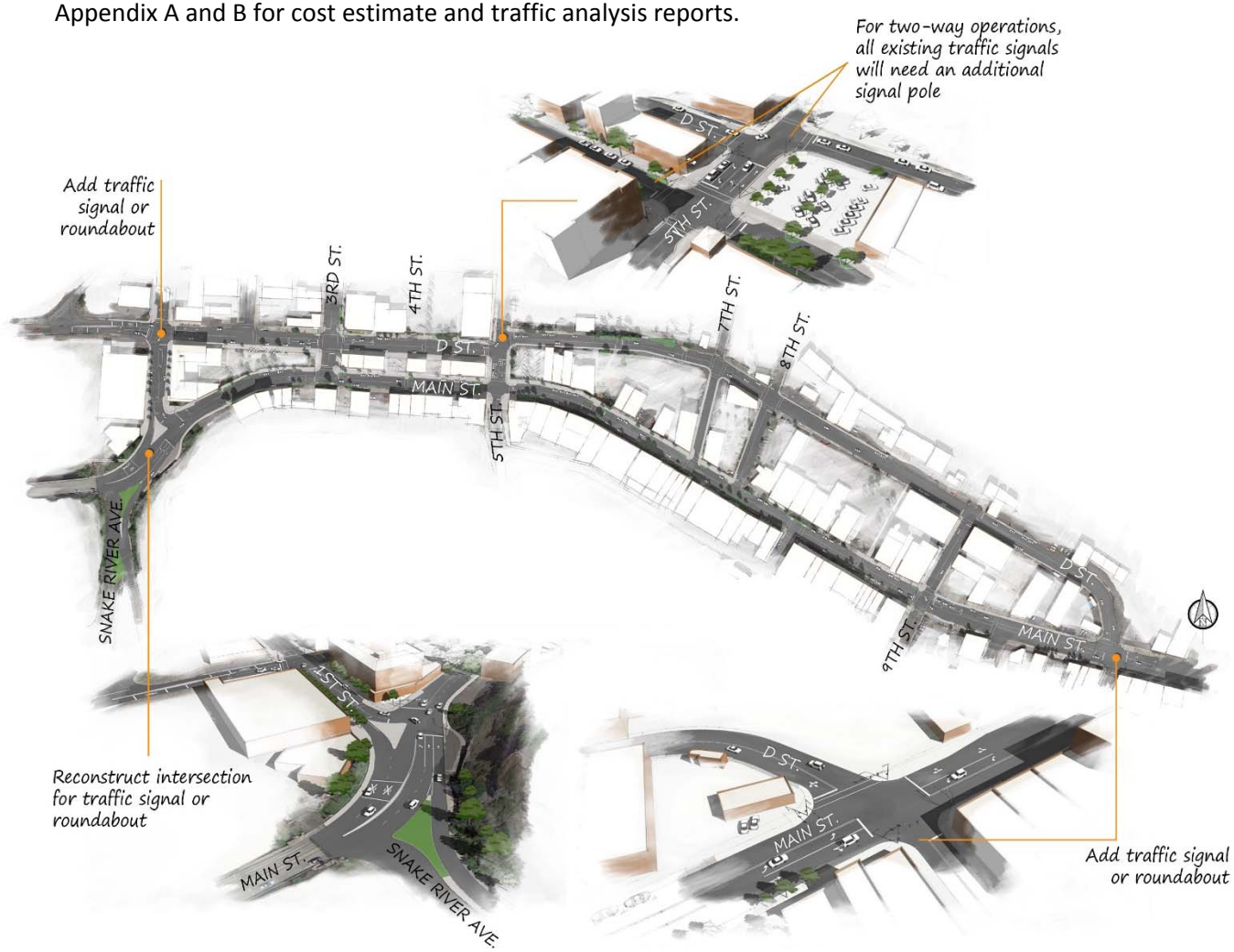



*Figure 20: Summary of Concept 2 Improvements*

## Two-Way Street Implications

Concept 2 converts downtown Lewiston traffic from a one-way couplet to two-way streets. 7th Street is too narrow to serve two-way traffic and would remain one-way. Two-way streets can provide convenient access to adjacent properties and businesses. Mid-block pedestrian crossings may be safer on single-lane two-way streets (with the existing two lane one-way couplet, vehicles in adjacent lanes can block drivers' view of crossing pedestrians). However, one-way couplets provide stronger signal progression and therefore better traffic flow for through traffic.

*Figure 21: 1st/D and 1st/Main Intersections with Traffic Signals*

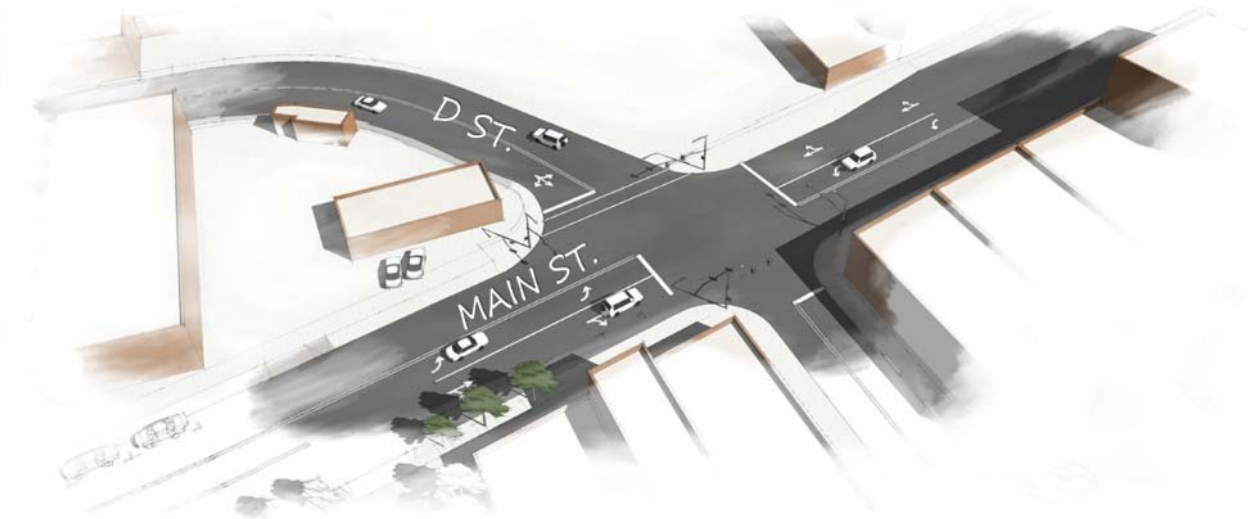
### Signal Upgrades

The change from one-way to two-way streets requires installing an additional signal pole and other hardware modifications at all existing signal-controlled intersections.

### Traffic Signal or Roundabout Installations

With the current one-way couplet configuration, intersections at 1st/Main, 1st/D, and Main/11th/D are uncontrolled and free-flowing on most approaches, with slip lanes or stop signs on minor movements. Changing to two-way traffic necessitates installation of traffic signals or roundabouts at these intersections. Concept sketches of these changes are shown in Figure 21 and Figure 22. The advantages and disadvantages of a traffic signal or roundabout at each intersection should be evaluated during the design process.

*Figure 22: Main/D/11th Intersection with Traffic Signals*



## Traffic Analysis

Operational analyses of Concept 2 under 2040 traffic conditions estimated corridor directional ADT, average intersection delays, and intersection LOS.

Directional 2040 ADT projections for Main Street, D Street, and the Levee Bypass were estimated using LCVMPO's QRS II travel demand forecast model to modify existing traffic counts. ADT was measured across a screenline oriented immediately east and parallel to 8th Street. Table 5 shows ADT projections for 2040 existing conditions and Concept 2.

*Table 5: 2040 ADT Projections for Existing Conditions and Concept 2*

| | | DO NOTHING | CONCEPT 2 |
|---|---|---|---|
| MAIN STREET | EASTBOUND ADT | 10,400 | 4,800 |
| | WESTBOUND ADT | 0 | 6,600 |
| | TOTAL ADT | 10,400 | 11,400 |
| | ADT CHANGE: | | 1,000 |
| | **% ADT CHANGE:** | | **10%** |
| D STREET | EASTBOUND ADT | 0 | 1,200 |
| | WESTBOUND ADT | 9,000 | 1,600 |
| | TOTAL ADT | 9,000 | 2,800 |
| | ADT CHANGE: | | -6,200 |
| | **% ADT CHANGE:** | | **-69%** |
| LEVEE BYPASS | EASTBOUND ADT | 3,600 | 7,100 |
| | WESTBOUND ADT | 5,000 | 4,600 |
| | TOTAL ADT | 8,600 | 11,700 |
| | ADT CHANGE: | | 3,100 |
| | **% ADT CHANGE:** | | **36%** |
| TOTALS | EASTBOUND ADT | 14,000 | 13,100 |
| | WESTBOUND ADT | 14,000 | 12,800 |
| | TOTAL ADT | 28,000 | 25,900 |
| | ADT CHANGE: | | -2,100 |
| | **% ADT CHANGE:** | | **-8%** |

As expected, these ADT projections show substantial changes in traffic flow after changing to two-way streets. Contrary to the relatively even ADT split between Main Street, D Street, and the Levee Bypass under existing conditions, Concept 2 most likely would divert traffic away from D Street. 1,000 vehicles/day of the diverted traffic go to Main Street, 3,100 vehicles/day reroute through the Bypass, and 2,100 vehicles/day avoid downtown altogether.

Operational analyses of Concept 2 with 2040 traffic volumes show expected minor decreases in LOS compared to the existing configuration with 2040 traffic volumes. Comparisons of delay and LOS are shown below in Table 6. Note that analyses were conducted assuming signal control at the 1st/Main, 1st/D, and Main/11th/D intersections.

*Table 6: Concept 2 Intersection Delay and LOS*

| INTERSECTION | 2040 DO NOTHING | | | 2040 CONCEPT 2 | | |
|---|---|---|---|---|---|---|
| | DELAY (s) | ATS (mph) | LOS | DELAY (s) | ATS (mph) | LOS |
| **MAIN STREET** | | | | | | |
| 1st | 1.8 | - | A | 5.4 | - | A |
| 3rd | 10.9 | - | B | 12.8 | - | B |
| 5th | 5.3 | - | A | 17.7 | - | B |
| 9th | 7.7 | - | A | 15.6 | - | B |
| 11th / D Street | 2.6 | - | A | 9.7 | - | A |
| 13th | 15.2 | - | B | 10.6 | - | B |
| EB Corridor | - | 16.4* | C | - | 13.0* | C |
| WB Corridor | - | - | - | - | 12.3* | D |
| **D STREET** | | | | | | |
| 1st | 5.0 | - | A | 9.1 | - | A |
| 3rd | 11.7 | - | B | 5.5 | - | A |
| 5th | 9.8 | - | A | 12.3 | - | B |
| 9th | 11.2 | - | B | 10.4 | - | B |
| EB Corridor | - | - | - | - | 17.0* | C |
| WB Corridor | - | 16.4* | C | - | 16.0* | C |

* Corridor LOS determined by average travel speed over free-flow speed.

LOS A = Free flow
LOS B = Reasonably free flowing
LOS C = Stable flow
LOS D = Approaching unstable flow
LOS E = Unstable flow (at capacity)
LOS F = Forced or breakdown flow

LOS at the 3rd/D intersection should improve under Concept 2. Three intersections may experience decreases in LOS from A to B. Corridor LOS shows expected stable flow on D Street. However, Main Street may experience congestion and low travel speeds, especially in the westbound direction.

**Advantages:**

- **Potential for downtown business growth**
- **Pedestrian friendly**
- **Increased street parking capacity**

**Disadvantages:**

- **Possible D Street traffic congestion**
- **Potential business traffic diverted away from downtown**
- **Reduced Main Street business drive-by traffic**

**Estimated Cost: $3,908,000**

## Long-Term Concept 3 – One Lane on Main Street / Two-Way on D Street

Concept 3 converts D Street from one-way to two-way traffic and narrows Main Street to one lane from 3rd to 9th Streets. The lane removal adds space for diagonal parking. Two-way traffic on D Street necessitates traffic signals or roundabouts at the 1st/D and Main/11th/D intersections and upgrade of signals to two-way operations. This traffic pattern should discourage Main Street through traffic and increase use of the Levee Bypass. Peak hour D Street congestion is possible. This may be detrimental to Main Street businesses that rely on pass-by traffic. However, the increase in parking capacity and pedestrian appeal associated with the Main Street improvements can facilitate business growth. See Appendix A and B for cost estimate and traffic analysis reports.

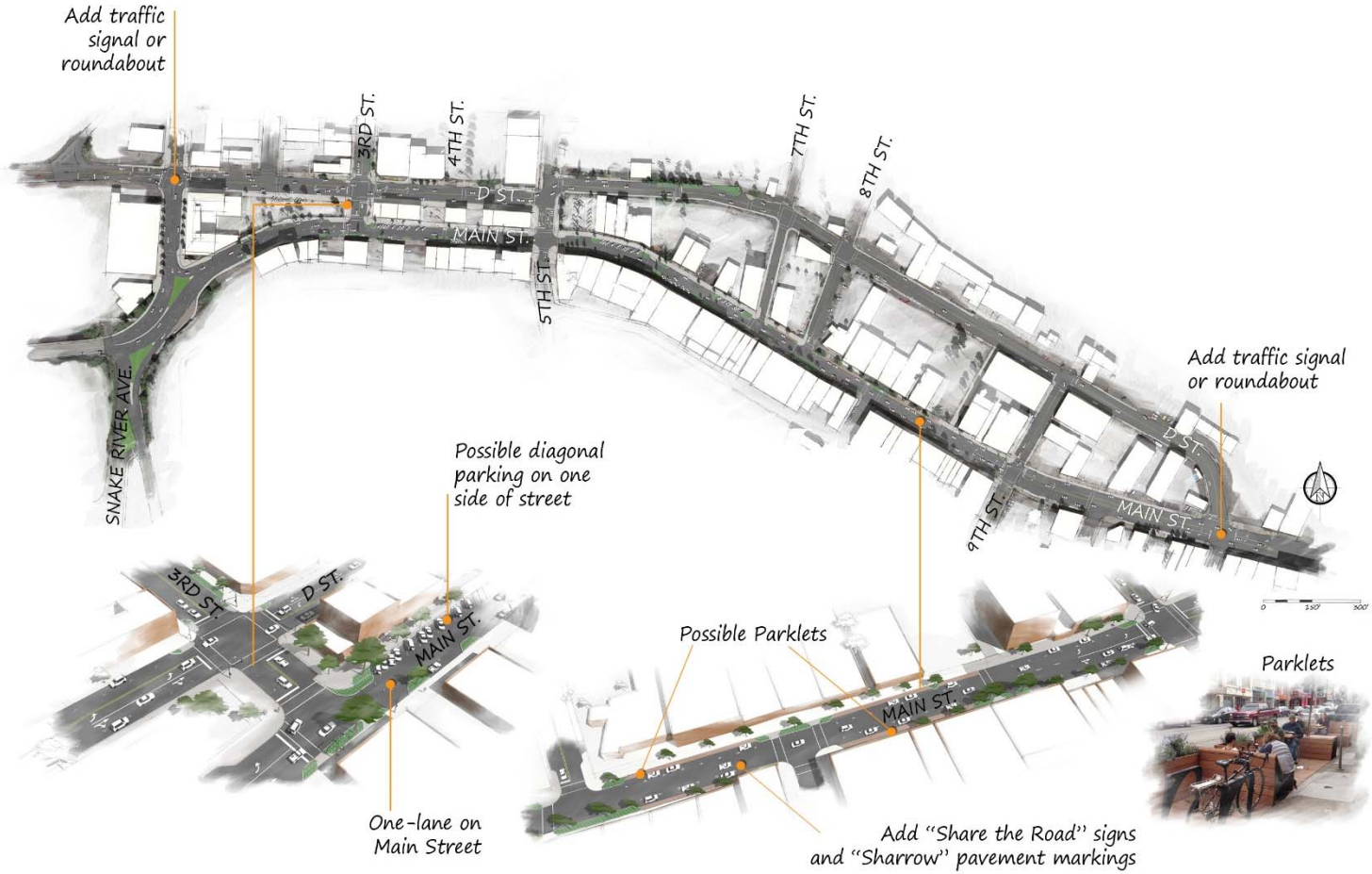



*Figure 23: Summary of Concept 3 Improvements*

## Two-Way Street Implications

Concept 3 converts D Street from one-way to two-way traffic. Main Street from 9th to 11th Streets also converts to two-way traffic. Main Street from 3rd to 9th Streets (or 5th to 9th if desired) would only have one eastbound lane. This is to encourage business traffic instead of through traffic. 7th Street would remain one-way. Mid-block pedestrian crossings may be safer on single-lane two-way streets (with the existing two lane one-way couplet, vehicles in adjacent lanes can block drivers' view of crossing pedestrians). However, one-way couplets provide stronger signal progression and therefore better traffic flow for through traffic.

### Signal Upgrades

The change from one-way to two-way streets requires installing an additional signal pole and other hardware modifications at existing signal-controlled intersections.

### Traffic Signal or Roundabout Installations

With the current one-way couplet configuration, intersections at 1st/D and Main/11th/D are uncontrolled and free-flowing on most approaches, with slip lanes or stop signs on minor movements. Changing to two-way traffic necessitates installation of traffic signals or roundabouts at these intersections. Figure 24 shows a concept sketch of the Main/11th/D intersection. The advantages and disadvantages of a traffic signal or roundabout at each intersection should be evaluated during the design process.

*Figure 24: Main/D/11th Intersection with Traffic Signals*

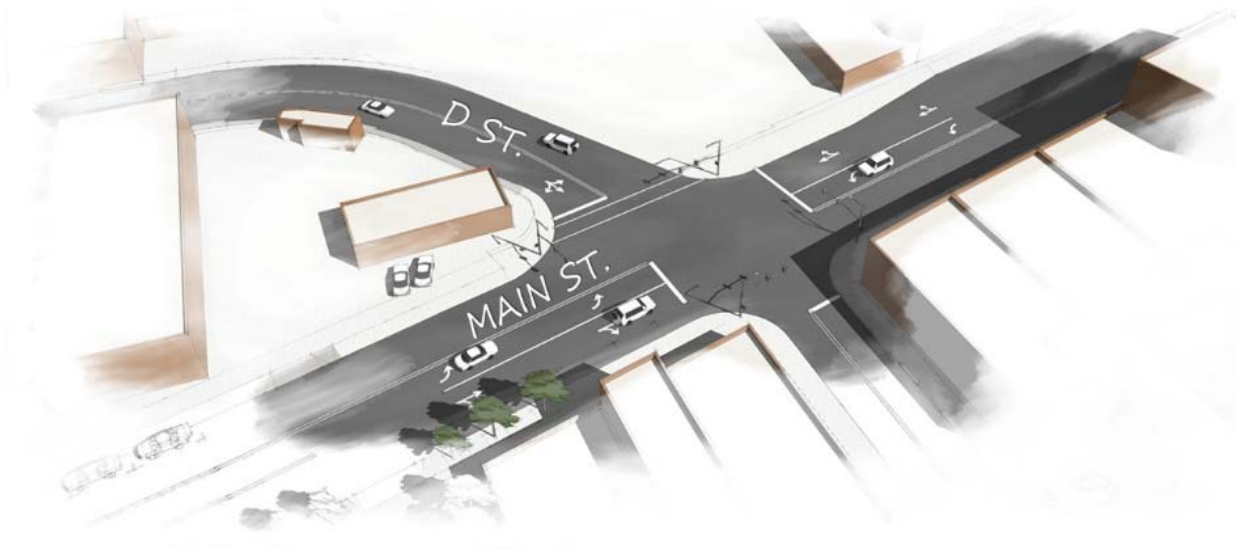


*Figure 25: Diagonal Parking and One Lane on Main Street*

*Figure 26: Parklet Example*

## Implications of One Lane on Main Street

### Mid-block Pedestrian Crossing Safety

One lane on Main Street should make mid-block pedestrian crossings safer and more effective (with the existing two lane one-way couplet, vehicles in adjacent lanes can block drivers' view of crossing pedestrians).

### Parking

Removing a lane from Main Street allows space for diagonal parking in place of parallel parking. Diagonal parking provides approximately double the capacity of parallel parking. If implemented on one side of Main Street from 3rd to 7th Street, this should add approximately 25 parking spaces on Main Street. This can increase capacity for downtown business growth. Figure 25 shows a concept sketch of diagonal parking on Main Street.

### Traffic Calming

The option to alternate diagonal parking from one side of the street to the other every 200 feet can create natural chicanes in the roadway. This reduces sight distance for drivers, increasing driver alertness and reducing speeds.

### Bicycles

Bike lanes and diagonal parking would conflict if the diagonal parking changed sides of the street. Therefore, "Share the Road" signs and "sharrow" pavement markings should be installed if not already in place.

### Parklets

Parklets are sidewalk extensions featuring benches, bike racks, green space, and other amenities for pedestrians and bicyclists. Figure 26 shows an example of a parklet. The addition of parklets on Main Street sidewalks can improve aesthetics and draw pedestrians to the area. Business owners could request permission from the City of Lewiston to install parklets in street parking stalls. The City can develop parklet design and approval standards similar to those implemented in San Francisco. Cost of parklets would be the responsibility of business owners.

## Traffic Analysis

Operational analyses of Concept 3 under 2040 traffic conditions estimated corridor directional ADT, average intersection delays, and intersection LOS.

Directional 2040 ADT projections for Main Street, D Street, and the Bypass were estimated using LCVMPO's QRS II travel demand forecast model to modify existing traffic counts. ADT was measured across a screenline oriented immediately east and parallel to 8th Street. Table 7 shows ADT projections for 2040 Do Nothing conditions and Concept 3.

Converting D Street to two-way traffic and narrowing Main Street to one lane significantly impacts downtown traffic flow distribution. 7,300 vehicles/day of the 2040 Do Nothing Main Street volumes are expected to divert away from Main Street. The Bypass should pick up 3,900 vehicles/day of this diversion and 3,200 vehicles/day are expected to avoid downtown altogether. D Street is expected to carry a larger portion of westbound traffic than the Bypass.

| | | DO NOTHING | CONCEPT 3 |
|---|---|---|---|
| **MAIN STREET** | EASTBOUND ADT | 10,400 | 3,100 |
| | WESTBOUND ADT | 0 | 0 |
| | TOTAL ADT | 10,400 | 3,100 |
| | ADT CHANGE: | | -7,300 |
| | **% ADT CHANGE:** | | **-70%** |
| **D STREET** | EASTBOUND ADT | 0 | 1,700 |
| | WESTBOUND ADT | 9,000 | 7,500 |
| | TOTAL ADT | 9,000 | 9,200 |
| | ADT CHANGE: | | 200 |
| | **% ADT CHANGE:** | | **2%** |
| **LEVEE BYPASS** | EASTBOUND ADT | 3,600 | 7,500 |
| | WESTBOUND ADT | 5,000 | 5,000 |
| | TOTAL ADT | 8,600 | 12,500 |
| | ADT CHANGE: | | 3,900 |
| | **% ADT CHANGE:** | | **45%** |
| **TOTALS** | EASTBOUND ADT | 14,000 | 12,300 |
| | WESTBOUND ADT | 14,000 | 12,500 |
| | TOTAL ADT | 28,000 | 24,800 |
| | ADT CHANGE: | | -3,200 |
| | **% ADT CHANGE:** | | **-11%** |

*Table 7: 2040 ADT Projections for Existing Conditions and Concept 3*

Analyses of Concept 3 with 2040 traffic volumes show expected decreases in LOS compared to the existing 2040 traffic volumes. Comparisons of delay and LOS are shown below in Table 8. Note that analyses were conducted assuming signal control at the 1st/D and Main/11th/D intersections.

*Table 8: Concept 3 Intersection Delay and LOS*

| | 2040 DO NOTHING | | | 2040 CONCEPT 3 | | |
|---|---|---|---|---|---|---|
| **INTERSECTION** | DELAY (s) | ATS (mph) | LOS | DELAY (s) | ATS (mph) | LOS |
| **MAIN STREET** | | | | | | |
| 1st | 1.8 | - | A | 1.1 | - | A |
| 3rd | 10.9 | - | B | 11.2 | - | B |
| 5th | 5.3 | - | A | 8.8 | - | A |
| 9th | 7.7 | - | A | 15.7 | - | B |
| 11th / D Street | 2.6 | - | A | 7.9 | - | A |
| 13th | 15.2 | - | B | 14.0 | - | B |
| EB Corridor | - | 16.4* | C | - | 15.6* | C |
| **D STREET** | | | | | | |
| 1st | 5.0 | - | A | 23.5 | - | C |
| 3rd | 11.7 | - | B | 15.3 | - | B |
| 5th | 9.8 | - | A | 17.0 | - | B |
| 9th | 11.2 | - | B | 8.3 | - | A |
| EB Corridor | - | - | - | - | 12.7* | D |
| WB Corridor | - | 16.4* | C | - | 15.6* | C |

* Corridor LOS determined by average travel speed (ATS) over free-flow speed.

LOS A = Free flow
LOS B = Reasonably free flowing
LOS C = Stable flow
LOS D = Approaching unstable flow
LOS E = Unstable flow (at capacity)
LOS F = Forced or breakdown flow

Three intersections may experience decreases in LOS under Concept 3. This is most notable at 1st/D, where LOS drops from A to C. This is foreseeable considering a) all westbound traffic from D Street and the Levee Bypass is planned to pass through the intersection and b) the two-way D Street conversion produces more turning movements at the intersection, requiring a traffic signal or roundabout. The 1st/D intersection is expected to experience congestion during peak hours, which slows progression through the corridor and lowers the eastbound corridor LOS to D. However, other intersections should operate adequately.

## Long-Term Concept 4 – Pedestrian Mall

Concept 4 converts Main Street into a pedestrian mall and allows two-way traffic on D Street. This concept will likely cause the most downtown congestion and divert the most traffic away from downtown. Success of the pedestrian mall and nearby businesses can be aided by several factors:

- Strong public transit
- Close proximity to residential neighborhoods or a university
- Planned community activities in the pedestrian mall
- Sufficient adjacent parking

This section includes recommendations to support the pedestrian mall in these areas. A summary of Concept 4 improvements is shown below in Figure 27. See Appendix A and B for cost estimate and traffic analysis reports.

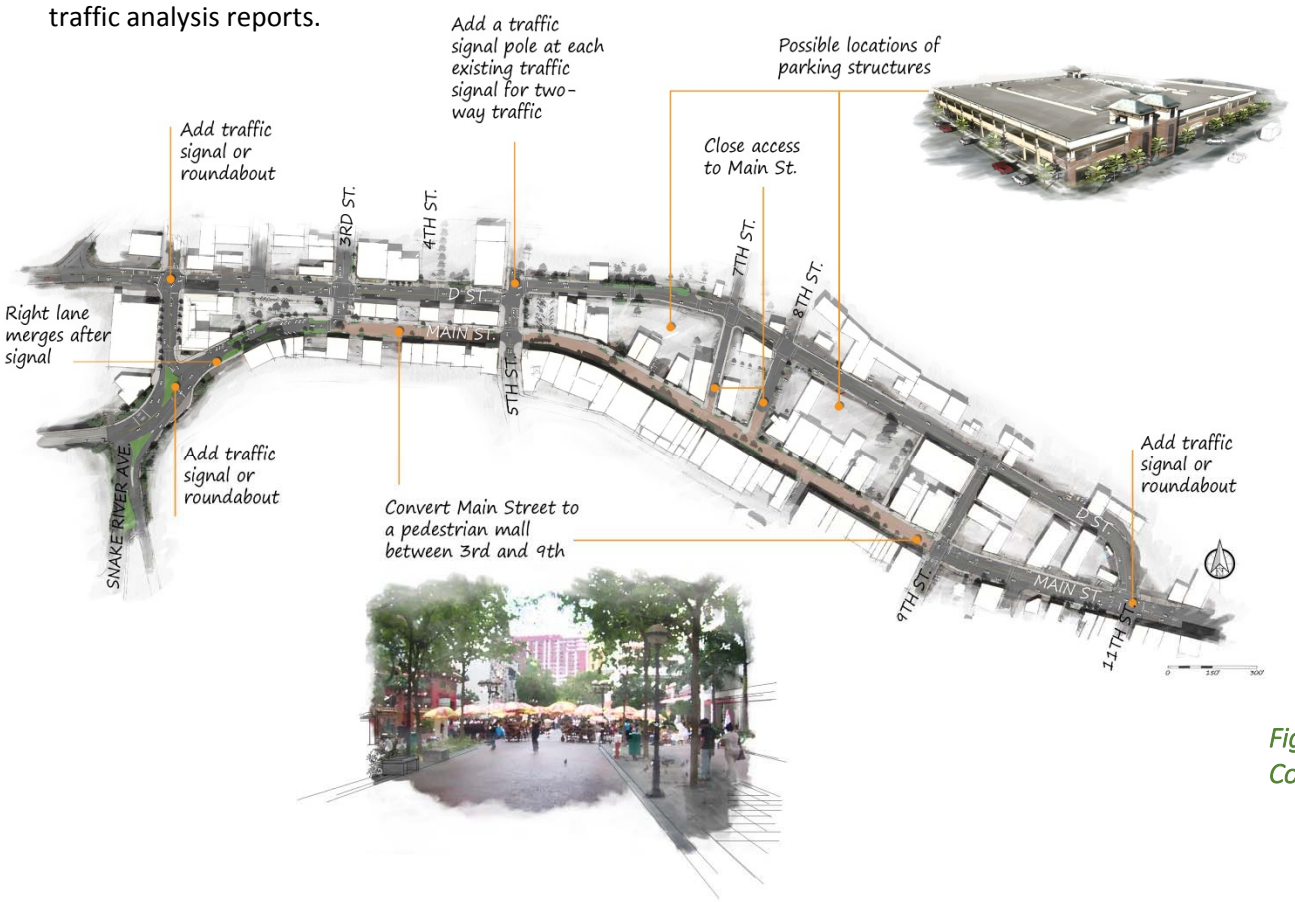



*Figure 27: Summary of Concept 4 Improvements*

**Advantages:**

- **Pedestrian friendly**
- **Possible downtown revitalization if implemented properly**

**Disadvantages:**

- **Highest estimated cost**
- **Likely traffic congestion in downtown**
- **Diverts most traffic away from downtown**
- **Most unpredictable outcome of all concepts**

**Estimated Cost: $11,530,000 (Includes parking structure)**

## Pedestrian Mall Implications and Considerations

Concept 4 closes Main Street to vehicle traffic from 3rd to 9th Street (or 5th to 9th Street if desired) to accommodate a pedestrian mall. This eliminates intersections at Main and 3rd, 5th, 7th, and 8th Streets. 5th Street would continue south from D Street and bisect the pedestrian mall. Main Street from 1st to 3rd Street would narrow to one lane to accommodate diagonal parking spaces. Planters can be used as barriers to vehicle traffic. Figure 28 shows an example of a pedestrian mall.

### Positive Atmosphere

Concert venues, bazaars, art galleries, exhibits, street vendors, and other attractions should be encouraged to create an active, positive atmosphere that attracts pedestrians.

*Figure 28: Example Pedestrian Mall*

### Parking

Closing Main Street to vehicle traffic results in the loss of 90 street parking stalls. Main Street parallel parking from 1st to 3rd Streets should be replaced with diagonal parking. A three-story parking structure would increase downtown parking capacity, which may be needed if the pedestrian mall is successful.

### Public Transit

Existing Lewiston Transit bus routes should be redesigned to emphasize service to the pedestrian mall.

## Traffic Analysis

Operational analyses of Concept 4 under 2040 traffic conditions estimated corridor directional ADT, average intersection delays, and intersection LOS.

Directional 2040 ADT projections for Main Street, D Street, and the Levee Bypass were estimated using LCVMPO's QRS II travel demand forecast model to modify existing traffic counts. ADT was measured across a screenline oriented immediately east and parallel to 8th Street. Table 9 shows ADT projections for 2040 Do Nothing conditions and Concept 4.

Elimination of Main Street from 3rd to 9th Street is expected to result in the most dramatic traffic flow changes of the four concepts. The change is expected to divert 6,500 vehicles/day away from downtown Lewiston. Traffic that currently travels eastbound on Main Street will be redirected through D Street and the Levee Bypass, with eastbound D Street carrying 4,000 vehicles/day and the eastbound Levee Bypass carrying 7,800 vehicles/day. Westbound Bypass traffic is expected to be comparable to 2040 Do Nothing conditions.

*Table 9: 2040 ADT Projections for Existing Conditions and Concept 4*

| | | DO NOTHING | CONCEPT 4 |
|---|---|---|---|
| **MAIN STREET** | EASTBOUND ADT | 10,400 | 0 |
| | WESTBOUND ADT | 0 | 0 |
| | TOTAL ADT | 10,400 | 0 |
| | ADT CHANGE: | | -10,400 |
| | **% ADT CHANGE:** | | **-100%** |
| **D STREET** | EASTBOUND ADT | 0 | 4,000 |
| | WESTBOUND ADT | 9,000 | 5,000 |
| | TOTAL ADT | 9,000 | 9,000 |
| | ADT CHANGE: | | 0 |
| | **% ADT CHANGE:** | | **0%** |
| **LEVEE BYPASS** | EASTBOUND ADT | 3,600 | 7,800 |
| | WESTBOUND ADT | 5,000 | 4,700 |
| | TOTAL ADT | 8,600 | 12,500 |
| | ADT CHANGE: | | 3,900 |
| | **% ADT CHANGE:** | | **45%** |
| **TOTALS** | EASTBOUND ADT | 14,000 | 11,800 |
| | WESTBOUND ADT | 14,000 | 9,700 |
| | TOTAL ADT | 28,000 | 21,500 |
| | ADT CHANGE: | | -6,500 |
| | **% ADT CHANGE:** | | **-23%** |

Operational analyses of Concept 4 with 2040 traffic volumes show expected decreases in LOS compared to the existing configuration with 2040 traffic volumes. Comparisons of delay and LOS are shown below in Table 10. Note that analyses were conducted assuming signal control at the 1st/Main, 1st/D, and Main/11th/D intersections.

*Table 10: Concept 4 Intersection Delay and LOS*

| | 2040 DO NOTHING | | | 2040 CONCEPT 4 | | |
|---|---|---|---|---|---|---|
| **INTERSECTION** | DELAY (s) | ATS (mph) | LOS | DELAY (s) | ATS (mph) | LOS |
| **MAIN STREET** | | | | | | |
| 1st | 1.8 | - | A | 3.2 | - | A |
| 3rd | 10.9 | - | B | - | - | - |
| 5th | 5.3 | - | A | - | - | - |
| 9th | 7.7 | - | A | 14.4 | - | B |
| 11th / D Street | 2.6 | - | A | 7.9 | - | A |
| 13th | 15.2 | - | B | 7.6 | - | A |
| EB Corridor | - | 16.4* | C | - | - | - |
| **D STREET** | | | | | | |
| 1st | 5.0 | - | A | 54.9 | - | D |
| 3rd | 11.7 | - | B | 10.1 | - | B |
| 5th | 9.8 | - | A | 12.5 | - | B |
| 9th | 11.2 | - | B | 6.0 | - | A |
| EB Corridor | - | - | - | - | 13.4* | C |
| WB Corridor | - | 16.4* | C | - | 16.6* | C |

* Corridor LOS determined by average travel speed (ATS) over free-flow speed.

LOS A = Free flow
LOS B = Reasonably free flowing
LOS C = Stable flow
LOS D = Approaching unstable flow
LOS E = Unstable flow (at capacity)
LOS F = Forced or breakdown flow

Two intersections are expected to experience improved LOS, while three are expected to experience decreases. Similar to Concept 3, Concept 4 may place particular strain on the 1st and D intersection because it carries westbound Levee Bypass traffic as well as westbound and eastbound traffic through downtown. Peak hour congestion at the 1st/D Street intersection is likely and may slow eastbound progression through D Street. However westbound traffic flow should be more stable.

# Public Opinion of Solutions

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## Public Meeting Questions

**What the public thought of the concepts**

An open house was held to hear what the public thought of the concepts. The public meeting was held at the Lewiston Towne Square Building on September 25, 2014 from 3:30 pm to 5:30 pm.

A total of 30 comment forms were collected; 27 during the meeting and 3 via email. Two emails were received expressing opinions on the proposed concepts. Concept-specific comments are summarized below the Question Summaries.

**Question 1 Summary:** Do you feel we captured the existing issues related to Main and D Street?

A majority of attendees felt the concept alternatives addressed their concerns about the corridor, as seen in Figure 29. Among those who answered "No" suggested emphasizing parking capacity, including F Street in the improvement plans, coordinating improvements with the Downtown Infrastructure Repair and Replacement Project, and improving safety at the crosswalk on 1st Street between Main and D Streets. One resident noted the presence of underground vaults beneath Main Street that could impact construction efforts.

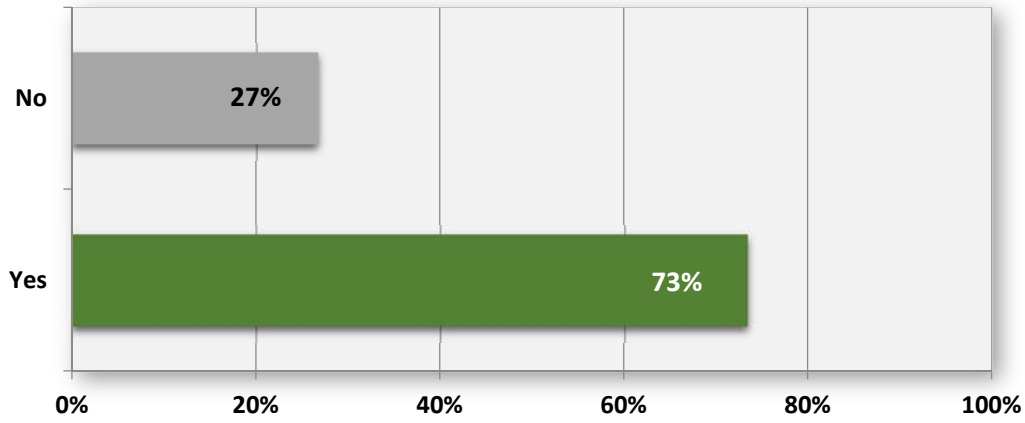


*Figure 29: Question 1 Responses from September 25, 2014 Open House*

**Question 2 Summary:** Please rank the alternatives in order of preference.

Table 11 shows the average rank of each concept among attendees. The most popular concept was Concept 3, which changes D Street to two-way traffic and narrows Main Street to one lane. Concept 4, which turns Main Street into a pedestrian mall, was the least favorable concept.

*Table 11: Question 2 Response Averages from September 25, 2014 Open House*

| Average Rank | Alternative |
|---|---|
| 1 | Concept 3 |
| 2 | Concept 1 |
| 3 | Concept 2 |
| 4 | Concept 4 |

Table 12 shows even greater distinction between the four concepts. Concept 3 is the clearly the most favorable, while Concepts 2 and 4 are the least favorable.

*Table 12: Question 2 Favorable and Unfavorable Concepts from September 25, 2014 Open House*

| | More Favorable (Ranked #1 or #2) | Less Favorable (Ranked #3 or #4) |
|---|---|---|
| Concept 1 | 26% | 24% |
| Concept 2 | 18% | 32% |
| Concept 3 | 38% | 12% |
| Concept 4 | 18% | 32% |

These results come from a relatively small sample size of 30 residents. A much larger population should be surveyed to justify the significant changes proposed in the concepts.

## Concept-Specific Reactions

### Concept 1 – One-Way Couplet Enhancements

#### Positive Reactions

Comments received for Concept 1 expressed approval for its low cost, efficient traffic flow, fast implementation, and presumed positive influence on business development. The public also liked the planned intersection geometry improvements, namely the concrete divider at Main/11th/D and dual left turn lanes at D and 1st. Most comments addressing pedestrians and bicyclists thought one-way streets would accommodate them well. Some respondents liked the concept because it retains most of the existing downtown atmosphere and traffic plan.

#### Negative Reactions

One respondent expected negative effects on pedestrians and bicyclists. Another desired more comprehensive imaginative solutions.

### Concept 2 – Two-Way Street Conversion

#### Positive Reactions

Comments received for Concept 2 expressed approval for the planned traffic signals or roundabouts at Main/11th/D, 1st/D, and 1st/Main intersections. Commenters thought the conversion to two-way streets would improve access to properties and businesses downtown. Some thought two-way streets would provide traffic calming, accommodate pedestrians and bicyclists, preserve the historical significance of the area, and divert through traffic away from downtown.

#### Negative Reactions

Four respondents saw no benefits of converting to two-way streets.

## Concept 3 – One Lane on Main Street / Two-Way on D Street

### Positive Reactions

Comments received for Concept 3 expressed approval for presumed positive effects on businesses and downtown community atmosphere, pedestrian appeal, and traffic calming effects of one lane on Main Street and two-way traffic on D Street. Some commenters liked the idea of diagonal parking on Main Street. Two respondents expressed interest in the proposed parklets on Main Street, which would enhance pedestrian appeal and therefore business activity and community atmosphere. Three commenters liked plans for roundabouts at Main/D/11th and 1st/D intersections. Some commenters said Concept 3 was the overall best concept because it maintains adequate traffic flow through downtown, addresses speeding and parking concerns, and benefits pedestrians, businesses and community atmosphere.

### Negative Reactions

Some commenters were wary of the potential safety risks to bicyclists from vehicles backing out of parking spaces.

## Concept 4 – Pedestrian Mall

### Positive Reactions

A substantial portion of commenters liked Concept 4 for the proposed pedestrian mall between 3rd and 9th Streets. Three commenters suggested reducing the size of the pedestrian mall to extend from 5th to 9th Street instead of 3rd to 9th Street. Proponents expect more downtown pedestrian and bicycle traffic and thought the pedestrian mall would revitalize downtown business and community atmosphere. Some desired parking structures at the expense of street parking.

### Negative Reactions

However, a more substantial portion was strongly opposed to the pedestrian mall or did not see any benefits of Concept 4. Opposition to Concept 4 recognized that pedestrian malls have been ineffective in many other cities. Some disliked the reliance on walking from parking structures to Main Street destinations.

## Public Opinion Summary

Public opinion of the four long-term concepts was assessed through a public meeting. Comment sheets asked respondents to rank the favorability of the concepts and explain their reasoning.

Concept 3 was the highest ranked solution and also received the most positive comments. Concept 1 was the next most favorable. Concept 2 received the least comments and seemed the least interesting alternative to the public. Concept 4 received the most polarized rankings and comments and was the overall least favorable alternative.

Comments sheets were collected from only 30 residents. A much larger representation of the public is needed to determine a future vision for downtown Lewiston.

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# Recommendations

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1. **Implement short-term Common Improvements.**

   Implementation can begin immediately. The total cost of these improvements is estimated at $844,000 but costs can be divided into smaller work packages. Improvements include:

   - Install radar speed signs at four locations along the corridor:
     - Main Street between 1st and 3rd Streets
     - Main Street between 9th and 10th Streets
     - D Street between 7th and 8th Streets
     - D Street between 9th and 10th Streets
   - Set signal progression timing for 18 mph on Main and D Streets
   - Install Rectangular Rapid Flashing Beacons (RRFBs) and refuge islands at mid-block crossings between 5th and 7th Streets on both Main and D Streets
   - Upgrade sidewalks and ramps to comply with Public Right-of-Way Accessibility Guidelines (PROWAG)
   - Extend Lewiston Transit bus service later in the evenings and on weekends
   - Construct bus shelter with benches and bike racks or lockers on Main Street immediately west of 5th Street (where right-of-way allows)
   - Create an online real-time bus arrival system with message boards and smartphone access info at bus stops
   - Install business wayfinding signs on both Main and D Streets
   - Install "Share the Road" signs, "sharrow" pavement markings, and bike racks for bicyclists on Main and D Streets
   - Develop a tree replacement plan
   - Main Street – Establish continuous 6-foot wide walking path by removing empty planters, excess signs, and other obstructions
   - Main Street – Trim tree canopies to reveal business signage and expose street lights and signals
   - Main Street – Install grates at the base of street trees where absent
   - D Street – Construct continuous sidewalks, install street lights, and plant street trees from 5th to 11th Streets
   - D Street – Remove unnecessary mid-block crossing 100 feet west of 7th Street

2. **Conduct public and business outreach to determine future vision of downtown Lewiston.**

   The public input gathered in this study was not significant enough to justify the large-scale traffic pattern changes proposed in the concepts. The proposed traffic changes could have major positive or negative implications on downtown business and vitality. Therefore, this proposed public outreach study should gather input from hundreds of Lewiston residents. Public opinion, and especially downtown business opinion, should be heavily considered when choosing the best solution.

   The recommended budget for the public outreach study is $50,000. The effects of the Common Improvements should be analyzed to determine if further upgrades are needed. Long-term Concepts 1, 2, and 3 can be used as starting points for the study solutions. Concept 4 is not recommended due to low public favorability and high cost.

3. **Implement most publicly favorable long-term concept.**

# Appendix A
# Cost Estimates

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KELLER associates
131 S.W. 5TH Avenue, Suite A, Meridian, Idaho 83642
Phone: 208.288.1992 - Fax: 208.288.1999

Project: Main & D Corridor Study
Agency: LCVMPO
Engineer: Nathan Cleaver

Printed: November 17, 2014

# ENGINEER'S OPINION OF MOST PROBABLE COST

## COMMON IMPROVEMENTS - SHORT TERM SOLUTIONS

| ITEM | QUANTITY | UNITS | UNIT PRICE | COST |
|---|---|---|---|---|
| TRIM & THIN TREE CANOPIES ON MAIN ST. | 1 | LS | $ 50,000 | $ 50,000 |
| REDUCE TRAFFIC SIGNAL PROGRESSION SPEED | 1 | LS | $ - | $ - |
| RECONSTRUCT ADA RAMPS THROUGHOUT CORRIDOR | 30 | EA | $ 1,500 | $ 45,000 |
| BEAUTIFICATION OF D ST. | 1100 | LF | $ 235 | $ 258,500 |
| RADAR SPEED SIGNS | 4 | EA | $ 6,000 | $ 24,000 |
| BUS STOP IMPROVEMENTS | 1 | EA | $ 20,000 | $ 20,000 |
| WAYFINDING SIGNAGE | 1 | LS | $ 20,000 | $ 20,000 |
| MID-BLOCK PEDESTRIAN CROSSING ISLANDS & RRFBs | 2 | EA | $ 20,000 | $ 40,000 |
| MAIN ST. STREETSCAPE IMPROVEMENTS | 1 | LS | $ 50,000 | $ 50,000 |
| MOBILIZATION | | | 10.00% | $ 50,750 |
| BONDING & INSURANCE | | | 3.00% | $ 15,225 |
| PLANNING LEVEL ESTIMATING CONTINGENCY | | | 20.00% | $ 101,500 |
| | | | **SUB-TOTAL =** | **$ 675,000** |
| | | | (ROUNDED UP TO NEAREST THOUSAND) | |
| ENGINEERING (DESIGN & CONSTRUCTION) | | | 20.00% | $ 135,000 |
| PROJECT CONTINGENCY | | | 5.00% | $ 33,750 |
| | | | **SUB-TOTAL =** | **$ 169,000** |
| | | | (ROUNDED UP TO NEAREST THOUSAND) | |

**TOTAL = $ 844,000**

ESTIMATE IS BASED ON 2014 PRESENT VALUE,
INCREASE BY 2%-3% PER YEAR FOR INFLATION

The opinion of most probable cost herein is based on our perception of current conditions at the project location. This estimate reflects our opinion of probable costs at this time and is subject to change as the project design matures. Keller Associates has no control over variances in the cost of labor, materials, equipment, services provided by others, contractor's methods of determining prices, competitive bidding or market conditions, practices or bidding strategies. Keller Associates cannot and does not warrant or guarantee that proposals, bids or actual construction costs will not vary from the costs presented herein.

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131 S.W. 5TH Avenue, Suite A, Meridian, Idaho 83642
Phone: 208.288.1992 - Fax: 208.288.1999

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# ENGINEER'S OPINION OF MOST PROBABLE COST

## CONCEPT 1 - ONE-WAY COUPLET ENHANCEMENTS

| ITEM | QUANTITY | UNITS | UNIT PRICE | | COST |
|---|---|---|---|---|---|
| IMPROVE 1st / D ST. / LEVEE BYPASS INT. | 1 | LS | $ 75,000 | $ | 75,000 |
| IMPROVE 11th / D ST. / MAIN ST. INT. | 1 | LS | $ 75,000 | $ | 75,000 |
| MOBILIZATION | | | 10.00% | $ | 15,000 |
| BONDING & INSURANCE | | | 3.00% | $ | 4,500 |
| PLANNING LEVEL ESTIMATING CONTINGENCY | | | 20.00% | $ | 30,000 |
| | | | **SUB-TOTAL =** | **$** | **200,000** |
| | | | (ROUNDED UP TO NEAREST THOUSAND) | | |
| ENGINEERING (DESIGN & CONSTRUCTION) | | | 20.00% | $ | 40,000 |
| PROJECT CONTINGENCY | | | 5.00% | $ | 10,000 |
| | | | **SUB-TOTAL =** | **$** | **50,000** |
| | | | (ROUNDED UP TO NEAREST THOUSAND) | | |

**TOTAL = $ 250,000**

ESTIMATE IS BASED ON 2014 PRESENT VALUE,
INCREASE BY 2%-3% PER YEAR FOR INFLATION

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Phone: 208.288.1992 - Fax: 208.288.1999

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# ENGINEER'S OPINION OF MOST PROBABLE COST

## CONCEPT 2 - TWO-WAY STREET CONVERSION

| ITEM | QUANTITY | UNITS | UNIT PRICE | COST |
|---|---|---|---|---|
| IMPROVE 1st / D ST. / LEVEE BYPASS INT. | 1 | LS | $ 600,000 | $ 600,000 |
| IMPROVE 11th / D ST. / MAIN ST. INT. | 1 | LS | $ 600,000 | $ 600,000 |
| RECONFIGURE 1st / MAIN ST. INT. | 1 | LS | $ 750,000 | $ 750,000 |
| CONVERT EXISTING SIGNALS TO TWO-WAY OPERATIONS | 6 | EA | $ 250,000 | $ 1,500,000 |
| RE-STRIPE & SIGN MODIFICATIONS ON MAIN ST. | 1 | LS | $ 60,000 | $ 60,000 |
| RE-STRIPE & SIGN MODIFICATIONS ON D ST. | 1 | LS | $ 60,000 | $ 60,000 |
| MOBILIZATION | | | 10.00% | $ 345,000 |
| BONDING & INSURANCE | | | 3.00% | $ 103,500 |
| PLANNING LEVEL ESTIMATING CONTINGENCY | | | 20.00% | $ 690,000 |
| | | | **SUB-TOTAL =** | **$ 4,709,000** |
| | | | (ROUNDED UP TO NEAREST THOUSAND) | |
| ENGINEERING (DESIGN & CONSTRUCTION) | | | 20.00% | $ 941,800 |
| PROJECT CONTINGENCY | | | 5.00% | $ 235,450 |
| | | | **SUB-TOTAL =** | **$ 1,178,000** |
| | | | (ROUNDED UP TO NEAREST THOUSAND) | |

**TOTAL = $ 5,887,000**

ESTIMATE IS BASED ON 2014 PRESENT VALUE,
INCREASE BY 2%-3% PER YEAR FOR INFLATION

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Phone: 208.288.1992 - Fax: 208.288.1999

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# ENGINEER'S OPINION OF MOST PROBABLE COST

## CONCEPT 3 - ONE LANE ON MAIN ST. / TWO-WAY ON D ST.

| ITEM | QUANTITY | UNITS | UNIT PRICE | COST |
|---|---|---|---|---|
| IMPROVE 1st / D ST. / LEVEE BYPASS INT. | 1 | LS | $ 600,000 | $ 600,000 |
| IMPROVE 11th / D ST. / MAIN ST. INT. | 1 | LS | $ 600,000 | $ 600,000 |
| CONVERT EXISTING SIGNALS TO TWO-WAY OPERATIONS | 4 | EA | $ 250,000 | $ 1,000,000 |
| MODIFY EXISTING SIGNALS ON MAIN ST. | 2 | EA | $ 50,000 | $ 100,000 |
| RE-STRIPE MAIN ST. FOR DIAGONAL PARKING | 1 | LS | $ 40,000 | $ 40,000 |
| RE-STRIPE & SIGNING MODIFICATIONS ON D ST. | 1 | LS | $ 60,000 | $ 60,000 |
| MOBILIZATION | | | 10.00% | $ 220,000 |
| BONDING & INSURANCE | | | 3.00% | $ 66,000 |
| PLANNING LEVEL ESTIMATING CONTINGENCY | | | 20.00% | $ 440,000 |
| | | | **SUB-TOTAL =** | **$ 3,126,000** |
| | | | (ROUNDED UP TO NEAREST THOUSAND) | |
| ENGINEERING (DESIGN & CONSTRUCTION) | | | 20.00% | $ 625,200 |
| PROJECT CONTINGENCY | | | 5.00% | $ 156,300 |
| | | | **SUB-TOTAL =** | **$ 782,000** |
| | | | (ROUNDED UP TO NEAREST THOUSAND) | |

**TOTAL = $ 3,908,000**

ESTIMATE IS BASED ON 2014 PRESENT VALUE,
INCREASE BY 2%-3% PER YEAR FOR INFLATION

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131 S.W. 5TH Avenue, Suite A, Meridian, Idaho 83642
Phone: 208.288.1992 - Fax: 208.288.1999

Project: Main & D Corridor Study
Agency: LCVMPO
Engineer: Nathan Cleaver

Printed: November 17, 2014

# ENGINEER'S OPINION OF MOST PROBABLE COST

## CONCEPT 4 - PEDESTRIAN MALL

| ITEM | QUANTITY | UNITS | UNIT PRICE | COST |
|---|---|---|---|---|
| IMPROVE 1st / D ST. / LEVEE BYPASS INT. | 1 | LS | $ 600,000 | $ 600,000 |
| IMPROVE 11th / D ST. / MAIN ST. INT. | 1 | LS | $ 600,000 | $ 600,000 |
| RECONFIGURE 1st / MAIN ST. INT. | 1 | LS | $ 750,000 | $ 750,000 |
| CONVERT EXISTING SIGNALS TO TWO-WAY OPERATIONS | 4 | EA | $ 250,000 | $ 1,000,000 |
| MODIFY EXISTING SIGNALS ON MAIN ST. | 2 | EA | $ 50,000 | $ 100,000 |
| RE-STRIPE & SIGNING MODIFICATIONS ON D ST. | 1 | LS | $ 60,000 | $ 60,000 |
| CLOSE MAIN ST. | 4 | LS | $ 10,000 | $ 40,000 |
| CLOSE 7th & 8th SIDE STREETS | 2 | EA | $ 50,000 | $ 100,000 |
| PARKING STRUCTURE | 1 | LS | $ 5,000,000 | $ 5,000,000 |
| MOBILIZATION | | | 10.00% | $ 295,000 |
| BONDING & INSURANCE | | | 3.00% | $ 88,500 |
| PLANNING LEVEL ESTIMATING CONTINGENCY | | | 20.00% | $ 590,000 |
| | | | **SUB-TOTAL =** | **$ 9,224,000** |
| | | | (ROUNDED UP TO NEAREST THOUSAND) | |
| ENGINEERING (DESIGN & CONSTRUCTION) | | | 20.00% | $ 1,844,800 |
| PROJECT CONTINGENCY | | | 5.00% | $ 461,200 |
| | | | **SUB-TOTAL =** | **$ 2,306,000** |
| | | | (ROUNDED UP TO NEAREST THOUSAND) | |

**TOTAL = $ 11,530,000**

ESTIMATE IS BASED ON 2014 PRESENT VALUE,
INCREASE BY 2%-3% PER YEAR FOR INFLATION

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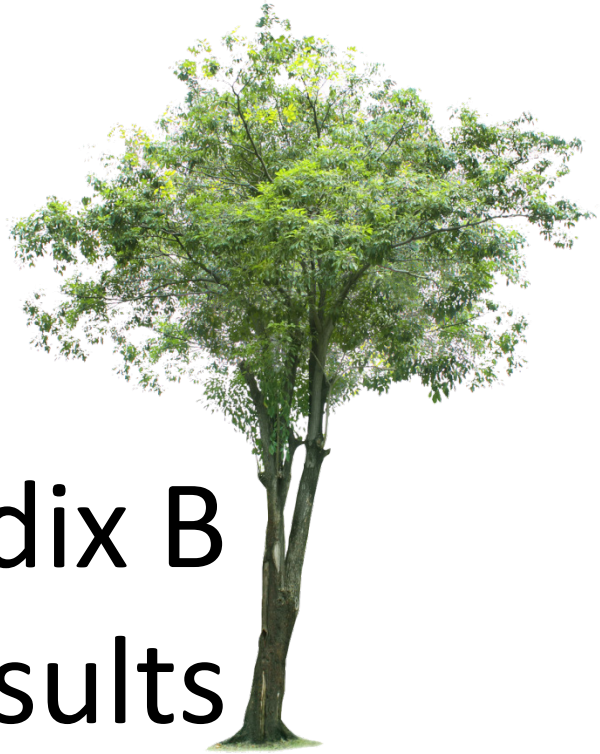
# Appendix B
# Traffic Simulation Results



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## Arterial Level of Service: WB D St

| Cross Street | Arterial Class | Flow Speed | Running Time | Signal Delay | Travel Time (s) | Dist (mi) | Arterial Speed | Arterial LOS |
|---|---|---|---|---|---|---|---|---|
| 9th St | IV | 25 | 24.4 | 9.3 | 33.7 | 0.14 | 14.5 | C |
| 5th St | IV | 25 | 49.3 | 9.0 | 58.3 | 0.32 | 19.9 | B |
| 3rd St | IV | 25 | 23.8 | 6.8 | 30.6 | 0.11 | 12.7 | D |
| Total | IV | | 97.5 | 25.1 | 122.6 | 0.57 | 16.6 | C |

## Arterial Level of Service: EB Main St

| Cross Street | Arterial Class | Flow Speed | Running Time | Signal Delay | Travel Time (s) | Dist (mi) | Arterial Speed | Arterial LOS |
|---|---|---|---|---|---|---|---|---|
| 3rd St | IV | 25 | 35.6 | 13.8 | 49.4 | 0.23 | 17.0 | C |
| 5th St | IV | 25 | 23.6 | 1.9 | 25.5 | 0.11 | 15.2 | C |
| 9th St | IV | 25 | 46.4 | 2.6 | 49.0 | 0.30 | 22.3 | B |
| 13th St. | IV | 25 | 44.0 | 13.7 | 57.7 | 0.29 | 17.9 | C |
| Total | IV | | 149.6 | 32.0 | 181.6 | 0.93 | 18.5 | C |

## Arterial Level of Service: WB Main St

| Cross Street | Arterial Class | Flow Speed | Running Time | Signal Delay | Travel Time (s) | Dist (mi) | Arterial Speed | Arterial LOS |
|---|---|---|---|---|---|---|---|---|
| 13th St. | IV | 25 | 18.5 | 12.4 | 30.9 | 0.08 | 9.8 | D |
| Total | IV | | 18.5 | 12.4 | 30.9 | 0.08 | 9.8 | D |

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## Arterial Level of Service: WB D St

| Cross Street | Arterial Class | Flow Speed | Running Time | Signal Delay | Travel Time (s) | Dist (mi) | Arterial Speed | Arterial LOS |
|---|---|---|---|---|---|---|---|---|
| 9th St | IV | 25 | 23.0 | 11.2 | 34.2 | 0.13 | 13.5 | C |
| 5th St | IV | 25 | 48.8 | 8.5 | 57.3 | 0.32 | 20.0 | B |
| 3rd St | IV | 25 | 23.6 | 6.9 | 30.5 | 0.11 | 12.7 | D |
| Total | IV | | 95.4 | 26.6 | 122.0 | 0.55 | 16.4 | C |

## Arterial Level of Service: EB Main St

| Cross Street | Arterial Class | Flow Speed | Running Time | Signal Delay | Travel Time (s) | Dist (mi) | Arterial Speed | Arterial LOS |
|---|---|---|---|---|---|---|---|---|
| 3rd St | IV | 25 | 20.3 | 16.1 | 36.4 | 0.09 | 9.1 | D |
| 5th St | IV | 25 | 23.3 | 2.6 | 25.9 | 0.11 | 14.7 | C |
| 9th St | IV | 25 | 45.8 | 2.3 | 48.1 | 0.30 | 22.4 | B |
| 13th St. | IV | 25 | 43.6 | 18.3 | 61.9 | 0.29 | 16.6 | C |
| Total | IV | | 133.0 | 39.3 | 172.3 | 0.78 | 16.4 | C |

## Arterial Level of Service: WB Main St

| Cross Street | Arterial Class | Flow Speed | Running Time | Signal Delay | Travel Time (s) | Dist (mi) | Arterial Speed | Arterial LOS |
|---|---|---|---|---|---|---|---|---|
| 13th St. | IV | 25 | 18.5 | 12.8 | 31.3 | 0.08 | 9.7 | D |
| Total | IV | | 18.5 | 12.8 | 31.3 | 0.08 | 9.7 | D |

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## Arterial Level of Service: WB D St

| Cross Street | Arterial Class | Flow Speed | Running Time | Signal Delay | Travel Time (s) | Dist (mi) | Arterial Speed | Arterial LOS |
|---|---|---|---|---|---|---|---|---|
| 9th St | IV | 25 | 23.0 | 6.6 | 29.6 | 0.13 | 15.5 | C |
| 5th St | IV | 25 | 48.8 | 4.8 | 53.6 | 0.32 | 21.4 | B |
| 3rd St | IV | 25 | 23.6 | 1.9 | 25.5 | 0.11 | 15.1 | C |
| Total | IV | | 95.4 | 13.3 | 108.7 | 0.55 | 18.4 | C |

## Arterial Level of Service: EB Main St

| Cross Street | Arterial Class | Flow Speed | Running Time | Signal Delay | Travel Time (s) | Dist (mi) | Arterial Speed | Arterial LOS |
|---|---|---|---|---|---|---|---|---|
| 3rd St | IV | 25 | 20.3 | 2.9 | 23.2 | 0.09 | 14.3 | C |
| 5th St | IV | 25 | 23.3 | 2.9 | 26.2 | 0.11 | 14.6 | C |
| 9th St | IV | 25 | 45.8 | 5.3 | 51.1 | 0.30 | 21.1 | B |
| 13th St. | IV | 25 | 43.7 | 15.7 | 59.4 | 0.29 | 17.3 | C |
| Total | IV | | 133.1 | 26.8 | 159.9 | 0.78 | 17.6 | C |

## Arterial Level of Service: WB Main St

| Cross Street | Arterial Class | Flow Speed | Running Time | Signal Delay | Travel Time (s) | Dist (mi) | Arterial Speed | Arterial LOS |
|---|---|---|---|---|---|---|---|---|
| 13th St. | IV | 25 | 18.5 | 8.8 | 27.3 | 0.08 | 11.1 | D |
| Total | IV | | 18.5 | 8.8 | 27.3 | 0.08 | 11.1 | D |

## Summary of All Intervals

| | |
|---|---|
| Start Time | 4:57 |
| End Time | 5:15 |
| Total Time (min) | 18 |
| Time Recorded (min) | 15 |
| # of Intervals | 2 |
| # of Recorded Intervals | 1 |
| Vehs Entered | 882 |
| Vehs Exited | 881 |
| Starting Vehs | 120 |
| Ending Vehs | 121 |
| Travel Distance (mi) | 508 |
| Travel Time (hr) | 28.4 |
| Total Delay (hr) | 7.0 |
| Total Stops | 924 |
| Fuel Used (gal) | 19.4 |

## Interval #0 Information Seeding

| | |
|---|---|
| Start Time | 4:57 |
| End Time | 5:00 |
| Total Time (min) | 3 |

Volumes adjusted by Growth Factors.

No data recorded this interval.

## Interval #1 Information Recording

| | |
|---|---|
| Start Time | 5:00 |
| End Time | 5:15 |
| Total Time (min) | 15 |

Volumes adjusted by Growth Factors.

| | |
|---|---|
| Vehs Entered | 882 |
| Vehs Exited | 881 |
| Starting Vehs | 120 |
| Ending Vehs | 121 |
| Travel Distance (mi) | 508 |
| Travel Time (hr) | 28.4 |
| Total Delay (hr) | 7.0 |
| Total Stops | 924 |
| Fuel Used (gal) | 19.4 |

## 1: Main St & 3rd St Performance by movement

| Movement | EBL | EBT | SBL | SBT | All |
|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 3.1 | 2.0 | 25.2 | 0.0 | 2.7 |

## 2: 5th St & Main St Performance by movement

| Movement | EBL | EBT | EBR | NBT | NBR | SBL | SBT | All |
|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 0.2 | 0.1 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 13.8 | 6.4 | 6.0 | 20.8 | 5.6 | 15.5 | 9.9 | 8.7 |

## 4: 9th St & Main St Performance by movement

| Movement | EBL | EBT | EBR | NBT | NBR | SBL | SBT | All |
|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 0.4 | 0.2 | 0.0 | 0.0 | 0.1 |
| Total Del/Veh (s) | 3.8 | 5.0 | 4.1 | 21.0 | 10.9 | 45.7 | 16.9 | 9.2 |

## 5: 13th St. & Main St Performance by movement

| Movement | EBT | EBR | WBL | WBT | NBL | NBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.1 | 0.6 | 3.9 | 0.3 | 0.3 | 0.1 | 0.3 |
| Total Del/Veh (s) | 9.4 | 5.5 | 21.8 | 5.5 | 12.6 | 6.4 | 8.5 |

## 6: 3rd St & D St Performance by movement

| Movement | WBL | WBT | WBR | NBL | NBT | SBT | SBR | All |
|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.0 |
| Total Del/Veh (s) | 2.6 | 2.8 | 0.6 | 36.4 | 5.5 | 37.8 | 10.7 | 4.9 |

## 7: 5th St & D St Performance by movement

| Movement | WBL | WBT | WBR | NBL | NBT | SBT | SBR | All |
|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 2.2 | 0.0 | 0.1 | 0.1 | 0.3 |
| Total Del/Veh (s) | 6.3 | 6.2 | 4.2 | 28.7 | 10.0 | 30.1 | 12.1 | 10.9 |

## 9: 9th St & D St Performance by movement

| Movement | WBL | WBT | NBL | NBT | All |
|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 3.5 | 3.8 | 20.7 | 1.8 | 7.3 |

## 13: Main St & Return Performance by movement

| Movement | EBT | NER | All |
|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 5.4 | 1.2 | 1.4 |

## 21: 11th St/D St & Main St Performance by movement

| Movement | EBL | EBT | EBR | WBT | WBR | NBT | NBR | All |
|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.0 |
| Total Del/Veh (s) | 4.2 | 2.4 | 0.0 | 0.4 | 1.3 | 20.2 | 3.7 | 2.2 |

## 23: 1st St & D St Performance by movement

| Movement | EBL | EBR | WBL | WBT | SBT | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.1 | 0.4 | 0.0 | 0.0 | 0.1 | 3.5 | 0.2 |
| Total Del/Veh (s) | 2.3 | 19.8 | 3.0 | 1.6 | 8.0 | 3.9 | 9.6 |

## 25: 1st St & Return Performance by movement

| Movement | SBL | SBT | All |
|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 3.8 | 4.2 | 4.1 |

## 26: Snake River & Main St & 1st St Performance by movement

| Movement | EBT | EBR | NBR2 | SWR | All |
|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.4 | 0.5 | 0.1 | 0.0 | 0.2 |
| Total Del/Veh (s) | 0.8 | 1.7 | 0.3 | 0.3 | 0.7 |

## Total Network Performance

| | |
|---|---|
| Denied Del/Veh (s) | 0.5 |
| Total Del/Veh (s) | 24.6 |

## Intersection: 1: Main St & 3rd St

| Movement | EB | EB | SB |
|---|---|---|---|
| Directions Served | LT | T | L |
| Maximum Queue (ft) | 91 | 93 | 31 |
| Average Queue (ft) | 37 | 21 | 24 |
| 95th Queue (ft) | 91 | 79 | 42 |
| Link Distance (ft) | 436 | 436 | 78 |
| Upstream Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |
| Storage Bay Dist (ft) | | | |
| Storage Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |

## Intersection: 2: 5th St & Main St

| Movement | EB | EB | NB | NB | SB | SB |
|---|---|---|---|---|---|---|
| Directions Served | LT | TR | T | R | L | T |
| Maximum Queue (ft) | 106 | 129 | 76 | 56 | 30 | 29 |
| Average Queue (ft) | 70 | 81 | 64 | 30 | 21 | 22 |
| 95th Queue (ft) | 109 | 126 | 80 | 66 | 43 | 39 |
| Link Distance (ft) | 491 | 491 | 168 | 168 | 73 | 73 |
| Upstream Blk Time (%) | | | | | | |
| Queuing Penalty (veh) | | | | | | |
| Storage Bay Dist (ft) | | | | | | |
| Storage Blk Time (%) | | | | | | |
| Queuing Penalty (veh) | | | | | | |

## Intersection: 4: 9th St & Main St

| Movement | EB | EB | NB | SB |
|---|---|---|---|---|
| Directions Served | LT | TR | TR | LT |
| Maximum Queue (ft) | 111 | 97 | 200 | 188 |
| Average Queue (ft) | 71 | 47 | 115 | 65 |
| 95th Queue (ft) | 115 | 103 | 192 | 157 |
| Link Distance (ft) | 1196 | 1196 | 248 | 271 |
| Upstream Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |
| Storage Bay Dist (ft) | | | | |
| Storage Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |

## Intersection: 5: 13th St. & Main St

| Movement | EB | EB | WB | WB | NB | NB |
|---|---|---|---|---|---|---|
| Directions Served | T | R | L | T | L | R |
| Maximum Queue (ft) | 413 | 175 | 32 | 131 | 141 | 50 |
| Average Queue (ft) | 166 | 61 | 13 | 66 | 86 | 25 |
| 95th Queue (ft) | 353 | 142 | 39 | 117 | 129 | 57 |
| Link Distance (ft) | 402 | | | 404 | 285 | 285 |
| Upstream Blk Time (%) | 1 | | | | | |
| Queuing Penalty (veh) | 7 | | | | | |
| Storage Bay Dist (ft) | | 150 | 95 | | | |
| Storage Blk Time (%) | 6 | 0 | | 2 | | |
| Queuing Penalty (veh) | 13 | 0 | | 0 | | |

## Intersection: 6: 3rd St & D St

| Movement | WB | WB | NB | SB |
|---|---|---|---|---|
| Directions Served | LT | TR | LT | TR |
| Maximum Queue (ft) | 94 | 120 | 71 | 50 |
| Average Queue (ft) | 35 | 53 | 40 | 29 |
| 95th Queue (ft) | 78 | 113 | 82 | 52 |
| Link Distance (ft) | 491 | 491 | 78 | 248 |
| Upstream Blk Time (%) | | | 1 | |
| Queuing Penalty (veh) | | | 1 | |
| Storage Bay Dist (ft) | | | | |
| Storage Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |

## Intersection: 7: 5th St & D St

| Movement | WB | WB | NB | NB | SB |
|---|---|---|---|---|---|
| Directions Served | LT | TR | L | T | TR |
| Maximum Queue (ft) | 114 | 152 | 77 | 32 | 95 |
| Average Queue (ft) | 80 | 90 | 62 | 15 | 46 |
| 95th Queue (ft) | 113 | 138 | 80 | 39 | 88 |
| Link Distance (ft) | 306 | 306 | 73 | 73 | 186 |
| Upstream Blk Time (%) | | | 10 | | |
| Queuing Penalty (veh) | | | 8 | | |
| Storage Bay Dist (ft) | | | | | |
| Storage Blk Time (%) | | | | | |
| Queuing Penalty (veh) | | | | | |

## Intersection: 9: 9th St & D St

| Movement | WB | WB | NB |
|---|---|---|---|
| Directions Served | LT | T | L |
| Maximum Queue (ft) | 76 | 74 | 141 |
| Average Queue (ft) | 59 | 56 | 111 |
| 95th Queue (ft) | 76 | 75 | 143 |
| Link Distance (ft) | 610 | 610 | 271 |
| Upstream Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |
| Storage Bay Dist (ft) | | | |
| Storage Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |

## Intersection: 13: Main St & Return

| Movement | EB | NE | NE |
|---|---|---|---|
| Directions Served | T | R | R |
| Maximum Queue (ft) | 31 | 30 | 56 |
| Average Queue (ft) | 18 | 4 | 12 |
| 95th Queue (ft) | 43 | 22 | 47 |
| Link Distance (ft) | 55 | 277 | 277 |
| Upstream Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |
| Storage Bay Dist (ft) | | | |
| Storage Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |

## Intersection: 21: 11th St/D St & Main St

| Movement | NB |
|---|---|
| Directions Served | TR |
| Maximum Queue (ft) | 28 |
| Average Queue (ft) | 15 |
| 95th Queue (ft) | 38 |
| Link Distance (ft) | 243 |
| Upstream Blk Time (%) | |
| Queuing Penalty (veh) | |
| Storage Bay Dist (ft) | |
| Storage Blk Time (%) | |
| Queuing Penalty (veh) | |

## Intersection: 23: 1st St & D St

| Movement | EB | WB | SB | SB |
|---|---|---|---|---|
| Directions Served | R | L | T | R |
| Maximum Queue (ft) | 426 | 22 | 55 | 31 |
| Average Queue (ft) | 246 | 3 | 25 | 13 |
| 95th Queue (ft) | 407 | 16 | 55 | 37 |
| Link Distance (ft) | 455 | 504 | 222 | |
| Upstream Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |
| Storage Bay Dist (ft) | | | | 50 |
| Storage Blk Time (%) | | | 0 | 0 |
| Queuing Penalty (veh) | | | 0 | 0 |

## Intersection: 25: 1st St & Return

| Movement |
|---|
| Directions Served |
| Maximum Queue (ft) |
| Average Queue (ft) |
| 95th Queue (ft) |
| Link Distance (ft) |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%) |
| Queuing Penalty (veh) |

## Intersection: 26: Snake River & Main St & 1st St

| Movement |
|---|
| Directions Served |
| Maximum Queue (ft) |
| Average Queue (ft) |
| 95th Queue (ft) |
| Link Distance (ft) |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%) |
| Queuing Penalty (veh) |

## Network Summary

Network wide Queuing Penalty: 29

## Arterial Level of Service: EB D St

| Cross Street | Arterial Class | Flow Speed | Running Time | Signal Delay | Travel Time (s) | Dist (mi) | Arterial Speed | Arterial LOS |
|---|---|---|---|---|---|---|---|---|
| 1st St | IV | 25 | 20.6 | 6.6 | 27.2 | 0.09 | 12.4 | D |
| 3rd St | IV | 25 | 23.5 | 1.2 | 24.7 | 0.11 | 15.6 | C |
| 5th St | IV | 25 | 23.5 | 3.3 | 26.8 | 0.11 | 14.4 | C |
| 9th St | IV | 25 | 49.0 | 9.5 | 58.5 | 0.32 | 19.7 | B |
| Main St | IV | 25 | 23.5 | 0.0 | 23.5 | 0.13 | 20.0 | B |
| Total | IV | | 140.1 | 20.6 | 160.7 | 0.76 | 17.0 | C |

## Arterial Level of Service: WB D St

| Cross Street | Arterial Class | Flow Speed | Running Time | Signal Delay | Travel Time (s) | Dist (mi) | Arterial Speed | Arterial LOS |
|---|---|---|---|---|---|---|---|---|
| 9th St | IV | 25 | 23.5 | 12.1 | 35.6 | 0.13 | 13.2 | C |
| 5th St | IV | 25 | 49.0 | 6.3 | 55.3 | 0.32 | 20.8 | B |
| 3rd St | IV | 25 | 23.5 | 2.4 | 25.9 | 0.11 | 14.9 | C |
| 1st St | IV | 25 | 23.5 | 9.6 | 33.1 | 0.11 | 11.6 | D |
| Total | IV | | 119.5 | 30.4 | 149.9 | 0.66 | 16.0 | C |

## Arterial Level of Service: EB Main St

| Cross Street | Arterial Class | Flow Speed | Running Time | Signal Delay | Travel Time (s) | Dist (mi) | Arterial Speed | Arterial LOS |
|---|---|---|---|---|---|---|---|---|
| 1st St | IV | 25 | 11.6 | 5.0 | 16.6 | 0.04 | 9.5 | D |
| 3rd St | IV | 30 | 19.9 | 8.0 | 27.9 | 0.11 | 14.2 | C |
| 5th St | IV | 25 | 23.4 | 12.5 | 35.9 | 0.11 | 10.7 | D |
| 9th St | IV | 25 | 45.6 | 24.0 | 69.6 | 0.30 | 15.4 | C |
| 11th St | IV | 25 | 26.1 | 12.0 | 38.1 | 0.12 | 11.2 | D |
| 13th St. | IV | 25 | 30.1 | 14.9 | 45.0 | 0.17 | 13.4 | C |
| Total | IV | | 156.7 | 76.4 | 233.1 | 0.84 | 13.0 | C |

## Arterial Level of Service: WB Main St

| Cross Street | Arterial Class | Flow Speed | Running Time | Signal Delay | Travel Time (s) | Dist (mi) | Arterial Speed | Arterial LOS |
|---|---|---|---|---|---|---|---|---|
| 13th St. | IV | 25 | 18.5 | 9.2 | 27.7 | 0.08 | 11.0 | D |
| D St | IV | 25 | 30.1 | 13.2 | 43.3 | 0.17 | 13.9 | C |
| 9th St | IV | 25 | 26.1 | 9.7 | 35.8 | 0.12 | 11.9 | D |
| 5th St | IV | 25 | 45.6 | 23.2 | 68.8 | 0.30 | 15.6 | C |
| 3rd St | IV | 25 | 23.4 | 21.9 | 45.3 | 0.11 | 8.4 | E |
| 1st St | IV | 30 | 19.9 | 18.2 | 38.1 | 0.11 | 10.4 | D |
| Total | IV | | 163.6 | 95.4 | 259.0 | 0.88 | 12.3 | D |

## Summary of All Intervals

| | |
|---|---|
| Start Time | 4:57 |
| End Time | 5:15 |
| Total Time (min) | 18 |
| Time Recorded (min) | 15 |
| # of Intervals | 2 |
| # of Recorded Intervals | 1 |
| Vehs Entered | 810 |
| Vehs Exited | 813 |
| Starting Vehs | 75 |
| Ending Vehs | 72 |
| Travel Distance (mi) | 340 |
| Travel Time (hr) | 21.5 |
| Total Delay (hr) | 7.3 |
| Total Stops | 1074 |
| Fuel Used (gal) | 13.8 |

## Interval #0 Information Seeding

| | |
|---|---|
| Start Time | 4:57 |
| End Time | 5:00 |
| Total Time (min) | 3 |

Volumes adjusted by Growth Factors.

No data recorded this interval.

## Interval #1 Information Recording

| | |
|---|---|
| Start Time | 5:00 |
| End Time | 5:15 |
| Total Time (min) | 15 |

Volumes adjusted by Growth Factors.

| | |
|---|---|
| Vehs Entered | 810 |
| Vehs Exited | 813 |
| Starting Vehs | 75 |
| Ending Vehs | 72 |
| Travel Distance (mi) | 340 |
| Travel Time (hr) | 21.5 |
| Total Delay (hr) | 7.3 |
| Total Stops | 1074 |
| Fuel Used (gal) | 13.8 |

## 1: Main St & 3rd St Performance by movement

| Movement | EBL | EBT | WBT | WBR | SBL | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 11.9 | 6.7 | 17.1 | 12.2 | 11.1 | 10.3 | 12.8 |

## 2: 5th St & Main St Performance by movement

| Movement | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR | All |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.2 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 15.3 | 2.7 | 27.7 | 22.9 | 14.6 | 17.4 | 9.1 | 2.4 | 1.4 | 1.3 | 17.7 |

## 4: 9th St & Main St Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 | 0.2 | 0.3 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 11.3 | 19.2 | 19.3 | 13.4 | 6.9 | 12.7 | 20.1 | 19.4 | 15.2 | 1.3 | 16.7 | 5.0 |

## 4: 9th St & Main St Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.1 |
| Total Del/Veh (s) | 15.6 |

## 5: 13th St. & Main St Performance by movement

| Movement | EBT | EBR | WBL | WBT | NBL | NBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 3.3 | 0.3 | 0.1 | 0.1 | 0.3 |
| Total Del/Veh (s) | 12.5 | 6.1 | 9.5 | 9.4 | 15.9 | 2.6 | 10.6 |

## 6: 3rd St & D St Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBT | SBR | All |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.0 |
| Total Del/Veh (s) | 3.7 | 1.2 | 4.3 | 2.5 | 2.7 | 15.6 | 16.8 | 0.5 | 18.2 | 4.4 | 5.5 |

## 7: 5th St & D St Performance by movement

| Movement | EBT | WBT | WBR | NBL | NBT | SBL | SBT | SBR | All |
|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 | 0.2 | 0.1 | 0.1 |
| Total Del/Veh (s) | 0.0 | 4.6 | 2.6 | 9.3 | 2.1 | 16.3 | 25.5 | 10.4 | 12.3 |

## 9: 9th St & D St Performance by movement

| Movement | EBT | EBR | WBT | NBL | NBT | All |
|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 12.5 | 9.8 | 6.9 | 15.9 | 0.7 | 10.4 |

## 21: 11th St/D St & Main St Performance by movement

| Movement | EBL | EBT | WBT | WBR | NBL | NBR | SBL | SBT | SBR | All |
|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 19.4 | 9.8 | 10.2 | 8.1 | 6.1 | 4.4 | 12.0 | 0.8 | 8.3 | 9.7 |

## 23: 1st St & D St Performance by movement

| Movement | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR | All |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.4 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.1 | 0.2 |
| Total Del/Veh (s) | 14.0 | 7.2 | 12.5 | 6.3 | 21.8 | 9.0 | 5.6 | 6.0 | 5.6 | 2.6 | 9.1 |

## 25: Main St & 1st St Performance by movement

| Movement | SBR | NEL | NET | SWT | All |
|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 0.7 | 16.0 | 3.6 | 10.3 | 5.4 |

## 26: Snake River & Main St Performance by movement

| Movement | EBL | EBR | NBR | SWR | All |
|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.4 | 0.6 | 0.3 | 0.0 | 0.3 |
| Total Del/Veh (s) | 0.3 | 1.8 | 0.0 | 0.7 | 1.0 |

## Total Network Performance

| | |
|---|---|
| Denied Del/Veh (s) | 0.4 |
| Total Del/Veh (s) | 29.2 |

## Intersection: 1: Main St & 3rd St

| Movement | EB | EB | WB | SB |
|---|---|---|---|---|
| Directions Served | L | T | TR | LR |
| Maximum Queue (ft) | 53 | 178 | 327 | 53 |
| Average Queue (ft) | 23 | 73 | 156 | 29 |
| 95th Queue (ft) | 59 | 158 | 299 | 52 |
| Link Distance (ft) | 514 | 514 | 496 | 46 |
| Upstream Blk Time (%) | | | | 2 |
| Queuing Penalty (veh) | | | | 1 |
| Storage Bay Dist (ft) | | | | |
| Storage Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |

## Intersection: 2: 5th St & Main St

| Movement | EB | WB | B3 | NB |
|---|---|---|---|---|
| Directions Served | LTR | LTR | T | LTR |
| Maximum Queue (ft) | 256 | 331 | 54 | 94 |
| Average Queue (ft) | 120 | 203 | 8 | 61 |
| 95th Queue (ft) | 251 | 335 | 39 | 94 |
| Link Distance (ft) | 496 | 259 | 1186 | 181 |
| Upstream Blk Time (%) | | 6 | | |
| Queuing Penalty (veh) | | 34 | | |
| Storage Bay Dist (ft) | | | | |
| Storage Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |

## Intersection: 4: 9th St & Main St

| Movement | EB | WB | WB | NB | SB |
|---|---|---|---|---|---|
| Directions Served | LTR | L | TR | LTR | LTR |
| Maximum Queue (ft) | 267 | 117 | 96 | 248 | 22 |
| Average Queue (ft) | 176 | 45 | 66 | 152 | 8 |
| 95th Queue (ft) | 304 | 104 | 112 | 255 | 24 |
| Link Distance (ft) | 1186 | | 580 | 257 | 250 |
| Upstream Blk Time (%) | | | | 0 | |
| Queuing Penalty (veh) | | | | 0 | |
| Storage Bay Dist (ft) | | 100 | | | |
| Storage Blk Time (%) | | | 1 | | |
| Queuing Penalty (veh) | | | 1 | | |

## Intersection: 5: 13th St. & Main St

| Movement | EB | EB | WB | WB | NB | NB |
|---|---|---|---|---|---|---|
| Directions Served | T | R | L | T | L | R |
| Maximum Queue (ft) | 190 | 175 | 56 | 180 | 74 | 30 |
| Average Queue (ft) | 112 | 65 | 19 | 98 | 47 | 13 |
| 95th Queue (ft) | 203 | 141 | 52 | 170 | 76 | 38 |
| Link Distance (ft) | 799 | | | 404 | 284 | 284 |
| Upstream Blk Time (%) | | | | | | |
| Queuing Penalty (veh) | | | | | | |
| Storage Bay Dist (ft) | | 150 | 95 | | | |
| Storage Blk Time (%) | 5 | | | 6 | | |
| Queuing Penalty (veh) | 6 | | | 2 | | |

## Intersection: 6: 3rd St & D St

| Movement | EB | EB | WB | NB | SB |
|---|---|---|---|---|---|
| Directions Served | L | TR | TR | LTR | LTR |
| Maximum Queue (ft) | 30 | 30 | 54 | 53 | 31 |
| Average Queue (ft) | 17 | 13 | 33 | 31 | 30 |
| 95th Queue (ft) | 41 | 37 | 63 | 67 | 32 |
| Link Distance (ft) | | 495 | 125 | 46 | 254 |
| Upstream Blk Time (%) | | | | 4 | |
| Queuing Penalty (veh) | | | | 3 | |
| Storage Bay Dist (ft) | 100 | | | | |
| Storage Blk Time (%) | | | | | |
| Queuing Penalty (veh) | | | | | |

## Intersection: 7: 5th St & D St

| Movement | WB | NB | SB |
|---|---|---|---|
| Directions Served | LTR | L | LTR |
| Maximum Queue (ft) | 42 | 24 | 160 |
| Average Queue (ft) | 23 | 7 | 85 |
| 95th Queue (ft) | 52 | 25 | 156 |
| Link Distance (ft) | 314 | 80 | 200 |
| Upstream Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |
| Storage Bay Dist (ft) | | | |
| Storage Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |

## Intersection: 9: 9th St & D St

| Movement | EB | WB | NB |
|---|---|---|---|
| Directions Served | TR | LT | LR |
| Maximum Queue (ft) | 96 | 73 | 53 |
| Average Queue (ft) | 42 | 30 | 27 |
| 95th Queue (ft) | 87 | 77 | 52 |
| Link Distance (ft) | 1254 | 632 | 250 |
| Upstream Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |
| Storage Bay Dist (ft) | | | |
| Storage Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |

## Intersection: 21: 11th St/D St & Main St

| Movement | EB | EB | WB | NB | SB |
|---|---|---|---|---|---|
| Directions Served | L | TR | TR | LTR | LTR |
| Maximum Queue (ft) | 31 | 178 | 259 | 45 | 54 |
| Average Queue (ft) | 9 | 118 | 94 | 14 | 28 |
| 95th Queue (ft) | 32 | 184 | 217 | 42 | 52 |
| Link Distance (ft) | | 580 | 799 | 250 | 632 |
| Upstream Blk Time (%) | | | | | |
| Queuing Penalty (veh) | | | | | |
| Storage Bay Dist (ft) | 100 | | | | |
| Storage Blk Time (%) | | 9 | 5 | | |
| Queuing Penalty (veh) | | 0 | 0 | | |

## Intersection: 23: 1st St & D St

| Movement | EB | WB | WB | NB | NB | SB | SB |
|---|---|---|---|---|---|---|---|
| Directions Served | TR | L | TR | L | TR | L | TR |
| Maximum Queue (ft) | 144 | 121 | 23 | 28 | 77 | 27 | 51 |
| Average Queue (ft) | 101 | 69 | 3 | 13 | 27 | 4 | 20 |
| 95th Queue (ft) | 170 | 112 | 17 | 33 | 72 | 20 | 50 |
| Link Distance (ft) | 449 | | 495 | | 229 | 220 | 220 |
| Upstream Blk Time (%) | | | | | | | |
| Queuing Penalty (veh) | | | | | | | |
| Storage Bay Dist (ft) | | 100 | | 100 | | | |
| Storage Blk Time (%) | | 2 | | | | | |
| Queuing Penalty (veh) | | 0 | | | | | |

## Intersection: 25: Main St & 1st St

| Movement | NE | NE | NE | SW |
|---|---|---|---|---|
| Directions Served | L | T | T | T |
| Maximum Queue (ft) | 66 | 54 | 73 | 274 |
| Average Queue (ft) | 41 | 24 | 34 | 133 |
| 95th Queue (ft) | 75 | 61 | 67 | 280 |
| Link Distance (ft) | | 161 | 161 | 514 |
| Upstream Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |
| Storage Bay Dist (ft) | 100 | | | |
| Storage Blk Time (%) | | | | 13 |
| Queuing Penalty (veh) | | | | 0 |

## Intersection: 26: Snake River & Main St

| Movement |
|---|
| Directions Served |
| Maximum Queue (ft) |
| Average Queue (ft) |
| 95th Queue (ft) |
| Link Distance (ft) |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%) |
| Queuing Penalty (veh) |

## Network Summary

Network wide Queuing Penalty: 46

## Arterial Level of Service: EB D St

| Cross Street | Arterial Class | Flow Speed | Running Time | Signal Delay | Travel Time (s) | Dist (mi) | Arterial Speed | Arterial LOS |
|---|---|---|---|---|---|---|---|---|
| 1st St | IV | 25 | 20.6 | 47.2 | 67.8 | 0.09 | 5.0 | F |
| 3rd St | IV | 25 | 23.5 | 5.7 | 29.2 | 0.11 | 13.2 | C |
| 5th St | IV | 25 | 23.5 | 2.3 | 25.8 | 0.11 | 14.9 | C |
| 9th St | IV | 25 | 49.0 | 8.9 | 57.9 | 0.32 | 19.9 | B |
| Main St | IV | 25 | 23.5 | 11.1 | 34.6 | 0.13 | 13.6 | C |
| Total | IV | | 140.1 | 75.2 | 215.3 | 0.76 | 12.7 | D |

## Arterial Level of Service: WB D St

| Cross Street | Arterial Class | Flow Speed | Running Time | Signal Delay | Travel Time (s) | Dist (mi) | Arterial Speed | Arterial LOS |
|---|---|---|---|---|---|---|---|---|
| 9th St | IV | 25 | 23.5 | 10.4 | 33.9 | 0.13 | 13.9 | C |
| 5th St | IV | 25 | 49.0 | 12.6 | 61.6 | 0.32 | 18.7 | C |
| 3rd St | IV | 25 | 23.5 | 8.5 | 32.0 | 0.11 | 12.0 | D |
| 1st St | IV | 25 | 23.5 | 2.3 | 25.8 | 0.11 | 14.9 | C |
| Total | IV | | 119.5 | 33.8 | 153.3 | 0.66 | 15.6 | C |

## Arterial Level of Service: EB Main St

| Cross Street | Arterial Class | Flow Speed | Running Time | Signal Delay | Travel Time (s) | Dist (mi) | Arterial Speed | Arterial LOS |
|---|---|---|---|---|---|---|---|---|
| 3rd St | IV | 28 | 23.3 | 8.7 | 32.0 | 0.16 | 17.5 | C |
| 5th St | IV | 25 | 23.4 | 10.1 | 33.5 | 0.11 | 11.4 | D |
| 9th St | IV | 25 | 45.6 | 5.4 | 51.0 | 0.30 | 21.0 | B |
| 11th St | IV | 25 | 26.1 | 9.3 | 35.4 | 0.12 | 12.1 | D |
| 13th St. | IV | 25 | 30.1 | 12.8 | 42.9 | 0.17 | 14.0 | C |
| Total | IV | | 148.5 | 46.3 | 194.8 | 0.84 | 15.6 | C |

## Arterial Level of Service: WB Main St

| Cross Street | Arterial Class | Flow Speed | Running Time | Signal Delay | Travel Time (s) | Dist (mi) | Arterial Speed | Arterial LOS |
|---|---|---|---|---|---|---|---|---|
| 13th St. | IV | 25 | 18.5 | 10.3 | 28.8 | 0.08 | 10.5 | D |
| D St | IV | 25 | 30.1 | 6.0 | 36.1 | 0.17 | 16.7 | C |
| 9th St | IV | 25 | 26.1 | 8.6 | 34.7 | 0.12 | 12.3 | D |
| Total | IV | | 74.7 | 24.9 | 99.6 | 0.37 | 13.4 | C |

## Summary of All Intervals

| | |
|---|---|
| Start Time | 4:57 |
| End Time | 5:15 |
| Total Time (min) | 18 |
| Time Recorded (min) | 15 |
| # of Intervals | 2 |
| # of Recorded Intervals | 1 |
| Vehs Entered | 847 |
| Vehs Exited | 830 |
| Starting Vehs | 92 |
| Ending Vehs | 109 |
| Travel Distance (mi) | 339 |
| Travel Time (hr) | 24.0 |
| Total Delay (hr) | 9.5 |
| Total Stops | 1017 |
| Fuel Used (gal) | 14.4 |

## Interval #0 Information Seeding

| | |
|---|---|
| Start Time | 4:57 |
| End Time | 5:00 |
| Total Time (min) | 3 |

Volumes adjusted by Growth Factors.

No data recorded this interval.

## Interval #1 Information Recording

| | |
|---|---|
| Start Time | 5:00 |
| End Time | 5:15 |
| Total Time (min) | 15 |

Volumes adjusted by Growth Factors.

| | |
|---|---|
| Vehs Entered | 847 |
| Vehs Exited | 830 |
| Starting Vehs | 92 |
| Ending Vehs | 109 |
| Travel Distance (mi) | 339 |
| Travel Time (hr) | 24.0 |
| Total Delay (hr) | 9.5 |
| Total Stops | 1017 |
| Fuel Used (gal) | 14.4 |

## 1: Main St & 3rd St Performance by movement

| Movement | EBL | EBT | SBL | All |
|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 22.0 | 4.7 | 4.8 | 11.2 |

## 2: 5th St & Main St Performance by movement

| Movement | EBL | EBT | EBR | NBT | NBR | SBL | SBT | All |
|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 0.2 | 0.2 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 17.4 | 4.2 | 5.0 | 22.4 | 6.6 | 23.3 | 7.1 | 8.8 |

## 4: 9th St & Main St Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBR | NBT | NBR | SBT | All |
|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 0.3 | 0.0 | 0.3 | 0.2 | 0.0 | 0.1 |
| Total Del/Veh (s) | 1.0 | 4.2 | 3.6 | 7.9 | 4.6 | 40.6 | 23.0 | 4.6 | 15.7 |

## 5: 13th St. & Main St Performance by movement

| Movement | EBT | EBR | WBL | WBT | NBL | NBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.3 | 3.5 | 0.3 | 0.2 | 0.1 | 0.2 |
| Total Del/Veh (s) | 13.3 | 5.2 | 19.1 | 10.6 | 29.2 | 8.0 | 14.0 |

## 6: 3rd St & D St Performance by movement

| Movement | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBR | All |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.9 | 0.0 | 6.0 | 0.1 | 0.1 | 0.8 |
| Total Del/Veh (s) | 12.6 | 4.3 | 2.6 | 13.1 | 6.4 | 31.0 | 47.7 | 17.8 | 13.9 | 8.7 | 15.3 |

## 7: 5th St & D St Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT | SBR | All |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 2.3 | 0.7 | 0.0 | 0.0 | 0.0 | 0.4 | 0.3 | 0.2 | 0.5 |
| Total Del/Veh (s) | 12.4 | 2.0 | 0.7 | 12.5 | 12.3 | 23.8 | 36.4 | 0.9 | 23.4 | 42.4 | 26.7 | 17.0 |

## 9: 9th St & D St Performance by movement

| Movement | EBT | EBR | WBT | NBL | All |
|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 9.3 | 0.0 | 6.8 | 11.1 | 8.3 |

## 21: 11th St/D St & Main St Performance by movement

| Movement | EBT | WBL | WBT | WBR | NBT | NBR | SBL | SBT | SBR | All |
|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 11.4 | 16.5 | 7.9 | 5.5 | 0.8 | 1.4 | 8.4 | 1.7 | 3.9 | 7.9 |

## 23: 1st St & D St Performance by movement

| Movement | EBT | EBR | WBL | WBT | WBR | SBT | SBR | All |
|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.3 | 0.4 | 1.1 | 0.0 | 0.0 | 0.1 | 0.1 | 0.7 |
| Total Del/Veh (s) | 19.0 | 12.6 | 33.1 | 23.3 | 7.1 | 16.3 | 4.7 | 23.5 |

## 25: Main St & 1st St Performance by movement

| Movement | SBL | SBT | SBR | NET | All |
|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 3.1 | 0.7 | 0.9 | 1.9 | 1.1 |

## 26: Snake River & Main St Performance by movement

| Movement | EBL | EBR | NBR | SWR | All |
|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.6 | 0.8 | 0.1 | 0.0 | 0.4 |
| Total Del/Veh (s) | 3.7 | 4.2 | 0.8 | 0.3 | 2.2 |

## Total Network Performance

| | |
|---|---|
| Denied Del/Veh (s) | 1.1 |
| Total Del/Veh (s) | 35.5 |

## Intersection: 1: Main St & 3rd St

| Movement | EB | EB | SB |
|---|---|---|---|
| Directions Served | L | T | L |
| Maximum Queue (ft) | 160 | 94 | 27 |
| Average Queue (ft) | 66 | 46 | 4 |
| 95th Queue (ft) | 147 | 86 | 19 |
| Link Distance (ft) | 514 | 514 | 56 |
| Upstream Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |
| Storage Bay Dist (ft) | | | |
| Storage Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |

## Intersection: 2: 5th St & Main St

| Movement | EB | NB | SB | SB |
|---|---|---|---|---|
| Directions Served | LTR | TR | L | T |
| Maximum Queue (ft) | 70 | 116 | 31 | 55 |
| Average Queue (ft) | 27 | 53 | 15 | 18 |
| 95th Queue (ft) | 65 | 111 | 38 | 56 |
| Link Distance (ft) | 493 | 181 | 92 | 92 |
| Upstream Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |
| Storage Bay Dist (ft) | | | | |
| Storage Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |

## Intersection: 4: 9th St & Main St

| Movement | EB | WB | WB | NB | SB |
|---|---|---|---|---|---|
| Directions Served | TR | L | R | TR | LT |
| Maximum Queue (ft) | 122 | 53 | 30 | 221 | 22 |
| Average Queue (ft) | 40 | 18 | 4 | 131 | 3 |
| 95th Queue (ft) | 103 | 50 | 21 | 220 | 16 |
| Link Distance (ft) | | | 580 | 257 | 250 |
| Upstream Blk Time (%) | | | | | |
| Queuing Penalty (veh) | | | | | |
| Storage Bay Dist (ft) | 200 | 100 | | | |
| Storage Blk Time (%) | | | | | |
| Queuing Penalty (veh) | | | | | |

## Intersection: 5: 13th St. & Main St

| Movement | EB | EB | WB | WB | NB | NB |
|---|---|---|---|---|---|---|
| Directions Served | T | R | L | T | L | R |
| Maximum Queue (ft) | 183 | 175 | 31 | 132 | 138 | 24 |
| Average Queue (ft) | 109 | 74 | 18 | 86 | 69 | 6 |
| 95th Queue (ft) | 196 | 176 | 43 | 137 | 135 | 21 |
| Link Distance (ft) | 799 | | | 404 | 284 | 284 |
| Upstream Blk Time (%) | | | | | | |
| Queuing Penalty (veh) | | | | | | |
| Storage Bay Dist (ft) | | 150 | 95 | | | |
| Storage Blk Time (%) | 3 | 0 | | 7 | | |
| Queuing Penalty (veh) | 3 | 0 | | 2 | | |

## Intersection: 6: 3rd St & D St

| Movement | EB | EB | WB | B16 | NB | SB |
|---|---|---|---|---|---|---|
| Directions Served | L | TR | TR | T | LTR | LTR |
| Maximum Queue (ft) | 30 | 29 | 197 | 324 | 76 | 50 |
| Average Queue (ft) | 7 | 4 | 190 | 150 | 65 | 25 |
| 95th Queue (ft) | 25 | 21 | 210 | 353 | 91 | 53 |
| Link Distance (ft) | | 499 | 125 | 314 | 56 | 254 |
| Upstream Blk Time (%) | | | 26 | 3 | 50 | |
| Queuing Penalty (veh) | | | 207 | 23 | 87 | |
| Storage Bay Dist (ft) | 100 | | | | | |
| Storage Blk Time (%) | | | 27 | | | |
| Queuing Penalty (veh) | | | 6 | | | |

## Intersection: 7: 5th St & D St

| Movement | EB | WB | NB | SB |
|---|---|---|---|---|
| Directions Served | LTR | LTR | L | LTR |
| Maximum Queue (ft) | 29 | 339 | 92 | 208 |
| Average Queue (ft) | 8 | 155 | 39 | 126 |
| 95th Queue (ft) | 30 | 314 | 93 | 197 |
| Link Distance (ft) | 314 | 314 | 92 | 200 |
| Upstream Blk Time (%) | | 1 | 9 | 1 |
| Queuing Penalty (veh) | | 8 | 4 | 0 |
| Storage Bay Dist (ft) | | | | |
| Storage Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |

## Intersection: 9: 9th St & D St

| Movement | EB | WB | NB |
|---|---|---|---|
| Directions Served | TR | LT | LR |
| Maximum Queue (ft) | 92 | 158 | 88 |
| Average Queue (ft) | 42 | 80 | 31 |
| 95th Queue (ft) | 85 | 157 | 60 |
| Link Distance (ft) | 1254 | 632 | 250 |
| Upstream Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |
| Storage Bay Dist (ft) | | | |
| Storage Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |

## Intersection: 21: 11th St/D St & Main St

| Movement | EB | WB | WB | NB | SB |
|---|---|---|---|---|---|
| Directions Served | TR | L | TR | LTR | LTR |
| Maximum Queue (ft) | 109 | 26 | 94 | 27 | 118 |
| Average Queue (ft) | 79 | 9 | 71 | 4 | 66 |
| 95th Queue (ft) | 114 | 28 | 94 | 19 | 119 |
| Link Distance (ft) | 580 | | 799 | 250 | 632 |
| Upstream Blk Time (%) | | | | | |
| Queuing Penalty (veh) | | | | | |
| Storage Bay Dist (ft) | | 100 | | | |
| Storage Blk Time (%) | 3 | | 0 | | |
| Queuing Penalty (veh) | 0 | | 0 | | |

## Intersection: 23: 1st St & D St

| Movement | EB | WB | WB | SB |
|---|---|---|---|---|
| Directions Served | TR | L | TR | TR |
| Maximum Queue (ft) | 326 | 224 | 508 | 30 |
| Average Queue (ft) | 163 | 201 | 266 | 20 |
| 95th Queue (ft) | 294 | 245 | 656 | 42 |
| Link Distance (ft) | 460 | | 499 | 220 |
| Upstream Blk Time (%) | | | 9 | |
| Queuing Penalty (veh) | | | 67 | |
| Storage Bay Dist (ft) | | 200 | | |
| Storage Blk Time (%) | | 25 | 0 | |
| Queuing Penalty (veh) | | 8 | 1 | |

## Intersection: 25: Main St & 1st St

| Movement | SB |
|---|---|
| Directions Served | L |
| Maximum Queue (ft) | 21 |
| Average Queue (ft) | 6 |
| 95th Queue (ft) | 21 |
| Link Distance (ft) | |
| Upstream Blk Time (%) | |
| Queuing Penalty (veh) | |
| Storage Bay Dist (ft) | 50 |
| Storage Blk Time (%) | |
| Queuing Penalty (veh) | |

## Intersection: 26: Snake River & Main St

| Movement | EB | EB |
|---|---|---|
| Directions Served | L | LR |
| Maximum Queue (ft) | 44 | 334 |
| Average Queue (ft) | 6 | 56 |
| 95th Queue (ft) | 32 | 246 |
| Link Distance (ft) | 318 | 318 |
| Upstream Blk Time (%) | | 1 |
| Queuing Penalty (veh) | | 0 |
| Storage Bay Dist (ft) | | |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

## Network Summary

Network wide Queuing Penalty: 416

## Arterial Level of Service: EB D St

| Cross Street | Arterial Class | Flow Speed | Running Time | Signal Delay | Travel Time (s) | Dist (mi) | Arterial Speed | Arterial LOS |
|---|---|---|---|---|---|---|---|---|
| 1st St | IV | 25 | 20.6 | 37.5 | 58.1 | 0.09 | 5.8 | F |
| 3rd St | IV | 25 | 23.5 | 5.0 | 28.5 | 0.11 | 13.5 | C |
| 5th St | IV | 25 | 23.5 | 8.6 | 32.1 | 0.11 | 12.0 | D |
| 9th St | IV | 25 | 49.0 | 5.3 | 54.3 | 0.32 | 21.2 | B |
| Main St | IV | 25 | 23.5 | 6.8 | 30.3 | 0.13 | 15.5 | C |
| Total | IV | | 140.1 | 63.2 | 203.3 | 0.76 | 13.4 | C |

## Arterial Level of Service: WB D St

| Cross Street | Arterial Class | Flow Speed | Running Time | Signal Delay | Travel Time (s) | Dist (mi) | Arterial Speed | Arterial LOS |
|---|---|---|---|---|---|---|---|---|
| 9th St | IV | 25 | 23.5 | 10.2 | 33.7 | 0.13 | 13.9 | C |
| 5th St | IV | 25 | 49.0 | 7.2 | 56.2 | 0.32 | 20.5 | B |
| 3rd St | IV | 25 | 23.5 | 3.2 | 26.7 | 0.11 | 14.4 | C |
| 1st St | IV | 25 | 23.5 | 4.2 | 27.7 | 0.11 | 13.9 | C |
| Total | IV | | 119.5 | 24.8 | 144.3 | 0.66 | 16.6 | C |

## Arterial Level of Service: NE Main St

| Cross Street | Arterial Class | Flow Speed | Running Time | Signal Delay | Travel Time (s) | Dist (mi) | Arterial Speed | Arterial LOS |
|---|---|---|---|---|---|---|---|---|
| 1st St | IV | 25 | 11.6 | 7.7 | 19.3 | 0.04 | 8.2 | E |
| Total | IV | | 11.6 | 7.7 | 19.3 | 0.04 | 8.2 | E |

## Summary of All Intervals

| | |
|---|---|
| Start Time | 4:57 |
| End Time | 5:15 |
| Total Time (min) | 18 |
| Time Recorded (min) | 15 |
| # of Intervals | 2 |
| # of Recorded Intervals | 1 |
| Vehs Entered | 780 |
| Vehs Exited | 774 |
| Starting Vehs | 93 |
| Ending Vehs | 99 |
| Travel Distance (mi) | 318 |
| Travel Time (hr) | 24.7 |
| Total Delay (hr) | 11.0 |
| Total Stops | 1005 |
| Fuel Used (gal) | 13.9 |

## Interval #0 Information Seeding

| | |
|---|---|
| Start Time | 4:57 |
| End Time | 5:00 |
| Total Time (min) | 3 |

Volumes adjusted by Growth Factors.

No data recorded this interval.

## Interval #1 Information Recording

| | |
|---|---|
| Start Time | 5:00 |
| End Time | 5:15 |
| Total Time (min) | 15 |

Volumes adjusted by Growth Factors.

| | |
|---|---|
| Vehs Entered | 780 |
| Vehs Exited | 774 |
| Starting Vehs | 93 |
| Ending Vehs | 99 |
| Travel Distance (mi) | 318 |
| Travel Time (hr) | 24.7 |
| Total Delay (hr) | 11.0 |
| Total Stops | 1005 |
| Fuel Used (gal) | 13.9 |

## 4: 9th St & Main St Performance by movement

| Movement | WBL | NBT | NBR | SBT | All |
|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.4 | 0.1 | 0.2 | 0.0 | 0.2 |
| Total Del/Veh (s) | 3.4 | 46.4 | 8.6 | 30.1 | 14.4 |

## 5: 13th St. & Main St Performance by movement

| Movement | EBT | EBR | WBL | WBT | NBL | NBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 3.4 | 0.4 | 0.2 | 0.1 | 0.3 |
| Total Del/Veh (s) | 4.5 | 2.9 | 15.8 | 7.3 | 16.4 | 1.5 | 7.6 |

## 6: 3rd St & D St Performance by movement

| Movement | EBL | EBT | WBT | NBL | NBT | NBR | SBL | SBR | All |
|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 0.3 | 0.1 | 0.5 | 0.1 | 4.2 | 0.2 |
| Total Del/Veh (s) | 21.8 | 11.9 | 10.4 | 21.1 | 7.7 | 3.2 | 41.5 | 16.1 | 10.1 |

## 7: 5th St & D St Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.2 | 0.2 |
| Total Del/Veh (s) | 7.4 | 8.4 | 6.7 | 17.8 | 7.3 | 8.1 | 26.9 | 3.9 | 4.2 | 23.0 | 34.8 | 14.1 |

## 7: 5th St & D St Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.0 |
| Total Del/Veh (s) | 12.5 |

## 9: 9th St & D St Performance by movement

| Movement | EBT | EBR | WBT | NBL | All |
|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.2 | 0.0 | 0.1 |
| Total Del/Veh (s) | 4.3 | 4.4 | 8.0 | 1.5 | 6.0 |

## 21: 11th St/D St & Main St Performance by movement

| Movement | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR | All |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 10.9 | 12.0 | 12.0 | 5.8 | 2.2 | 0.1 | 2.4 | 10.3 | 2.2 | 4.2 | 7.9 |

## 23: 1st St & D St Performance by movement

| Movement | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | All |
|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.1 | 0.5 | 7.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.2 | 3.9 |
| Total Del/Veh (s) | 55.8 | 63.2 | 55.8 | 43.7 | 43.2 | 1.0 | 1.7 | 26.9 | 17.8 | 54.9 |

## 25: Main St & 1st St Performance by movement

| Movement | SBL | SBT | SBR | NEL | NET | All |
|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 50.4 | 1.2 | 1.3 | 13.0 | 8.5 | 3.2 |

## 26: Snake River & Main St Performance by movement

| Movement | EBL | EBR | NBR | SWR | All |
|---|---|---|---|---|---|
| Denied Del/Veh (s) | 1.1 | 1.2 | 0.1 | 0.0 | 0.6 |
| Total Del/Veh (s) | 5.3 | 4.5 | 0.0 | 0.4 | 2.4 |

## Total Network Performance

| | |
|---|---|
| Denied Del/Veh (s) | 2.5 |
| Total Del/Veh (s) | 43.0 |

## Intersection: 4: 9th St & Main St

| Movement | WB | NB | SB |
|---|---|---|---|
| Directions Served | L | TR | LT |
| Maximum Queue (ft) | 51 | 52 | 72 |
| Average Queue (ft) | 24 | 44 | 29 |
| 95th Queue (ft) | 53 | 59 | 69 |
| Link Distance (ft) | | 257 | 252 |
| Upstream Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |
| Storage Bay Dist (ft) | 100 | | |
| Storage Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |

## Intersection: 5: 13th St. & Main St

| Movement | EB | EB | WB | WB | NB | NB |
|---|---|---|---|---|---|---|
| Directions Served | T | R | L | T | L | R |
| Maximum Queue (ft) | 115 | 31 | 52 | 161 | 96 | 30 |
| Average Queue (ft) | 40 | 9 | 13 | 73 | 56 | 8 |
| 95th Queue (ft) | 101 | 32 | 48 | 155 | 95 | 30 |
| Link Distance (ft) | 799 | | | 404 | 284 | 284 |
| Upstream Blk Time (%) | | | | | | |
| Queuing Penalty (veh) | | | | | | |
| Storage Bay Dist (ft) | | 150 | 95 | | | |
| Storage Blk Time (%) | | | | 4 | | |
| Queuing Penalty (veh) | | | | 1 | | |

## Intersection: 6: 3rd St & D St

| Movement | EB | EB | WB | B16 | NB | NB | SB | SB |
|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | TR | T | L | TR | L | R |
| Maximum Queue (ft) | 24 | 81 | 228 | 77 | 53 | 68 | 30 | 30 |
| Average Queue (ft) | 7 | 31 | 154 | 11 | 31 | 53 | 19 | 9 |
| 95th Queue (ft) | 25 | 78 | 209 | 55 | 56 | 72 | 40 | 31 |
| Link Distance (ft) | | 487 | 121 | 323 | | 65 | 253 | |
| Upstream Blk Time (%) | | | 19 | | 0 | 1 | | |
| Queuing Penalty (veh) | | | 111 | | 0 | 4 | | |
| Storage Bay Dist (ft) | 100 | | | | 50 | | | 50 |
| Storage Blk Time (%) | | 0 | | | 6 | 7 | | 0 |
| Queuing Penalty (veh) | | 0 | | | 15 | 4 | | 0 |

## Intersection: 7: 5th St & D St

| Movement | EB | WB | NB | NB | SB |
|---|---|---|---|---|---|
| Directions Served | LTR | LTR | L | TR | LTR |
| Maximum Queue (ft) | 94 | 147 | 110 | 20 | 114 |
| Average Queue (ft) | 82 | 74 | 81 | 5 | 65 |
| 95th Queue (ft) | 105 | 140 | 121 | 20 | 115 |
| Link Distance (ft) | 323 | 313 | 80 | 80 | 200 |
| Upstream Blk Time (%) | | | 10 | | |
| Queuing Penalty (veh) | | | 0 | | |
| Storage Bay Dist (ft) | | | | | |
| Storage Blk Time (%) | | | | | |
| Queuing Penalty (veh) | | | | | |

## Intersection: 9: 9th St & D St

| Movement | EB | WB |
|---|---|---|
| Directions Served | TR | LT |
| Maximum Queue (ft) | 98 | 182 |
| Average Queue (ft) | 56 | 91 |
| 95th Queue (ft) | 93 | 183 |
| Link Distance (ft) | 1254 | 632 |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (ft) | | |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

## Intersection: 21: 11th St/D St & Main St

| Movement | EB | WB | WB | NB | SB |
|---|---|---|---|---|---|
| Directions Served | TR | L | TR | LTR | LTR |
| Maximum Queue (ft) | 51 | 26 | 127 | 27 | 114 |
| Average Queue (ft) | 19 | 7 | 69 | 8 | 48 |
| 95th Queue (ft) | 50 | 26 | 122 | 28 | 101 |
| Link Distance (ft) | 580 | | 799 | 250 | 632 |
| Upstream Blk Time (%) | | | | | |
| Queuing Penalty (veh) | | | | | |
| Storage Bay Dist (ft) | | 100 | | | |
| Storage Blk Time (%) | | | 2 | | |
| Queuing Penalty (veh) | | | 0 | | |

## Intersection: 23: 1st St & D St

| Movement | EB | WB | WB | NB | NB | SB | SB |
|---|---|---|---|---|---|---|---|
| Directions Served | TR | L | TR | L | TR | L | TR |
| Maximum Queue (ft) | 475 | 225 | 498 | 26 | 30 | 27 | 51 |
| Average Queue (ft) | 402 | 224 | 444 | 4 | 9 | 4 | 35 |
| 95th Queue (ft) | 581 | 228 | 573 | 19 | 31 | 19 | 51 |
| Link Distance (ft) | 460 | | 487 | | 268 | 220 | 220 |
| Upstream Blk Time (%) | 5 | | 3 | | | | |
| Queuing Penalty (veh) | 0 | | 20 | | | | |
| Storage Bay Dist (ft) | | 200 | | 100 | | | |
| Storage Blk Time (%) | | 59 | 0 | | | | |
| Queuing Penalty (veh) | | 6 | 3 | | | | |

## Intersection: 25: Main St & 1st St

| Movement | SB | NE | NE |
|---|---|---|---|
| Directions Served | L | L | T |
| Maximum Queue (ft) | 27 | 72 | 162 |
| Average Queue (ft) | 4 | 32 | 86 |
| 95th Queue (ft) | 19 | 64 | 147 |
| Link Distance (ft) | | 188 | 188 |
| Upstream Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |
| Storage Bay Dist (ft) | 50 | | |
| Storage Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |

## Intersection: 26: Snake River & Main St

| Movement | EB |
|---|---|
| Directions Served | LR |
| Maximum Queue (ft) | 334 |
| Average Queue (ft) | 0 |
| 95th Queue (ft) | 0 |
| Link Distance (ft) | 318 |
| Upstream Blk Time (%) | 0 |
| Queuing Penalty (veh) | 0 |
| Storage Bay Dist (ft) | |
| Storage Blk Time (%) | |
| Queuing Penalty (veh) | |

## Network Summary

Network wide Queuing Penalty: 165

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# Appendix C
# Existing Conditions
# Technical Memorandum

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# Technical Memorandum

# Lewis-Clark Valley Metropolitan Planning Organization

Main Street & D Street Corridor Study
Task 2 Existing and Future Conditions

KELLER associates

**July 22, 2014**

# Technical Memorandum

**TO:** Lewis-Clark Valley Metropolitan Planning Organization

**FROM:** Keller Associates, Inc.

**DATE:** Revised 7/22/2014

**SUBJECT:** Main St. & D St. Corridor Study - Task 2 Existing and Future Conditions

## *Introduction*

The purpose of this technical memorandum is to analyze the existing and future conditions of all modes of transportation within the Main St. & D St. corridor in downtown Lewiston, Idaho. The study area encompasses Main St. and D St. from 1st St. East to 11th St. as shown in Figure 1 below. This memorandum documents deficiencies for motorists, transit, parking, pedestrians, and bicyclists within the corridor. In addition, streetscape features were studied and evaluated. This memorandum does not present solutions for deficiencies, as those will be presented in Task 3, Develop and Refine Alternatives. Previously developed plans and studies are incorporated in this memorandum.

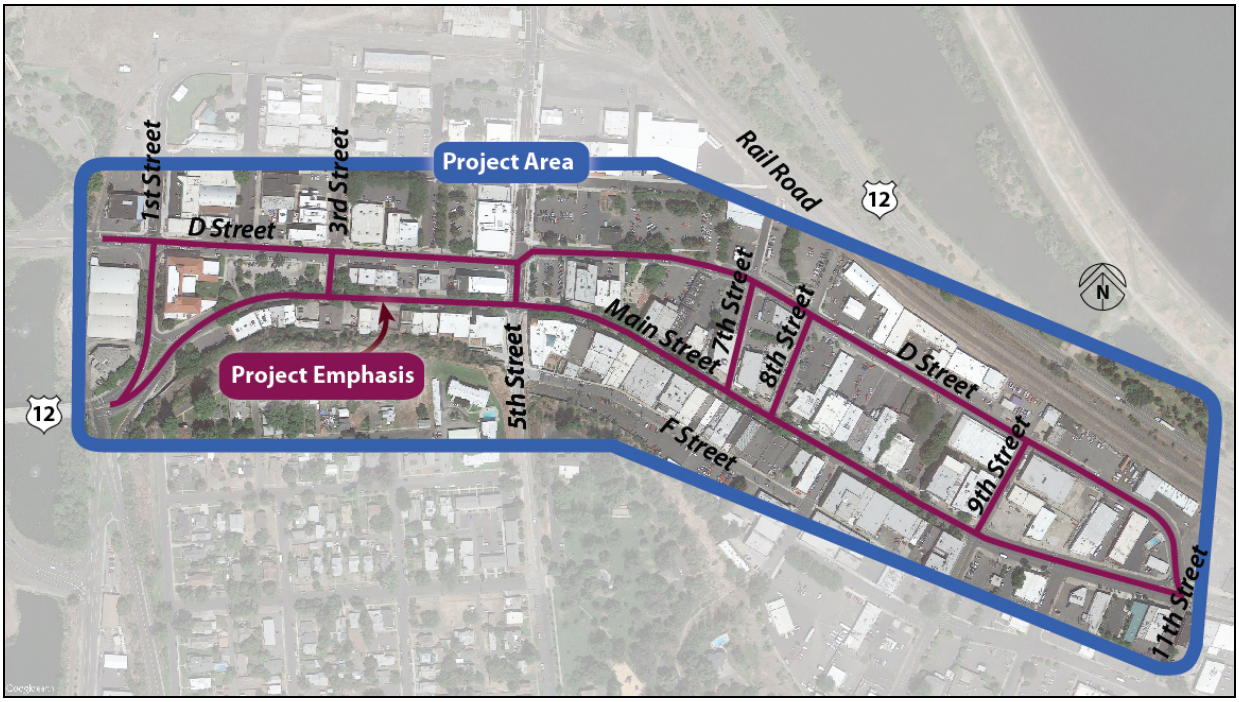



**Figure 1: Main St. & D St. Corridor Study Area**

## *Methodology*

### *Traffic Analysis*

The previously counted *2009* intersection traffic volumes and turning movements from the *Lewiston-Clarkston Downtown Circulation Plan* were selected to be used for the 2014 traffic analysis. The 2009 traffic counts were used since the *2013 North Clarkston Circulation Study* showed there was almost zero traffic growth since 2009. In addition, extremely accurate traffic counts are not needed for this level of analysis. The future traffic projections used the LCVMPO's QRS II travel demand forecast model for the 2040 traffic volumes.

In order to estimate the existing average daily traffic (ADT), for the intersections and roadway segments, the peak hour volume was divided by a K-value (design hour factor) of 0.10. This is an approximate method typically used in a planning level analysis for estimating the ADT.

### *Operational Analysis*

The operational conditions of the non-signalized and signalized intersections were evaluated using the modeling software Synchro. Synchro provides realistic/accurate intersection results and a virtual check so that observations in the field can easily be compared to the model. It was assumed that all signals on Main St. and D St. were pre-timed and had time-based coordination with each other. Synchro also optimized the signal timing of each intersection for the existing conditions analysis. The operational analysis evaluated the queue lengths, level of service (LOS), and delays for each intersection. The future 2040 analysis assumes no improvements will be made to the existing road network. Details of the existing and future operational analyses are presented in Appendix A.

### *Pedestrian and Bicycle*

The City of Lewiston Bike Route Master Plan and Sidewalk Master Plan and the Revitalization Plan for Downtown Lewiston were used to help evaluate the existing multi-modal features of downtown Lewiston. The AASHTO Bike manual and MUTCD design guides were used as references in this analysis. A walkthrough of the study area was completed to better understand the existing conditions and deficiencies.

## *Previous Studies*

The following studies have been reviewed/referenced:

- *A Parking Management Plan for Downtown Lewiston (2007)*
- *A Revitalization Plan for Downtown Lewiston (2008)*
- *LCVMPO Transit Regionalization Study (2008)*
- *Lewiston-Clarkston Wayfinding Plan (2010 Draft)*
- *Lewiston-Clarkston Downtown Circulation Plan (2011)*
- *Valley Destination 2040 The Long Range Transportation Plan (2013)*

## *Existing Traffic*

The current downtown Lewiston transportation system consists of two key one-way routes, also referred to as a one-way couplet; Main St. serves as the eastbound one-way and D St. as the westbound one-way route. Main St. and D St. are both two-lane roadways with street side parking on either side of the roadway. The one-way couplet starts at the intersection of Snake River Avenue and Main St., and ends at 11th St. intersection. This study encompasses a total of nine key intersections, with six being signalized and three unsignalized intersections. All of the intersections were analyzed using Synchro. The signalized intersections were evaluated based on pre-timed and time-based signal timing coordination.

The existing intersections are operating very efficiently, with the average signal delay of the intersections being 8.5 seconds. The signal coordination has proven to be very effective in efficiently moving traffic through downtown Lewiston. The worst operating signal was the Main St. & 3rd St. intersection, which experienced a delay of approximately 14 seconds. This is primarily because this is the first signalized intersection that the unregulated eastbound traffic encounters. The Main St. corridor from 3rd St. to 13th St. experienced a LOS of C and B with an average travel speed of 18 mph. The D St. corridor had a slower average travel speed of approximately 17 mph, with the segment between 1st and 3rd St. operating at a LOS D and the others operating at LOS C and B. These results show that both the corridors will still be functioning at an acceptable LOS without an excessive amount of delay. D St. will experience greater delays than Main St.

Although the unsignalized intersections have unique geometry, most movements are operating well with little to no delay, since most are free-flowing traffic movements. Traffic volumes and operational conditions for each intersection can be seen below in Table 1.

**Table 1: 2014 Operational and Traffic Volume Summary**

| Intersection | Level Of Service | Delay (seconds) | Peak Hour Volume (veh/hr) | Average Daily Traffic |
|---|---|---|---|---|
| 1st/D St.[1] | A | 7 | 1,168 | 11,680 |
| 1st/Main St.[1] | A | 4 | 1,838 | 18,380 |
| 3rd/D St. | A | 7 | 766 | 7,660 |
| 3rd/Main St. | B | 14 | 721 | 7,210 |
| 5th/D St. | A | 9 | 832 | 8,320 |
| 5th/Main St. | A | 5 | 946 | 9,460 |
| 9th/D St. | B | 10 | 685 | 6,850 |
| 9th/Main St. | A | 6 | 1,104 | 11,040 |
| 11th/D St./Main St.[1] | C | 15 | 1,221 | 12,210 |

[1] *Unsignalized intersection.*

Currently a large percentage of motorists using the Main St. corridor are passing through downtown Lewiston without stopping. The Dike Bypass was constructed to provide a heavy vehicle route, and a route that had a higher speed limit, limited access points, and a reduction in travel time compared to traveling through downtown Lewiston. At times this bypass is underutilized. In evaluating the travel time for the Main St. corridor compared to Dike Bypass, it was discovered that the Bypass was approximately 48 seconds faster compared to Main St. This is a minimal difference and appears to have not changed the majority of the motorists' routes. The Dike Bypass is 2 miles long with hardly any passing opportunities and a speed limit of 45 mph, while Main St. is 1.3 miles long with a speed limit of 25 mph.

It was discovered that there is an unbalanced traffic flow on Dike Bypass. Considerably more traffic used Dike Bypass to go westbound versus eastbound. One reason for this could be the difficulty accessing the bypass from Clarkston. When heading westbound, getting on the bypass is not very intuitive nor is it well-marked. This is a possible reason that the route is underutilized.

Figure 2 below shows the peak-hour turning movements for each of the intersections.

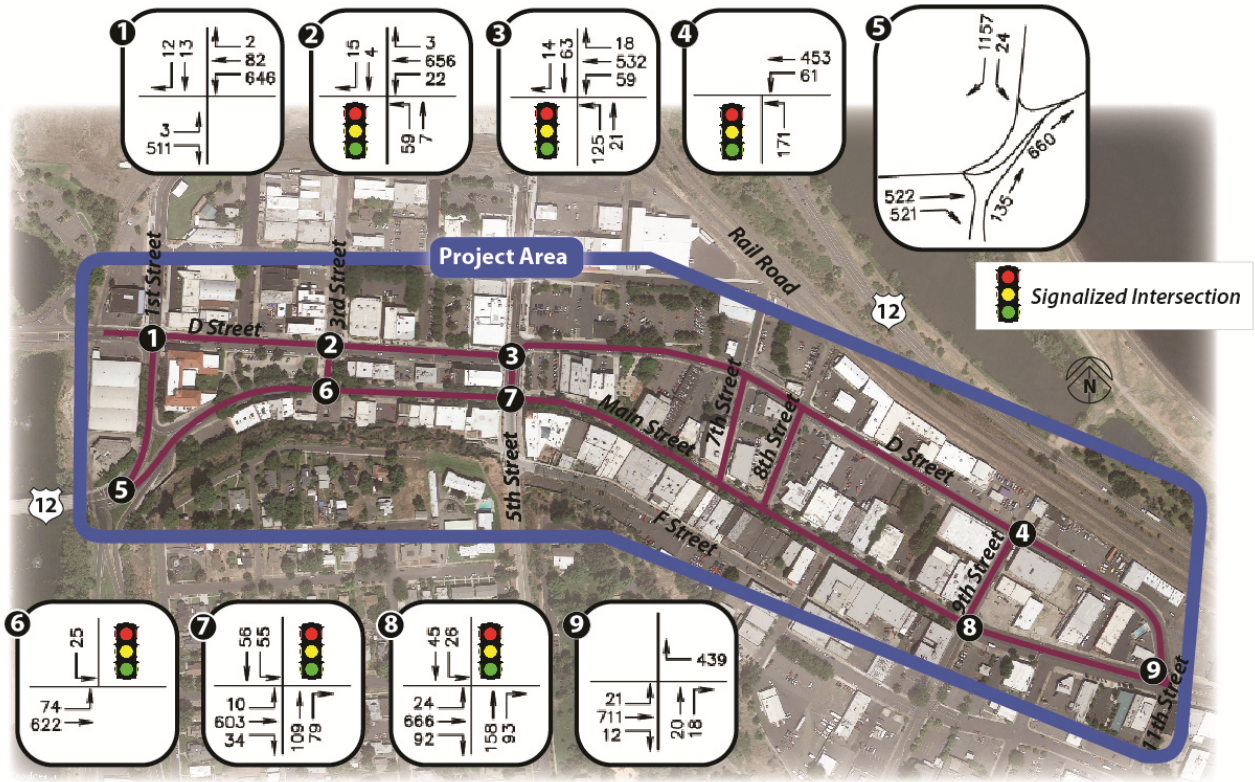



**Figure 2: 2014 Peak-Hour Turning Movements**

Although not part of the Scope of Work for this project, a high-level review of crash history was preformed to help identify any hot spots. A total of 147 crashes occurred in the study area from 2008-2012. Of the 147 crashes, 78% were property damage only while 22%

were injury. This distribution of property damage vs. injury crashes is typical for an urban setting. There were no fatal crashes within the study area. There were also no crashes that involved pedestrians in the five- year study period. Out of the 147 crashes, two involved bicyclists on the roadway. No hot spots or unusual trends were apparent.

## *Future Traffic*

Future traffic volumes were estimated using the LCVMPO's QRS II travel demand forecast model. Downtown Lewiston is anticipated to have minimal growth based on the model. The operating conditions and volumes for each studied intersection can be seen below in Figure 2.

**Table 2: Future 2040 Volumes and Operating Conditions**

| Intersection | Level Of Service | Delay (seconds) | Peak Hour Volume (vehicle/hour) | Average Daily Traffic |
|---|---|---|---|---|
| 1st/D St.[1] | A | 9 | 1,448 | 14,480 |
| 1st/Main St.[1,2] | A | 6 | 2,228 | 22,280 |
| 3rd/D St. | A | 7 | 919 | 9,190 |
| 3rd/Main St. | B | 16 | 911 | 9,110 |
| 5th/D St. | A | 9 | 1,040 | 10,400 |
| 5th/Main St. | A | 5 | 1,135 | 11,350 |
| 9th/D St. | B | 12 | 829 | 8,290 |
| 9th/Main St. | A | 6 | 1,241 | 12,410 |
| 11th/D St./Main St.[1] | C | 18 | 1,473 | 14,730 |

The intersections' future operational conditions had minimal change compared to existing conditions. The 1St and Main St. intersection had the highest peak hour volume of approximately 2,228 vehicles/hour. An operational analysis was conducted on the Main St. and D St. corridor for the future 2040 conditions. The Main St. corridor from 3rd St. to 13th St. experienced a LOS of C and B with an average travel speed of 18 mph. The D St. corridor had a slower average travel speed of approximately 16 mph, with the segment between 1st and 3rd St. operating at a LOS D and the others operating at LOS C and B. These results show that both the corridors will still be functioning at an acceptable LOS without an excessive amount of delay. D St. will experience greater delays than Main St. Appendix A contains the existing and future Synchro operational analysis.

## *Existing Pedestrians*

Walking is a major mode of transportation in downtown Lewiston. Pedestrian facilities in downtown Lewiston are currently comprised of pathways that are typically wider than 8 feet. The sidewalks contain benches, trash receptacles, lighting, bicycle racks, and many other streetscape items. Many of the pedestrian pathways do not meet the current

Americans with Disability Act (ADA) standards. Several crossing locations do not have pedestrian ramps and a large percentage is missing truncated domes. Several portions along D St. do not have an actual sidewalk and pedestrians walk through parking spaces. Portions of the existing sidewalk are in poor condition with cracked and heaved panels exceeding vertical tolerances of ¼" maximum for pathways.

There are two pedestrian midblock crossings on Main St. and D St. that have continuous flashing amber signals as seen in Figure 3. Drivers become accustomed to the continuous flashing, resulting in less awareness of pedestrians trying to cross. None of the signalized intersections have audio or count-down pedestrian signals.

**Figure 3: Midblock Pedestrian Crossing with Flashing Signals**

The majority of the pedestrian crossings have sidewalk bulb-outs, which reduce the crossing distance and provide traffic calming at intersections. There are currently eight midblock pedestrian crossings throughout the corridor. The average midblock crossing distance in the corridor is approximately 30 feet. The average pedestrian walks at a speed of 3.5 feet/seconds. At this rate, it takes approximately 8.5 seconds for a pedestrian to successfully cross the street. Based on the signal timing there is approximately 5 seconds of clearance interval between signal cycles, which includes 3.2 seconds yellow time and 1.9 seconds red time. This provides enough of a gap opportunity for pedestrians to start to cross at midblock locations every signal change or approximately every 30 seconds throughout the corridor. Many of the midblock crossings have the correct signing, but motorists can easily miss the signs with distractions such as parked cars, businesses, and other signs. Midblock pedestrian crossing locations are shown in Figure 4.

Percent vehicle yielding at pedestrian midblock crossings was not evaluated for this study. Based on previous experience, warning devices that notify drivers of a pedestrian crossing have been shown to be more effective than signing. Due to parked vehicles and streetscape, pedestrians may find themselves waiting until a vehicle recognizes they are trying to cross the street and yields.

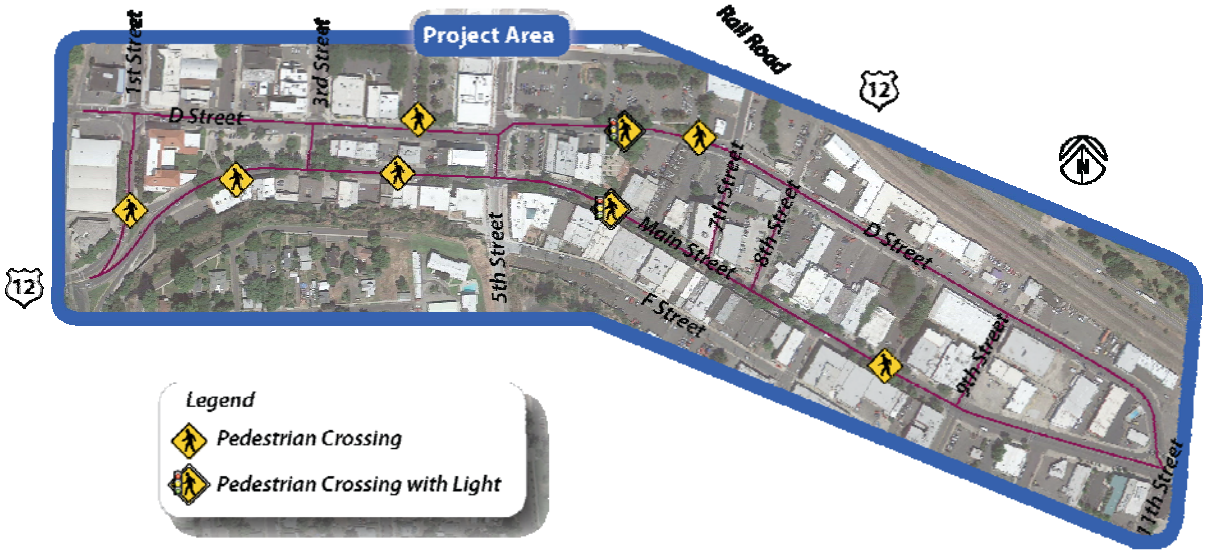



**Figure 4: Midblock Pedestrian Crossing Locations**

The downtown Lewiston streetscape provides aesthetics, but at certain locations constricts the sidewalk making it difficult for pedestrians to pass. Several store fronts along Main St. have fences that extend into the sidewalk and message boards, leaving a narrow gap for pedestrians to walk. Current ADA standards require a 3-foot wide accessible path, while the Public Right-of-Way Accessibility Guidelines (PROWAG) requires a 4-foot minimum accessible path width. Several of the planter grates have openings larger than half-inch, which violates ADA standards. Figure 5 shows a segment of narrow sidewalk.

**Figure 5: Narrow sidewalk in front of business**

The lighting though Main St. varies considerably, from short pedestrian lights to roadway cobra-bend. It was noticed at several intersections that the lights were above the tree canopies, which greatly inhibits light from effectively lighting the intersection. Based on AASHTO's Roadway Lighting design guide, the sidewalk lighting should have a lighting level of 1.3 foot-candles and the roadway should have 1.4 foot-candles minimum. The lighting levels downtown are currently unavailable.

### *Future Pedestrians*

Expected pedestrian growth will have a direct effect on the operational conditions of downtown Lewiston. As the number of pedestrians that use the midblock crossings increase, higher traffic delays and congestion through downtown should be expected. In a downtown setting that already offers many distractions to a motorist, being alert and focused on the roadway can become difficult. Pedestrian activated warning devices with beacons might be warranted to aid drivers in staying alert for pedestrians.

### *Existing Bicyclists*

There are many bike paths along the Clearwater River and Snake River, but many of the downtown streets do not accommodate bicyclists. There are currently no designated bike lanes through downtown Lewiston on either Main St. or D St. Existing signage prohibits bicyclists from using the sidewalks. Bicyclists are required to ride in the streets and share lanes with motorists. There is no marking or sign designation to notify the motorists or bicyclists of shared lane use.

The AASHTO Guide for the Development of Bicycle Facilities recommends a shared lane width of 15-feet, which is suitable for on-street parking. The majority of the existing traffic lanes are less than 13-feet wide, creating a hazard for bicyclists when parked motorists open their doors into the shared lanes. Shared lane use aims to encourage a safe coexistence for bicycles and motorists, yet lane widths of 13-feet or less make it likely that motorists will have to encroach at least partway into the next lane to pass a bicyclist. Since there are no bike lanes or shared lane designation some bicyclists use the sidewalks as seen in Figure 6. This creates a hazard as bikes are forced to weave in and out of pedestrians, planters, and benches

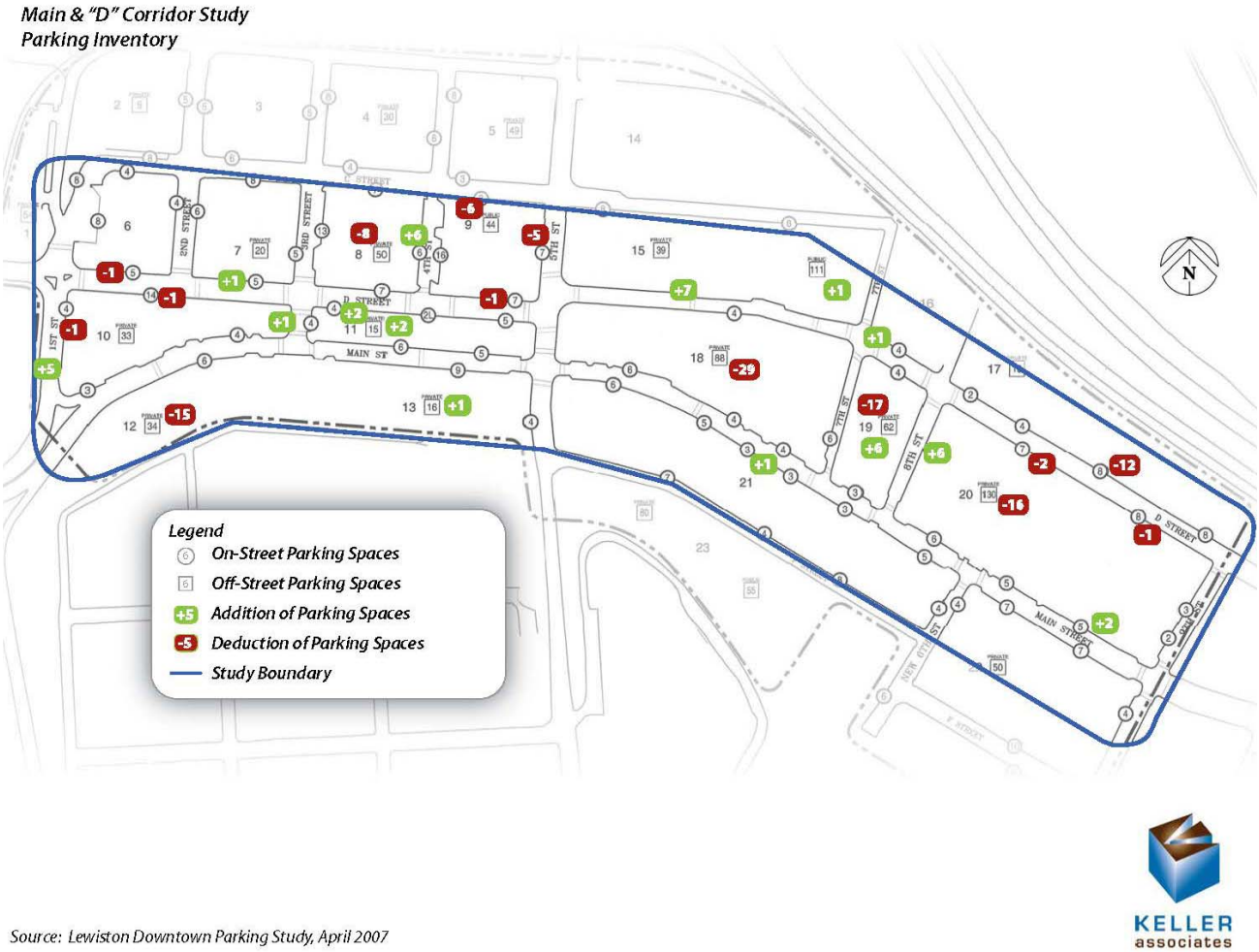
### *Future Bicyclists*

Bicyclists' desire to ride downtown may diminish in the future if improvements are not made to safely accommodate bicycles. Providing bicycle facilities downtown will be essential for mobility. If improvements are not completed, bicyclists could resort to riding on sidewalks, whether prohibited or not.

**Figure 6: Bicyclist riding on the Sidewalk**

## *Existing Parking*

Parking stalls are instrumental in enabling visitors and residents to stop and access businesses and city services. The purpose of this task was to determine the net change in parking stalls from the base condition *2007 Parking Management Plan* to existing 2014 conditions. The 2014 parking analysis studied only the parking stalls that were in both the 2007 project area and 2014 project area. A walkthrough of the study area determined the number of 2014 parking stalls. The majority of the parking changes occurred in the private sector. There was a gain of 16 public parking stalls; however, combining public and private counts there was a total loss of 59 parking stalls from the 2007 Parking Management Plan to 2014 conditions. This reduction may be caused by re-striping or counting inconsistencies. The 2007 Parking Management Plan showed that approximately 25% of the vehicles stayed in public parking stalls for four or more hours. Those parked for four or more hours are most likely downtown employees. Based on the 2007 Parking Management Plan, occupancy levels were 44% to 49% throughout most of the day, with some areas experiencing high utilization. Figure 7 shows the parking stall balance from the 2007 to the 2014 conditions.




Source: Lewiston Downtown Parking Study, April 2007

**Figure 7: Parking Inventory**

The downtown parking signage is well-marked and easy to find. However, there are multiple styles of parking signs, which could create confusion for some drivers in what is public versus private. Having consistent public parking signs would help to eliminate any confusion for public parking.

## *Future Parking*

Public parking used by downtown employees will be detrimental to the success of the local businesses if there is not enough parking for shoppers. According to the 2007 Parking Management Plan there is a need for more efficient use of the existing parking. By utilizing the existing parking more efficiently, the perception of available parking will increase. As development occurs, available parking immediately adjacent to the development should be evaluated to prevent further areas of high parking use with downtown. This effort may involve modifications to city codes and parking requirements.

## *Existing Public Transit*

Lewiston Transit is currently the public transit agency for Lewiston. The West Route and East Route both currently serve downtown Lewiston. Figure 8 below shows the routes that go through downtown. The West Route has two stop locations in the project area – Lewis Clark State College (LCSC) Dorms #4 and Community Action Partnership #5. The East Route also has two stops within the project area – Health Department #9 and Lewiston City Hall #10. The Downtown Clarkston & Lewiston Route of Asotin County PTBA also has one stop in downtown Lewiston on D Street near Brackenbury Square and a second stop at the Community Center, denoted by T3 in Figure 8. The D Street Stop is not currently shown on the transit maps. Service hours and further information on transit stop locations can be found in Appendix C.

**Figure 8: Ride the Valley Transit Route Downtown Lewiston**

Lewiston Transit buses stop at each of the locations within the study area 13 times a day from 6:00 AM to 7:00 PM; the bus runs 13 hours a day and has destinations throughout Lewiston and Clarkston. No bus service is provided on the weekends. In addition to the posted stops, Lewiston Transit will also accept 'flag downs' if the location is safe for pickups. Other than the intersection of 5th and Main, stop times are not posted at each stop. 5th and Main utilizes a transit tube to display the stop times and destinations.

Bus pullouts (former parallel parking stalls converted to bus pullouts) are provided in downtown that allow a bus to move out of the traveled lane to pick up pedestrians. The PTBA stop on D Street, near Brackenbury Square, does not use the provided pullout due to a drainage issue. PTBA has requested the stop be moved to the corner of D Street and 5th Street. None of the downtown stops have pedestrian shelters. Existing right-of-way and sidewalk width may prevent the installation of shelters at downtown stops.

Currently, fares can be paid by the route for $0.75 to $1.00 depending on the route or by fixed-route monthly passes for $30.00. Seniors, qualified disabled individuals, and Medicare card holders can receive half-fare discounts. In addition, Lewiston Transit and the PTBA offer free rides during the summer for youth ages 17 and younger through the Kids Freedom Pass.

### *Future Public Transit*

Public transit in the Lewis-Clark Valley is in its infancy compared to other larger metropolitan areas. Ridership primarily consists the transit dependent public. Unless parking availability downtown decreases or commute times and costs increase, ridership is anticipated to grow at the same overall growth rate of the Valley. There may be an increase in ridership (faster than the valley growth rate) as youth, who take advantage of the Kids Freedom Pass, enter adulthood and begin to use transit at a higher rate than the current adult population.

Some of the transit innovations provided in the large metropolitan areas can be seen as future improvements to Lewiston Transit. Current practices that could be implemented include:

- Web-enabled real-time arrivals – Passengers would be able to obtain real-time information on bus arrivals using the internet, texting, a smart phone or mobile applications (apps) for iPhones or Android phones. This tools would help passengers determine when the next bus would arrive at their stop.
- Bus Shelters – Shelters could include a push-button light to signal buses to stop, a kiosk with route maps, a reader board showing arrival times, a push-button audio option for the blind, and WiFi access. Some shelters could be paid for by private corporations in exchange for the advertising space on the sides.
- Downtown Shuttle/Trolley – A downtown shuttle or trolley could allow for redevelopment of parking lots to commercial use. Parking facilities could be placed at the perimeter of downtown near the US-12 Bypass allowing easy access to parking for motorists and the shuttle/trolley could stop every five minutes approximately to shuttle people to and from the businesses and parking.
- Bike Lockers or Racks – Bike lockers or racks could allow commuters who live in the Orchards to ride their bike to downtown and ride the bus back up the hill to their homes.

### *Existing Streetscape*

Downtown Lewiston has a wide variety of streetscape. Main St. streetscape consists of a wide sidewalk including benches and trash receptacles that are spaced frequently. Main St. has the majority of the landscaping planting islands and trees, which line the street on both sides. Vegetation on Main St., at times, can prohibit vehicles' line of sight for motorists looking for pedestrians. In addition, several of the wood planters are void of vegetation. Main St. streetscape prohibits use of the pathway in some locations.

Restaurants with outdoor seating and fences extending into the sidewalk take up considerable portions of the sidewalks. Based on the City Code Section 31, permanent encroachments in the right-of-way are prohibited. Semi-permanent encroachments are permitted only if there is 8 feet of unobstructed sidewalk, the encroachment does not pose a safety hazard, and it is not within clear vision area defined in Section 31-2. There are multiple instances along Main St. where the City Code Section 31 is not satisfied. D St. consists of a narrower sidewalk with few benches and trash receptacles at the west end, while the east end is void of amenities. D St. has minimal landscaping and very few of trees along the sidewalk.

### *Future Streetscape*

Downtown Lewiston's streetscape elements will most likely increase as the area redevelops. Trends show restaurants on Main St. will desire sidewalk seating, which will likely further constrict the sidewalks. The streetscape policy that is currently in place is anticipated to lead to continued inconsistencies within the downtown corridor. Main St. should be de-cluttered. Individual landscape areas should be evaluated for removal or modification. Street signs, flip boards, fencing, and awning columns should also be adjusted to provide a continuous pedestrian corridor. As traffic volumes increase, pedestrians will desire a greater separation from vehicle traffic or a reduction in vehicle speed and volume.

On D St., east end of the corridor will continue to require sidewalks. Installation of sidewalks and street trees may help transform the area from an industrial use to more commercial. In addition, it may have a calming effect on traffic.

### *Overall Existing Conditions*

The downtown Lewiston transportation system is currently operating well, with the all but one of the intersections and roadways operating at an acceptable level of service of B or better. Travel speeds on average are 18 mph and 17 mph on Main St. and D St. respectively. However, higher speeds are experienced on Main St. at the west end between the blue bridge and the signal at 3$^{rd}$ Street, and after 9$^{th}$ Street at 11$^{th}$ due to the merger of the two travel lanes. Travel speeds on D St. also are excessive near the west end due to the merge required to turn left on to 1$^{st}$ street.

Street-side parking is provided along both sides of the streets as well as in public lots, making it convenient for quick access to downtown. There was a total reduction of 59 stalls from the 2007 analysis to 2014. This reduction may be due to re-striping or counting inconsistencies. Overall, the available parking still appears adequate but some areas do experience shortages during peak hours - namely lunch hour near the Main Street Grill.

Many of the pathways do not meet ADA standards and do not have truncated domes or pedestrian ramps. There are currently no bicyclist accommodations on Main St. or D St. Neglecting to incorporate bicycles into the transit system creates a safety concern for all modes of transportation.

Lewiston Transit and Asotin County PTBA provide public transit to the downtown. They provide multiple stop locations and stop times, making it very flexible and convenient for the public. However, hours of operations are limited to 7 pm, Monday through Friday. No weekend service is provided.

### *Overall Future Conditions*

Over the next 26 years, downtown Lewiston is anticipated to continue to redevelop into a commercial/retail area, especially as new apartments are located in the downtown. The downtown will become more congested by all modes of transportation. As a result, vehicle accidents and pedestrian/bicyclist accidents will increase.

Increased downtown developments will result in a greater need for pedestrian- and bicycle-friendly streets. Streets that safely accommodate pedestrians and bicyclists will be essential for the growth of the downtown. Providing clearly marked pedestrian crossings with vehicle warning devices will be essential due to all of the curbside distractions viewed by motorist. Existing midblock crossings should be enhanced to increase awareness of motorist.

Lewiston Transit must provide additional hours of operation and service on weekends. Technology should be implemented to allow transit users to obtain real-time bus arrival information. In addition, bus shelters should be installed where right-of-way exists or can be obtained.

The streetscape will have many inconsistencies if no clear streetscape policy is implemented. A policy that demands uniformity throughout downtown Lewiston will be essential to promote all modes of transportation.

# Appendix

Appendix A – Synchro Operational Analysis
Appendix B – Parking Summary
Appendix C – Public Transit

# Appendix A – Synchro Operational Results

# Existing Conditions

Lanes, Volumes, Timings
1: Main St & 3rd St

4/21/2014

| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 74 | 622 | 0 | 0 | 25 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | 1.00 | | | 1.00 | |
| Frt | | | | | | |
| Flt Protected | | 0.995 | | | 0.950 | |
| Satd. Flow (prot) | 0 | 3169 | 0 | 0 | 1593 | 0 |
| Flt Permitted | | 0.995 | | | 0.950 | |
| Satd. Flow (perm) | 0 | 3167 | 0 | 0 | 1586 | 0 |
| Right Turn on Red | | | | Yes | | Yes |
| Satd. Flow (RTOR) | | | | | | |
| Link Speed (mph) | | 25 | 25 | | 25 | |
| Link Distance (ft) | | 459 | 567 | | 111 | |
| Travel Time (s) | | 12.5 | 15.5 | | 3.0 | |
| Confl. Peds. (#/hr) | 5 | | | | 5 | |
| Confl. Bikes (#/hr) | | | | 1 | | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 80 | 676 | 0 | 0 | 27 | 0 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 0 | 756 | 0 | 0 | 27 | 0 |
| Turn Type | Perm | NA | | | Prot | |
| Protected Phases | | 2 | | | 4 | |
| Permitted Phases | 2 | | | | | |
| Minimum Split (s) | 30.1 | 30.1 | | | 27.1 | |
| Total Split (s) | 32.9 | 32.9 | | | 27.1 | |
| Total Split (%) | 54.8% | 54.8% | | | 45.2% | |
| Maximum Green (s) | 27.8 | 27.8 | | | 22.0 | |
| Yellow Time (s) | 3.2 | 3.2 | | | 3.2 | |
| All-Red Time (s) | 1.9 | 1.9 | | | 1.9 | |
| Lost Time Adjust (s) | | 1.0 | | | -1.0 | |
| Total Lost Time (s) | | 6.1 | | | 4.1 | |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Walk Time (s) | 8.0 | 8.0 | | | 10.0 | |
| Flash Dont Walk (s) | 17.0 | 17.0 | | | 12.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | | 0 | |
| Act Effct Green (s) | | 26.8 | | | 23.0 | |
| Actuated g/C Ratio | | 0.45 | | | 0.38 | |
| v/c Ratio | | 0.53 | | | 0.04 | |
| Control Delay | | 13.8 | | | 3.7 | |
| Queue Delay | | 0.0 | | | 1.5 | |
| Total Delay | | 13.8 | | | 5.2 | |
| LOS | | B | | | A | |
| Approach Delay | | 13.8 | | | 5.2 | |
| Approach LOS | | B | | | A | |
| Queue Length 50th (ft) | | 98 | | | 1 | |
| Queue Length 95th (ft) | | 144 | | | m4 | |
| Internal Link Dist (ft) | | 379 | 487 | | 31 | |

Downtown Lewiston Existing Conditions
SJL

Synchro 8 Report
Page 1

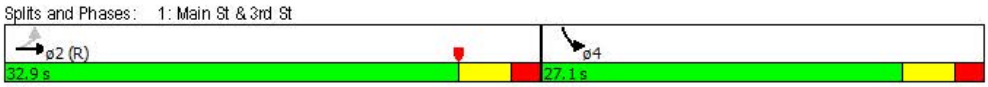
Lanes, Volumes, Timings
1: Main St & 3rd St 4/21/2014

| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Turn Bay Length (ft) | | | | | | |
| Base Capacity (vph) | | 1414 | | | 610 | |
| Starvation Cap Reductn | | 0 | | | 498 | |
| Spillback Cap Reductn | | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | | | 0 | |
| Reduced v/c Ratio | | 0.53 | | | 0.24 | |

Intersection Summary

Area Type: CBD
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 51 (85%), Referenced to phase 2:EBTL, Start of Yellow
Natural Cycle: 60
Control Type: Pretimed
Maximum v/c Ratio: 0.53
Intersection Signal Delay: 13.5 Intersection LOS: B
Intersection Capacity Utilization 36.7% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Main St & 3rd St




Downtown Lewiston Existing Conditions
SJL

Synchro 8 Report
Page 2

Lanes, Volumes, Timings
2: 5th St & Main St

4/21/2014

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 10 | 603 | 34 | 0 | 0 | 0 | 0 | 109 | 79 | 55 | 56 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 0.95 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | 1.00 | | | | | | | 0.98 | 1.00 | | |
| Frt | | 0.992 | | | | | | | 0.850 | | | |
| Flt Protected | | 0.999 | | | | | | | | 0.950 | | |
| Satd. Flow (prot) | 0 | 3503 | 0 | 0 | 0 | 0 | 0 | 1863 | 1583 | 1770 | 1863 | 0 |
| Flt Permitted | | 0.999 | | | | | | | | 0.681 | | |
| Satd. Flow (perm) | 0 | 3502 | 0 | 0 | 0 | 0 | 0 | 1863 | 1559 | 1264 | 1863 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 12 | | | | | | | 86 | | | |
| Link Speed (mph) | | 25 | | | 25 | | | 25 | | | 25 | |
| Link Distance (ft) | | 567 | | | 320 | | | 210 | | | 116 | |
| Travel Time (s) | | 15.5 | | | 8.7 | | | 5.7 | | | 3.2 | |
| Confl. Peds. (#/hr) | 5 | | 5 | | | | | | 5 | 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) | 11 | 655 | 37 | 0 | 0 | 0 | 0 | 118 | 86 | 60 | 61 | 0 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 703 | 0 | 0 | 0 | 0 | 0 | 118 | 86 | 60 | 61 | 0 |
| Turn Type | Perm | NA | | | | | | NA | Perm | Perm | NA | |
| Protected Phases | | 2 | | | | | | 4 | | | 4 | |
| Permitted Phases | 2 | | | | | | | | 4 | 4 | | |
| Minimum Split (s) | 28.1 | 28.1 | | | | | | 29.1 | 29.1 | 29.1 | 29.1 | |
| Total Split (s) | 30.0 | 30.0 | | | | | | 30.0 | 30.0 | 30.0 | 30.0 | |
| Total Split (%) | 50.0% | 50.0% | | | | | | 50.0% | 50.0% | 50.0% | 50.0% | |
| Maximum Green (s) | 24.9 | 24.9 | | | | | | 24.9 | 24.9 | 24.9 | 24.9 | |
| Yellow Time (s) | 3.2 | 3.2 | | | | | | 3.2 | 3.2 | 3.2 | 3.2 | |
| All-Red Time (s) | 1.9 | 1.9 | | | | | | 1.9 | 1.9 | 1.9 | 1.9 | |
| Lost Time Adjust (s) | | -1.0 | | | | | | 1.0 | 1.0 | 1.0 | 1.0 | |
| Total Lost Time (s) | | 4.1 | | | | | | 6.1 | 6.1 | 6.1 | 6.1 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Walk Time (s) | 9.0 | 9.0 | | | | | | 11.0 | 11.0 | 11.0 | 11.0 | |
| Flash Dont Walk (s) | 14.0 | 14.0 | | | | | | 13.0 | 13.0 | 13.0 | 13.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | | | | | 0 | 0 | 0 | 0 | |
| Act Effct Green (s) | | 25.9 | | | | | | 23.9 | 23.9 | 23.9 | 23.9 | |
| Actuated g/C Ratio | | 0.43 | | | | | | 0.40 | 0.40 | 0.40 | 0.40 | |
| v/c Ratio | | 0.46 | | | | | | 0.16 | 0.13 | 0.12 | 0.08 | |
| Control Delay | | 1.9 | | | | | | 12.4 | 3.8 | 12.3 | 11.8 | |
| Queue Delay | | 0.0 | | | | | | 0.0 | 0.0 | 5.1 | 5.2 | |
| Total Delay | | 1.9 | | | | | | 12.4 | 3.8 | 17.4 | 17.0 | |
| LOS | | A | | | | | | B | A | B | B | |
| Approach Delay | | 1.9 | | | | | | 8.8 | | | 17.2 | |
| Approach LOS | | A | | | | | | A | | | B | |
| Queue Length 50th (ft) | | 5 | | | | | | 26 | 0 | 14 | 14 | |
| Queue Length 95th (ft) | | 8 | | | | | | 55 | 22 | m31 | m30 | |
| Internal Link Dist (ft) | | 487 | | | 240 | | | 130 | | | 36 | |
| Turn Bay Length (ft) | | | | | | | | | | | | |

Downtown Lewiston Existing Conditions
SJL

Synchro 8 Report
Page 3

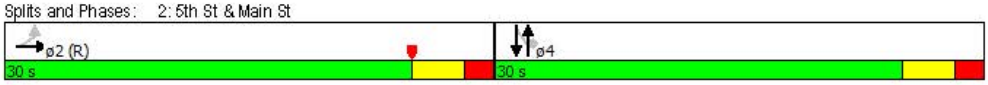
Lanes, Volumes, Timings
2: 5th St & Main St

4/21/2014

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Capacity (vph) | | 1518 | | | | | | 742 | 672 | 503 | 742 | |
| Starvation Cap Reductn | | 0 | | | | | | 0 | 0 | 390 | 628 | |
| Spillback Cap Reductn | | 0 | | | | | | 2 | 0 | 0 | 0 | |
| Storage Cap Reductn | | 0 | | | | | | 0 | 0 | 0 | 0 | |
| Reduced v/c Ratio | | 0.46 | | | | | | 0.16 | 0.13 | 0.53 | 0.54 | |

| Intersection Summary | |
|---|---|
| Area Type: | Other |
| Cycle Length: 60 | |
| Actuated Cycle Length: 60 | |
| Offset: 4 (7%), Referenced to phase 2:EBTL, Start of Yellow | |
| Natural Cycle: 60 | |
| Control Type: Pretimed | |
| Maximum v/c Ratio: 0.46 | |
| Intersection Signal Delay: 5.1 | Intersection LOS: A |
| Intersection Capacity Utilization 89.2% | ICU Level of Service E |
| Analysis Period (min) 15 | |
| m Volume for 95th percentile queue is metered by upstream signal. | |

Splits and Phases: 2: 5th St & Main St




Downtown Lewiston Existing Conditions
SJL

Synchro 8 Report
Page 4

Lanes, Volumes, Timings
4: 9th St & Main St

4/21/2014

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 24 | 666 | 92 | 0 | 0 | 0 | 0 | 158 | 93 | 26 | 45 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 0.95 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | 1.00 | | | | | | 0.99 | | | 1.00 | |
| Frt | | 0.982 | | | | | | 0.950 | | | | |
| Flt Protected | | 0.998 | | | | | | | | | 0.982 | |
| Satd. Flow (prot) | 0 | 3458 | 0 | 0 | 0 | 0 | 0 | 1758 | 0 | 0 | 1829 | 0 |
| Flt Permitted | | 0.998 | | | | | | | | | 0.843 | |
| Satd. Flow (perm) | 0 | 3458 | 0 | 0 | 0 | 0 | 0 | 1758 | 0 | 0 | 1568 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 38 | | | | | | 50 | | | | |
| Link Speed (mph) | | 25 | | | 25 | | | 25 | | | 25 | |
| Link Distance (ft) | | 1281 | | | 657 | | | 299 | | | 315 | |
| Travel Time (s) | | 34.9 | | | 17.9 | | | 8.2 | | | 8.6 | |
| Confl. Peds. (#/hr) | 5 | | 5 | | | | | | 5 | 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) | 26 | 724 | 100 | 0 | 0 | 0 | 0 | 172 | 101 | 28 | 49 | 0 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 850 | 0 | 0 | 0 | 0 | 0 | 273 | 0 | 0 | 77 | 0 |
| Turn Type | Perm | NA | | | | | | NA | | Perm | NA | |
| Protected Phases | | 2 | | | | | | 4 | | | 4 | |
| Permitted Phases | 2 | | | | | | | | | 4 | | |
| Minimum Split (s) | 35.1 | 35.1 | | | | | | 21.1 | | 21.1 | 21.1 | |
| Total Split (s) | 38.0 | 38.0 | | | | | | 22.0 | | 22.0 | 22.0 | |
| Total Split (%) | 63.3% | 63.3% | | | | | | 36.7% | | 36.7% | 36.7% | |
| Maximum Green (s) | 32.9 | 32.9 | | | | | | 16.9 | | 16.9 | 16.9 | |
| Yellow Time (s) | 3.2 | 3.2 | | | | | | 3.2 | | 3.2 | 3.2 | |
| All-Red Time (s) | 1.9 | 1.9 | | | | | | 1.9 | | 1.9 | 1.9 | |
| Lost Time Adjust (s) | | 0.0 | | | | | | -1.0 | | | -1.0 | |
| Total Lost Time (s) | | 5.1 | | | | | | 4.1 | | | 4.1 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Walk Time (s) | 13.0 | 13.0 | | | | | | 8.0 | | 8.0 | 8.0 | |
| Flash Dont Walk (s) | 17.0 | 17.0 | | | | | | 8.0 | | 8.0 | 8.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | | | | | 0 | | 0 | 0 | |
| Act Effct Green (s) | | 32.9 | | | | | | 17.9 | | | 17.9 | |
| Actuated g/C Ratio | | 0.55 | | | | | | 0.30 | | | 0.30 | |
| v/c Ratio | | 0.44 | | | | | | 0.49 | | | 0.16 | |
| Control Delay | | 2.6 | | | | | | 17.5 | | | 9.3 | |
| Queue Delay | | 0.0 | | | | | | 0.0 | | | 0.0 | |
| Total Delay | | 2.6 | | | | | | 17.5 | | | 9.3 | |
| LOS | | A | | | | | | B | | | A | |
| Approach Delay | | 2.6 | | | | | | 17.5 | | | 9.3 | |
| Approach LOS | | A | | | | | | B | | | A | |
| Queue Length 50th (ft) | | 14 | | | | | | 64 | | | 8 | |
| Queue Length 95th (ft) | | 23 | | | | | | 126 | | | 18 | |
| Internal Link Dist (ft) | | 1201 | | | 577 | | | 219 | | | 235 | |
| Turn Bay Length (ft) | | | | | | | | | | | | |

Downtown Lewiston Existing Conditions
SJL

Synchro 8 Report
Page 5

Lanes, Volumes, Timings
4: 9th St & Main St

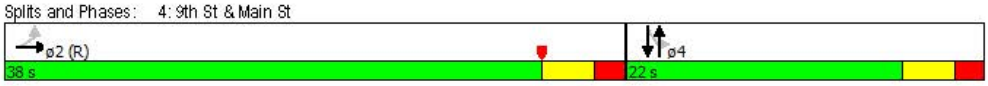
4/21/2014

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Capacity (vph) | | 1913 | | | | | | 559 | | | 467 | |
| Starvation Cap Reductn | | 0 | | | | | | 0 | | | 0 | |
| Spillback Cap Reductn | | 0 | | | | | | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | | | | | | 0 | | | 0 | |
| Reduced v/c Ratio | | 0.44 | | | | | | 0.49 | | | 0.16 | |

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 55 (92%), Referenced to phase 2:EBTL, Start of Yellow
Natural Cycle: 60
Control Type: Pretimed
Maximum v/c Ratio: 0.49
Intersection Signal Delay: 6.4 Intersection LOS: A
Intersection Capacity Utilization 56.9% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 4: 9th St & Main St




Downtown Lewiston Existing Conditions
SJL

Synchro 8 Report
Page 6

Lanes, Volumes, Timings
5: 13th St. & Main St

4/21/2014

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 607 | 137 | 32 | 319 | 136 | 34 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | | 150 | 95 | | 0 | 0 |
| Storage Lanes | | 1 | 1 | | 1 | 1 |
| Taper Length (ft) | | | 25 | | 25 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | 0.97 | 1.00 | | 0.99 | 0.97 |
| Frt | | 0.850 | | | | 0.850 |
| Flt Protected | | | 0.950 | | 0.950 | |
| Satd. Flow (prot) | 1863 | 1583 | 1770 | 1863 | 1770 | 1583 |
| Flt Permitted | | | 0.197 | | 0.950 | |
| Satd. Flow (perm) | 1863 | 1540 | 366 | 1863 | 1758 | 1542 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 149 | | | | 37 |
| Link Speed (mph) | 25 | | | 25 | 25 | |
| Link Distance (ft) | 861 | | | 445 | 327 | |
| Travel Time (s) | 23.5 | | | 12.1 | 8.9 | |
| Confl. Peds. (#/hr) | | 5 | 5 | | 5 | 5 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 660 | 149 | 35 | 347 | 148 | 37 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 660 | 149 | 35 | 347 | 148 | 37 |
| Turn Type | NA | Perm | Perm | NA | Prot | Perm |
| Protected Phases | 2 | | | 2 | 4 | |
| Permitted Phases | | 2 | 2 | | | 4 |
| Minimum Split (s) | 25.1 | 25.1 | 25.1 | 25.1 | 28.1 | 28.1 |
| Total Split (s) | 31.9 | 31.9 | 31.9 | 31.9 | 28.1 | 28.1 |
| Total Split (%) | 53.2% | 53.2% | 53.2% | 53.2% | 46.8% | 46.8% |
| Maximum Green (s) | 26.8 | 26.8 | 26.8 | 26.8 | 23.0 | 23.0 |
| Yellow Time (s) | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 |
| All-Red Time (s) | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 |
| Lost Time Adjust (s) | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 |
| Total Lost Time (s) | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Flash Dont Walk (s) | 13.0 | 13.0 | 13.0 | 13.0 | 16.0 | 16.0 |
| Pedestrian Calls (#/hr) | 8 | 8 | 8 | 8 | 1 | 1 |
| Act Effct Green (s) | 27.8 | 27.8 | 27.8 | 27.8 | 24.0 | 24.0 |
| Actuated g/C Ratio | 0.46 | 0.46 | 0.46 | 0.46 | 0.40 | 0.40 |
| v/c Ratio | 0.76 | 0.19 | 0.21 | 0.40 | 0.21 | 0.06 |
| Control Delay | 13.7 | 0.7 | 13.5 | 12.4 | 12.8 | 4.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 13.7 | 0.7 | 13.5 | 12.4 | 12.8 | 4.7 |
| LOS | B | A | B | B | B | A |
| Approach Delay | 11.3 | | | 12.5 | 11.2 | |
| Approach LOS | B | | | B | B | |
| Queue Length 50th (ft) | 76 | 1 | 7 | 77 | 34 | 0 |

Downtown Lewiston Existing Conditions
SJL

Synchro 8 Report
Page 7

Lanes, Volumes, Timings
5: 13th St. & Main St 4/21/2014

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Queue Length 95th (ft) | #863 | 2 | 25 | 134 | 67 | 15 |
| Internal Link Dist (ft) | 781 | | | 365 | 247 | |
| Turn Bay Length (ft) | | 150 | 95 | | | |
| Base Capacity (vph) | 863 | 793 | 169 | 863 | 708 | 639 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.76 | 0.19 | 0.21 | 0.40 | 0.21 | 0.06 |

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 24 (40%), Referenced to phase 2:EBWB, Start of Yellow
Natural Cycle: 60
Control Type: Pretimed
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 11.6 Intersection LOS: B
Intersection Capacity Utilization 57.9% ICU Level of Service B
Analysis Period (min) 15
# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: 13th St. & Main St

Downtown Lewiston Existing Conditions
SJL

Synchro 8 Report
Page 8

Lanes, Volumes, Timings
6: 3rd St & D St

4/21/2014

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 0 | 0 | 0 | 22 | 656 | 3 | 59 | 7 | 0 | 0 | 4 | 15 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | 1.00 | | | 1.00 | | | 0.99 | |
| Frt | | | | | 0.999 | | | | | | 0.892 | |
| Flt Protected | | | | | 0.998 | | | 0.957 | | | | |
| Satd. Flow (prot) | 0 | 0 | 0 | 0 | 3528 | 0 | 0 | 1783 | 0 | 0 | 1641 | 0 |
| Flt Permitted | | | | | 0.998 | | | 0.785 | | | | |
| Satd. Flow (perm) | 0 | 0 | 0 | 0 | 3528 | 0 | 0 | 1457 | 0 | 0 | 1641 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | | | 1 | | | | | | 16 | |
| Link Speed (mph) | | 25 | | | 25 | | | 25 | | | 25 | |
| Link Distance (ft) | | 565 | | | 571 | | | 111 | | | 289 | |
| Travel Time (s) | | 15.4 | | | 15.6 | | | 3.0 | | | 7.9 | |
| Confl. Peds. (#/hr) | | | | 5 | | 5 | 5 | | | | | 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) | 0 | 0 | 0 | 24 | 713 | 3 | 64 | 8 | 0 | 0 | 4 | 16 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 0 | 0 | 740 | 0 | 0 | 72 | 0 | 0 | 20 | 0 |
| Turn Type | | | | Perm | NA | | Perm | NA | | | NA | |
| Protected Phases | | | | | 2 | | | 4 | | | 4 | |
| Permitted Phases | | | | 2 | | | 4 | | | | | |
| Minimum Split (s) | | | | 30.1 | 30.1 | | 28.1 | 28.1 | | | 28.1 | |
| Total Split (s) | | | | 31.9 | 31.9 | | 28.1 | 28.1 | | | 28.1 | |
| Total Split (%) | | | | 53.2% | 53.2% | | 46.8% | 46.8% | | | 46.8% | |
| Maximum Green (s) | | | | 26.8 | 26.8 | | 23.0 | 23.0 | | | 23.0 | |
| Yellow Time (s) | | | | 3.2 | 3.2 | | 3.2 | 3.2 | | | 3.2 | |
| All-Red Time (s) | | | | 1.9 | 1.9 | | 1.9 | 1.9 | | | 1.9 | |
| Lost Time Adjust (s) | | | | | 1.0 | | | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | | | | 6.1 | | | 5.1 | | | 5.1 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Walk Time (s) | | | | 11.0 | 11.0 | | 11.0 | 11.0 | | | 11.0 | |
| Flash Dont Walk (s) | | | | 14.0 | 14.0 | | 12.0 | 12.0 | | | 12.0 | |
| Pedestrian Calls (#/hr) | | | | 0 | 0 | | 0 | 0 | | | 0 | |
| Act Effct Green (s) | | | | | 25.8 | | | 23.0 | | | 23.0 | |
| Actuated g/C Ratio | | | | | 0.43 | | | 0.38 | | | 0.38 | |
| v/c Ratio | | | | | 0.49 | | | 0.13 | | | 0.03 | |
| Control Delay | | | | | 6.8 | | | 4.3 | | | 7.1 | |
| Queue Delay | | | | | 0.0 | | | 1.8 | | | 0.0 | |
| Total Delay | | | | | 6.8 | | | 6.1 | | | 7.1 | |
| LOS | | | | | A | | | A | | | A | |
| Approach Delay | | | | | 6.8 | | | 6.1 | | | 7.1 | |
| Approach LOS | | | | | A | | | A | | | A | |
| Queue Length 50th (ft) | | | | | 37 | | | 3 | | | 1 | |
| Queue Length 95th (ft) | | | | | 55 | | | m6 | | | 12 | |
| Internal Link Dist (ft) | | 485 | | | 491 | | | 31 | | | 209 | |
| Turn Bay Length (ft) | | | | | | | | | | | | |

Downtown Lewiston Existing Conditions
SJL

Synchro 8 Report
Page 9

Lanes, Volumes, Timings
6: 3rd St & D St

4/21/2014

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Capacity (vph) | | | | | 1517 | | | 558 | | | 638 | |
| Starvation Cap Reductn | | | | | 0 | | | 377 | | | 0 | |
| Spillback Cap Reductn | | | | | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | | | | | 0 | | | 0 | | | 0 | |
| Reduced v/c Ratio | | | | | 0.49 | | | 0.40 | | | 0.03 | |

| Intersection Summary | |
|---|---|
| Area Type: | Other |
| Cycle Length: 60 | |
| Actuated Cycle Length: 60 | |
| Offset: 18 (30%), Referenced to phase 2:WBTL, Start of Yellow | |
| Natural Cycle: 60 | |
| Control Type: Pretimed | |
| Maximum v/c Ratio: 0.49 | |
| Intersection Signal Delay: 6.7 | Intersection LOS: A |
| Intersection Capacity Utilization 49.3% | ICU Level of Service A |
| Analysis Period (min) 15 | |
| m Volume for 95th percentile queue is metered by upstream signal. | |

Splits and Phases: 6: 3rd St & D St

Lanes, Volumes, Timings
7: 5th St & D St

4/21/2014

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 0 | 0 | 0 | 59 | 532 | 18 | 125 | 21 | 0 | 0 | 63 | 14 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | 1.00 | | 1.00 | | | | 1.00 | |
| Frt | | | | | 0.995 | | | | | | 0.976 | |
| Flt Protected | | | | | 0.995 | | 0.950 | | | | | |
| Satd. Flow (prot) | 0 | 0 | 0 | 0 | 3501 | 0 | 1770 | 1863 | 0 | 0 | 1813 | 0 |
| Flt Permitted | | | | | 0.995 | | 0.703 | | | | | |
| Satd. Flow (perm) | 0 | 0 | 0 | 0 | 3501 | 0 | 1305 | 1863 | 0 | 0 | 1813 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | | | 6 | | | | | | 15 | |
| Link Speed (mph) | | 25 | | | 25 | | | 25 | | | 25 | |
| Link Distance (ft) | | 571 | | | 370 | | | 116 | | | 265 | |
| Travel Time (s) | | 15.6 | | | 10.1 | | | 3.2 | | | 7.2 | |
| Confl. Peds. (#/hr) | | | | | | 5 | 5 | | | | | 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) | 0 | 0 | 0 | 64 | 578 | 20 | 136 | 23 | 0 | 0 | 68 | 15 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 0 | 0 | 662 | 0 | 136 | 23 | 0 | 0 | 83 | 0 |
| Turn Type | | | | Perm | NA | | Perm | NA | | | NA | |
| Protected Phases | | | | | 2 | | | 4 | | | 4 | |
| Permitted Phases | | | | 2 | | | 4 | | | | | |
| Minimum Split (s) | | | | 30.1 | 30.1 | | 28.1 | 28.1 | | | 28.1 | |
| Total Split (s) | | | | 31.9 | 31.9 | | 28.1 | 28.1 | | | 28.1 | |
| Total Split (%) | | | | 53.2% | 53.2% | | 46.8% | 46.8% | | | 46.8% | |
| Maximum Green (s) | | | | 26.8 | 26.8 | | 23.0 | 23.0 | | | 23.0 | |
| Yellow Time (s) | | | | 3.2 | 3.2 | | 3.2 | 3.2 | | | 3.2 | |
| All-Red Time (s) | | | | 1.9 | 1.9 | | 1.9 | 1.9 | | | 1.9 | |
| Lost Time Adjust (s) | | | | | 1.0 | | 0.0 | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | | | | 6.1 | | 5.1 | 5.1 | | | 5.1 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Walk Time (s) | | | | 9.0 | 9.0 | | 10.0 | 10.0 | | | 10.0 | |
| Flash Dont Walk (s) | | | | 14.0 | 14.0 | | 12.0 | 12.0 | | | 12.0 | |
| Pedestrian Calls (#/hr) | | | | 0 | 0 | | 0 | 0 | | | 0 | |
| Act Effct Green (s) | | | | | 25.8 | | 23.0 | 23.0 | | | 23.0 | |
| Actuated g/C Ratio | | | | | 0.43 | | 0.38 | 0.38 | | | 0.38 | |
| v/c Ratio | | | | | 0.44 | | 0.27 | 0.03 | | | 0.12 | |
| Control Delay | | | | | 9.0 | | 6.7 | 5.0 | | | 10.8 | |
| Queue Delay | | | | | 0.1 | | 2.5 | 1.7 | | | 0.0 | |
| Total Delay | | | | | 9.1 | | 9.2 | 6.7 | | | 10.8 | |
| LOS | | | | | A | | A | A | | | B | |
| Approach Delay | | | | | 9.1 | | | 8.8 | | | 10.8 | |
| Approach LOS | | | | | A | | | A | | | B | |
| Queue Length 50th (ft) | | | | | 38 | | 12 | 2 | | | 15 | |
| Queue Length 95th (ft) | | | | | 53 | | 23 | m6 | | | 39 | |
| Internal Link Dist (ft) | | 491 | | | 290 | | | 36 | | | 185 | |
| Turn Bay Length (ft) | | | | | | | | | | | | |

Downtown Lewiston Existing Conditions
SJL

Synchro 8 Report
Page 11

Lanes, Volumes, Timings
7: 5th St & D St

4/21/2014

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Capacity (vph) | | | | | 150ǂ | | 500 | 714 | | | 704 | |
| Starvation Cap Reductn | | | | | 0 | | 259 | 617 | | | 0 | |
| Spillback Cap Reductn | | | | | 127 | | 0 | 0 | | | 0 | |
| Storage Cap Reductn | | | | | 0 | | 0 | 0 | | | 0 | |
| Reduced v/c Ratio | | | | | 0.4ǂ | | 0.56 | 0.24 | | | 0.12 | |

| Intersection Summary | |
|---|---|
| Area Type: | Other |
| Cycle Length: 60 | |
| Actuated Cycle Length: 60 | |
| Offset: 5 (ǂ%), Referenced to phase 2:WBTL, Start of Yellow | |
| Natural Cycle: 60 | |
| Control Type: Pretimed | |
| Maximum v/c Ratio: 0.44 | |
| Intersection Signal Delay: 9.2 | Intersection LOS: A |
| Intersection Capacity Utilization ǂ9.2% | ICU Level of Service E |
| Analysis Period (min) 15 | |
| m Volume for 95th percentile queue is metered by upstream signal. | |

Splits and Phases: 7: 5th St & D St

Lanes, Volumes, Timings
9: 9th St & D St

4/21/2014

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 0 | 0 | 61 | 453 | 171 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 1.00 |
| Ped Bike Factor | | | | 1.00 | 1.00 | |
| Frt | | | | | | |
| Flt Protected | | | | 0.994 | 0.950 | |
| Satd. Flow (prot) | 0 | 0 | 0 | 3518 | 1770 | 0 |
| Flt Permitted | | | | 0.994 | 0.950 | |
| Satd. Flow (perm) | 0 | 0 | 0 | 3515 | 1763 | 0 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | | | | | |
| Link Speed (mph) | 25 | | | 25 | 25 | |
| Link Distance (ft) | 1330 | | | 717 | 315 | |
| Travel Time (s) | 36.3 | | | 19.6 | 8.6 | |
| Confl. Peds. (#/hr) | | | 5 | | 5 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 0 | 0 | 66 | 492 | 186 | 0 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 0 | 558 | 186 | 0 |
| Turn Type | | | Perm | NA | Prot | |
| Protected Phases | | | | 2 | 4 | |
| Permitted Phases | | | 2 | | | |
| Minimum Split (s) | | | 30.1 | 30.1 | 28.1 | |
| Total Split (s) | | | 31.9 | 31.9 | 28.1 | |
| Total Split (%) | | | 53.2% | 53.2% | 46.8% | |
| Maximum Green (s) | | | 26.8 | 26.8 | 23.0 | |
| Yellow Time (s) | | | 3.2 | 3.2 | 3.2 | |
| All-Red Time (s) | | | 1.9 | 1.9 | 1.9 | |
| Lost Time Adjust (s) | | | | 1.0 | 0.0 | |
| Total Lost Time (s) | | | | 6.1 | 5.1 | |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Walk Time (s) | | | 10.0 | 10.0 | 11.0 | |
| Flash Dont Walk (s) | | | 15.0 | 15.0 | 12.0 | |
| Pedestrian Calls (#/hr) | | | 0 | 0 | 0 | |
| Act Effct Green (s) | | | | 25.8 | 23.0 | |
| Actuated g/C Ratio | | | | 0.43 | 0.38 | |
| v/c Ratio | | | | 0.37 | 0.27 | |
| Control Delay | | | | 9.3 | 13.2 | |
| Queue Delay | | | | 0.0 | 0.0 | |
| Total Delay | | | | 9.3 | 13.2 | |
| LOS | | | | A | B | |
| Approach Delay | | | | 9.3 | 13.2 | |
| Approach LOS | | | | A | B | |
| Queue Length 50th (ft) | | | | 71 | 61 | |
| Queue Length 95th (ft) | | | | 107 | 117 | |
| Internal Link Dist (ft) | 1250 | | | 637 | 235 | |
| Turn Bay Length (ft) | | | | | | |

Downtown Lewiston Existing Conditions
SJL

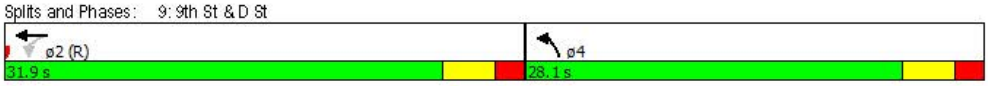
Synchro 8 Report
Page 13

Lanes, Volumes, Timings
9: 9th St & D St 4/21/2014

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Base Capacity (vph) | | | | 1511 | 678 | |
| Starvation Cap Reductn | | | | 0 | 0 | |
| Spillback Cap Reductn | | | | 0 | 0 | |
| Storage Cap Reductn | | | | 0 | 0 | |
| Reduced v/c Ratio | | | | 0.37 | 0.27 | |

| Intersection Summary | |
|---|---|
| Area Type: Other | |
| Cycle Length: 60 | |
| Actuated Cycle Length: 60 | |
| Offset: 52 (87%), Referenced to phase 2:WBTL, Start of Green | |
| Natural Cycle: 60 | |
| Control Type: Pretimed | |
| Maximum v/c Ratio: 0.37 | |
| Intersection Signal Delay: 10.2 | Intersection LOS: B |
| Intersection Capacity Utilization 33.1% | ICU Level of Service A |
| Analysis Period (min) 15 | |

Splits and Phases: 9: 9th St & D St




Downtown Lewiston Existing Conditions
SJL

Synchro 8 Report
Page 14

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.7 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR |
|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 21 | 711 | 12 | 0 | 0 | 439 | 0 | 20 | 18 |
| Conflicting Peds, #/hr | 5 | 0 | 5 | 0 | 0 | 5 | 0 | 0 | 5 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | Free | - | - | None |
| Storage Length | 0 | - | - | - | - | 0 | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 23 | 773 | 13 | 0 | 0 | 477 | 0 | 22 | 20 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | |
|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 0 | - | - | - | 830 | 830 | 784 |
| Stage 1 | - | - | - | - | - | - | 830 | 830 | - |
| Stage 2 | - | - | - | - | - | - | 0 | 0 | - |
| Critical Hdwy | - | - | - | - | - | - | 6.42 | 6.52 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 5.42 | 5.52 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | - | - | - |
| Follow-up Hdwy | - | - | - | - | - | - | 3.518 | 4.018 | 3.318 |
| Pot Cap-1 Maneuver | - | - | - | 0 | 0 | 0 | 340 | 306 | 393 |
| Stage 1 | - | - | - | 0 | 0 | 0 | 428 | 385 | - |
| Stage 2 | - | - | - | 0 | 0 | 0 | - | - | - |
| Platoon blocked, % | | - | - | - | - | | | | |
| Mov Cap-1 Maneuver | - | - | - | - | - | - | 337 | 0 | 391 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 337 | 0 | - |
| Stage 1 | - | - | - | - | - | - | 426 | 0 | - |
| Stage 2 | - | - | - | - | - | - | - | 0 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | 0 | 0 | 15.3 |
| HCM LOS | | | C |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR |
|---|---|---|---|---|
| Capacity (veh/h) | 391 | - | - | - |
| HCM Lane V/C Ratio | 0.106 | - | - | - |
| HCM Control Delay (s) | 15.3 | - | - | - |
| HCM Lane LOS | C | - | - | - |
| HCM 95th %tile Q(veh) | 0.4 | - | - | - |

| Intersection | | | |
|---|---|---|---|
| Int Delay, s/veh | | | |

| Movement | SBL | SBT | SBR |
|---|---|---|---|
| Vol, veh/h | 0 | 0 | 0 |
| Conflicting Peds, #/hr | 0 | 0 | 0 |
| Sign Control | Free | Free | Free |
| RT Channelized | - | - | None |
| Storage Length | - | - | - |
| Veh in Median Storage, # | - | 0 | - |
| Grade, % | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 |
| Mvmt Flow | 0 | 0 | 0 |

| Major/Minor |
|---|
| Conflicting Flow All |
| Stage 1 |
| Stage 2 |
| Critical Hdwy |
| Critical Hdwy Stg 1 |
| Critical Hdwy Stg 2 |
| Follow-up Hdwy |
| Pot Cap-1 Maneuver |
| Stage 1 |
| Stage 2 |
| Platoon blocked, % |
| Mov Cap-1 Maneuver |
| Mov Cap-2 Maneuver |
| Stage 1 |
| Stage 2 |

| Approach |
|---|
| HCM Control Delay, s |
| HCM LOS |

| Minor Lane/Major Mvmt |
|---|

| Intersection | |
|---|---|
| Int Delay, s/veh | 0 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR |
|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 3 | 0 | 511 | 646 | 82 | 2 | 0 | 0 | 0 |
| Conflicting Peds, #/hr | 5 | 0 | 5 | 5 | 0 | 5 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | Free | - | - | None | - | - | None |
| Storage Length | 0 | - | 0 | 0 | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 3 | 0 | 555 | 702 | 89 | 2 | 0 | 0 | 0 |

| Major/Minor | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 96 | 0 | - | 0 | 0 | 0 |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |
| Critical Hdwy | 4.12 | - | - | - | - | - |
| Critical Hdwy Stg 1 | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - |
| Follow-up Hdwy | 2.218 | - | - | - | - | - |
| Pot Cap-1 Maneuver | 1498 | - | 0 | - | - | - |
| Stage 1 | - | - | 0 | - | - | - |
| Stage 2 | - | - | 0 | - | - | - |
| Platoon blocked, % | | - | | | - | - |
| Mov Cap-1 Maneuver | 1491 | - | - | - | - | - |
| Mov Cap-2 Maneuver | - | - | - | - | - | - |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |

| Approach | EB | WB |
|---|---|---|
| HCM Control Delay, s | 7.4 | 0 |
| HCM LOS | | |

| Minor Lane/Major Mvmt | EBL | EBT | WBL | WBT | WBR | SBLn1 | SBLn2 |
|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1491 | - | - | - | - | - | 947 |
| HCM Lane V/C Ratio | 0.002 | - | - | - | - | - | 0.014 |
| HCM Control Delay (s) | 7.4 | - | - | - | - | - | 8.9 |
| HCM Lane LOS | A | - | - | - | - | - | A |
| HCM 95th %tile Q(veh) | 0 | - | - | - | - | - | 0 |

| Intersection | | | |
|---|---|---|---|
| Int Delay, s/veh | | | |

| Movement | SBL | SBT | SBR |
|---|---|---|---|
| Vol, veh/h | 0 | 13 | 12 |
| Conflicting Peds, #/hr | 0 | 0 | 5 |
| Sign Control | Stop | Stop | Stop |
| RT Channelized | - | - | None |
| Storage Length | - | - | 50 |
| Veh in Median Storage, # | - | 0 | - |
| Grade, % | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 |
| Mvmt Flow | 0 | 14 | 13 |

| Major/Minor | Minor2 | | |
|---|---|---|---|
| Conflicting Flow All | 1500 | 1507 | 100 |
| Stage 1 | 1500 | 1500 | - |
| Stage 2 | 0 | 7 | - |
| Critical Hdwy | 6.42 | 6.52 | 6.22 |
| Critical Hdwy Stg 1 | 5.42 | 5.52 | - |
| Critical Hdwy Stg 2 | - | - | - |
| Follow-up Hdwy | 3.518 | 4.018 | 3.318 |
| Pot Cap-1 Maneuver | 134 | 121 | 956 |
| Stage 1 | 204 | 185 | - |
| Stage 2 | - | - | - |
| Platoon blocked, % | | | |
| Mov Cap-1 Maneuver | 132 | 0 | 947 |
| Mov Cap-2 Maneuver | 132 | 0 | - |
| Stage 1 | 203 | 0 | - |
| Stage 2 | - | 0 | - |

| Approach | SB |
|---|---|
| HCM Control Delay, s | |
| HCM LOS | - |

| Minor Lane/Major Mvmt |
|---|

## Arterial Level of Service: WB D St

| Cross Street | Arterial Class | Flow Speed | Running Time | Signal Delay | Travel Time (s) | Dist (mi) | Arterial Speed | Arterial LOS |
|---|---|---|---|---|---|---|---|---|
| 9th St | IV | 25 | 24.4 | 9.3 | 33.7 | 0.14 | 14.5 | C |
| 5th St | IV | 25 | 49.3 | 9.0 | 58.3 | 0.32 | 19.9 | B |
| 3rd St | IV | 25 | 23.8 | 6.8 | 30.6 | 0.11 | 12.7 | D |
| Total | IV | | 97.5 | 25.1 | 122.6 | 0.57 | 16.6 | C |

## Arterial Level of Service: EB Main St

| Cross Street | Arterial Class | Flow Speed | Running Time | Signal Delay | Travel Time (s) | Dist (mi) | Arterial Speed | Arterial LOS |
|---|---|---|---|---|---|---|---|---|
| 3rd St | IV | 25 | 35.6 | 13.8 | 49.4 | 0.23 | 17.0 | C |
| 5th St | IV | 25 | 23.6 | 1.9 | 25.5 | 0.11 | 15.2 | C |
| 9th St | IV | 25 | 46.4 | 2.6 | 49.0 | 0.30 | 22.3 | B |
| 13th St. | IV | 25 | 44.0 | 13.7 | 57.7 | 0.29 | 17.9 | C |
| Total | IV | | 149.6 | 32.0 | 181.6 | 0.93 | 18.5 | C |

## Arterial Level of Service: WB Main St

| Cross Street | Arterial Class | Flow Speed | Running Time | Signal Delay | Travel Time (s) | Dist (mi) | Arterial Speed | Arterial LOS |
|---|---|---|---|---|---|---|---|---|
| 13th St. | IV | 25 | 18.5 | 12.4 | 30.9 | 0.08 | 9.8 | D |
| Total | IV | | 18.5 | 12.4 | 30.9 | 0.08 | 9.8 | D |

# Future Conditions

Lanes, Volumes, Timings
1: Main St & 3rd St

4/30/2014

| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 78 | 802 | 0 | 0 | 31 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | 1.00 | | | 1.00 | |
| Frt | | | | | | |
| Flt Protected | | 0.996 | | | 0.950 | |
| Satd. Flow (prot) | 0 | 3173 | 0 | 0 | 1593 | 0 |
| Flt Permitted | | 0.996 | | | 0.950 | |
| Satd. Flow (perm) | 0 | 3171 | 0 | 0 | 1586 | 0 |
| Right Turn on Red | | | | Yes | | Yes |
| Satd. Flow (RTOR) | | | | | | |
| Link Speed (mph) | | 25 | 25 | | 25 | |
| Link Distance (ft) | | 459 | 567 | | 111 | |
| Travel Time (s) | | 12.5 | 15.5 | | 3.0 | |
| Confl. Peds. (#/hr) | 5 | | | | 5 | |
| Confl. Bikes (#/hr) | | | | 1 | | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 85 | 872 | 0 | 0 | 34 | 0 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 0 | 957 | 0 | 0 | 34 | 0 |
| Turn Type | Perm | NA | | | Prot | |
| Protected Phases | | 2 | | | 4 | |
| Permitted Phases | 2 | | | | | |
| Minimum Split (s) | 30.1 | 30.1 | | | 27.1 | |
| Total Split (s) | 32.9 | 32.9 | | | 27.1 | |
| Total Split (%) | 54.8% | 54.8% | | | 45.2% | |
| Maximum Green (s) | 27.8 | 27.8 | | | 22.0 | |
| Yellow Time (s) | 3.2 | 3.2 | | | 3.2 | |
| All-Red Time (s) | 1.9 | 1.9 | | | 1.9 | |
| Lost Time Adjust (s) | | 1.0 | | | -1.0 | |
| Total Lost Time (s) | | 6.1 | | | 4.1 | |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Walk Time (s) | 8.0 | 8.0 | | | 10.0 | |
| Flash Dont Walk (s) | 17.0 | 17.0 | | | 12.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | | 0 | |
| Act Effct Green (s) | | 26.8 | | | 23.0 | |
| Actuated g/C Ratio | | 0.45 | | | 0.38 | |
| v/c Ratio | | 0.68 | | | 0.06 | |
| Control Delay | | 16.1 | | | 7.0 | |
| Queue Delay | | 0.0 | | | 2.2 | |
| Total Delay | | 16.1 | | | 9.2 | |
| LOS | | B | | | A | |
| Approach Delay | | 16.1 | | | 9.2 | |
| Approach LOS | | B | | | A | |
| Queue Length 50th (ft) | | 136 | | | 3 | |
| Queue Length 95th (ft) | | 196 | | | m8 | |
| Internal Link Dist (ft) | | 379 | 487 | | 31 | |

Downtown Lewiston 4/30/2014 2040 Projections
SJL

Synchro 8 Report
Page 1

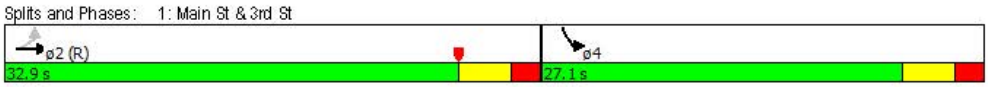
Lanes, Volumes, Timings
1: Main St & 3rd St 4/30/2014

| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Turn Bay Length (ft) | | | | | | |
| Base Capacity (vph) | | 1416 | | | 610 | |
| Starvation Cap Reductn | | 0 | | | 502 | |
| Spillback Cap Reductn | | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | | | 0 | |
| Reduced v/c Ratio | | 0.68 | | | 0.31 | |

| Intersection Summary | |
|---|---|
| Area Type: CBD | |
| Cycle Length: 60 | |
| Actuated Cycle Length: 60 | |
| Offset: 51 (85%), Referenced to phase 2:EBTL, Start of Yellow | |
| Natural Cycle: 60 | |
| Control Type: Pretimed | |
| Maximum v/c Ratio: 0.68 | |
| Intersection Signal Delay: 15.9 | Intersection LOS: B |
| Intersection Capacity Utilization 42.3% | ICU Level of Service A |
| Analysis Period (min) 15 | |

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

Splits and Phases: 1: Main St & 3rd St




Downtown Lewiston 4/30/2014 2040 Projections
SJL

Synchro 8 Report
Page 2

Lanes, Volumes, Timings
2: 5th St & Main St

4/30/2014

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 22 | 764 | 41 | 0 | 0 | 0 | 0 | 133 | 54 | 61 | 60 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 0.95 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | 1.00 | | | | | | | 0.98 | 1.00 | | |
| Frt | | 0.992 | | | | | | | 0.850 | | | |
| Flt Protected | | 0.999 | | | | | | | | 0.950 | | |
| Satd. Flow (prot) | 0 | 3503 | 0 | 0 | 0 | 0 | 0 | 1863 | 1583 | 1770 | 1863 | 0 |
| Flt Permitted | | 0.999 | | | | | | | | 0.665 | | |
| Satd. Flow (perm) | 0 | 3502 | 0 | 0 | 0 | 0 | 0 | 1863 | 1559 | 1235 | 1863 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 11 | | | | | | | 59 | | | |
| Link Speed (mph) | | 25 | | | 25 | | | 25 | | | 25 | |
| Link Distance (ft) | | 567 | | | 320 | | | 210 | | | 116 | |
| Travel Time (s) | | 15.5 | | | 8.7 | | | 5.7 | | | 3.2 | |
| Confl. Peds. (#/hr) | 5 | | 5 | | | | | | 5 | 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) | 24 | 830 | 45 | 0 | 0 | 0 | 0 | 145 | 59 | 66 | 65 | 0 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 899 | 0 | 0 | 0 | 0 | 0 | 145 | 59 | 66 | 65 | 0 |
| Turn Type | Perm | NA | | | | | | NA | Perm | Perm | NA | |
| Protected Phases | | 2 | | | | | | 4 | | | 4 | |
| Permitted Phases | 2 | | | | | | | | 4 | 4 | | |
| Minimum Split (s) | 28.1 | 28.1 | | | | | | 29.1 | 29.1 | 29.1 | 29.1 | |
| Total Split (s) | 30.0 | 30.0 | | | | | | 30.0 | 30.0 | 30.0 | 30.0 | |
| Total Split (%) | 50.0% | 50.0% | | | | | | 50.0% | 50.0% | 50.0% | 50.0% | |
| Maximum Green (s) | 24.9 | 24.9 | | | | | | 24.9 | 24.9 | 24.9 | 24.9 | |
| Yellow Time (s) | 3.2 | 3.2 | | | | | | 3.2 | 3.2 | 3.2 | 3.2 | |
| All-Red Time (s) | 1.9 | 1.9 | | | | | | 1.9 | 1.9 | 1.9 | 1.9 | |
| Lost Time Adjust (s) | | -1.0 | | | | | | 1.0 | 1.0 | 1.0 | 1.0 | |
| Total Lost Time (s) | | 4.1 | | | | | | 6.1 | 6.1 | 6.1 | 6.1 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Walk Time (s) | 9.0 | 9.0 | | | | | | 11.0 | 11.0 | 11.0 | 11.0 | |
| Flash Dont Walk (s) | 14.0 | 14.0 | | | | | | 13.0 | 13.0 | 13.0 | 13.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | | | | | 0 | 0 | 0 | 0 | |
| Act Effct Green (s) | | 25.9 | | | | | | 23.9 | 23.9 | 23.9 | 23.9 | |
| Actuated g/C Ratio | | 0.43 | | | | | | 0.40 | 0.40 | 0.40 | 0.40 | |
| v/c Ratio | | 0.59 | | | | | | 0.20 | 0.09 | 0.13 | 0.09 | |
| Control Delay | | 2.4 | | | | | | 12.7 | 4.1 | 10.5 | 9.9 | |
| Queue Delay | | 0.0 | | | | | | 0.0 | 0.0 | 6.0 | 5.8 | |
| Total Delay | | 2.4 | | | | | | 12.7 | 4.1 | 16.5 | 15.8 | |
| LOS | | A | | | | | | B | A | B | B | |
| Approach Delay | | 2.4 | | | | | | 10.2 | | | 16.1 | |
| Approach LOS | | A | | | | | | B | | | B | |
| Queue Length 50th (ft) | | 6 | | | | | | 33 | 0 | 14 | 13 | |
| Queue Length 95th (ft) | | 7 | | | | | | 65 | 18 | m28 | m27 | |
| Internal Link Dist (ft) | | 487 | | | 240 | | | 130 | | | 36 | |
| Turn Bay Length (ft) | | | | | | | | | | | | |

Downtown Lewiston 4/30/2014 2040 Projections
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Synchro 8 Report
Page 3

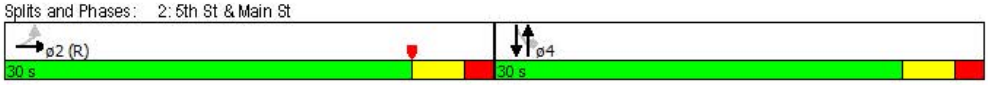
Lanes, Volumes, Timings
2: 5th St & Main St

4/30/2014

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Capacity (vph) | | 1517 | | | | | | 742 | 656 | 491 | 742 | |
| Starvation Cap Reductn | | 0 | | | | | | 0 | 0 | 376 | 627 | |
| Spillback Cap Reductn | | 0 | | | | | | 43 | 0 | 0 | 0 | |
| Storage Cap Reductn | | 0 | | | | | | 0 | 0 | 0 | 0 | |
| Reduced v/c Ratio | | 0.59 | | | | | | 0.21 | 0.09 | 0.57 | 0.57 | |

| Intersection Summary | |
|---|---|
| Area Type: | Other |
| Cycle Length: 60 | |
| Actuated Cycle Length: 60 | |
| Offset: 5 (8%), Referenced to phase 2:EBTL, Start of Yellow | |
| Natural Cycle: 60 | |
| Control Type: Pretimed | |
| Maximum v/c Ratio: 0.59 | |
| Intersection Signal Delay: 5.2 | Intersection LOS: A |
| Intersection Capacity Utilization 95.2% | ICU Level of Service F |
| Analysis Period (min) 15 | |
| m Volume for 95th percentile queue is metered by upstream signal. | |

Splits and Phases: 2: 5th St & Main St




Downtown Lewiston 4/30/2014 2040 Projections
SJL

Synchro 8 Report
Page 4

Lanes, Volumes, Timings
4: 9th St & Main St

4/30/2014

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 30 | 788 | 104 | 0 | 0 | 0 | 0 | 160 | 89 | 26 | 44 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 0.95 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | 1.00 | | | | | | 0.99 | | | 1.00 | |
| Frt | | 0.983 | | | | | | 0.952 | | | | |
| Flt Protected | | 0.998 | | | | | | | | | 0.982 | |
| Satd. Flow (prot) | 0 | 3462 | 0 | 0 | 0 | 0 | 0 | 1762 | 0 | 0 | 1829 | 0 |
| Flt Permitted | | 0.998 | | | | | | | | | 0.842 | |
| Satd. Flow (perm) | 0 | 3462 | 0 | 0 | 0 | 0 | 0 | 1762 | 0 | 0 | 1566 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 36 | | | | | | 48 | | | | |
| Link Speed (mph) | | 25 | | | 25 | | | 25 | | | 25 | |
| Link Distance (ft) | | 1281 | | | 657 | | | 299 | | | 315 | |
| Travel Time (s) | | 34.9 | | | 17.9 | | | 8.2 | | | 8.6 | |
| Confl. Peds. (#/hr) | 5 | | 5 | | | | | | 5 | 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) | 33 | 857 | 113 | 0 | 0 | 0 | 0 | 174 | 97 | 28 | 48 | 0 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 1003 | 0 | 0 | 0 | 0 | 0 | 271 | 0 | 0 | 76 | 0 |
| Turn Type | Perm | NA | | | | | | NA | | Perm | NA | |
| Protected Phases | | 2 | | | | | | 4 | | | 4 | |
| Permitted Phases | 2 | | | | | | | | | 4 | | |
| Minimum Split (s) | 35.1 | 35.1 | | | | | | 21.1 | | 21.1 | 21.1 | |
| Total Split (s) | 38.0 | 38.0 | | | | | | 22.0 | | 22.0 | 22.0 | |
| Total Split (%) | 63.3% | 63.3% | | | | | | 36.7% | | 36.7% | 36.7% | |
| Maximum Green (s) | 32.9 | 32.9 | | | | | | 16.9 | | 16.9 | 16.9 | |
| Yellow Time (s) | 3.2 | 3.2 | | | | | | 3.2 | | 3.2 | 3.2 | |
| All-Red Time (s) | 1.9 | 1.9 | | | | | | 1.9 | | 1.9 | 1.9 | |
| Lost Time Adjust (s) | | 0.0 | | | | | | -1.0 | | | -1.0 | |
| Total Lost Time (s) | | 5.1 | | | | | | 4.1 | | | 4.1 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Walk Time (s) | 13.0 | 13.0 | | | | | | 8.0 | | 8.0 | 8.0 | |
| Flash Dont Walk (s) | 17.0 | 17.0 | | | | | | 8.0 | | 8.0 | 8.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | | | | | 0 | | 0 | 0 | |
| Act Effct Green (s) | | 32.9 | | | | | | 17.9 | | | 17.9 | |
| Actuated g/C Ratio | | 0.55 | | | | | | 0.30 | | | 0.30 | |
| v/c Ratio | | 0.52 | | | | | | 0.48 | | | 0.16 | |
| Control Delay | | 2.4 | | | | | | 17.6 | | | 12.1 | |
| Queue Delay | | 0.0 | | | | | | 0.0 | | | 0.0 | |
| Total Delay | | 2.4 | | | | | | 17.6 | | | 12.1 | |
| LOS | | A | | | | | | B | | | B | |
| Approach Delay | | 2.4 | | | | | | 17.6 | | | 12.1 | |
| Approach LOS | | A | | | | | | B | | | B | |
| Queue Length 50th (ft) | | 13 | | | | | | 64 | | | 11 | |
| Queue Length 95th (ft) | | 21 | | | | | | 125 | | | m22 | |
| Internal Link Dist (ft) | | 1201 | | | 577 | | | 219 | | | 235 | |
| Turn Bay Length (ft) | | | | | | | | | | | | |

Downtown Lewiston 4/30/2014 2040 Projections
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Synchro 8 Report
Page 5

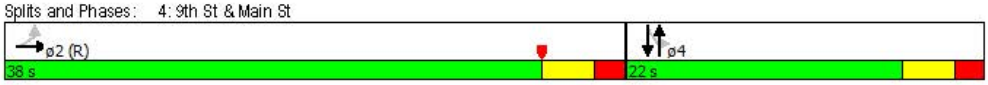
Lanes, Volumes, Timings
4: 9th St & Main St

4/30/2014

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Capacity (vph) | | 1914 | | | | | | 559 | | | 467 | |
| Starvation Cap Reductn | | 0 | | | | | | 0 | | | 0 | |
| Spillback Cap Reductn | | 0 | | | | | | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | | | | | | 0 | | | 0 | |
| Reduced v/c Ratio | | 0.52 | | | | | | 0.48 | | | 0.16 | |

| Intersection Summary | |
|---|---|
| Area Type: | Other |
| Cycle Length: 60 | |
| Actuated Cycle Length: 60 | |
| Offset: 56 (93%), Referenced to phase 2:EBTL, Start of Yellow | |
| Natural Cycle: 60 | |
| Control Type: Pretimed | |
| Maximum v/c Ratio: 0.52 | |
| Intersection Signal Delay: 6.0 | Intersection LOS: A |
| Intersection Capacity Utilization 57.8% | ICU Level of Service B |
| Analysis Period (min) 15 | |
| m Volume for 95th percentile queue is metered by upstream signal. | |

Splits and Phases: 4: 9th St & Main St



Lanes, Volumes, Timings
5: 13th St. & Main St

4/30/2014

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 684 | 205 | 21 | 346 | 250 | 29 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | | 150 | 95 | | 0 | 0 |
| Storage Lanes | | 1 | 1 | | 1 | 1 |
| Taper Length (ft) | | | 25 | | 25 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | 0.97 | 1.00 | | 0.99 | 0.97 |
| Frt | | 0.850 | | | | 0.850 |
| Flt Protected | | | 0.950 | | 0.950 | |
| Satd. Flow (prot) | 1863 | 1583 | 1770 | 1863 | 1770 | 1583 |
| Flt Permitted | | | 0.144 | | 0.950 | |
| Satd. Flow (perm) | 1863 | 1540 | 268 | 1863 | 1758 | 1542 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 223 | | | | 32 |
| Link Speed (mph) | 25 | | | 25 | 25 | |
| Link Distance (ft) | 861 | | | 445 | 327 | |
| Travel Time (s) | 23.5 | | | 12.1 | 8.9 | |
| Confl. Peds. (#/hr) | | 5 | 5 | | 5 | 5 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 743 | 223 | 23 | 376 | 272 | 32 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 743 | 223 | 23 | 376 | 272 | 32 |
| Turn Type | NA | Perm | Perm | NA | Prot | Perm |
| Protected Phases | 2 | | | 2 | 4 | |
| Permitted Phases | | 2 | 2 | | | 4 |
| Minimum Split (s) | 25.1 | 25.1 | 25.1 | 25.1 | 28.1 | 28.1 |
| Total Split (s) | 31.9 | 31.9 | 31.9 | 31.9 | 28.1 | 28.1 |
| Total Split (%) | 53.2% | 53.2% | 53.2% | 53.2% | 46.8% | 46.8% |
| Maximum Green (s) | 26.8 | 26.8 | 26.8 | 26.8 | 23.0 | 23.0 |
| Yellow Time (s) | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 |
| All-Red Time (s) | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 |
| Lost Time Adjust (s) | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 |
| Total Lost Time (s) | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Flash Dont Walk (s) | 13.0 | 13.0 | 13.0 | 13.0 | 16.0 | 16.0 |
| Pedestrian Calls (#/hr) | 8 | 8 | 8 | 8 | 1 | 1 |
| Act Effct Green (s) | 27.8 | 27.8 | 27.8 | 27.8 | 24.0 | 24.0 |
| Actuated g/C Ratio | 0.46 | 0.46 | 0.46 | 0.46 | 0.40 | 0.40 |
| v/c Ratio | 0.86 | 0.27 | 0.19 | 0.44 | 0.38 | 0.05 |
| Control Delay | 18.4 | 0.8 | 14.1 | 12.8 | 14.8 | 4.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 18.4 | 0.8 | 14.1 | 12.8 | 14.8 | 4.9 |
| LOS | B | A | B | B | B | A |
| Approach Delay | 14.3 | | | 12.9 | 13.8 | |
| Approach LOS | B | | | B | B | |
| Queue Length 50th (ft) | 81 | 1 | 5 | 86 | 67 | 0 |

Downtown Lewiston 4/30/2014 2040 Projections
SJL

Synchro 8 Report
Page 7

Lanes, Volumes, Timings
5: 13th St. & Main St 4/30/2014

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Queue Length 95th (ft) | #411 | 1 | 19 | 146 | 120 | 13 |
| Internal Link Dist (ft) | 781 | | | 365 | 247 | |
| Turn Bay Length (ft) | | 150 | 95 | | | |
| Base Capacity (vph) | 863 | 833 | 124 | 863 | 708 | 636 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.86 | 0.27 | 0.19 | 0.44 | 0.38 | 0.05 |

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 24 (40%), Referenced to phase 2:EBWB, Start of Yellow
Natural Cycle: 60
Control Type: Pretimed
Maximum v/c Ratio: 0.86
Intersection Signal Delay: 13.9 Intersection LOS: B
Intersection Capacity Utilization 62.0% ICU Level of Service B
Analysis Period (min) 15
# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: 13th St. & Main St

Downtown Lewiston 4/30/2014 2040 Projections
SJL

Synchro 8 Report
Page 8

Lanes, Volumes, Timings
6: 3rd St & D St

4/30/2014

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 0 | 0 | 0 | 24 | 778 | 3 | 65 | 8 | 0 | 0 | 8 | 33 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | 1.00 | | | 1.00 | | | 0.99 | |
| Frt | | | | | 0.999 | | | | | | 0.892 | |
| Flt Protected | | | | | 0.999 | | | 0.958 | | | | |
| Satd. Flow (prot) | 0 | 0 | 0 | 0 | 3532 | 0 | 0 | 1785 | 0 | 0 | 1641 | 0 |
| Flt Permitted | | | | | 0.999 | | | 0.764 | | | | |
| Satd. Flow (perm) | 0 | 0 | 0 | 0 | 3531 | 0 | 0 | 1418 | 0 | 0 | 1641 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | | | 1 | | | | | | 36 | |
| Link Speed (mph) | | 25 | | | 25 | | | 25 | | | 25 | |
| Link Distance (ft) | | 565 | | | 571 | | | 111 | | | 289 | |
| Travel Time (s) | | 15.4 | | | 15.6 | | | 3.0 | | | 7.9 | |
| Confl. Peds. (#/hr) | | | | 5 | | 5 | 5 | | | | | 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) | 0 | 0 | 0 | 26 | 846 | 3 | 71 | 9 | 0 | 0 | 9 | 36 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 0 | 0 | 875 | 0 | 0 | 80 | 0 | 0 | 45 | 0 |
| Turn Type | | | | Perm | NA | | Perm | NA | | | NA | |
| Protected Phases | | | | | 2 | | | 4 | | | 4 | |
| Permitted Phases | | | | 2 | | | 4 | | | | | |
| Minimum Split (s) | | | | 30.1 | 30.1 | | 28.1 | 28.1 | | | 28.1 | |
| Total Split (s) | | | | 31.9 | 31.9 | | 28.1 | 28.1 | | | 28.1 | |
| Total Split (%) | | | | 53.2% | 53.2% | | 46.8% | 46.8% | | | 46.8% | |
| Maximum Green (s) | | | | 26.8 | 26.8 | | 23.0 | 23.0 | | | 23.0 | |
| Yellow Time (s) | | | | 3.2 | 3.2 | | 3.2 | 3.2 | | | 3.2 | |
| All-Red Time (s) | | | | 1.9 | 1.9 | | 1.9 | 1.9 | | | 1.9 | |
| Lost Time Adjust (s) | | | | | 1.0 | | | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | | | | 6.1 | | | 5.1 | | | 5.1 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Walk Time (s) | | | | 11.0 | 11.0 | | 11.0 | 11.0 | | | 11.0 | |
| Flash Dont Walk (s) | | | | 14.0 | 14.0 | | 12.0 | 12.0 | | | 12.0 | |
| Pedestrian Calls (#/hr) | | | | 0 | 0 | | 0 | 0 | | | 0 | |
| Act Effct Green (s) | | | | | 25.8 | | | 23.0 | | | 23.0 | |
| Actuated g/C Ratio | | | | | 0.43 | | | 0.38 | | | 0.38 | |
| v/c Ratio | | | | | 0.58 | | | 0.15 | | | 0.07 | |
| Control Delay | | | | | 6.8 | | | 2.2 | | | 6.0 | |
| Queue Delay | | | | | 0.0 | | | 2.8 | | | 0.0 | |
| Total Delay | | | | | 6.8 | | | 5.0 | | | 6.0 | |
| LOS | | | | | A | | | A | | | A | |
| Approach Delay | | | | | 6.8 | | | 5.0 | | | 6.0 | |
| Approach LOS | | | | | A | | | A | | | A | |
| Queue Length 50th (ft) | | | | | 40 | | | 2 | | | 2 | |
| Queue Length 95th (ft) | | | | | 60 | | | m2 | | | 18 | |
| Internal Link Dist (ft) | | 485 | | | 491 | | | 31 | | | 209 | |
| Turn Bay Length (ft) | | | | | | | | | | | | |

Downtown Lewiston 4/30/2014 2040 Projections
SJL

Synchro 8 Report
Page 9

Lanes, Volumes, Timings
6: 3rd St & D St

4/30/2014

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Capacity (vph) | | | | | 1518 | | | 543 | | | 651 | |
| Starvation Cap Reductn | | | | | 0 | | | 376 | | | 0 | |
| Spillback Cap Reductn | | | | | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | | | | | 0 | | | 0 | | | 0 | |
| Reduced v/c Ratio | | | | | 0.58 | | | 0.48 | | | 0.07 | |

| Intersection Summary | |
|---|---|
| Area Type: | Other |
| Cycle Length: 60 | |
| Actuated Cycle Length: 60 | |
| Offset: 22 (37%), Referenced to phase 2:WBTL, Start of Yellow | |
| Natural Cycle: 60 | |
| Control Type: Pretimed | |
| Maximum v/c Ratio: 0.58 | |
| Intersection Signal Delay: 6.6 | Intersection LOS: A |
| Intersection Capacity Utilization 50.8% | ICU Level of Service A |
| Analysis Period (min) 15 | |
| m Volume for 95th percentile queue is metered by upstream signal. | |

Splits and Phases: 6: 3rd St & D St

Lanes, Volumes, Timings
7: 5th St & D St

4/30/2014

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 0 | 0 | 0 | 57 | 669 | 35 | 143 | 38 | 0 | 0 | 76 | 22 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | 1.00 | | 1.00 | | | | 1.00 | |
| Frt | | | | | 0.993 | | | | | | 0.970 | |
| Flt Protected | | | | | 0.996 | | 0.950 | | | | | |
| Satd. Flow (prot) | 0 | 0 | 0 | 0 | 3496 | 0 | 1770 | 1863 | 0 | 0 | 1800 | 0 |
| Flt Permitted | | | | | 0.996 | | 0.688 | | | | | |
| Satd. Flow (perm) | 0 | 0 | 0 | 0 | 3496 | 0 | 1277 | 1863 | 0 | 0 | 1800 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | | | 10 | | | | | | 24 | |
| Link Speed (mph) | | 25 | | | 25 | | | 25 | | | 25 | |
| Link Distance (ft) | | 571 | | | 370 | | | 116 | | | 265 | |
| Travel Time (s) | | 15.6 | | | 10.1 | | | 3.2 | | | 7.2 | |
| Confl. Peds. (#/hr) | | | | | | 5 | 5 | | | | | 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) | 0 | 0 | 0 | 62 | 727 | 38 | 155 | 41 | 0 | 0 | 83 | 24 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 0 | 0 | 827 | 0 | 155 | 41 | 0 | 0 | 107 | 0 |
| Turn Type | | | | Perm | NA | | Perm | NA | | | NA | |
| Protected Phases | | | | | 2 | | | 4 | | | 4 | |
| Permitted Phases | | | | 2 | | | 4 | | | | | |
| Minimum Split (s) | | | | 30.1 | 30.1 | | 28.1 | 28.1 | | | 28.1 | |
| Total Split (s) | | | | 31.8 | 31.8 | | 28.2 | 28.2 | | | 28.2 | |
| Total Split (%) | | | | 53.0% | 53.0% | | 47.0% | 47.0% | | | 47.0% | |
| Maximum Green (s) | | | | 26.7 | 26.7 | | 23.1 | 23.1 | | | 23.1 | |
| Yellow Time (s) | | | | 3.2 | 3.2 | | 3.2 | 3.2 | | | 3.2 | |
| All-Red Time (s) | | | | 1.9 | 1.9 | | 1.9 | 1.9 | | | 1.9 | |
| Lost Time Adjust (s) | | | | | 1.0 | | 0.0 | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | | | | 6.1 | | 5.1 | 5.1 | | | 5.1 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Walk Time (s) | | | | 9.0 | 9.0 | | 10.0 | 10.0 | | | 10.0 | |
| Flash Dont Walk (s) | | | | 14.0 | 14.0 | | 12.0 | 12.0 | | | 12.0 | |
| Pedestrian Calls (#/hr) | | | | 0 | 0 | | 0 | 0 | | | 0 | |
| Act Effct Green (s) | | | | | 25.7 | | 23.1 | 23.1 | | | 23.1 | |
| Actuated g/C Ratio | | | | | 0.43 | | 0.38 | 0.38 | | | 0.38 | |
| v/c Ratio | | | | | 0.55 | | 0.32 | 0.06 | | | 0.15 | |
| Control Delay | | | | | 8.7 | | 7.7 | 4.5 | | | 10.4 | |
| Queue Delay | | | | | 0.1 | | 2.5 | 2.1 | | | 0.0 | |
| Total Delay | | | | | 8.8 | | 10.2 | 6.6 | | | 10.4 | |
| LOS | | | | | A | | B | A | | | B | |
| Approach Delay | | | | | 8.8 | | | 9.4 | | | 10.4 | |
| Approach LOS | | | | | A | | | A | | | B | |
| Queue Length 50th (ft) | | | | | 41 | | 13 | 3 | | | 19 | |
| Queue Length 95th (ft) | | | | | 54 | | m23 | m8 | | | 46 | |
| Internal Link Dist (ft) | | 491 | | | 290 | | | 36 | | | 185 | |
| Turn Bay Length (ft) | | | | | | | | | | | | |

Downtown Lewiston 4/30/2014 2040 Projections
SJL

Synchro 8 Report
Page 11

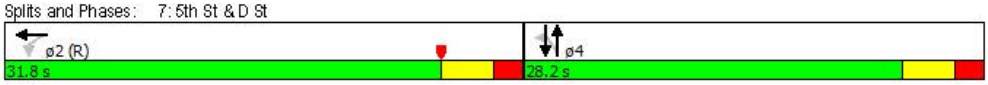
Lanes, Volumes, Timings
7: 5th St & D St

4/30/2014

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Capacity (vph) | | | | | 1503 | | 491 | 717 | | | 707 | |
| Starvation Cap Reductn | | | | | 0 | | 230 | 594 | | | 0 | |
| Spillback Cap Reductn | | | | | 109 | | 0 | 0 | | | 0 | |
| Storage Cap Reductn | | | | | 0 | | 0 | 0 | | | 0 | |
| Reduced v/c Ratio | | | | | 0.59 | | 0.59 | 0.33 | | | 0.15 | |

| Intersection Summary | |
|---|---|
| Area Type: | Other |
| Cycle Length: 60 | |
| Actuated Cycle Length: 60 | |
| Offset: 9 (15%), Referenced to phase 2:WBTL, Start of Yellow | |
| Natural Cycle: 60 | |
| Control Type: Pretimed | |
| Maximum v/c Ratio: 0.55 | |
| Intersection Signal Delay: 9.1 | Intersection LOS: A |
| Intersection Capacity Utilization 95.2% | ICU Level of Service F |
| Analysis Period (min) 15 | |
| m Volume for 95th percentile queue is metered by upstream signal. | |

Splits and Phases: 7: 5th St & D St



Lanes, Volumes, Timings
9: 9th St & D St

4/30/2014

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 0 | 0 | 61 | 588 | 180 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 1.00 |
| Ped Bike Factor | | | | 1.00 | 1.00 | |
| Frt | | | | | | |
| Flt Protected | | | | 0.995 | 0.950 | |
| Satd. Flow (prot) | 0 | 0 | 0 | 3522 | 1770 | 0 |
| Flt Permitted | | | | 0.995 | 0.950 | |
| Satd. Flow (perm) | 0 | 0 | 0 | 3520 | 1763 | 0 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | | | | | |
| Link Speed (mph) | 25 | | | 25 | 25 | |
| Link Distance (ft) | 1330 | | | 717 | 315 | |
| Travel Time (s) | 36.3 | | | 19.6 | 8.6 | |
| Confl. Peds. (#/hr) | | | 5 | | 5 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 0 | 0 | 66 | 639 | 196 | 0 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 0 | 705 | 196 | 0 |
| Turn Type | | | Perm | NA | Prot | |
| Protected Phases | | | | 2 | 4 | |
| Permitted Phases | | | 2 | | | |
| Minimum Split (s) | | | 30.1 | 30.1 | 28.1 | |
| Total Split (s) | | | 31.9 | 31.9 | 28.1 | |
| Total Split (%) | | | 53.2% | 53.2% | 46.8% | |
| Maximum Green (s) | | | 26.8 | 26.8 | 23.0 | |
| Yellow Time (s) | | | 3.2 | 3.2 | 3.2 | |
| All-Red Time (s) | | | 1.9 | 1.9 | 1.9 | |
| Lost Time Adjust (s) | | | | 1.0 | 0.0 | |
| Total Lost Time (s) | | | | 6.1 | 5.1 | |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Walk Time (s) | | | 10.0 | 10.0 | 11.0 | |
| Flash Dont Walk (s) | | | 15.0 | 15.0 | 12.0 | |
| Pedestrian Calls (#/hr) | | | 0 | 0 | 0 | |
| Act Effct Green (s) | | | | 25.8 | 23.0 | |
| Actuated g/C Ratio | | | | 0.43 | 0.38 | |
| v/c Ratio | | | | 0.47 | 0.29 | |
| Control Delay | | | | 11.2 | 15.1 | |
| Queue Delay | | | | 0.0 | 0.0 | |
| Total Delay | | | | 11.2 | 15.1 | |
| LOS | | | | B | B | |
| Approach Delay | | | | 11.2 | 15.1 | |
| Approach LOS | | | | B | B | |
| Queue Length 50th (ft) | | | | 86 | 66 | |
| Queue Length 95th (ft) | | | | 130 | 118 | |
| Internal Link Dist (ft) | 1250 | | | 637 | 235 | |
| Turn Bay Length (ft) | | | | | | |

Downtown Lewiston 4/30/2014 2040 Projections
SJL

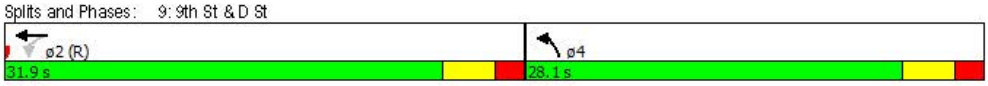
Synchro 8 Report
Page 13

Lanes, Volumes, Timings
9: 9th St & D St 4/30/2014

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Base Capacity (vph) | | | | 1513 | 678 | |
| Starvation Cap Reductn | | | | 0 | 0 | |
| Spillback Cap Reductn | | | | 0 | 0 | |
| Storage Cap Reductn | | | | 0 | 0 | |
| Reduced v/c Ratio | | | | 0.47 | 0.29 | |

| Intersection Summary | |
|---|---|
| Area Type: Other | |
| Cycle Length: 60 | |
| Actuated Cycle Length: 60 | |
| Offset: 56 (93%), Referenced to phase 2:WBTL, Start of Green | |
| Natural Cycle: 60 | |
| Control Type: Pretimed | |
| Maximum v/c Ratio: 0.47 | |
| Intersection Signal Delay: 12.0 | Intersection LOS: B |
| Intersection Capacity Utilization 37.3% | ICU Level of Service A |
| Analysis Period (min) 15 | |

Splits and Phases: 9: 9th St & D St




Downtown Lewiston 4/30/2014 2040 Projections
SJL

Synchro 8 Report
Page 14

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.8 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR |
|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 23 | 824 | 15 | 0 | 0 | 571 | 0 | 21 | 19 |
| Conflicting Peds, #/hr | 5 | 0 | 5 | 0 | 0 | 5 | 0 | 0 | 5 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | Free | - | - | None |
| Storage Length | 0 | - | - | - | - | 0 | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 25 | 896 | 16 | 0 | 0 | 621 | 0 | 23 | 21 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | |
|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 0 | - | - | - | 959 | 959 | 909 |
| Stage 1 | - | - | - | - | - | - | 959 | 959 | - |
| Stage 2 | - | - | - | - | - | - | 0 | 0 | - |
| Critical Hdwy | - | - | - | - | - | - | 6.42 | 6.52 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 5.42 | 5.52 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | - | - | - |
| Follow-up Hdwy | - | - | - | - | - | - | 3.518 | 4.018 | 3.318 |
| Pot Cap-1 Maneuver | - | - | - | 0 | 0 | 0 | 285 | 257 | 333 |
| Stage 1 | - | - | - | 0 | 0 | 0 | 372 | 335 | - |
| Stage 2 | - | - | - | 0 | 0 | 0 | - | - | - |
| Platoon blocked, % | | - | - | - | - | | | | |
| Mov Cap-1 Maneuver | - | - | - | - | - | - | 282 | 0 | 331 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 282 | 0 | - |
| Stage 1 | - | - | - | - | - | - | 370 | 0 | - |
| Stage 2 | - | - | - | - | - | - | - | 0 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | 0 | 0 | 17.5 |
| HCM LOS | | | C |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR |
|---|---|---|---|---|
| Capacity (veh/h) | 331 | - | - | - |
| HCM Lane V/C Ratio | 0.131 | - | - | - |
| HCM Control Delay (s) | 17.5 | - | - | - |
| HCM Lane LOS | C | - | - | - |
| HCM 95th %tile Q(veh) | 0.4 | - | - | - |

| Intersection | | | |
|---|---|---|---|
| Int Delay, s/veh | | | |

| Movement | SBL | SBT | SBR |
|---|---|---|---|
| Vol, veh/h | 0 | 0 | 0 |
| Conflicting Peds, #/hr | 0 | 0 | 0 |
| Sign Control | Free | Free | Free |
| RT Channelized | - | - | None |
| Storage Length | - | - | - |
| Veh in Median Storage, # | - | 0 | - |
| Grade, % | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 |
| Mvmt Flow | 0 | 0 | 0 |

| Major/Minor |
|---|
| Conflicting Flow All |
| Stage 1 |
| Stage 2 |
| Critical Hdwy |
| Critical Hdwy Stg 1 |
| Critical Hdwy Stg 2 |
| Follow-up Hdwy |
| Pot Cap-1 Maneuver |
| Stage 1 |
| Stage 2 |
| Platoon blocked, % |
| Mov Cap-1 Maneuver |
| Mov Cap-2 Maneuver |
| Stage 1 |
| Stage 2 |

| Approach |
|---|
| HCM Control Delay, s |
| HCM LOS |

| Minor Lane/Major Mvmt |
|---|

| Intersection | |
|---|---|
| Int Delay, s/veh | 0 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR |
|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 3 | 0 | 536 | 829 | 78 | 2 | 0 | 0 | 0 |
| Conflicting Peds, #/hr | 5 | 0 | 5 | 5 | 0 | 5 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | Free | - | - | None | - | - | None |
| Storage Length | 0 | - | 0 | 0 | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 3 | 0 | 583 | 901 | 85 | 2 | 0 | 0 | 0 |

| Major/Minor | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 92 | 0 | - | 0 | 0 | 0 |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |
| Critical Hdwy | 4.12 | - | - | - | - | - |
| Critical Hdwy Stg 1 | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - |
| Follow-up Hdwy | 2.218 | - | - | - | - | - |
| Pot Cap-1 Maneuver | 1503 | - | 0 | - | - | - |
| Stage 1 | - | - | 0 | - | - | - |
| Stage 2 | - | - | 0 | - | - | - |
| Platoon blocked, % | | - | | | - | - |
| Mov Cap-1 Maneuver | 1496 | - | - | - | - | - |
| Mov Cap-2 Maneuver | - | - | - | - | - | - |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |

| Approach | EB | WB |
|---|---|---|
| HCM Control Delay, s | 7.4 | 0 |
| HCM LOS | | |

| Minor Lane/Major Mvmt | EBL | EBT | WBL | WBT | WBR | SBLn1 | SBLn2 |
|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1496 | - | - | - | - | - | 951 |
| HCM Lane V/C Ratio | 0.002 | - | - | - | - | - | 0.023 |
| HCM Control Delay (s) | 7.4 | - | - | - | - | - | 8.9 |
| HCM Lane LOS | A | - | - | - | - | - | A |
| HCM 95th %tile Q(veh) | 0 | - | - | - | - | - | 0.1 |

| Intersection | | | |
|---|---|---|---|
| Int Delay, s/veh | | | |

| Movement | SBL | SBT | SBR |
|---|---|---|---|
| Vol, veh/h | 0 | 29 | 20 |
| Conflicting Peds, #/hr | 0 | 0 | 5 |
| Sign Control | Stop | Stop | Stop |
| RT Channelized | - | - | None |
| Storage Length | - | - | 50 |
| Veh in Median Storage, # | - | 0 | - |
| Grade, % | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 |
| Mvmt Flow | 0 | 32 | 22 |

| Major/Minor | Minor2 | | |
|---|---|---|---|
| Conflicting Flow All | 1893 | 1900 | 96 |
| Stage 1 | 1893 | 1893 | - |
| Stage 2 | 0 | 7 | - |
| Critical Hdwy | 6.42 | 6.52 | 6.22 |
| Critical Hdwy Stg 1 | 5.42 | 5.52 | - |
| Critical Hdwy Stg 2 | - | - | - |
| Follow-up Hdwy | 3.518 | 4.018 | 3.318 |
| Pot Cap-1 Maneuver | 77 | 69 | 960 |
| Stage 1 | 130 | 118 | - |
| Stage 2 | - | - | - |
| Platoon blocked, % | | | |
| Mov Cap-1 Maneuver | 76 | 0 | 951 |
| Mov Cap-2 Maneuver | 76 | 0 | - |
| Stage 1 | 129 | 0 | - |
| Stage 2 | - | 0 | - |

| Approach | SB |
|---|---|
| HCM Control Delay, s | |
| HCM LOS | - |

| Minor Lane/Major Mvmt |
|---|

## Arterial Level of Service: WB D St

| Cross Street | Arterial Class | Flow Speed | Running Time | Signal Delay | Travel Time (s) | Dist (mi) | Arterial Speed | Arterial LOS |
|---|---|---|---|---|---|---|---|---|
| 9th St | IV | 25 | 24.4 | 11.2 | 35.6 | 0.14 | 13.7 | C |
| 5th St | IV | 25 | 49.3 | 8.7 | 58.0 | 0.32 | 20.0 | B |
| 3rd St | IV | 25 | 23.8 | 6.8 | 30.6 | 0.11 | 12.7 | D |
| Total | IV | | 97.5 | 26.7 | 124.2 | 0.57 | 16.4 | C |

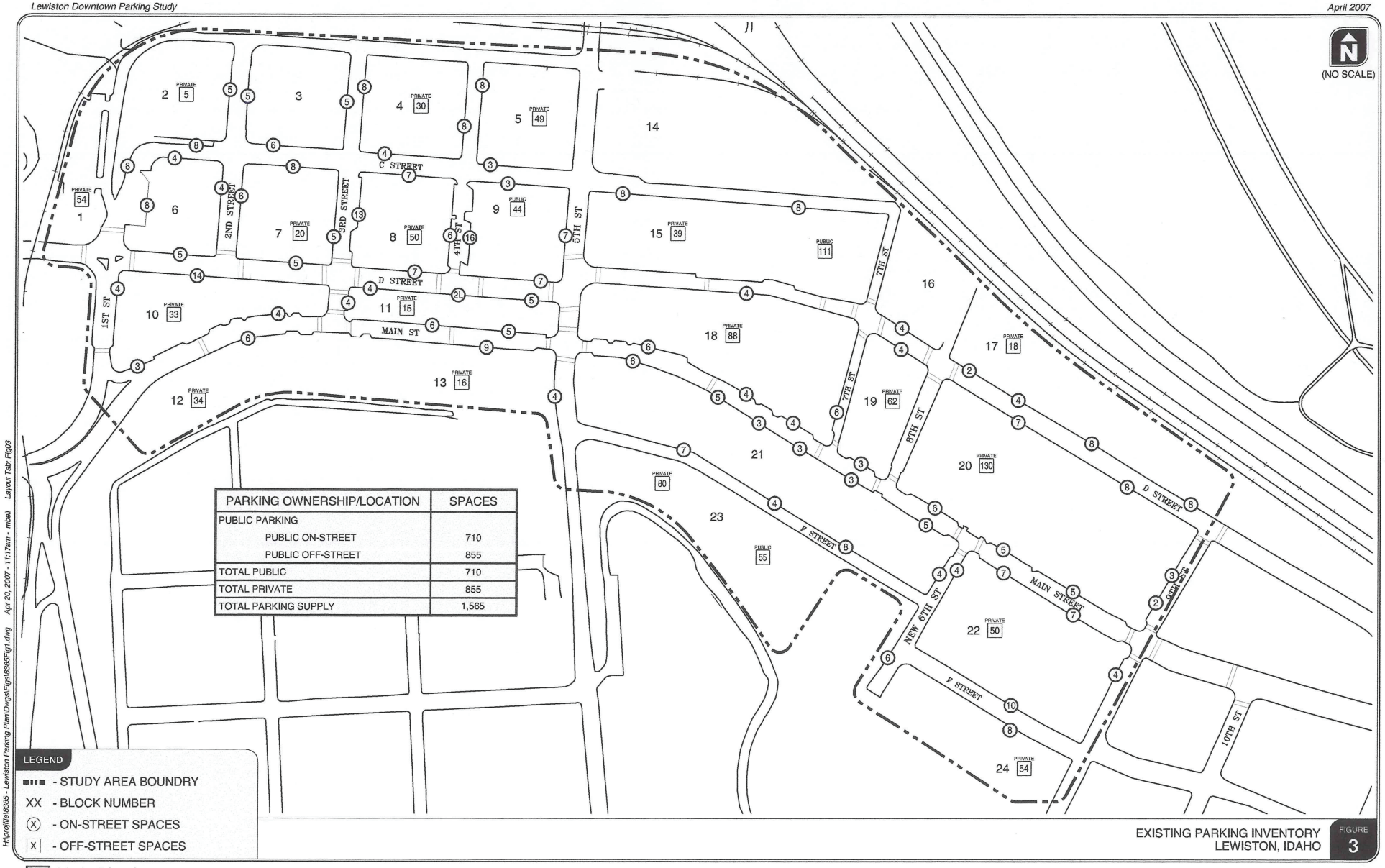
## Arterial Level of Service: EB Main St

| Cross Street | Arterial Class | Flow Speed | Running Time | Signal Delay | Travel Time (s) | Dist (mi) | Arterial Speed | Arterial LOS |
|---|---|---|---|---|---|---|---|---|
| 3rd St | IV | 25 | 35.6 | 16.1 | 51.7 | 0.23 | 16.2 | C |
| 5th St | IV | 25 | 23.6 | 2.4 | 26.0 | 0.11 | 14.9 | C |
| 9th St | IV | 25 | 46.4 | 2.4 | 48.8 | 0.30 | 22.4 | B |
| 13th St. | IV | 25 | 44.0 | 18.4 | 62.4 | 0.29 | 16.6 | C |
| Total | IV | | 149.6 | 39.3 | 188.9 | 0.93 | 17.7 | C |

## Arterial Level of Service: WB Main St

| Cross Street | Arterial Class | Flow Speed | Running Time | Signal Delay | Travel Time (s) | Dist (mi) | Arterial Speed | Arterial LOS |
|---|---|---|---|---|---|---|---|---|
| 13th St. | IV | 25 | 18.5 | 12.8 | 31.3 | 0.08 | 9.7 | D |
| Total | IV | | 18.5 | 12.8 | 31.3 | 0.08 | 9.7 | D |

# Appendix B – Parking Summary




| PARKING OWNERSHIP/LOCATION | SPACES |
|---|---|
| PUBLIC PARKING | |
| PUBLIC ON-STREET | 710 |
| PUBLIC OFF-STREET | 855 |
| TOTAL PUBLIC | 710 |
| TOTAL PRIVATE | 855 |
| TOTAL PARKING SUPPLY | 1,565 |

EXISTING PARKING INVENTORY
LEWISTON, IDAHO

FIGURE 3

H:\proj\file\8385 - Lewiston Parking Plan\Dwgs\Figs\8385Fig1.dwg Apr 20, 2007 - 11:17am - mbell Layout Tab: Fig03

John D. Edwards Transportation Consultant, Inc.
With Kittelson & Associates, Inc.

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