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1. Introduction

Logan City has a large residential population and serves as the main shopping, recreation and employment center of the region. Logan City has a limited number of north/south alternatives to Main Street. Congestion on Main Street has caused travelers to use nearby parallel roads, affecting safety and other neighborhood impacts, associated with increased traffic. Because Logan has an excellent grid system, one-way couplets are potential tools for traffic congestion management.

2. Focus of This Study

Logan City is studying the feasibility of converting from a two-way road system to a one-way couplet system, for either a portion or the entire length of the Main Street corridor. The intent of this study is to determine the feasibility of one-way couplet scenarios for meeting the future traffic capacity requirements of the Main Street corridor. This study evaluates the five couplet scenarios identified in the *Transportation Master Plan* (2011) in greater detail to determine which, if any, are feasible and beneficial to the city. This study also evaluates traditional two-way street options and the improvements, planned as part of the 2040 Regional Transportation Plan projects, to compare the potential solutions for addressing future congestion. The study area, including the Main Street corridor, begins near the “Y” intersection of Highways 165 and 89-91 to 1500 North between 300 East and 300 West.

The City determined that the couplet concepts warrant further evaluation to better understand the full benefits and implication of each couplet scenario. This effort, which began in September 2012, aims to compare and contrast each couplet scenario to shed light on the potential impacts and select a preferred scenario by Spring 2013. If a non-couplet scenario is found to be effective for congestion relief and is consistent with the City’s general plan, it could also be advanced instead of a couplet scenario. The selection of a preferred concept does not mean it would be implemented in the near future, if ever. It simply means it appears feasible to implement, and appears to be preferred over other scenarios when considering the opinions of stakeholders, such as Logan’s elected officials, Cache Metropolitan Planning Organization (CMPO), City and UDOT professional staff, business leaders, and neighborhood groups.

Project Purpose:

- Evaluate scenarios for one-way couplets within the Main Street corridor that help meet the future traffic capacity requirements.
- Evaluate which one-way couplet scenario(s) and provide the best opportunity to meet capacity needs for increased vehicle mobility and minimize impacts to neighborhoods.
- Evaluate impacts on businesses and neighborhoods resulting from implementation of a one-way couplet scenario(s) including land use, transit, and pedestrian considerations.

- Evaluate acceptability with UDOT of the potential use of Main Street as part of the one-way couplet scenario(s), if determined necessary.
- Provide opportunities for public input by presenting analysis and results of the feasibility study at neighborhood council meetings and Logan municipal council meetings.

This study will also provide information on cost of implementation, amount of congestion relief each scenario would produce, any fatal flaws, and the best locations for couplets to start and end. For concepts that directly involve UDOT arterials, we analyzed whether or not the couplet scenario could be developed to meet UDOT standards.

7.2.1 Couplet Scenario Development

Each scenario was evaluated to determine if it is feasible and which scenario (if any) has the best overall performance. This study will also document issues, comments, and provide recommendations on what the next step should be for solving the congestion issue within the Main Street corridor.

Upon selection of a preferred scenario, the City will have the opportunity to update its *Transportation Master Plan* (2011) with the results, seek funding for additional study and eventual construction, and work with stakeholders to advance the preferred scenario to the next stage of analysis. In addition, a preferred solution will receive additional scrutiny and additional comment via a formal public process before being implemented.

3. Agency Coordination and Public Outreach

Public outreach efforts for this study builds on stakeholder, community, and agency input collected from the *Transportation Master Plan* (2011) and *Downtown Logan Specific Plan* (2012), and other relevant studies. Past participation efforts and input is being carried forward and will continue to be incorporated through ongoing outreach efforts. Stakeholders and interested parties may include:

- Business owners
- Regulatory agencies
- Elected and appointed officials
- Neighborhood councils
- Special interest groups

To better understand what “success” looks like for the *Logan City One-Way Couplets Feasibility Study*, a stakeholder committee was formed to solicit input and expertise from community representatives. The group includes:

- Gary Saxton – Downtown Alliance
- Mark Nielsen – Logan Public Works

- Mike DeSimone – Logan Community Development
 - Downtown Business Alliance Project Liaison
- Jeff Gilbert – Cache Metropolitan Planning Organization
- Jaynan Chancellor – Cache MPO Bicycle and Pedestrian Advisory Committee
- James Geier – Neighborhood Council
 - Neighborhood Council Project Liaison (Adams, Ellis, Wilson, Bridger , and Woodruff)
- Todd Beutler – Cache Valley Transit District
- Tom Jensen – Logan City Council

The stakeholder committee met to develop the goals and objectives of this study. The goals and objectives were used as evaluation criteria for analyzing each couplet scenario. Additionally, the following parties will be incorporated into the evaluation phase for input on resources specific to their expertise:

- Marshall Garrett – Logan City School District
- Steve Call – FHWA, Planning and Research Program Manager
- Kris Peterson – UDOT, Region 1 Director

Outreach activities for this study will include:

- Neighborhood council outreach
- City Council meetings and presentation
- Public meetings
- Distribution of information to Chamber of Commerce
- Outreach to businesses located within the study area

4. Plan Goals and Objectives

The goals and objectives for the *Logan City One-Way Couplets Feasibility Study* are to develop and provide the framework for evaluation of scenarios. The stakeholder team identified broad goals and more focused objectives.

Goal: Promote Regional Multi-Modal Mobility

Objectives:

- Solve the immediate problem (or prevent it from getting worse by 2020)
- Find the best performing scenarios over the long run (post 2040) and minimize delay times
- Improve level of service (LOS) on Main Street
- Improve LOS on adjacent roadways
- Meet UDOT's Requirements and Standards
- Improve mobility for bikes, pedestrians, and transit

- Develop logical termini to roadways that can handle future traffic
- Address “missing links” in the transportation grid within project areas

Goal: Foster Positive Land Change and Economic Development

Objectives:

- Good access to local businesses (multi modal)
- Compatible with related/approved plans (*Transportation Master Plan, Downtown Specific Plan, Envision Cache*)
- Foster quality commercial and residential development
- Reduce pavement required for managing traffic
- Maintain high vehicle volumes on Main Street

Goal: Minimize Neighborhood and Environmental Impacts

Objectives:

- Community support
- Maintain effective emergency service access
- Minimize displacements and relocations
- Maintain or improve parking for businesses
- Minimize noise and air quality impacts (surrounding neighborhoods)
- Minimize impacts to parks, schools, and recreation areas
- Avoid or minimize impacts to historic buildings/properties

Couplet scenarios were evaluated in the context of how well they fulfill the project’s goals and meet its objectives. Evaluation measures to each objective were developed to be (to the degree possible) measurable and objective, and provide the means to gauge how well the scenarios can fulfill the objectives. See Section 5.2 Scenario Development for further detail.

5. Planning Process

5.1 Planning Context

The project team considered the local plans and policies related to land use and growth in the area in order to characterize the existing conditions.

Both the *Logan City General Plan* (2007) and the *Logan City Transportation Master Plan* (2011) identified a need to provide relief for traffic congestion on Main Street. The *Transportation Master Plan* identified multiple one-way couplet concepts that might be able to satisfy long-range demand, while at the same time staying within the existing right-of-way, blending in with the downtown vision, and potentially catalyzing high-quality downtown development. In 2012,

the city developed a *Downtown Specific Plan* aimed at attracting quality development consistent with their desires for a mixed-use, multi-modal environment as recommended by *Envision Cache*. Below is a summary of these plans as they apply to the *Logan City One-Way Couplets Feasibility Study*.

Logan City General Plan (2007)

The *General Plan* does not evaluate transportation in detail; however it does identify the following issues:

- Lack of capacity on Main Street (US 89/91)
- Lack of primary north-south roads
- Need to modify north-south routes to accommodate increasing traffic volumes

Envision Cache (2009)

Some of the recommendations of the *Envision Cache* as it relates to transportation include:

- Improved Roadway Connections:
 - Maximize connectivity providing multiple routes to destinations.
 - Better connections for local roads.
 - Enhanced public transportation scenarios.
 - Implement additional bike commute routes.
- Provide Mobility for Everyone:
 - Context sensitive design, construction and operation of streets to support all users including pedestrians, bicyclist and those riding public transportation.
- Infrastructure Efficiency:
 - Strive for a shorter road network that costs less to construct and maintain.

UDOT's SR-30 Study (2010)

This corridor study was prepared by UDOT to identify the long-term (2035) east-west transportation needs on SR-30 (also known as 200 North) between 1400 West and Main Street (U.S. Route 89/91). The study incorporates couplets as follows:

- Suggested that if the couplet scenario were advanced, the couplet should begin east of 1000 West.
- Evaluated the full couplet with the eastbound leg, including a bridge over 1000 West, which meets the UDOT signal spacing requirements (1/2 mile).
- Introduced the theory of using a three-phase signal instead of a four-phase signal, but did not evaluate.

Cache County Regional Transportation Plan (RTP) 2035 (2011)

This plan was developed to identify specific projects that are needed to meet the transportation demands of the Logan City urbanized area and the Utah portion of the greater Cache Valley. The Cache Metropolitan Planning Organization partnered with Envision Utah to engage the public through a comprehensive planning effort. This plan recognized that Logan's Main Street is often the point of convergence for north or south valley destinations and travelers passing through.

This plan indicated that congestion on the Logan Main Street corridor needed to be addressed, but did not specifically address couplets. However the RTP identified a need to conduct the *Logan City One-Way Couplets Feasibility Study* as soon as funding is available.

Logan's Transportation Master Plan (2011)

This plan guided the location and type of roadway facilities that are needed to meet projected growth and development of Logan City. The plan incorporates couplets as follows:

- Examined a future scenario that incorporated a one-way couplet running north and south near Main Street.
- Analyzed the feasibility of implementing one-way couplets to ease the burden on US-89/91 for north-south movement.
- Indicated that there are only a few streets available for north-south travel due to some natural barriers, rivers, and steep unstable bluffs. These streets include: 200 East, 100 East, Main Street, and 100 West.
- Identified that demand on these four roads will increase in the future as currently undeveloped areas of land on the eastern bench property in cities to the north and south of Logan develop.
- Indicated that western bypasses would not be adequate to meet future demand.
- Suggested that couplets offer the possibility of relieving Main Street congestion without major widening and minimal impacts to homes and businesses.

Downtown-Specific Plan (2012)

This plan was conducted to guide future development, transportation enhancements, and provide recommendations for growth. Couplets are incorporated in the plan as follows:

- Recognized that couplets could benefit downtown.
- Recognized that couplets would be supportive for downtown and reduce congestion.
- Recognized that couplets would be supportive of a mixed-use and multi-modal environment.

5.2 Scenario Evaluation

The CMPO model results were an important factor in helping determine the best concepts to carry forward (see Appendix A, “Model and Ranking Results” for further detail). In addition, the steering committee utilized a spreadsheet to help account for various factors important to the community, and to place a relative importance on each factor. Quantitative screening evaluated delay times, vehicle volume, and number of displacements. Qualitative screening evaluated land use and economic development impacts, traffic issues, environmental factors, conceptual engineering factors, and public preference (to be added later). The alignment scenarios that remain after this screening will be advanced for more detailed consideration separate from the *Logan City One-Way Couplet Feasibility Study* process.

The mechanics of the evaluation methodology include using the evaluation measures and the couplet scenarios as the rows and columns of the matrix. Typically there are two sets of matrices – one with raw data (delay times, vehicle volume, number of displacements, etc.) and another that creates a score or ranking for the couplet scenarios derived from the raw data. The general process is to look at the range of the values of the raw data, then develop a division of the range (poor, adequate, good, very good and excellent). A value or score is assigned to the division of the range (2 = poor, 4 = adequate, 6 = good, 8 = very good and 10 = excellent). It should be noted that for some measures, the inverse of the data receives the highest score. For example, more displacements are less desirable than fewer displacements, because of the social costs to those displaced and economic cost to the project. An alignment scenario having the fewest displacements would receive the highest rank or score. The scores for the individual evaluation measures are then summed to establish an overall score for each of the couplet scenarios.

The evaluation matrices for each of the project components and the couplet scenarios are presented below in Figure 1:

Figure 1. Evaluation Matrix

Alternatives	Multi-Modal Circulation		Economic Development		Minimize Impacts		Totals w/o Costs		Costs		Total plus Costs		Alternatives
	Total Points	Rank	Total Points	Rank	Total Points	Rank	Total Points	Rank	Total Points	Rank	Total Points	Rank	
Possible Points	37		27		24		88		10		97.7		Possible Points
RTP 2040	6	10	7	10	17	2	31	10	10	1	40.8	9	RTP 2040
Two 2-ways	16	8	15	8	4	10	35	9	3	6	38.2	10	Two 2-ways
A, 2-In	12	9	9	9	20	1	41	8	9	2	50.3	8	A, 2-In
B, 3-In	22	7	21	4	14	4	57	3	6	3	63.2	3	B, 3-In
B, 4-In	26	4	21	4	10	7	57	4	4	5	61.0	4	B, 4-In
C, 3-In	22	5	24	1	8	8	55	7	6	4	60.1	5	C, 3-In
D, 3-In	22	6	21	4	11	6	55	6	3	7	57.2	6	D, 3-In
D, 4-In	28	3	21	4	7	9	56	5	0	9	55.9	7	D, 4-In
E, 3-In	30	2	24	2	16	3	70	1	2	8	71.6	1	E, 3-In
E, 4-In	33	1	23	3	13	5	68	2	0	9	68.3	2	E, 4-In

5.3 Couplet Scenarios Eliminated

Couplet Scenario A, 100 East (SB)/200 East (NB): This scenario featured two lanes on each road and would not require widening of the existing roadway. This scenario would provide more capacity and would not result in impacts to land use, environmental or neighborhood resources. However, this scenario was eliminated from further consideration because it did not provide a long-term solution to relieving congestion on Main Street.

Couplet Scenario B, Four Lanes, 100 West (SB)/Main Street (NB): This option would convert today’s five-lane Main Street and three-lane 100 West, to three and four lanes northbound on Main Street and southbound on 100 West. Both 100 and 200 East would remain the same as they are now. This option would require Main Street to be widened to seven lanes north of the transition point between 750 and 1100 North. This would result in right-of-way impacts on Main Street, which would be harmful to businesses in the downtown area. This option required UDOT acceptance, implementation, and possible ownership of 100 West. Reducing Main Street to three or four lanes allowed for more room for redevelopment, infill and multi-modal uses.

Couplet Scenario C Local, 100 East (NB)/100 West (SB): This scenario would be constructed on local roads and could be designed to Logan City standards, which allows for greater flexibility than the UDOT standards. Under this scenario, Main Street would remain unchanged. The CMPO model did not indicate that traffic would move off of Main Street to fully utilize adjacent couplets. This scenario was eliminated from further review because it created impacts to properties at both the north and south transition points, and many properties in between. This scenario also had two blocks in between northbound and southbound couplets, and would have high costs associated with creating transitions between couplets and adjacent streets.

Couplet Scenario C, 100 East (NB)/100 West (SB), Pedestrian Mall: This scenario was similar to the above scenarios, but it diverted all traffic away from Main Street to create a pedestrian mall with one lane in each direction to access angled parking and potential transit mall shuttle. This scenario required an upgrade to 100 East and 100 West to meet UDOT design standards and handle additional traffic. This would require additional right-of-way on these roads and result in impacts to adjacent properties, not only on 100 East and West, but at transition points within the study area. This concept has potential for catalyzing economic development, but also comes with high cost and design challenges.

Although this scenario supported economic development and redevelopment of the downtown area, it was eliminated because it only provided adequate congestion relief and had a very high level of impact to the neighborhood and environment.

Couplet Scenario D, 100 West (SB)/Main Street (NB): This scenario is the same as scenario B, except at the northern transition. This scenario transitioned from 100 West to 200 West between 650 and 850 North and then continued on 200 West until about 1750 North. This scenario allowed Main Street to be narrowed from the existing five lanes to just three or four lanes, making Main Street more pedestrian friendly in this northern section. However, this northern portion of Main Street has larger retail and commercial uses, and is more auto-oriented than the downtown portion of Main Street. This scenario required acquisition (partial and total) of homes, parks, schools, and historic properties along the corridor. Scenario D was eliminated from further review because the right-of-way, neighborhood and environmental impacts outweigh the potential amount of congestion relief resulting from this scenario.

Two-way Scenario, Main Street/100 West: This scenario created additional capacity on Main Street and 100 West by widening both streets to five lanes. This scenario transferred from 100 West to 200 West at about 800 North and would also be widened to five lanes. The two-way scenario would have ten lanes total, five lanes on both Main Street and 100 West/200 West. However, two of these lanes would be center turn lanes which do not use the full capacity of Main Street or 100 West. In addition, the CMPO model did not indicate that this scenario would take traffic off of Main Street. The two-way scenario required far more property and right-of-way acquisition than any other scenario. This scenario was eliminated because it would result in a large amount of right-of-way, neighborhood and environmental impacts.

5.4 Short List of Couplet Scenarios

Couplet Scenario E, Three Lanes (Scenario A & B Together): This option is a combination of scenario A and B. The three lane concept means there would be three traffic lanes on Main Street and 100 West, but just two lanes on 100 East and 200 East. This scenario allowed for

increased capacity and the opportunity to reclaim two lanes on Main Street to make improvements in support of Logan’s future land use goals and the *Downtown Specific Plan* (2012). The three lane scenario also reduces neighborhood and right-of-way impacts on 100 West. This option provided good congestion relief, and a small impact to the neighborhood and environmental resources.

Couplet Scenario E, Four Lanes (Scenario A & B Together): The four lane concept increased Main Street/100 West to four lanes, but still leaves 100/200 East as two lanes each. This scenario provided the best travel time improvements and more overall capacity, which would help to improve regional mobility and local circulation through 2040. Although it would require an additional travel lane, it would still support redevelopment on Main Street and implementation of the *Downtown Specific Plan* (2012), because it still allowed space for implementation of pedestrian and bicycle friendly facilities along Main Street. This four-lane scenario would result in additional right-of-way impacts on 100 West to allow for an additional travel lane. This scenario created the most overall capacity increase of all other scenarios.

What are complete streets?
Road ways designed with **all users** in mind – including bicyclists, transit, and pedestrians of all ages and abilities.

Couplet Scenario B, Three Lanes, Main Street (NB)/100 West (SB): The three lane scenario increased mobility on Main Street and surrounding streets. In addition, it allowed for complete streets concepts to be implemented on Main Street and 100 West by using just three travel lanes. This would minimize or eliminate any impacts to right-of-way, environment, or neighborhood characteristics on 100 West. This scenario allowed for space to be used for transit only lanes to improve transit service to the community.

6. Developing Planning Cost Estimates

In order to compare the cost of various scenarios, we assumed that each alternative would need to be reconstructed over the planning period from 2013 to 2040. Asphalt pavement has a 20 year design life, and in the design life of the pavement, regular maintenance must be done to preserve the functionality of the roadway. Rather than break down the pavement condition of each alternatives, which will vary considerably along each alignment, the assumption was that the cost of maintaining and extending the life of the pavement throughout the specified planning time, would not exceed the cost of total reconstruction. Using total reconstruction enabled the cost comparison of alignments to be normalized for documenting the cost differences between alternatives. Once the top three scenarios were identified, a higher level planning estimate was developed for each to determine the minimum cost of implementation.

Assumptions that were made to calculate the minimum cost to implement the selected couplet scenarios included:

- Existing local roads will require only regularly scheduled pavement maintenance (no pavement cost for implementation).
- 100 West will be constructed to meet minimum pavement standards for an arterial facility.
- Main Street will require only regularly scheduled pavement maintenance (no pavement cost for implementation).
- Main Street will not be widened (no cost for implementation).
- Sidewalk, curb and gutter will only be replaced in locations where the roadway is widened.
- Right-of-way will be acquired only if roadway (asphalt pavement) requires widening (no right-of-way will be acquired for sidewalk, park strip, or curb and gutter).

The implementation costs for the three top performing scenarios, E-3 Lanes, E-4 Lanes, and B-3 Lanes, range from \$35M to \$50.2M. Implementing only couplet A, has a minimum cost of just over \$5.5M. Table 1 below identifies the planning estimates for both total reconstruction and minimum implementation.

Table 1. Cost Estimates

Couplet	Cost for Total Reconstruction	Minimum Implementation Cost
B- 3 Lanes	\$53.4M	\$35M
E- 4 Lanes	\$93.6M	\$50.2M
E- 3 Lanes	\$82.1M	\$40.5M
<i>Planning cost estimates require a higher contingency percentage because of unknown risks and changing conditions over a longer time period. In these scenarios we used a 30% contingency on materials and a 50% contingency on right-of-way costs.</i>		

7. Impacts Associated with Implementation of Couplet Scenarios

7.1 Existing Mobility and Local Circulation

Currently, Main Street (US-89/91) functions as an arterial for through traffic movement and long trips. An arterial is designed to provide high levels of mobility and a lower level of access to land use around it. US-91 connects Logan to Preston, Idaho to the north; US-89/91 connects Logan to Brigham City to the south, US- 89 connects Logan to Bear Lake to the east; and SR-30 connects Logan to Tremonton in the west. In addition, Logan has good local roadway connections to its neighbors to the north and south. US-91, 200 East, 600 East, SR-237 (800 East), 1200 East, and 1600 East all help Logan connect in the north to North Logan, Hyde Park, and Smithfield. US-89/91, SR-165 (Main Street), SR-238 (400 East), and 1000 East all help Logan connect in the south to River Heights, Providence, Millville, Nibley, Hyrum, and Wellsville.

Main Street is congested, especially during the AM/PM peak travel periods. Today Main Street carries upwards of 45,000 trips per day on some sections – far more than the 35,000 which is usually considered acceptable for most five lane arterial streets (Brown, 2013). Because of congestion on Main Street, traffic has begun to spread crowding to parallel streets. UDOT is currently upgrading 1000 West to alleviate congestion; however, traffic forecasts suggested that additional improvements will be needed to relieve congestion within Logan.

The parking study completed for the *Downtown Specific Plan (2012)* indicated that parking demand increased throughout the day, notably decreased by mid-afternoon and incrementally increased by the early evening hours. This trend is consistent with typical working hours for employees and visitors, and the presence of retail and restaurants within the downtown area. Analysis also indicated that on- and off-street parking in the downtown area is underutilized. Many of the block studies in the downtown area have multi-level surface parking lots. As a result, there is an abundant amount of available parking throughout the downtown area during a typical weekday.

Transit within the study area is very accessible. The Logan Intermodal Transit Center is located at 500 North between 100 East and 200 East. Transit service within the study area includes:

- Route 11 with stops on Main Street and between the Intermodal Transit Center and 3200 South in Nibley.
- Route 7 provides service along 100 West between the Intermodal Transit Center and the Logan River Golf Course area.
- Route 10 provides service along 100 East/300 East between the Intermodal Transit Center and 600 South.

The 2011 *Transportation Master Plan* identifies 10 and 20 year enhancement recommendations for transit. These improvements include increasing frequency of service, extending service hours, implementing circulator shuttles, branding of transit corridors, and the addition of bus rapid transit (BRT). The plan identifies a potential BRT route on Main Street between Smithfield and Hyrum. Service in North Logan and Logan would also serve communities east of Main Street. However, recent Cache Valley Transit District (CVTD) evaluation indicated that the mode and route for future high capacity transit needs further study. Therefore, CVTD has not adopted BRT or the proposed route identified in the *Transportation Master Plan (CVTD, 2013)*.

The study area in general already has many excellent pedestrian characteristics. The good connectivity between blocks makes walking paths generally short relative to more suburban locations with winding streets and many cul-de-sacs. But Main Street itself is a serious

impediment that separates the east side from the west side. Further, extreme levels of traffic and inferior pedestrian space and amenities also mean there is room for improvement.

Logan has a large cycling community with many bicycle commuters (many USU students and staff), as well as recreational riders using the trail system throughout the City. However, on-road bicycle conditions in the study area are disjointed and intersections with poor visibility can make bicycle commuting difficult.

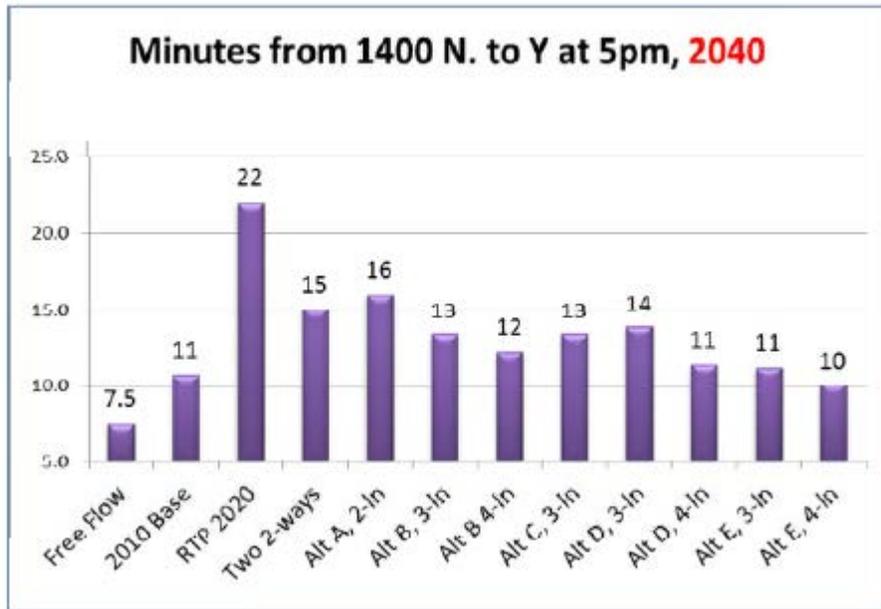
Biking throughout the study area would be considered uncomfortable and unsafe for some riders due to the high level of congestion. A recent survey conducted by CMPO indicated that there are many bicycle and pedestrian issues within the study area. Input from the community indicated that Main Street is too busy, making crossing very difficult and bicycle riding unsafe. There are fewer problem areas identified along the adjacent north-south running streets. The *Cache County Regional Transportation Plan* identified the following pedestrian and bicycle safety issues within the study area:

- Highway 89 (400 North) areas below Utah State University (street crossings)
- Downtown Logan (Main Street crossings)
- South Logan “Y” intersection area (Main Street and Highway 165 street crossings)
- 600 West (shoulder)

7.1.1 Potential Mobility Impacts

Analysis indicated that travel times between 1200 South and 1400 North on couplet scenarios was greatly improved over options that did not implement couplets in 2040 (see Table 2 below).

Table 2. 2040 Travel Time



In general, four-lane couplet options fare better than three-lane options, simply because there are more lanes to help assure that congestion will not be a problem. Also two couplets reduce congestion better than one. Scenario E is the best performer because it reduces congestion better than any other scenario.

Analysis shows that it is possible to move traffic off of Main Street and maintain or improve travel time and vehicle throughput. This would maintain or improve capacity while making Main Street available for improvements, such as streetscaping, angled parking, family oriented businesses, community gathering places, and pedestrian and bicycle friendly features. Out-of-direction travel would be required for all one-way couplet scenarios. However, the improved mobility and circulation would likely make up for one block-of-out of direction travel. Scenario E also fared well with multi-modal circulation and emergency service response times, because both the major and minor couplets are separated by only one block. Therefore, transit patrons are not unduly affected, and any minor out-of-direction travel for emergency services and local circulation, is more than made up for by time savings due to less congestion and better mobility.

The implementation of the short-list couplet scenarios would not impact the ability to provide current or future transit service to the study area. Each couplet is separated by one block, which would limit the distance needed to walk to access transit in the southbound or

northbound directions. The potential for less congestion and faster transit service may outweigh the need to walk one block further to reach a bus stop. Implementing any of the short-list scenarios would make additional pavement available and allow for improved transit service, transit stations and amenities, pedestrian facilities, and bicycle lanes.

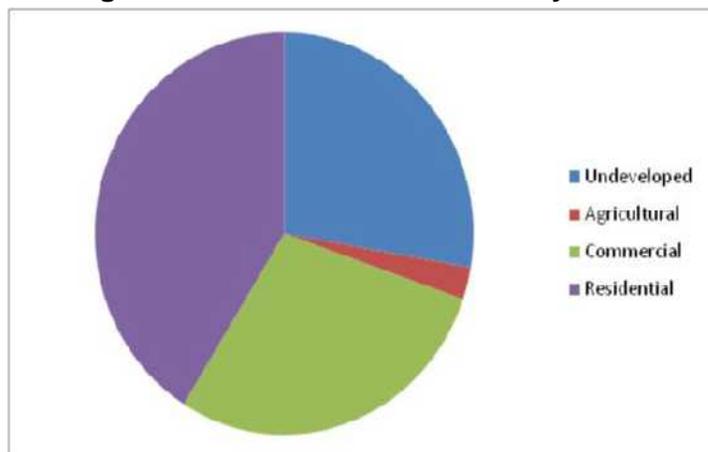
For 2040 within the study area, analysis determined that the existing two-way street configuration results in roughly 4,500 residents experiencing very good bicycle/pedestrian conditions immediately near their residence, but this number nearly doubles to 7,500 with Scenario E, Three Lanes. The effect on businesses is even more dramatic. Roughly 3,500 employees are within a very good walking environment, and that number nearly triples to 9,500 with the couplets. Therefore, all of the couplet scenarios would result in better pedestrian and bicycle conditions on one way streets within the entire study area. However, the Town Center area would realize the most benefit from lower congestion levels and smoother traffic flow on Main Street (ViaCity, 2013). See Appendix B, “Multi-Modal Analysis” for further information.

7.2 Existing Land Use Pattern

Land use within the study area consists of a mix of Town Center, commercial, and residential developments. Town center land use is concentrated between 500 North and 200 South, and 100 West and 200 East. This area consists of several land uses including governmental offices, shopping, theatres, restaurants, commercial business, hotels, banks, grocers, and residences, see Figure 2.

Larger scale commercial development (big box retail, grocery, home improvement) is concentrated north and south of the Main Street Town Center area and continues beyond the study area boundary. As land development moves east and west from Main Street, it consists of mixed residential, neighborhood residential, and transitions to single family residential at the outer limits of the study area. Over the past few years the homes along 100 West have been transitioning from residential to small commercial.

Figure 2. Land Use within the Study Area



7.2.1 Neighborhood Characteristics

The study area contains a small portion of each of Logan City’s major neighborhoods, including Woodruff, Wilson, Ellis, Adams, and Bridger. Over the past ten years, many of Logan City’s neighborhoods have aged and experienced conversion to apartments and rental units. Conversion to rental units has resulted in general housing deterioration, including unattended landscaping, minimal maintenance, and illegal parking. As a result of this conversion to renter occupied housing, the home ownership rate in Logan City is about 41.1 percent compared to the Utah average of 70.7 percent. Table 3 below presents U.S. Census Bureau census tract information that identifies the tracts located within the study area. Within the study area there is 43 percent owner occupied housing, compared to 57 percent renter occupied housing (US Census, 2013).

Table 3. Housing Information within Study Area

Census Tract	Total Housing	Occupied Housing	Owner Occupied	Renter Occupied
5.01	2,028	1,889	731	1,158
5.02	1,933	1,849	494	1,355
6	2,321	2,201	525	1,676
11.01	1,988	1,878	1,477	401
11.02	1,406	1,343	1,343	109
8	2,132	1,980	405	1,575
9	1,383	1,301	529	772
10.02	1,848	1,697	635	1,062

Source U.S. Census Bureau: 2013 10:48:32 EST

The Neighborhood Improvement Division was created at Logan City in response to the citizen’s desire to improve their community. In addition, the redevelopment initiatives identified in the *Downtown Specific Plan (2012)* would serve to the adjacent neighborhoods.

7.2.2 Major Activity Centers

Public or community facilities help define communities and also provide opportunities for residents to interact. Community facilities generally include (but are not limited to) churches, schools, parks, law enforcement facilities, fire stations, and government offices. Table 4 below identifies activity centers within the study area.

Table 4. Activity Centers within the Study Area

Name	Address	Type
Pioneer Park	245 East Poplar Avenue	Park
Logan Tabernacle	Bounded by Center, 1st North, Main, and 1st East Streets	Religious
Lyric Theatre	28 West Center Street	Arts/Community
St. John’s Episcopal Church	85 East 100 North	Religious
County Courthouse	135 N. 100 West	Public
Senior Center	240 North 100 East	Community
City Hall	290 North 100 West	Public
Logan Library	255 N. Main Street	Public
LDS Church	50 N Main Street	Religious
Logan High School	162 West 100 South	Educational
LDS Church	89 S. 200 W.	Religious
Cache County Clerk	179 N. Main St	Public
Cache County Attorney	North Main Street	Public
LDS Church	125 E 500 N	Religious
Tueller School of Dance	521 ½ N Main Street	Educational
Mt. Logan Middle School	875 North 200 East	Educational
Baha’I Faith	895 N 200 West	Religious
Fraternal Order of Eagles	170 West 900 North	Community
Logan Sports Complex	600 South 100 West	Community
Cache valley Bible Fellowship	1488 North 200 West	Religious
Logan Miniature Golf	650 North Main	Community
Cache Valley Mall	1300 North Main Street	Retail
Logan Mayor’s Office	290 North 100 West	Public
Logan LDS Temple	175 North 300 East	Religious
Logan Recreation Center	195 South 100 West	Community
LDS Church	94 West 600 South	Religious
Logan River Golf Course	550 West 1000 South	Public
Willow park zoo	419 West 700 South	Public
Cache Employment and Training Center	275 South 400 West	Public
Fair grounds	450 South 500 West	Public
Logan Regional Hospital	500 East 1400 North	Hospital
Logan River Trail	500 South Main Street	Public/ Recreation
Logan City Park	195 South 100 West	Public/ Recreation
Logan Justice Court	446 North 100 West	Public/ Recreation
Logan City Park	195 South 100 West	Public/ Recreation
Logan Hyde Park Canal	West Center Street	Public/ Recreation
Garff Wayside Gardens	100 South Main Street	Public/ Recreation
Merlin Olsen Park	300 East Center Street	Public/ Recreation
Bridgerland Park	100 West 900 North	Public/ Recreation

7.2.3 Future Land Use

The Logan City *General Plan* (2007) indicated that Main Street will continue to consist of mixed use within the Town Center, with larger commercial facilities north and south along Main Street. Redevelopment tools offered by Logan City indicated that businesses will be revitalized and infill development will likely occur in the study area. Homes along 100 West will continue to transition from residential to commercial. The *Downtown Specific Plan* (2012) identified a few areas in the Town Center, located along Main Street between 100 East and 100 West that could be redeveloped to provide new housing. Single family residential areas on the outer limits of the study area are not anticipated to change. These residential areas are dominated by detached residential, with small portions of mixed residential, that provides a range of housing for all stages of life and levels of income (General Plan, 2007).

7.2.4 Potential Land Use Impacts

The addition of couplet scenarios would not impact the ability of Logan City to realize the goals they have set for future land use in the study area. In contrast, relieving congestion and making the study area more accessible would help support the goals of creating a vibrant Town Center and more livable downtown area. In addition, implementation of any of the short list scenarios would improve accessibility to Logan City’s many activity centers within the study area. The implementation of the short list couplet scenarios would result in right-of-way takes and impacts as indicated in Table 5 below:

Table 5. Right-of-Way Information for Short List Scenarios

Scenario Name	Average Additional Right-of-way Needed*
Scenario E 3 Lanes	<ul style="list-style-type: none"> • 34.9 feet on 100 West • 8.6 feet on 100 East • 10 feet on 200 East • 34 feet on 800 North
Scenario E 4 Lanes	<ul style="list-style-type: none"> • 8.6 feet on 100 East • 10 feet on 200 East • 34 feet on 800 North • 38.4 feet on 100 West • 4 feet on Main Street
Scenario B 3 Lanes	<ul style="list-style-type: none"> • 34.9 feet on 100 West
<p><i>Note: Average right-of-way impacts will occur at specific spots along the roadway and are not meant to be applied to the entire roadway facility.</i></p>	

Four-lane scenarios would have greater impacts than three lane scenarios. No right-of-way would be needed to implement the two lane couplets on 100 East and 200 East.

Implementation of the short list scenarios would result in less pavement needed for automobiles, which will help most places become more walkable and require less right-of-way. If the project proceeds, potential impacts will be minimized through design optimization during the final design stage.

7.3 Ability to Foster Economic Development

7.3.1 Existing Development

Land and retail access along Main Street is a secondary function. This means that the function of a freeway arterial roadway is to move traffic between cities and states. Therefore, most commuters are not travelling on Main Street to visit shops or restaurants, but instead, are passing through. Transitioning through traffic away from Main Street and making it more inviting for shoppers, pedestrians, businesses, and community gatherings (as identified in the *Downtown Specific Plan*) would be consistent with the goals and objectives of Logan City. These goals for future land use within Town Center include:

- Mix of retail, office, residential and civic spaces
- Foster family oriented businesses
- Create pedestrian walkways
- Incorporate civic and community gathering spaces

The area between 200 North/200 South and 200 West/200 East also consists of a redevelopment area (RDA). The City promotes business development in this area through the Downtown Business Development Fund and the Downtown Façade Program to promote economic development in the downtown area. These programs allow Logan City to work in partnership with private development to enhance the social, economic, physical, and environmental vitality of a city.

7.3.2 Potential Impact to Economic Development

Relieving congestion and providing routes off of Main Street will open up opportunities for development on Main Street. Providing a Main Street corridor within the Town Center will foster a transit oriented and pedestrian friendly environment that could help to bring the community to the shops, restaurants, and civic facilities. Moving commuter through traffic away from Main Street will allow the City to better implement the goal of improving pedestrian comfort with less traffic, reduced speeds, mid-block crossing, angled parking, and enhanced crossing signals/crossing.

Scenario B and E, three lanes, would allow for existing pavement on Main Street to be converted to “complete street” uses, which will make it attractive to redevelop existing auto-

oriented uses into higher-density mixed uses. Also, the upgrade of 100 West will likewise encourage the expansion of downtown to 100 West and possibly beyond.

However, scenario E provides better overall ability of the four streets combined to handle a lot more multi-modal traffic trips. It will likewise help ensure that development that otherwise would have went to suburban locations, will instead find it attractive to locate in the historic core. Scenario E is a good compromise between the RTP, with its serious problems on Main Street, and scenario C (which routes all traffic away from Main Street). Scenario E maintains enough volume on Main Street for the auto visibility that existing businesses may be dependent on, but also opens opportunities on Main Street for it to emerge as an attractive complete street corridor. A more detailed study with microsimulation analysis should determine if three or four lanes are ultimately needed on Main Street.

7.4 Existing Historic Resources

Because the study area encompasses the downtown portion of Logan City, there are many historic buildings that should be considered in analysis. Center Street Historic District is located in the heart of Logan City between 200 North and 200 South, and 200 East and 600 West. The district is significant because it is representative of classic revival, prairie school, and Late Victorian architecture. The area consists of 358 buildings. A few buildings listed on the National Register of Historic Places (NRHP) are located adjacent to one-way couplet scenarios including County Court House, Tabernacle Square, LDS Tabernacle, Blue Bird, and St. John's Episcopal Church. In addition, many buildings and homes built during historic periods may exist within the study area.

7.4.1 Potential Historic Resource Impacts

A high level historical resources analysis was conducted using available Geographic Information System (GIS) information from the National Register of Historic Places. Each of the short-list couplet scenarios would potentially have an effect on NHRP property due to the potential to widen 100 East near the William McNeil House and near the Logan LDS Sixth Ward Church on Main Street. However, final design of the preferred couplet scenario would avoid or minimize any potential right-of-way impacts near these historic resources.

7.5 Existing Air Quality and Noise Conditions

Pursuant to the federal Clean Air Act (CAA) of 1970, the United States Environmental Protection Agency (EPA) established National Ambient Air Quality Standards (NAAQS). The NAAQS were established for six major pollutants, termed "criteria" pollutants. The six criteria pollutants are O₃, CO, particulate matter (PM), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), and lead (Pb). PM

includes particulate matter less than 2.5 microns in diameter ($PM_{2.5}$) and particulate matter smaller than 10 microns in diameter (PM_{10}).

The Cache Valley is a narrow valley bordered by mountains. The topography and cold weather cause cold pools and result in the condition known as inversion. This condition is concerning because of the potential for inhaling fine particles ($PM_{2.5}$) when molecules are 10 micrometers in diameter or smaller.

The major air pollutants of concern within the study area are carbon monoxide (CO), particulate matter (PM_{10} and $PM_{2.5}$) and ozone (O_3). CO is emitted by vehicles as a product of the combustion process and is of concern due to its tendency to reduce the amount of oxygen carried in the bloodstream. The pollutant PM_{10} is produced by vehicle emissions, agricultural activities, industrial activities, wintertime roadway sanding, and other emissions. O_3 is a secondary pollutant formed from the combination of other primary emissions that chemically react in the presence of sunlight and heat to create smog.

Currently Logan City is within a nonattainment area for $PM_{2.5}$ (EPA Greenbook, 2012). This means that the amount of $PM_{2.5}$ in Cache Valley exceeds the standard as defined in the National Ambient Air Quality Standards (NAAQS) set by the US EPA.

Utah Division of Air Quality (UDAQ), maintains a $PM_{2.5}$ monitor in downtown Logan City. Monitored values from this site indicated that the ambient concentrations of $PM_{2.5}$ in Logan City are often elevated during the winter months. The elevated concentrations of $PM_{2.5}$ during the winter months occur when strong inversions develop in the valley and keep air pollution from escaping.

Logan City, together with UDAQ and Bear River Health Department, has taken proactive steps to address air quality issues in the Logan area. These efforts include:

- Synchronized traffic lights in Logan City.
- Free rapid transit bus services during red and yellow air quality days.
- Replacement of USU coal-fired heating plant with a modern natural gas plant.
- Natural gas fueled buses for USU campus shuttles.
- Conversion of the municipal power plant from diesel to natural gas.
- Red-yellow-green wood-burning control program.
- Smoking vehicle program (UDEQ, 2013).

Noise conditions in the study area are representative of an urban area. Most of the residential communities identified within the study area represent active urban or suburban land uses that currently experience high volumes of traffic and noise.

7.5.1 Potential Air Quality and Noise Impacts

The Utah Department of Air Quality indicates that 57 percent of Utah’s air pollution comes from vehicles. Long-term emissions would improve from the enhanced traffic flow within the Logan area. Any of the short-list scenarios would lessen traffic congestion and improve public safety. These scenarios are not expected to generate any additional traffic. Regional traffic trips would remain similar. Therefore, no new long-term regional emissions would result from implementation of any of these scenarios. The short-list scenarios would improve mobility and improve congestion, and therefore, would lower associated pollutants emitted by vehicles. In addition, reducing automobile congestion could provide opportunity for increased transit service. This could include improvements on existing services or the addition of a high capacity transit service to the city and/or region.

The potential widening of certain roadways may result in increased noise due to more cars passing through and bringing traffic closer to businesses and residences. It is not likely that noise levels within the study area would notably increase due to the implementation of a couplet scenario. These areas are currently congested; the addition of couplets would introduce background noise (e.g. an increase in traffic noise compared to existing traffic noise) that is similar in character to existing conditions.

7.6 Existing Biological Resources

In general, the study area is highly developed and urbanized, and consists of residential and commercial areas with a few remaining agricultural remnants. The dominant vegetation types are landscaped, ornamental plants; agricultural species; and invasive weedy species.

There is National Wetland Inventory (NWI) wetland vegetation located in the southern portion of the study area (700 South). These NWI wetland areas are concentrated near the Logan City Golf Course. In addition, other wetland areas could be present throughout the study area.

Wildlife species are generally concentrated in floodplain, wetland, and natural areas close to the Logan River. Wildlife species found in the study area are indicative of species that are found in urban and suburban areas. Habitat for small mammals and migratory birds are likely concentrated around NWI and other potential wetland areas. However, habitat within the study is limited due to mowing (residential and agricultural), and proximity to residential homes and roadways.

7.6.1 Potential Impacts to Biological Resources

Potential impacts to wetlands and wildlife habitat would be site specific if a couplet scenario is implemented. If impacts occur, they would be concentrated at transition points where

roadways currently do not exist and new construction could change or remove vegetation and habitat.

8. Public Involvement

Stanley Consultants held a Public House meeting on July 17, 2013 at the Logan City Offices from 5:30 to 7:30 PM. About 30 people attended the meeting (27 utilized the sign-in sheet). The meeting format consisted of a brief presentation giving an overview of the project purpose, analysis method and project findings. The public was invited to view project information, ask questions and submit comments both written or via email from July 1 to July 31.

The project team received eight comments during the comment period. Of these comments three are positive, four are negative and one is neutral. In addition, the Herald Journal published two editorials on the project during the month of July. Comments on these editorials were added to the below comment summary in order to capture the input of community members. Comments received and materials distributed to the public on the Logan City website and presented at the public meeting are in Appendix C “Public Involvement Materials”.

9. Summary

The findings of this feasibility study conclude that Scenario E, three lanes should be retained as the best performing scenario. This alternative best meets the project goals and objectives with good congestion relief and a small impact to the neighborhood and environmental resources. Input from public involvement activities indicated that the community is concerned about additional traffic on 100 West, project cost, and which amenities would be incorporated into a new Main Street design; see Appendix C, “Public Involvement Materials” for further detail.

10. Next Steps

A National Environmental Policy Act (NEPA) analysis is needed to evaluate a no – action alternative and the alternative scenario E, three lanes. Future detailed design and analysis of the couplet scenarios which should include traffic modeling and simulation, economic analysis, and evaluation of the built and natural environment as part of the NEPA process. Logan City may also consider conducting supplemental studies including market analysis of downtown in order to better understand the true economic development potential of the downtown area and how it may affect adjacent residents. These efforts will clarify what the potential impacts from the proposed project would be in identifying a preferred alternative for potential federal or state funding.

The following additional information could be used when deciding to pursue further study of one-way couplets:

- Economic Evaluation of potential impact to downtown businesses
- Microsimulation analysis of the preferred couplet scenario to determine if three or four lanes are ultimately needed.
- Signal Warrant Studies for 1st and 2nd East
- Public Outreach with focus on Neighborhood Council and local businesses

If the project proceeds to the next phase, more detailed evaluation and analysis of the built and natural environment will be necessary.

Logan City will need to coordinate closely with UDOT on any State owned facility and maintain compliance with design standards. The project team should demonstrate to UDOT that the implementation of couplets would mitigate congestion, improve travel time, and maintain or improve regional mobility.

A supplement to the recently completed parking analysis would help better understand how parking needs may change due to the implementation of couplets.

A detailed analysis of land uses along the corridor of the preferred couplet scenario would identify potential impacts from project implementation. In addition, a 4(f) resource analysis will be necessary to determine the potential affect to public lands, including publicly owned parks, recreational areas, wildlife and waterfowl refuges, or public and private historical sites to further analyze opportunities to avoid or minimize potential impacts.

A detailed economic analysis would identify potential impacts to businesses in the Town Center. An in-depth economic analysis can be crafted to include a market analysis of the potential land value under the no-action alternative and after the implementation of the preferred couplet scenario. In addition, it may be useful to incorporate Envision Utah's *Envision Tomorrow Plus (ET+)* tool to analyze different development scenarios for areas within downtown. This tool compares a range of indicators relating to land use, housing, demographics, economic growth, development feasibility, fiscal impacts, transportation, environmental factors, and quality of life. This tool would be useful in determining what development would look like, and how couplets fit in to the future.

A historic property assessment will be necessary in order to comply with the National Historic Preservation Act (NHPA) to evaluate districts, sites, buildings, structures, and objects that could be eligible for the National Register of Historic Places (NRHP). Section 106 of the NHPA requires federal agencies to consider the effects of their undertakings. In addition, a 4(f) resource analysis will be necessary to determine the potential affect to historic properties and further analyze scenarios to avoid or minimize potential impacts.

If construction will occur in previously undisturbed areas, it may also be necessary to conduct a field inventory for paleontological resources that could be eligible for inclusion in the Utah State Paleontological Register.

A detailed analysis air quality will be necessary to determine existing conditions, potential impact to the six criteria pollutants, and mobile source air toxics that are commonly monitored and regulated for their effects on human health. It will be necessary to inventory on-road mobile sources of pollutants using EPA's MOVES model, in conjunction with information generated by travel demand models such as vehicle speeds and miles traveled.

Noise modeling will be necessary to determine impacts in more detail in accordance with the Utah Department of Transportation (UDOT) Noise Abatement Policy 08A2-1 and Federal Highway Administration (FHWA) criteria for evaluating noise impacts. This analysis should focus on sensitive receptors including hospitals, schools, residences, motels, hotels, recreational areas, parks, and places of worship.

Biological resources

Next steps will also include evaluation of potential wildlife habitat, and the presence of threatened and endangered species, as well as state sensitive species. In addition, wetland delineation will be required to assess the present wetlands or waters of the United States for the selected scenario. Delineation would especially be necessary near the Logan River Golf Course at the southern end of the study area.

References:

Cache County

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City of Logan

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Metro Analytics

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[PM/Background/CacheValleyBackground.htm](#) Accessed December 2012 by Dana Holmes of Stanley Consultants.

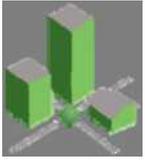
Utah Department of Transportation

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Appendix A
Model and Ranking Results

Results Summary

Alternatives	Multi-Modal Circulation		Economic Development		Minimize Impacts		Totals w/o Costs		Costs		Total plus Costs		Alternatives
	Total Points	Rank	Total Points	Rank	Total Points	Rank	Total Points	Rank	Total Points	Rank	Total Points	Rank	
Possible Points	37		27		24		88		10		97.7		Possible Points
RTP 2040	6	10	7	10	17	2	31	10	10	1	40.8	9	RTP 2040
Two 2-ways	16	8	15	8	4	10	35	9	3	6	38.2	10	Two 2-ways
A, 2-In	12	9	9	9	20	1	41	8	9	2	50.3	8	A, 2-In
B, 3-In	22	7	21	4	14	4	57	3	6	3	63.2	3	B, 3-In
B, 4-In	26	4	21	4	10	7	57	4	4	5	61.0	4	B, 4-In
C, 3-In	22	5	24	1	8	8	55	7	6	4	60.1	5	C, 3-In
D, 3-In	22	6	21	4	11	6	55	6	3	7	57.2	6	D, 3-In
D, 4-In	28	3	21	4	7	9	56	5	0	9	55.9	7	D, 4-In
E, 3-In	30	2	24	2	16	3	70	1	2	8	71.6	1	E, 3-In
E, 4-In	33	1	23	3	13	5	68	2	0	9	68.3	2	E, 4-In



TECHNICAL MEMORANDUM

Date: April 17, 2013

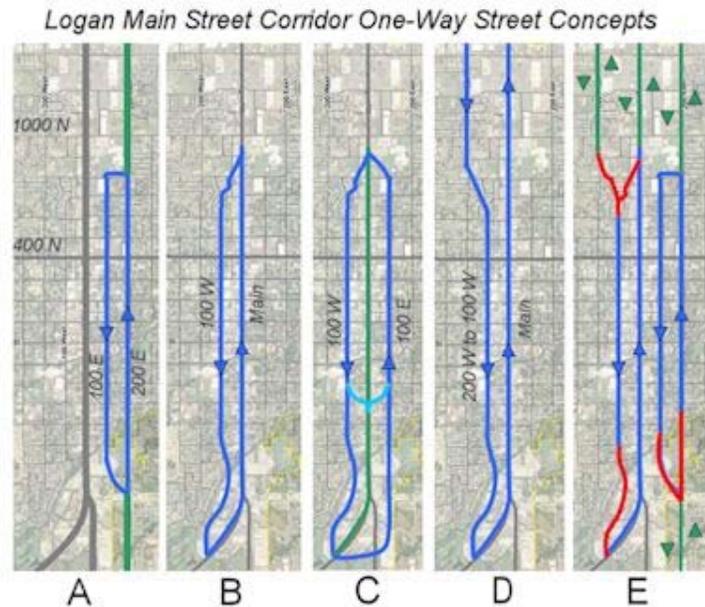
Subject: Logan Couplet Feasibility, CMPO Model Analysis

"Today's problems cannot be solved by the same level of thinking that created them." – Albert Einstein

Logan's Transportation Master Plan shows five concepts for one-way couplets labeled as alternatives A-E. This graphic is taken directly from that plan. The purpose of this study is to evaluate those concepts in greater detail to determine which are most feasible and beneficial to the city's overall objectives.

Model Preparation

The CMPO model was recalibrated to improve its accuracy for this study area (which also improved its accuracy across the entire county). It was then used to analyze the ability of each scenario to reduce congestion, and also to obtain daily and peak hour volumes. A separate memo was produced detailing this calibration effort. This memo first describes the nuances of each scenario, and then discusses observations of each from the CMPO model.



Alternative Concept Descriptions

Alternative A

Even today when Main Street is gridlocked, many choose to travel 100 and 200 East – especially those whose origin and destination is east of Main (a rapidly increasing number going into the future). But at present these streets cannot handle much additional volume when operated in 2-way configuration. Instead of operating two-way, with 1 lane each direction and a center turn lane, the city could change to operate 2-lanes in 1-direction (with no center lane required), then both streets together could handle significantly more traffic than they can together handle now. Any stop signs in the N-S direction would be eliminated, and signals would be installed where E-W traffic would otherwise be unduly inhibited. Very little construction would be required to implement these. They can maintain their residential character, and few if any trees would be affected. Pavement, shoulder and park-strip upgrades are optional and at the discretion of the city. Speed limits could be raised by 5 mph (helping them attract trips away from Main), or they could remain as they are now, also at the discretion of the city. Either way, average speeds will still be better due to easier signal coordination and because traffic would not be delayed as much at signals.

To residents this concept will probably feel like less traffic. When traffic is flowing heavily in two directions, drivers eventually take unsafe gaps out of frustration. This makes it easier and safer to get out of their driveway because they only need a gap in one direction. Because these streets are only a block apart, out of direction travel would be insignificant. The benefits of circulating more easily and getting in and out of driveways more easily would tend to overshadow the negatives of a block's worth of out of direction travel.

Bicyclists and pedestrians will also find this preferable to two-way streets. They too only need a gap in one direction to cross a street. To the extent that you already have center turn lanes, these could be eliminated, and

the space used instead for bike lanes or better pedestrian amenities. This also makes it easier to flair sidewalks out further at intersections, reducing the width required for pedestrians to cross. Signal cycle lengths are also typically shorter, reducing the time bicyclists and pedestrians must wait in order to cross.

At the southern transition point, the transportation plan shows that this couplet requires a bridge to be constructed over the river at 200 East, in order to carry northbound traffic. However, the existing bridge at 100 East appears to be wide enough to accommodate two-way traffic using 4 lanes (no center lane required on the deck). Thus the southern transition could use 90-degree angles at 300 South, just as the northern transition must do at 800 North because of the school. The bridge crossing is better and allows for a smoother transition, but it also makes implementation more expensive, which could delay implementation.

This couplet by itself will not solve the long-term problems of Main Street. But it can be a valuable short-term “relief valve” that reduces the stress on Main until a better long-term solution can be funded and implemented for Main. It can also remain in effect after a Main Street solution is implemented, continuing to do its part to maintain livable conditions on Main in perpetuity. It ranks poorly by itself as a long-term solution, but it ranks #1 when combined with Alternative B (forming Alternative E, which is A + B). Because it is low cost, it has high return on investment. It also would allow the public to experience a couplet and see the benefits (including that it eliminates any further discussion of widening 200 East through the heart of the city). If that early experience is positive, that could help generate support for a longer term couplet solution that may directly involve Main Street.

Alternative B

The CMPO model suggests that the Main Street corridor will soon need far more capacity than it currently has, but Main itself is already 5-lanes and cannot achieve 7-lanes in critical sections unless parking is eliminated. Even if parking were eliminated, the result would be a massive over-emphasis on autos through the middle of Logan’s most pedestrian-oriented commercial spaces – completely out of context with the Downtown Specific Vision.

Alternative B suggests that instead of today’s 2 lanes each direction on Main, and 1 each direction on 100 West, with center lanes on both (6 lanes + 2 center lanes), that you instead run 3 lanes in just one direction, with no need for center lanes (6 lanes + 0 center lanes). If 3 lanes is efficient enough to solve the problem, then pavement on Main dedicated to autos could be reduced by 2 lanes, and pavement on 100 West would remain largely unchanged except at transitions, where there clearly is not enough room, and as may be required by UDOT in order to meet their shoulder standards. This scenario of necessity requires that UDOT would take ownership of 100 West, or alternatively that Logan would agree to maintain the road at UDOT standards in perpetuity. In this scenario, 100 and 200 East would remain 2-way streets just as they are now.

The CMPO model suggests that 6-lanes in a couplet configuration creates significantly more capacity than today’s 8-lanes in two-way configuration. However it also suggests that future demands could be so high as to require 4-lanes each direction on Main and 100 West by 2040 (8 total) to solve the problem if 100 and 200 East remain as 2-way streets. But even if four northbound lanes were required on Main (one of which could be an HOV lane for BRT, etc.), then Main could still be reduced by 1-lane – making it far more practical to implement bike lanes, outdoor restaurant seating, taco carts, street vendors, wider/better pedestrian amenities – all of the things that help bring the Downtown Vision to life. But in that case 100 West would also need 4 lanes at UDOT standards rather than today’s 3. This would entail new right-of-way acquisition, but most homes and business buildings could remain, because existing setbacks are probably sufficient.

The northern transition point will most likely occur somewhere between 750 North and 1100 North. North of that point, Main Street would need to be widened to 7-lanes at least to 1500 North. This eventually needs to happen regardless, and the widening to 7-lanes is shown on the CMPO plan. 7-lanes in two-way operation will be quite inefficient because of the left turn arrows and double-left pockets required on all approaches at 1400 North. So it would also help to install an Innovative Intersection concept at 1400 North, and potentially at other locations, such as a Continuous Flow Intersection, a Quadrant Intersection, or a Thru-Turn Intersection. At first glance, all of these look like they could be implemented at 1400 North and Main. For more

information, see InnovativeIntersections.org. Also see the Downloads section at MetroAnalytics.com, and look for *"Innovative Intersections ~ Drive Slower But Travel Faster.pdf."*

The southern transition requires an extension of 100 West, which is already planned, but may need to be altered to meet UDOT design standards for width and bridge design if this alternative is selected. It would also be useful to run a connection from 100 West southeast to the "Y" intersection, so that southbound traffic can make its way over to Hwy 165 through Nibley (i.e., Main). That connection is not entirely necessary, as this movement could also be served by routing southbound traffic across Hwy 89/91 via 100 West, then reconnecting to Main at 1200 South, or also perhaps by simply continuing the couplet through Nibley on the same 100 West alignment, which from aerial photos appears to still be possible. Nibley may well prefer to first see how it goes in Logan before committing to a couplet themselves, but they would still be wise to create the 100 or 150 West alignment anyway and operate it as a two-way street in the meantime. Major corridors benefit greatly from such "backage roads" anyway, and they easily have the option to convert at any time. Perhaps CMPO could take initiative to work with Nibley to get a 100/150 West alignment shown on the CMPO plan.

Out of direction travel for autos is insignificant, because at all locations the Main/100 West couplet is separated by only one block. Time saved due to less congested circulation, and easier ability to get a gap in one direction rather than both, more than makes up for time lost due to a block of out of direction travel. And if your destination is between Main and 100 West, there is zero additional travel. For transit patrons, it is nice if the place they come back to is the same place they got off, so this couplet has that negative. But a block of extra walking may be overshadowed by positives such as the ability for transit to operate in an HOV lane or on dedicated right-of-way, and also by the ability to achieve the Downtown Vision, which creates new transit oriented development in Downtown.

A couplet that results in more traffic on 100 West, and a general upgrade of 100 West as a Complete Street, will also make it attractive to expand businesses and condominium projects over to that street, and on the cross streets between, resulting in a true walkable mixed-use Activity Center, rather than just a single popular street.

Alternative C

In this concept, 100 East would operate as northbound one-way, and 100 West would be southbound one-way. Main Street could then remain exactly as it is now, or it could be converted into a pedestrian mall, perhaps with a transit mall shuttle, and vehicle access to angle parking on Main. If Main remains as it is now, then no UDOT action is required, as Logan can easily implement this couplet to serve as a relief valve for Main. When modeled, this concept does little to reduce congestion on Main, because Main must first be failing before anyone is motivated to use the couplet. The couplet would have 2-blocks between northbound and southbound, and there are significant transition costs and problems also, so the local implementation of this concept was eliminated from further consideration.

In the concept where Main becomes a pedestrian mall with BRT and/or parking access, then UDOT action would be required, as both 100 East and 100 West would have to be upgraded to meet UDOT design standards since the state highway would be diverted to those alignments. UDOT standards would require smooth, diagonal transitions, creating significant impacts to properties at both the north and south transition points, and also to many properties in between. The couplet would be at least 3-lanes each direction. If 4 were required, impacts especially on 100 East would be very significant. Another negative about this couplet is that the use of 100 East for northbound flow eliminates the possibility of capacity to be gained by implementing Alternative A. But diverting traffic to 3-lanes northbound on 100 East, and 3-lanes southbound on 100 West, does handle traffic about as well as Alternative B when it has a similar 3-lanes.

The virtue of this alternative is that it is the only strategy available for converting Main into a pedestrian mall – a concept that is very compatible with the Downtown Plan. For that reason, it may be worth a detailed look as part of an environmental impact study, so that businesses and the general public can decide for themselves if the positives of a pedestrian mall outweigh the significant negatives. But given the other alternatives, a pedestrian mall is not necessary for Main to be far more pedestrian friendly.

Alternative D

D is identical to B, except at the northern transition. B transitions back to Main between 750 and 1100 North, while D first transitions from 100 West to 200 West between 650 and 850 North. It then continues on 200 West until at least 1600 North, where it transitions northeast diagonally to connect back to Main at about 1750 North. Alternatively, aerial photos show that it could easily transition back to 100 West at that point, and continue on as far northward as desired. Where Alternative B requires Main to be widened to 7-lanes between the northern transition point and 1500 North, Alternative D allows Main to be narrowed from the existing 5-lanes to just 3 or 4 lanes, making Main much more pedestrian friendly in that section. However, this northern portion of Main has much more auto-oriented uses than the downtown. If opening day traffic volumes drop below today's levels, these auto-oriented convenience businesses may initially be affected, even if volumes are expected to recover to the same levels by 2040.

Alternative E

This alternative is quite simply A + B, the collector-grade couplet on 100/200 East, combined with the UDOT couplet that uses Main and 100 West. It could also be implemented as A + D, but was evaluated here as A + B. The UDOT couplet by itself (B) performs very well, but it would probably need to have 4 lanes on each street. When the 100/200 East couplet is also implemented, it is a lot more practical for the UDOT couplet to have just 3 lanes on each alignment. Alternative E is extremely attractive regardless of whether Main/100 West each have 3 or 4 lanes. 3 lanes makes it possible to reclaim 2 lanes of Main Street pavement for other uses, and it also helps reduce the impacts of upgrading 100 West to UDOT standards. 4 lanes, combined with couplet A, creates more overall capacity than any other alternative, helping ensure that downtown circulation is easy and congestion free for a very long time.

Two 2-Way Arterials

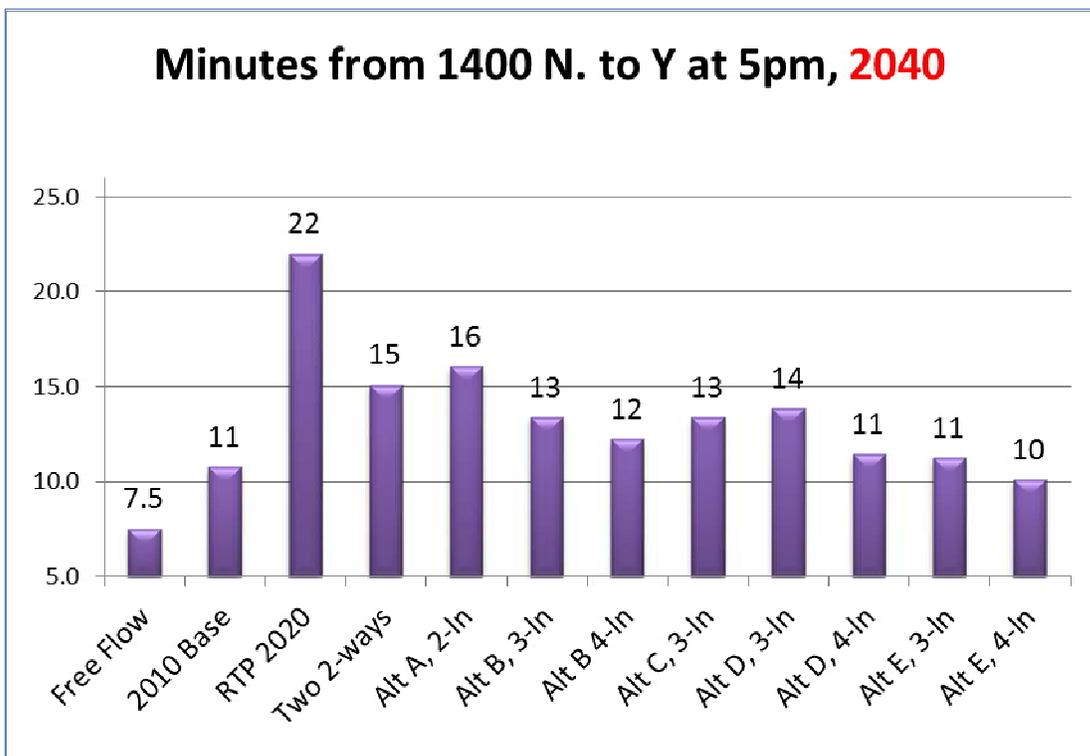
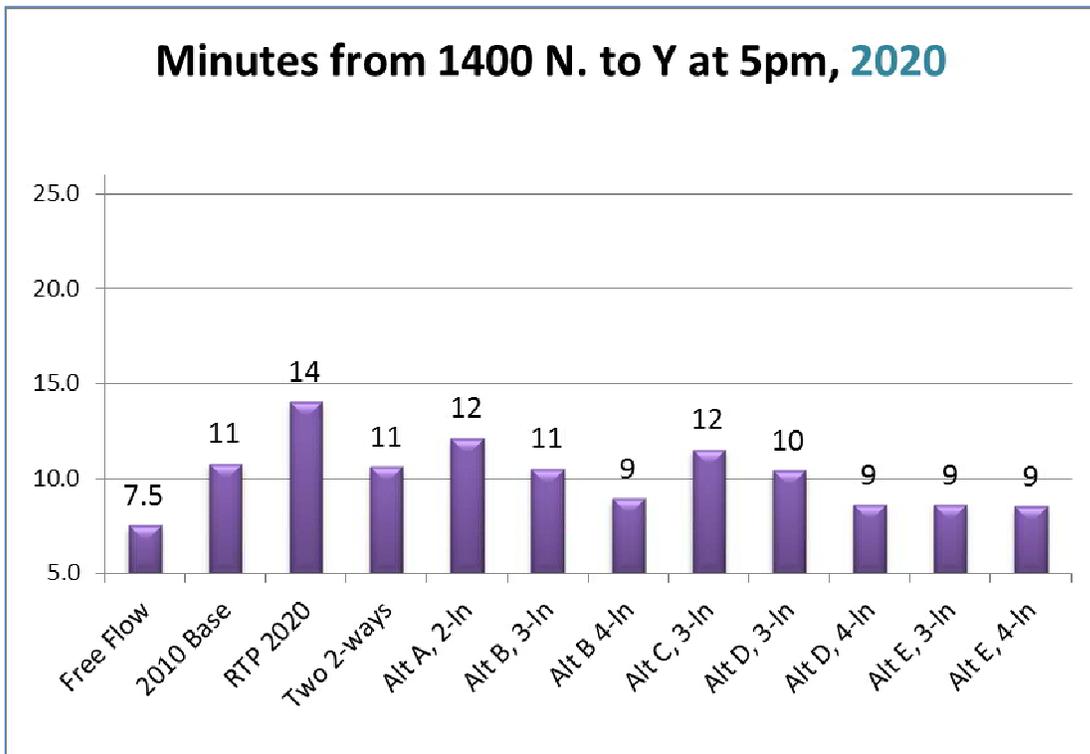
Besides couplets, it is also possible to create additional capacity in the Main Street corridor by widening 100 West into a 5-lane arterial, rather than widening Main itself into a 7-lane arterial. In that case, 100 West and Main would be virtually identical, with each as 5-lane two-way arterials. This scenario does not necessarily require UDOT to take ownership of 100 West, though it may still be possible to convince UDOT and the legislature to upgrade 100 West with state funds and take ownership of it because it helps the state solve their problem of excessive congestion on the state highway.

Where the couplets require a northern transition back to Main, so that southbound traffic can transition from Main to 100 West, this alternative does not need this transition. However, because this study attempts to solve problems clear to 1400 North, this concept requires widening 200 West to 5 lanes starting at about 1500 North, then the 5-lane arterial would transition to 100 West starting at about 850 North and ending by 650 North.

But even without the transition back to Main, this concept would require far more property acquisition than a 4-lane southbound couplet on 100 West, because it requires 5-lanes, one of which is a center median. It also would not have as much capacity as the couplets. At first glance it seems like it should have more capacity. It would have 10 lanes total, where the couplets would have just 8 lanes at the most. However 2 of those lanes are center medians which offer virtually no capacity, and the remaining 8 lanes have less capacity per lane, because one-way couplets are more efficient. The net effect is more pavement, but less capacity than the couplets. But it does allow the status quo on Main to continue, to the extent that there may be fear of change, and it would eliminate the potential to go the wrong way.

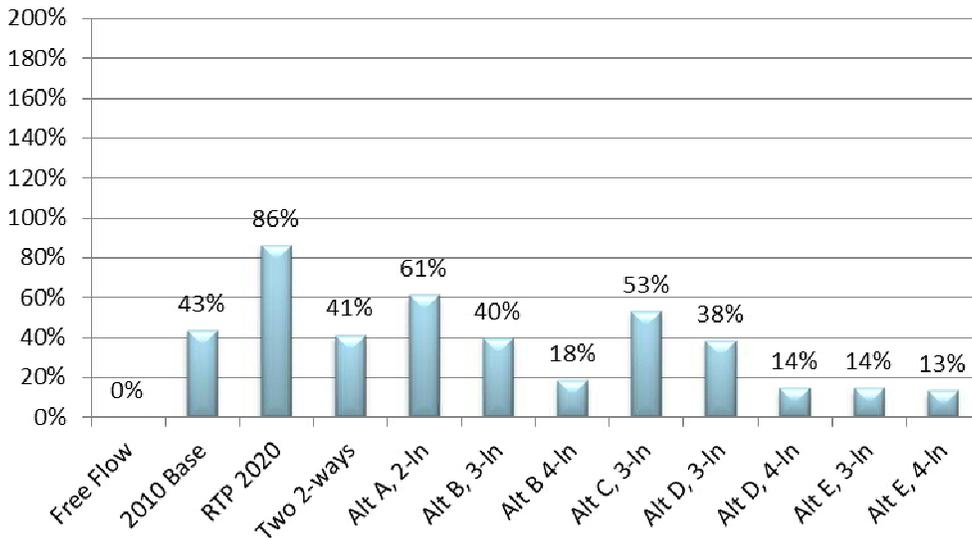
Model Results

The CMPO model was used to evaluate the alternatives in terms of traffic performance. Several measures of effectiveness were studied, including how many minutes it takes to travel from 1400 North to the Y in each alternative, percent increase in delay relative to free flow, screenline volumes vs. screenline capacity, the volume/capacity ratio of the of the single busiest road in the PM peak direction of flow, and the total volume expected on Main Street itself. Results are shown in the graphics of this section.

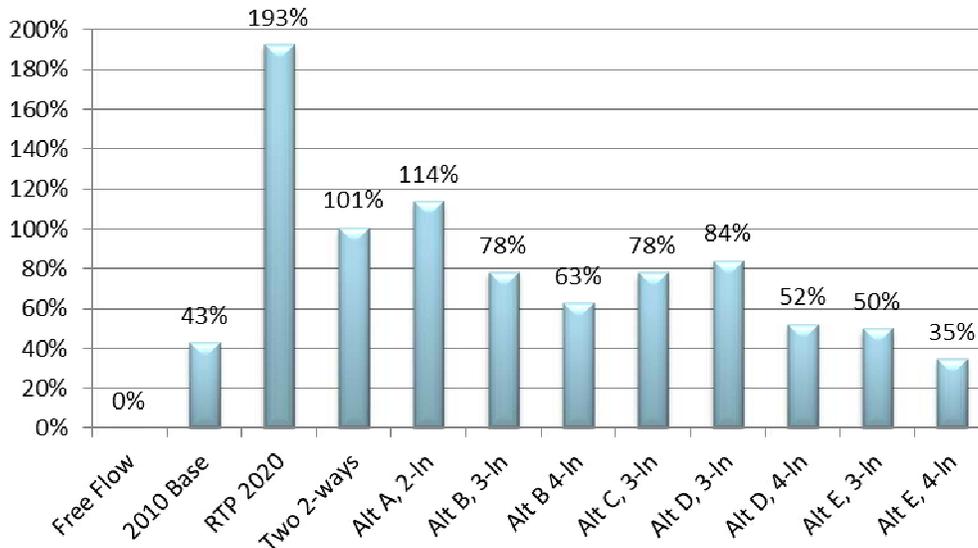


In uncongested conditions, it should take about 7.5 minutes to travel from 1400 North to the Y via Main Street (including stops at signals), and the model estimates it took about 11 minutes in 2010 at congested times. For each alternative, the time required in 2020 and 2040 is shown. Notice that in 2040 it takes twice as long to make the trip relative to 2010's 11 minutes. But many couplet concepts can restore operations to 2010 conditions.

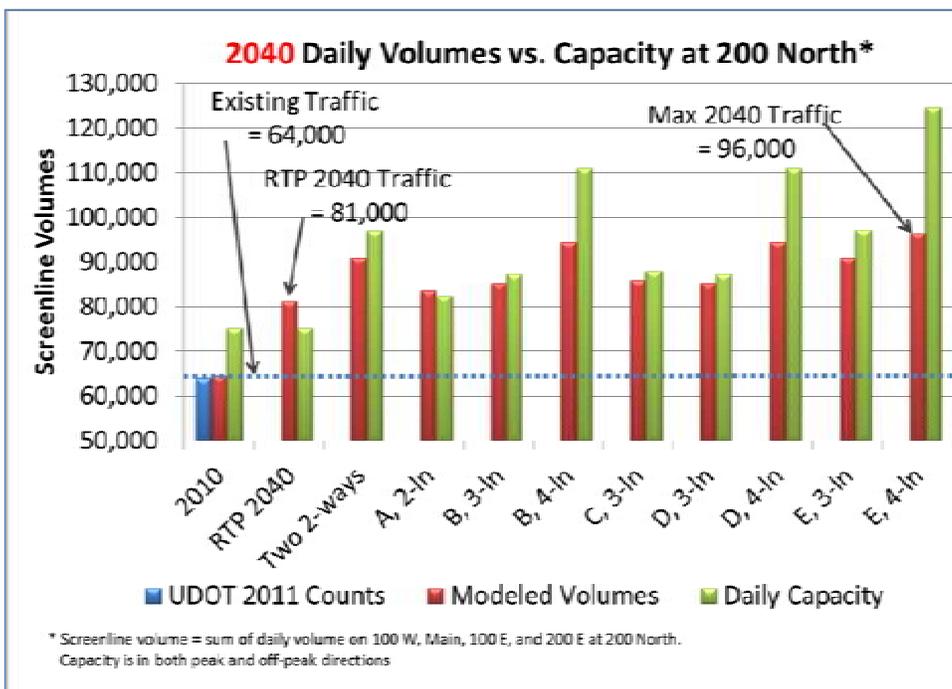
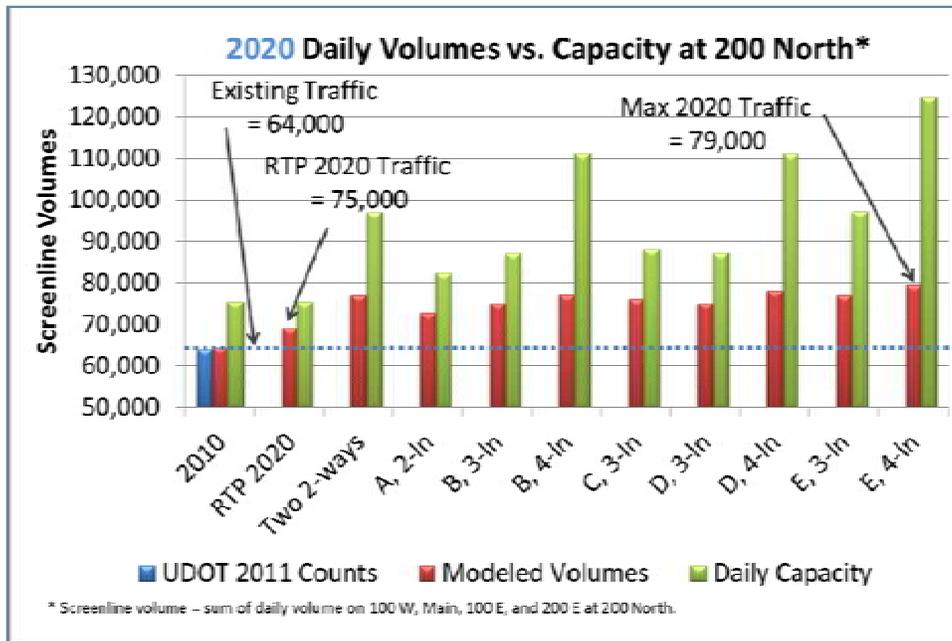
Travel Time Increase Relative to Free Flow, 1400 North to Y at 5pm, 2020



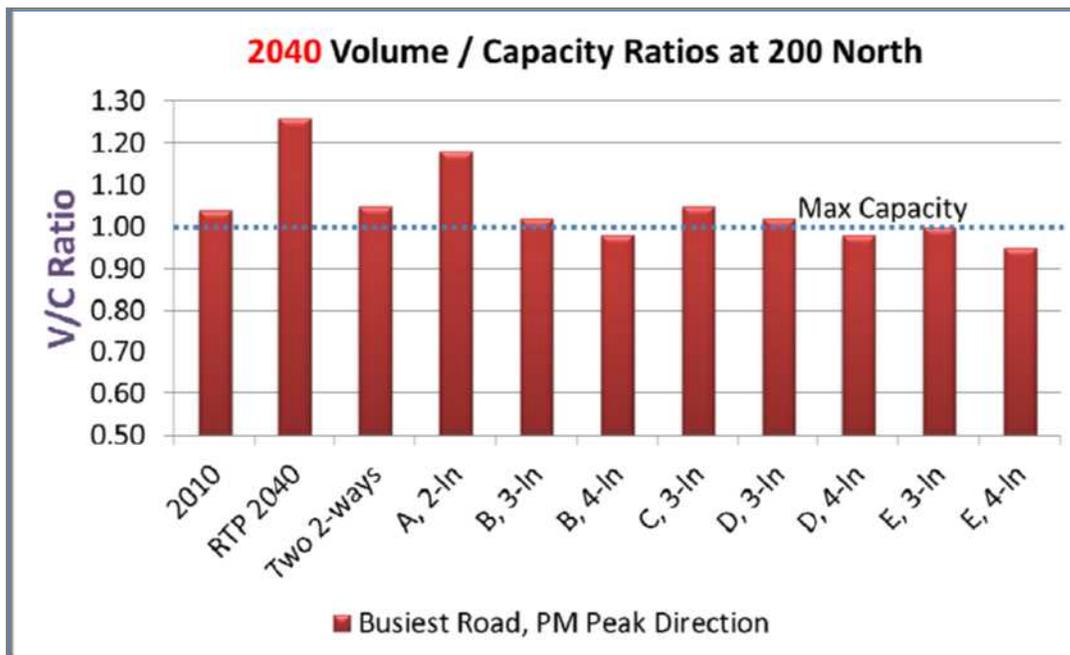
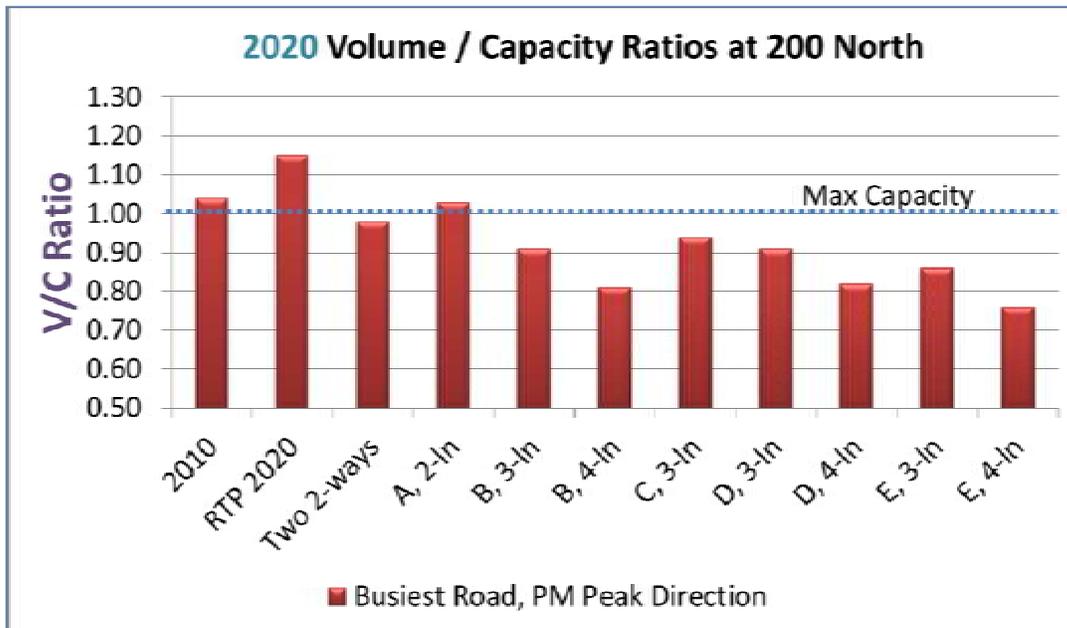
Travel Time Increase Relative to Free Flow, 1400 North to Y at 5pm, 2040



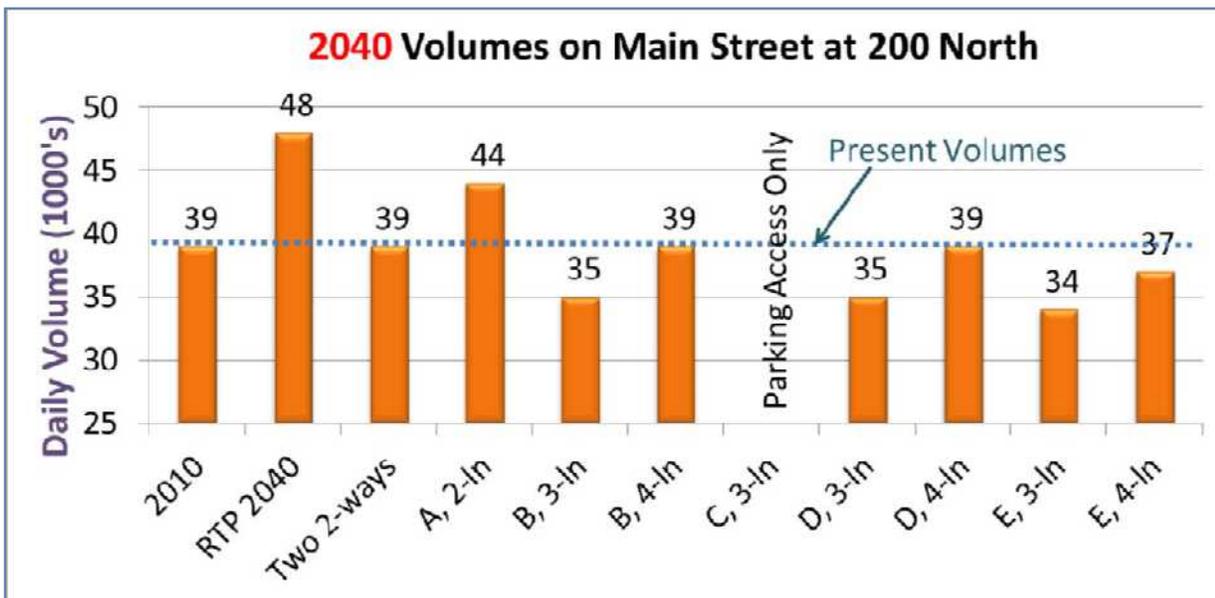
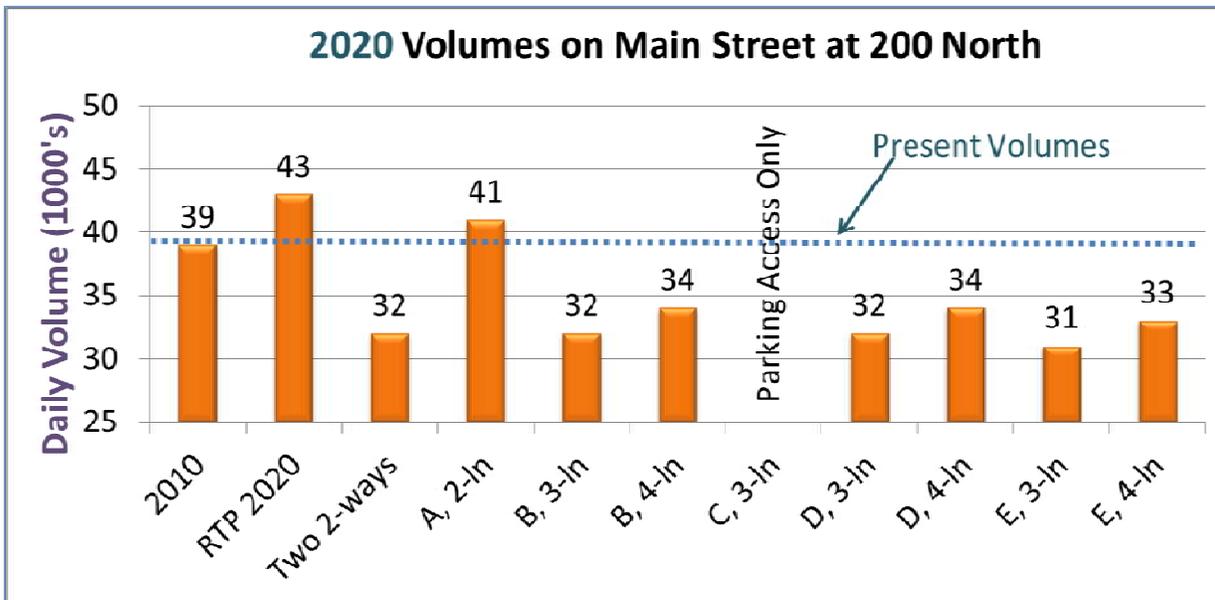
Similar to the previous charts, this shows the increase in delay relative to free flow conditions. Thus in 2010, a peak hour trip would take 43% longer than a free flow trip. By 2020 it will take 86% longer, and by 2040 the same trip will take 193% longer, or nearly three times longer than free flow. Many of the couplet concepts are able to virtually eliminate delay for 2020, and 2040 delay is at worst similar to 2010's delay.



Each alternative increases the sum of capacity on the four streets in question (green), but it also increases the sum of the volumes on the four streets as well. This is because latent demand that is otherwise traveling through neighborhoods outside these four streets is then attracted back into the corridor where it preferred to be all along. When the 2-direction volume is very near or exceeds the 2-direction capacity, it means that the peak direction streets are certainly failing. The more excess capacity there is, the less congestion there is. In 2010, the four streets together carried about 64,000 vehicles per day. Bangerter Highway in Salt Lake County was also about that much. By 2040 that volume would rise to 96,000 per day in Alt. E – roughly equivalent to a small freeway with 3-lanes each direction. Thus couplets allow the corridor to function as “Cache’s freeway,” as UDOT has described, but it does so in slower, context sensitive fashion.



This shows the Volume / Capacity ratios on the busiest road in the PM peak direction. Currently that is Main Street southbound south of 200 North, but it shifts over to 100 West southbound in couplet concepts where the southbound movement has been relocated to 100 West. Note that by 2020 the default RTP situation becomes worse than 2010, but all of the couplet concepts are able to reduce congestion back to no worse than 2010. By 2040, a number of alternatives may still be functioning a little better than 2010.



There have been concerns that some alternatives could reduce volume on Main by as much as half, potentially affecting businesses that rely on visibility from auto patrons. These charts show the expected volume changes on Main itself as a result of the alternative. In every case, volumes drop to no less than the low 30's in 2020 compared to the high 30's today. This is because while southbound movements are moved from Main to 100 West, northbound movements are moved from 100 West to Main. In addition, because it is possible to carry more, latent demand that is spilling over to neighborhoods by 2020 is able to come back to Main. So Main Street volumes always remain at a healthy level for business. By 2040, most scenarios show volumes once again approaching levels experienced in 2010. The only exception is Alternative C, where traffic is intentionally diverted completely away from Main. In this case, businesses would be trusting that excellent auto accessibility at their back door, combined with a premium pedestrian and parking experience at the front door, will ultimately be better for business than high auto volumes at the front door.

Summary of Ranking Criteria and Results

CMPO model results were an important factor in helping determine the best concepts to carry forward, but there are also many other factors as well. The steering committee for this effort utilized a spreadsheet to help account for various factors important to the community, and to place a relative importance on each factor. The table below shows how each alternative compared with the others in each major category. Observations from each category are discussed next.

Alternatives	Multi-Modal Circulation		Economic Development		Minimize Impacts		Totals w/o Costs			Costs		Total plus Costs		Alternatives
	Total Points	Rank	Total Points	Rank	Total Points	Rank	Total Points	Rank	Total Points	Rank	Total Points	Rank		
Possible Points	37		27		24		88		10		97.7		Possible Points	
RTP 2040	6	10	7	10	17	2	31	10	10	1	40.8	9	RTP 2040	
Two 2-ways	16	8	15	8	4	10	35	9	3	6	38.2	10	Two 2-ways	
A, 2-In	12	9	9	9	20	1	41	8	9	2	50.3	8	A, 2-In	
B, 3-In	22	7	21	4	14	4	57	3	6	3	63.2	3	B, 3-In	
B, 4-In	26	4	21	4	10	7	57	4	4	5	61.0	4	B, 4-In	
C, 3-In	22	5	24	1	8	8	55	7	6	4	60.1	5	C, 3-In	
D, 3-In	22	6	21	4	11	6	55	6	3	7	57.2	6	D, 3-In	
D, 4-In	28	3	21	4	7	9	56	5	0	9	55.9	7	D, 4-In	
E, 3-In	30	2	24	2	16	3	70	1	2	8	71.6	1	E, 3-In	
E, 4-In	33	1	23	3	13	5	68	2	0	9	68.3	2	E, 4-In	

Improve Multi-Modal Circulation and Mobility

Any option which leaves Main Street as a 5-lane arterial ranks near the bottom because congestion remains excessive, which negatively impacts all other modes as well. In general, 4-lane couplet options fare better than 3-lane options, simply because there are more lanes to help assure that congestion will not be a problem. Also two couplets reduce congestion better than one, so Alternative E is the best performer here because it reduces congestion better than any other option. Alternative E also fared well with multi-modal circulation and Emergency Service response times, because both the major and minor couplets are separated by only one block. Hence transit patrons are not unduly affected, and any minor out-of-direction travel for emergency services and local circulation is more than made up for by time savings due to less congestion and better gaps.

Foster Positive Land Use Change and Economic Development

Major two-way arterials require more lanes to manage the same traffic, and they also require center-turn lanes to help manage traffic. So their footprint is very large, which leaves little room for any Complete Street uses, and makes them most compatible with auto-oriented businesses rather than higher density mixed-use environments. Given that the historic downtown is already pedestrian-oriented, and most of the rest of the auto-oriented Main Street outside of Downtown is ripening for redevelopment and higher densities, it makes sense that options involving 5-lane auto-oriented arterials do not fare well in terms of fostering land use intensification and mixed uses. Alternative C, which reroutes traffic around Main, and the Alternative E options, which employ two couplets, both were ranked highest here, and are each addressed in detail.

Alternative C: This concept may be the best able to foster the most land use change, because it reroutes all through traffic around Main, leaving Main itself to re-emerge as it once was generations ago, with angle parking, trees, streetscape, etc. Perhaps this is why it is shown in the Downtown Plan as the preferred concept. The rerouting of traffic most likely would require the removal of several homes and businesses, seemingly more on 100 East than on 100 West, but several nonetheless. That is a major negative accounted for elsewhere, but also potentially positive for land use change and economic development in that it removes many less compatible uses and opens parcel remnants for more compatible uses.

Because of its impacts, Alternative C overall is not one of the top three concepts overall, but it is not far behind and could emerge in first place eventually depending on the community's interests and the development of a program that successfully addresses the negatives. The rerouting of traffic, and subsequent reinvention of Main is a radical change but not necessarily a bad change. It would clearly hurt businesses such as gas stations on Main. They'd still be accessible via Main and cross streets, but they would no longer have any significant amount of traffic passing by. But, the reinvention of Main could easily elevate the value of those parcels,

making it attractive to sell to more compatible higher density uses. They could then move elsewhere, perhaps a block over to where auto traffic has been rerouted.

This concept has high potential, but also comes with serious consequences. If the potential is ever to have a serious chance of emerging, then a program will have to be carefully crafted and could include a market analysis of the potential value of land after the change, perhaps a redevelopment area declaration that will enable you to acquire businesses and other properties that will be seriously affected. Perhaps the project itself could set up a revolving fund to purchase properties from anyone who would not want to remain, and then pay back the fund once those properties are resold for more compatible uses. Animations, artistic renderings, market analysis, and program details would need to exist before public opinion solidifies against the idea, as they may tend to focus on the obvious negatives unless those negatives have been addressed adequately in advance.

Alternative E: The 3-lane concept means there would be three traffic lanes on Main and 100 West, but just 2 on 100 East and 200 East. The 4-lane concept raises Main / 100 West to 4 lanes, but still leaves 100/200 East as 2-lanes each. With Main at just 3-lanes, existing pavement can be converted to Complete Street uses, which will make it attractive to redevelop existing auto-oriented uses into higher-density mixed uses. Also, the upgrade of 100 West will likewise encourage the expansion of Downtown to that street. The overall ability of the four streets combined to handle a lot more multimodal traffic trips will likewise help ensure that development that otherwise would have went to suburban locations will instead find it attractive to locate in the historic core. Many of the other couplet concepts do this as well, but E is the most pronounced. Most of the others also require 4-lanes on Main/100 West to operate well, but E operates well-enough on just 3-lanes, because the other couplet is able to carry any spillover. E is a good compromise between the RTP, with its serious problems on Main, and Alternative C, which routes all traffic away from Main. E maintains enough volume on Main for the auto visibility that existing businesses may be dependent on, but also opens opportunities on Main for it to emerge as an attractive Complete Street corridor. A more detailed study with microsimulation analysis should determine if 3 or 4 lanes are ultimately needed on Main, but either way this may be the best bridge to move from today's reality to tomorrow's vision.

Minimize Neighborhood and Environmental Impacts

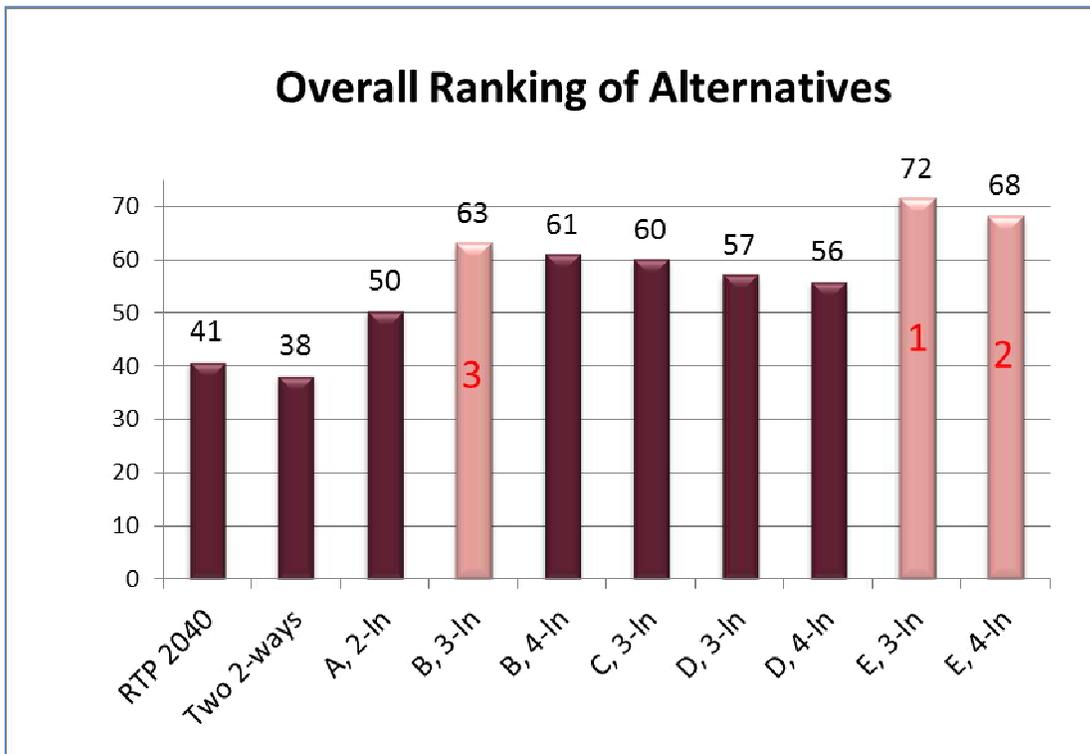
It almost goes without saying that since the RTP and smaller locally-implemented couplet concepts require very little effort to implement, they also score very well in terms of their ability to minimize impacts. But they also fail to adequately address the significant impact of congestion on Cache's livability and economy. Outside of these minimalist strategies, Alternative E 3-lanes scores well in this category, primarily because it fits well within existing right-of-way, but also because in many places it will need less pavement than is already there, which positively affects neighborhoods and helps most places become more walkable.

Minimize Overall Cost of Implementation

Minimizing costs also tends to minimize the effectiveness of the alternative at solving the congestion problem. So not unexpectedly the default RTP, and the locally implemented couplets score highest here. But as discussed earlier, while Alternative A does relatively little to solve long-term congestion, it also doesn't cost much to implement, so it has a high return on investment. The more effective options regarding long-term congestion are also expected to be among the most expensive options. Even those that can largely stay within the existing right-of-way may still need pavement and utility reconstruction, and ideally there would be a considerable effort aimed at beautification and upgraded multimodal amenities.

Overall Ranking of Alternatives

Given the criteria and weighting selected by the steering committee, along with both the quantitative and qualitative assessment of each alternative relative to each criteria, a comprehensive score was given to each alternative, which is visible in the above table and also shown graphically for each alternative in the figure below. Alternatives E 3-lane and E 4-lane were rated first and second respectively. The B alternatives, which are sub-elements of the E alternatives, are rated third and fourth. Alternative C, which routes traffic around Main, has great potential to be the best overall driver of economic development, but it also has significant impacts that push it to 5th place overall.



Citywide Effects of Alternative E

When streets like Main Street become overloaded, many drivers divert to parallel streets, which in turn overloads those streets, and causes spill over to roads even further away. The net effect on Logan is that as Main Street congestion gets worse, there will be a lot more traffic on neighborhood streets and collectors, often more than a mile away from Main Street. Any proposal that reduces delay on Main and increases overall capacity in the Main Street corridor will tend to pull that “latent demand” back into the Main Street corridor. That is a good thing for collectors of residential character such as 600 East and 600 West.

The figures on the next pages show the PM peak hour volumes of the currently preferred couplet strategy, Alternative E, compared to the CMPO RTP scenario for the 2040 time period. Green means Alt E causes volumes and congestion to go down on those streets significantly. Red means volumes go up, but congestion usually goes down – hence the reason more traffic was attracted to those corridors. Each half of the road is shown independently. Alternative E employs four streets in a couplet configuration. Notice that on those streets, one half of the road is red, and the other is grey. The grey means that direction carries zero traffic, while the other direction often carries double what it did before, because it has more lanes in that direction. So there is not necessarily much more overall traffic on those streets, but in the couplet direction there is much more, and the effect is to appear like there is much more in this figure.

Both figures are the same, but the second is zoomed in to show the labels more clearly, and the first lets you see the big picture effect on all of Logan. Labels represent daily volume in thousands. The label nearest the link is the RTP volume, and the next is the couplet volume. Looking at the big picture, the couplets generally increase traffic volumes within the corridor, and reduce traffic in all the rest of Logan. Both green and red appear to be desirable. Green because it draws down traffic in areas where the city wants it down, and red because higher volumes and better accessibility help support additional infill and positive redevelopment.

Appendix B

Multi Modal Analysis

TECHNICAL MEMORANDUM

Date: April 22, 2013

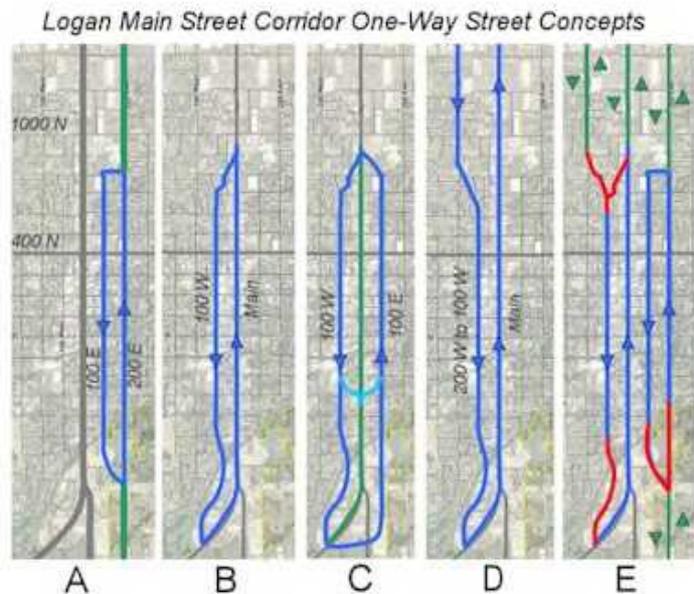
Subject: Logan Couplet Feasibility, CMPO Model Analysis

"Today's problems cannot be solved by the same level of thinking that created them." – Albert Einstein

Logan's Transportation Master Plan shows five concepts for one-way couplets labeled as alternatives A-E. This graphic is taken directly from that plan. The purpose of this study is to evaluate those concepts in greater detail to determine which are most feasible and beneficial to the city's overall objectives.

Model Preparation & Usage

The CMPO model was recalibrated to improve its accuracy for this study area (which also improved its accuracy across the entire county). It was then used to analyze the ability of each scenario to reduce congestion, and also to obtain daily and peak hour volumes. A separate memo was produced detailing this calibration effort. This memo first describes the nuances of each scenario, and then discusses observations of each from the CMPO model.



Alternative Concept Descriptions

Alternative A

Even today when Main Street is gridlocked, many choose to travel 100 and 200 East – especially those whose origin and destination is east of Main (a rapidly increasing number going into the future). But at present these streets cannot handle much additional volume when operated in 2-way configuration. Instead of operating two-way, with 1 lane each direction and a center turn lane, the city could change to operate 2-lanes in 1-direction (with no center lane required), then both streets together could handle significantly more traffic than they can together handle now. Any stop signs in the N-S direction would be eliminated, and signals would be installed where E-W traffic would otherwise be unduly inhibited. Very little construction would be required to implement these. They can maintain their residential character, and few if any trees would be affected. Pavement, shoulder and park-strip upgrades are optional and at the discretion of the city. Speed limits could be raised by 5 mph (helping them attract trips away from Main), or they could remain as they are now, also at the discretion of the city. Either way, average speeds will still be better due to easier signal coordination and because traffic would not be delayed as much at signals.

To residents this concept will probably feel like less traffic. When traffic is flowing heavily in two directions, drivers eventually take unsafe gaps out of frustration. This makes it easier and safer to get out of their driveway because they only need a gap in one direction. Because these streets are only a block apart, out of direction travel would be insignificant. The benefits of circulating more easily and getting in and out of driveways more easily would tend to overshadow the negatives of a block's worth of out of direction travel.

Bicyclists and pedestrians will also find this preferable to two-way streets. They too only need a gap in one direction to cross a street. To the extent that you already have center turn lanes, these could be eliminated, and the space used instead for bike lanes or better pedestrian amenities. This also makes it easier to flair sidewalks out further at intersections, reducing the width required for pedestrians to cross. Signal cycle lengths are also typically shorter, reducing the time bicyclists and pedestrians must wait in order to cross.

At the southern transition point, the transportation plan shows that this couplet requires a bridge to be constructed over the river at 200 East, in order to carry northbound traffic. However, the existing bridge at 100 East appears to be wide enough to accommodate two-way traffic using 4 lanes (no center lane required on the deck). Thus the southern transition could use 90-degree angles at 300 South, just as the northern transition must do at 800 North because of the school. The bridge crossing is better and allows for a smoother transition, but it also makes implementation more expensive, which could delay implementation.

This couplet by itself will not solve the long-term problems of Main Street. But it can be a valuable short-term “relief valve” that reduces the stress on Main until a better long-term solution can be funded and implemented for Main. It can also remain in effect after a Main Street solution is implemented, continuing to do its part to maintain livable conditions on Main in perpetuity. It ranks poorly by itself as a long-term solution, but it ranks #1 when combined with Alternative B (forming Alternative E, which is A + B). Because it is low cost, it has high return on investment. It also would allow the public to experience a couplet and see the benefits (including that it eliminates any further discussion of widening 200 East through the heart of the city). If that early experience is positive, that could help generate support for a longer term couplet solution that may directly involve Main Street.

Alternative B

The CMPO model suggests that the Main Street corridor will soon need far more capacity than it currently has, but Main itself is already 5-lanes and cannot achieve 7-lanes in critical sections unless parking is eliminated. Even if parking were eliminated, the result would be a massive over-emphasis on autos through the middle of Logan’s most pedestrian-oriented commercial spaces – completely out of context with the Downtown Specific Vision.

Alternative B suggests that instead of today’s 2 lanes each direction on Main, and 1 each direction on 100 West, with center lanes on both (6 lanes + 2 center lanes), that you instead run 3 lanes in just one direction, with no need for center lanes (6 lanes + 0 center lanes). If 3 lanes is efficient enough to solve the problem, then pavement on Main dedicated to autos could be reduced by 2 lanes, and pavement on 100 West would remain largely unchanged except at transitions, where there clearly is not enough room, and as may be required by UDOT in order to meet their shoulder standards. This scenario of necessity requires that UDOT would take ownership of 100 West, or alternatively that Logan would agree to maintain the road at UDOT standards in perpetuity. In this scenario, 100 and 200 East would remain 2-way streets just as they are now.

The CMPO model suggests that 6-lanes in a couplet configuration creates significantly more capacity than today’s 8-lanes in two-way configuration. However it also suggests that future demands could be so high as to require 4-lanes each direction on Main and 100 West by 2040 (8 total) to solve the problem if 100 and 200 East remain as 2-way streets. But even if four northbound lanes were required on Main (one of which could be an HOV lane for BRT, etc.), then Main could still be reduced by 1-lane – making it far more practical to implement bike lanes, outdoor restaurant seating, taco carts, street vendors, wider/better pedestrian amenities – all of the things that help bring the Downtown Vision to life. But in that case 100 West would also need 4 lanes at UDOT standards rather than today’s 3. This would entail new right-of-way acquisition, but most homes and business buildings could remain, because existing setbacks are probably sufficient.

The northern transition point will most likely occur somewhere between 750 North and 1100 North. North of that point, Main Street would need to be widened to 7-lanes at least to 1500 North. This eventually needs to happen regardless, and the widening to 7-lanes is shown on the CMPO plan. 7-lanes in two-way operation will be quite inefficient because of the left turn arrows and double-left pockets required on all approaches at 1400 North. So it would also help to install an Innovative Intersection concept at 1400 North, and potentially at other locations, such as a Continuous Flow Intersection, a Quadrant Intersection, or a Thru-Turn Intersection.

At first glance, all of these look like they could be implemented at 1400 North and Main. For more information, see InnovativeIntersections.org. Also see the Downloads section at MetroAnalytics.com, and look for *"Innovative Intersections ~ Drive Slower But Travel Faster.pdf."*

The southern transition requires an extension of 100 West, which is already planned, but may need to be altered to meet UDOT design standards for width and bridge design if this alternative is selected. It would also be useful to run a connection from 100 West southeast to the "Y" intersection, so that southbound traffic can make its way over to Hwy 165 through Nibley (i.e., Main). That connection is not entirely necessary, as this movement could also be served by routing southbound traffic across Hwy 89/91 via 100 West, then reconnecting to Main at 1200 South, or also perhaps by simply continuing the couplet through Nibley on the same 100 West alignment, which from aerial photos appears to still be possible. Nibley may well prefer to first see how it goes in Logan before committing to a couplet themselves, but they would still be wise to create the 100 or 150 West alignment anyway and operate it as a two-way street in the meantime. Major corridors benefit greatly from such "backage roads" anyway, and they easily have the option to convert at any time. Perhaps CMPO could take initiative to work with Nibley to get a 100/150 West alignment shown on the CMPO plan.

Out of direction travel for autos is insignificant, because at all locations the Main/100 West couplet is separated by only one block. Time saved due to less congested circulation, and easier ability to get a gap in one direction rather than both, more than makes up for time lost due to a block of out of direction travel. And if your destination is between Main and 100 West, there is zero additional travel. For transit patrons, it is nice if the place they come back to is the same place they got off, so this couplet has that negative. But a block of extra walking may be overshadowed by positives such as the ability for transit to operate in an HOV lane or on dedicated right-of-way, and also by the ability to achieve the Downtown Vision, which creates new transit oriented development in Downtown.

A couplet that results in more traffic on 100 West, and a general upgrade of 100 West as a Complete Street, will also make it attractive to expand businesses and condominium projects over to that street, and on the cross streets between, resulting in a true walkable mixed-use Activity Center, rather than just a single popular street.

Alternative C

In this concept, 100 East would operate as northbound one-way, and 100 West would be southbound one-way. Main Street could then remain exactly as it is now, or it could be converted into a pedestrian mall, perhaps with a transit mall shuttle, and vehicle access to angle parking on Main. If Main remains as it is now, then no UDOT action is required, as Logan can easily implement this couplet to serve as a relief valve for Main. When modeled, this concept does little to reduce congestion on Main, because Main must first be failing before anyone is motivated to use the couplet. The couplet would have 2-blocks between northbound and southbound, and there are significant transition costs and problems also, so the local implementation of this concept was eliminated from further consideration.

In the concept where Main becomes a pedestrian mall with BRT and/or parking access, then UDOT action would be required, as both 100 East and 100 West would have to be upgraded to meet UDOT design standards since the state highway would be diverted to those alignments. UDOT standards would require smooth, diagonal transitions, creating significant impacts to properties at both the north and south transition points, and also to many properties in between. The couplet would be at least 3-lanes each direction. If 4 were required, impacts especially on 100 East would be very significant. Another negative about this couplet is that the use of 100 East for northbound flow eliminates the possibility of capacity to be gained by implementing Alternative A. But diverting traffic to 3-lanes northbound on 100 East, and 3-lanes southbound on 100 West, does handle traffic about as well as Alternative B when it has a similar 3-lanes.

The virtue of this alternative is that it is the only strategy available for converting Main into a pedestrian mall – a concept that is very compatible with the Downtown Plan. For that reason, it may be worth a detailed look as part of an environmental impact study, so that businesses and the general public can decide for themselves if the positives of a pedestrian mall outweigh the significant negatives. But given the other alternatives, a pedestrian mall is not necessary for Main to be far more pedestrian friendly.

Alternative D

D is identical to B, except at the northern transition. B transitions back to Main between 750 and 1100 North, while D first transitions from 100 West to 200 West between 650 and 850 North. It then continues on 200 West until at least 1600 North, where it transitions northeast diagonally to connect back to Main at about 1750 North. Alternatively, aerial photos show that it could easily transition back to 100 West at that point, and continue on as far northward as desired. Where Alternative B requires Main to be widened to 7-lanes between the northern transition point and 1500 North, Alternative D allows Main to be narrowed from the existing 5-lanes to just 3 or 4 lanes, making Main much more pedestrian friendly in that section. However, this northern portion of Main has much more auto-oriented uses than the downtown. If opening day traffic volumes drop below today's levels, these auto-oriented convenience businesses may initially be affected, even if volumes are expected to recover to the same levels by 2040.

Alternative E

This alternative is quite simply A + B, the collector-grade couplet on 100/200 East, combined with the UDOT couplet that uses Main and 100 West. It could also be implemented as A + D, but was evaluated here as A + B. The UDOT couplet by itself (B) performs very well, but it would probably need to have 4 lanes on each street. When the 100/200 East couplet is also implemented, it is a lot more practical for the UDOT couplet to have just 3 lanes on each alignment. Alternative E is extremely attractive regardless of whether Main/100 West each have 3 or 4 lanes. 3 lanes makes it possible to reclaim 2 lanes of Main Street pavement for other uses, and it also helps reduce the impacts of upgrading 100 West to UDOT standards. 4 lanes, combined with couplet A, creates more overall capacity than any other alternative, helping ensure that downtown circulation is easy and congestion free for a very long time.

Two 2-Way Arterials

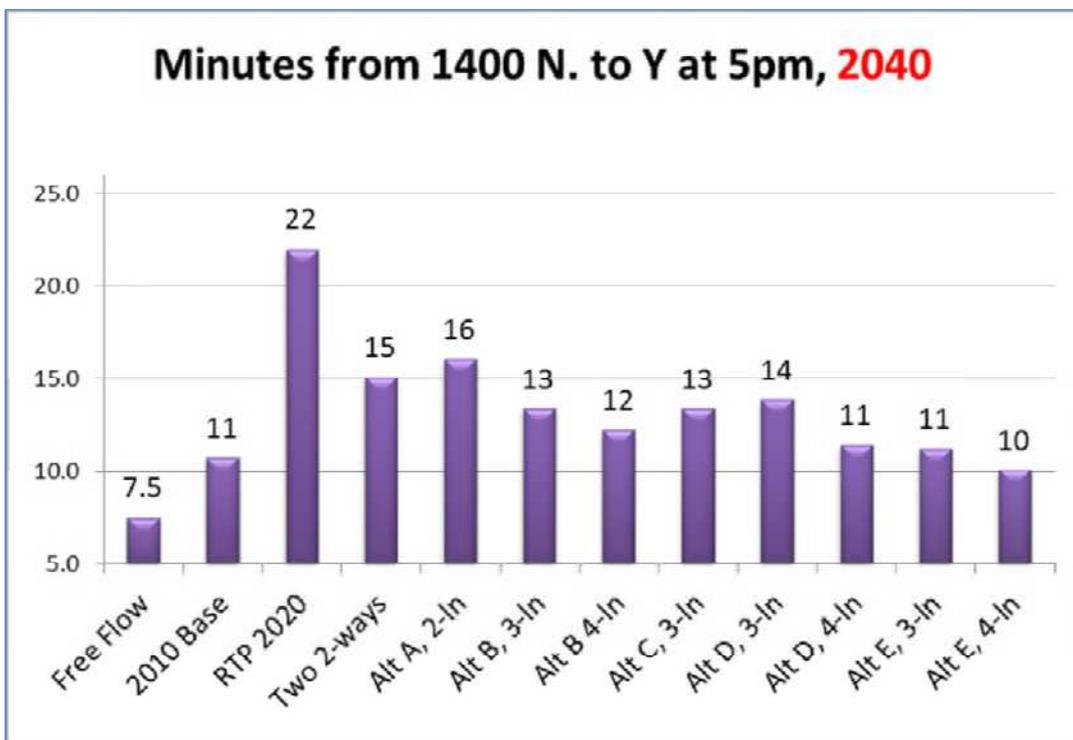
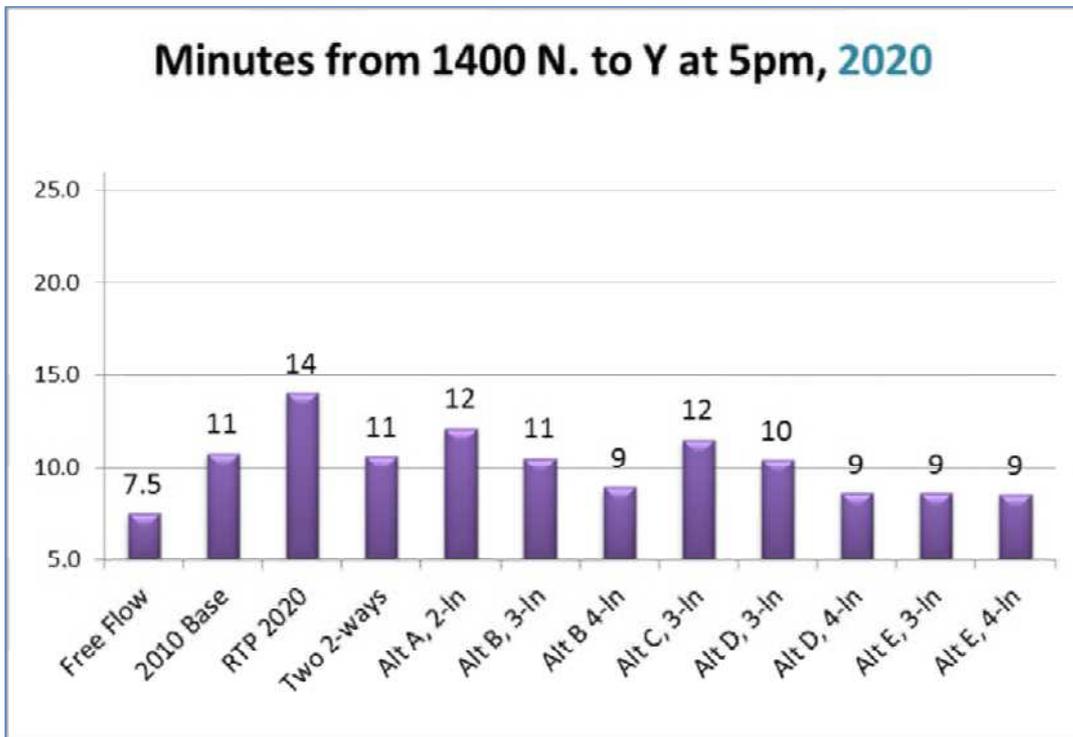
Besides couplets, it is also possible to create additional capacity in the Main Street corridor by widening 100 West into a 5-lane arterial, rather than widening Main itself into a 7-lane arterial. In that case, 100 West and Main would be virtually identical, with each as 5-lane two-way arterials. This scenario does not necessarily require UDOT to take ownership of 100 West, though it may still be possible to convince UDOT and the legislature to upgrade 100 West with state funds and take ownership of it because it helps the state solve their problem of excessive congestion on the state highway.

Where the couplets require a northern transition back to Main, so that southbound traffic can transition from Main to 100 West, this alternative does not need this transition. However, because this study attempts to solve problems clear to 1400 North, this concept requires widening 200 West to 5 lanes starting at about 1500 North, then the 5-lane arterial would transition to 100 West starting at about 850 North and ending by 650 North.

But even without the transition back to Main, this concept would require far more property acquisition than a 4-lane southbound couplet on 100 West, because it requires 5-lanes, one of which is a center median. It also would not have as much capacity as the couplets. At first glance it seems like it should have more capacity. It would have 10 lanes total, where the couplets would have just 8 lanes at the most. However 2 of those lanes are center medians which offer virtually no capacity, and the remaining 8 lanes have less capacity per lane, because one-way couplets are more efficient. The net effect is more pavement, but less capacity than the couplets. But it does allow the status quo on Main to continue, to the extent that there may be fear of change, and it would eliminate the potential to go the wrong way.

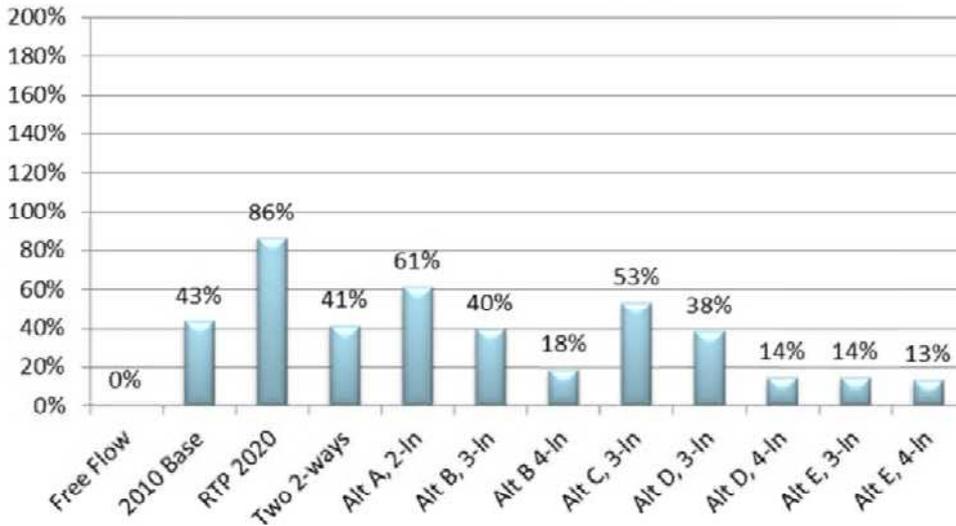
Model Results

The CMPO model was used to evaluate the alternatives in terms of traffic performance. Several measures of effectiveness were studied, including how many minutes it takes to travel from 1400 North to the Y in each alternative, percent increase in delay relative to free flow, screenline volumes vs. screenline capacity, the volume/capacity ratio of the of the single busiest road in the PM peak direction of flow, and the total volume expected on Main Street itself. Results are shown in the graphics of this section.

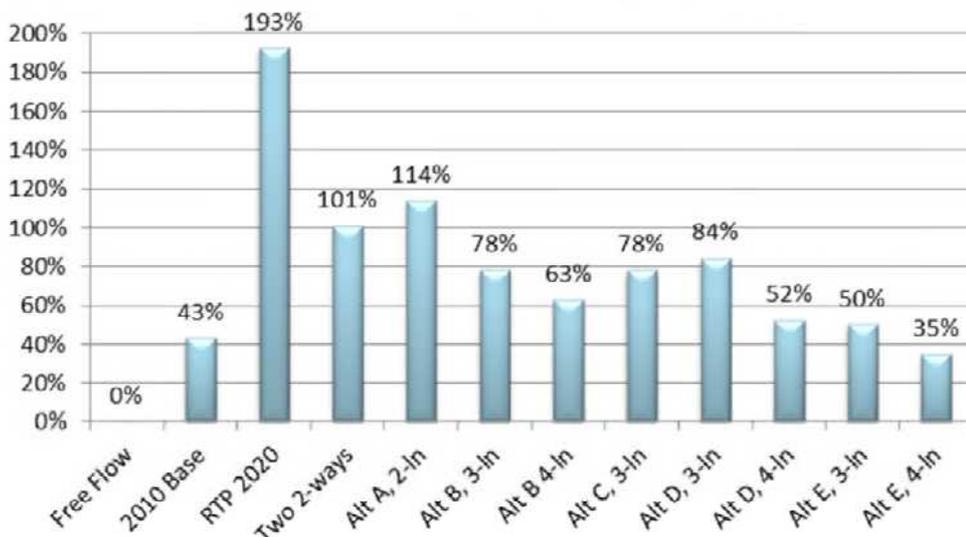


In uncongested conditions, it should take about 7.5 minutes to travel from 1400 North to the Y via Main Street (including stops at signals), and the model estimates it took about 11 minutes in 2010 at congested times. For each alternative, the time required in 2020 and 2040 is shown. Notice that in 2040 it takes twice as long to make the trip relative to 2010's 11 minutes. But many couplet concepts can restore operations to 2010 conditions.

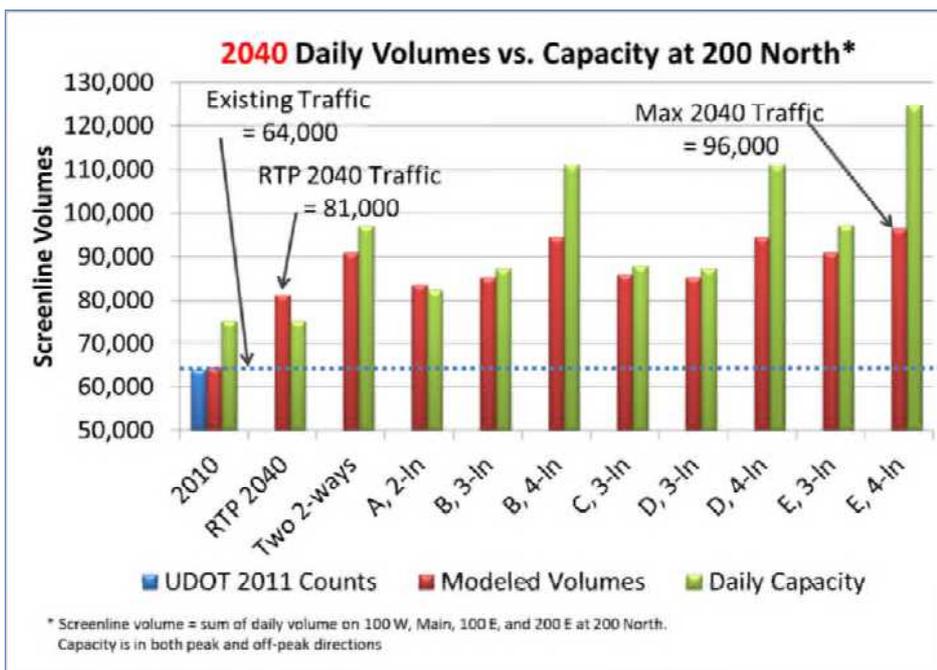
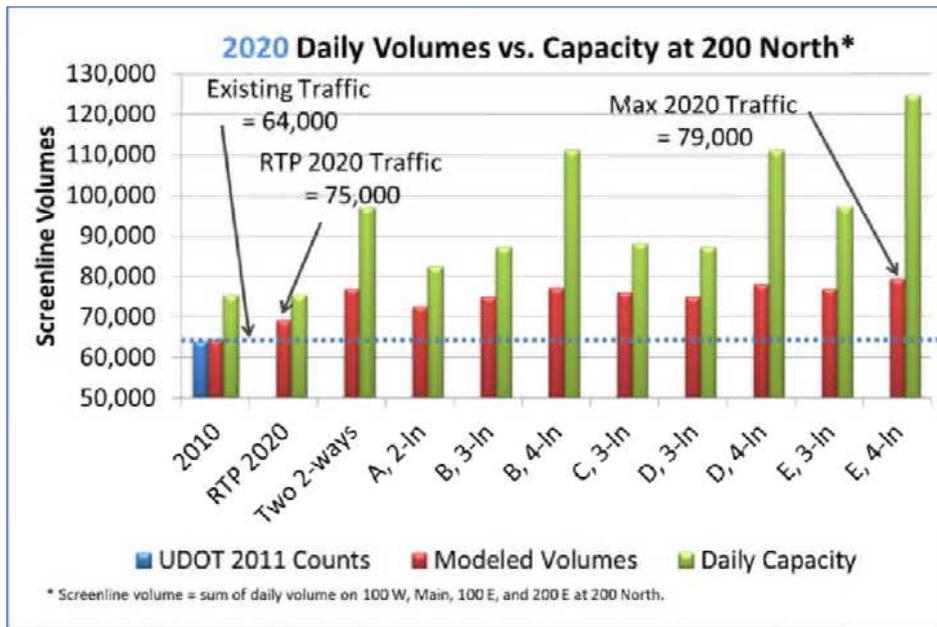
Travel Time Increase Relative to Free Flow, 1400 North to Y at 5pm, 2020



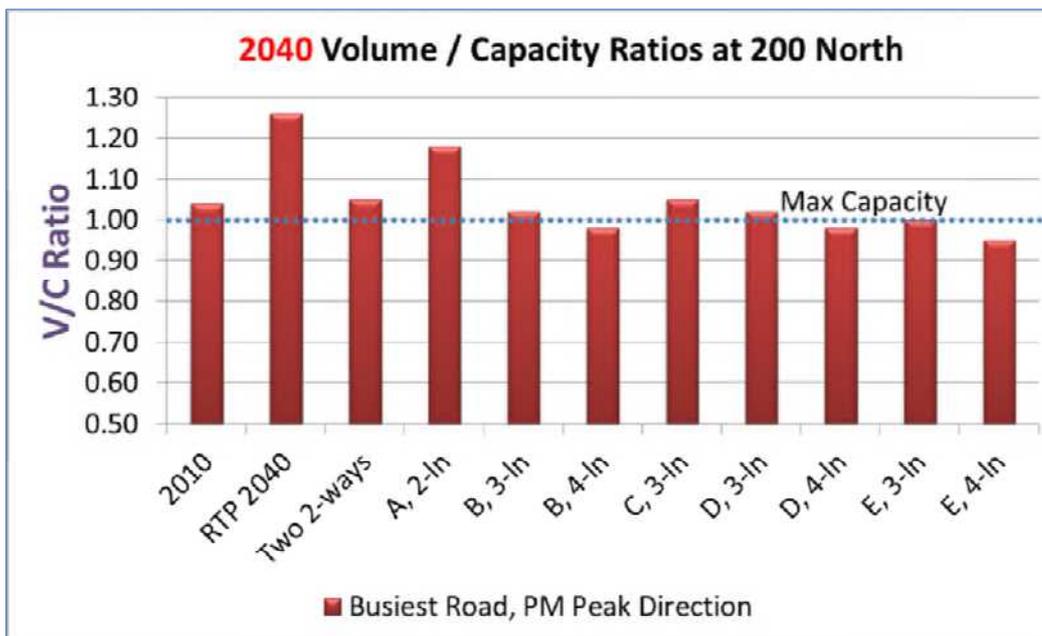
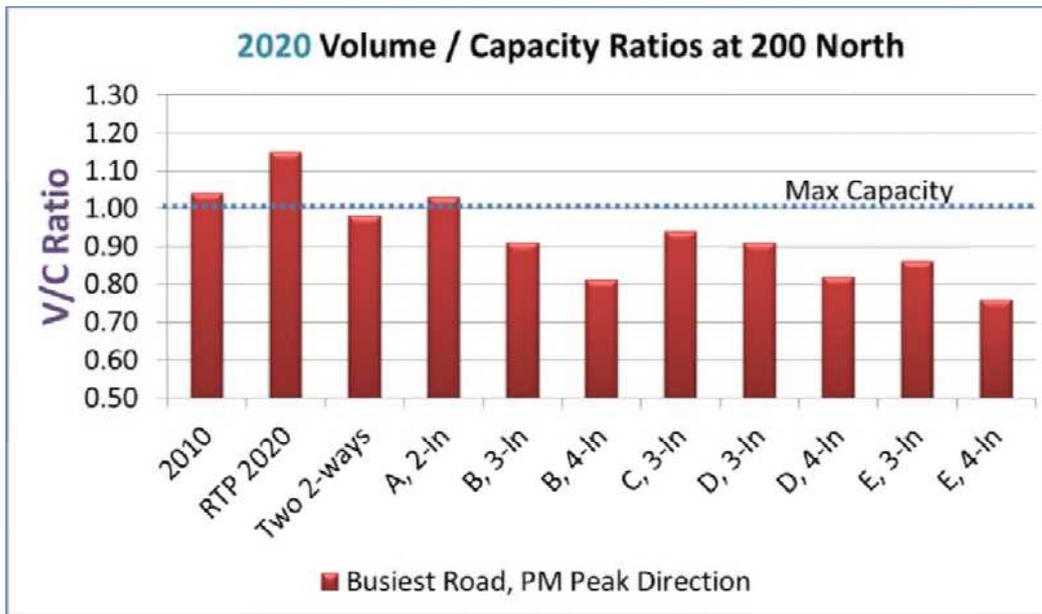
Travel Time Increase Relative to Free Flow, 1400 North to Y at 5pm, 2040



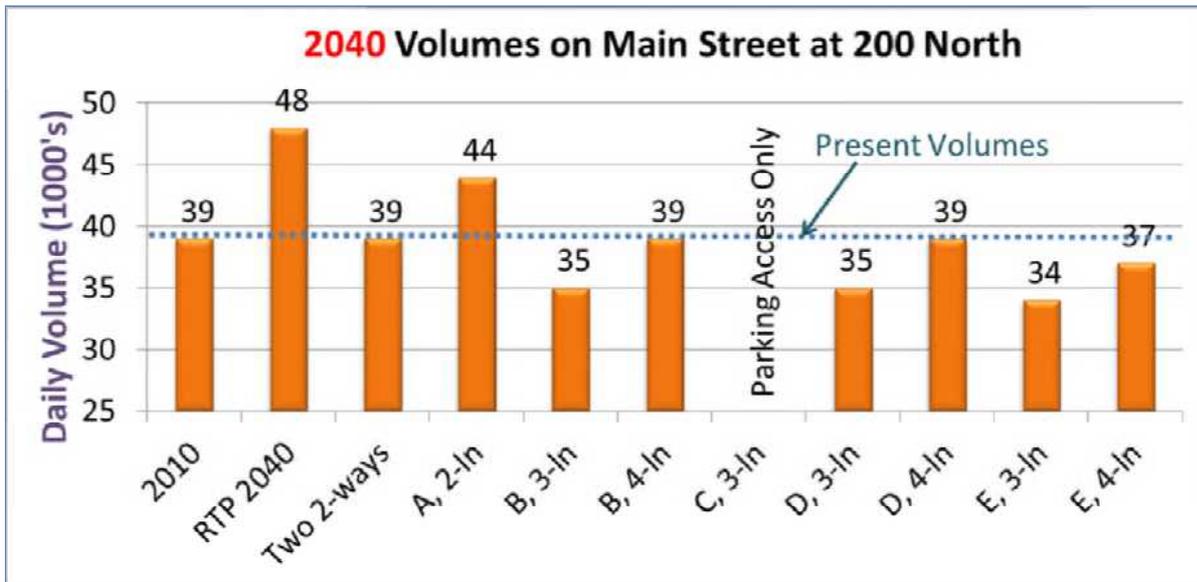
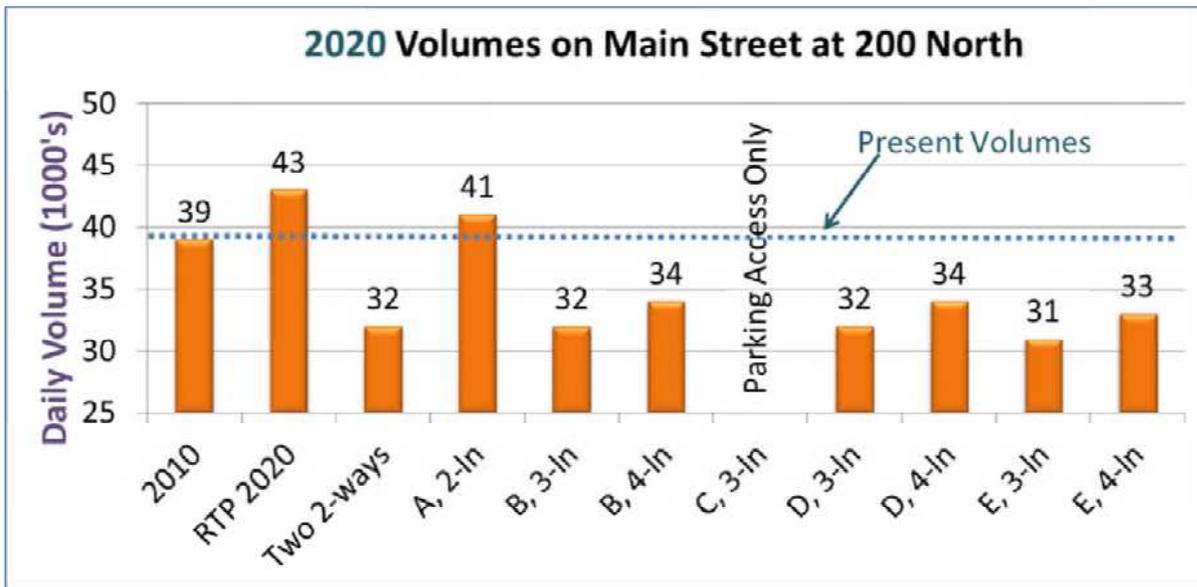
Similar to the previous charts, this shows the increase in delay relative to free flow conditions. Thus in 2010, a peak hour trip would take 43% longer than a free flow trip. By 2020 it will take 86% longer, and by 2040 the same trip will take 193% longer, or nearly three times longer than free flow. Many of the couplet concepts are able to virtually eliminate delay for 2020, and 2040 delay is at worst similar to 2010's delay.



Each alternative increases the sum of capacity on the four streets in question (green), but it also increases the sum of the volumes on the four streets as well. This is because latent demand that is otherwise traveling through neighborhoods outside these four streets is then attracted back into the corridor where it preferred to be all along. When the 2-direction volume is very near or exceeds the 2-direction capacity, it means that the peak direction streets are certainly failing. The more excess capacity there is, the less congestion there is. In 2010, the four streets together carried about 64,000 vehicles per day. Bangerter Highway in Salt Lake County was also about that much. By 2040 that volume would rise to 96,000 per day in Alt. E – roughly equivalent to a small freeway with 3-lanes each direction. Thus couplets allow the corridor to function as “Cache’s freeway,” as UDOT has described, but it does so in slower, context sensitive fashion.



This shows the Volume / Capacity ratios on the busiest road in the PM peak direction. Currently that is Main Street southbound south of 200 North, but it shifts over to 100 West southbound in couplet concepts where the southbound movement has been relocated to 100 West. Note that by 2020 the default RTP situation becomes worse than 2010, but all of the couplet concepts are able to reduce congestion back to no worse than 2010. By 2040, a number of alternatives may still be functioning a little better than 2010.



There have been concerns that some alternatives could reduce volume on Main by as much as half, potentially affecting businesses that rely on visibility from auto patrons. These charts show the expected volume changes on Main itself as a result of the alternative. In every case, volumes drop to no less than the low 30's in 2020 compared to the high 30's today. This is because while southbound movements are moved from Main to 100 West, northbound movements are moved from 100 West to Main. In addition, because it is possible to carry more, latent demand that is spilling over to neighborhoods by 2020 is able to come back to Main. So Main Street volumes always remain at a healthy level for business. By 2040, most scenarios show volumes once again approaching levels experienced in 2010. The only exception is Alternative C, where traffic is intentionally diverted completely away from Main. In this case, businesses would be trusting that excellent auto accessibility at their back door, combined with a premium pedestrian and parking experience at the front door, will ultimately be better for business than high auto volumes at the front door.

Summary of Ranking Criteria and Results

CMPO model results were an important factor in helping determine the best concepts to carry forward, but there are also many other factors as well. The steering committee for this effort utilized a spreadsheet to help account for various factors important to the community, and to place a relative importance on each factor. The table below shows how each alternative compared with the others in each major category. Observations from each category are discussed next.

Alternatives	Multi-Modal Circulation		Economic Development		Minimize Impacts		Totals w/o Costs		Costs		Total plus Costs		Alternatives
	Total Points	Rank	Total Points	Rank	Total Points	Rank	Total Points	Rank	Total Points	Rank	Total Points	Rank	
Possible Points	37		27		24		88		10		97.7		Possible Points
RTP 2040	6	10	7	10	17	2	31	10	10	1	40.8	9	RTP 2040
Two 2-ways	16	8	15	8	4	10	35	9	3	6	38.2	10	Two 2-ways
A, 2-In	12	9	9	9	20	1	41	8	9	2	50.3	8	A, 2-In
B, 3-In	22	7	21	4	14	4	57	3	6	3	63.2	3	B, 3-In
B, 4-In	26	4	21	4	10	7	57	4	4	5	61.0	4	B, 4-In
C, 3-In	22	5	24	1	8	8	55	7	6	4	60.1	5	C, 3-In
D, 3-In	22	6	21	4	11	6	55	6	3	7	57.2	6	D, 3-In
D, 4-In	28	3	21	4	7	9	56	5	0	9	55.9	7	D, 4-In
E, 3-In	30	2	24	2	16	3	70	1	2	8	71.6	1	E, 3-In
E, 4-In	33	1	23	3	13	5	68	2	0	9	68.3	2	E, 4-In

Improve Multi-Modal Circulation and Mobility

Any option which leaves Main Street as a 5-lane arterial ranks near the bottom because congestion remains excessive, which negatively impacts all other modes as well. In general, 4-lane couplet options fare better than 3-lane options, simply because there are more lanes to help assure that congestion will not be a problem. Also two couplets reduce congestion better than one, so Alternative E is the best performer here because it reduces congestion better than any other option. Alternative E also fared well with multi-modal circulation and Emergency Service response times, because both the major and minor couplets are separated by only one block. Hence transit patrons are not unduly affected, and any minor out-of-direction travel for emergency services and local circulation is more than made up for by time savings due to less congestion and better gaps.

Foster Positive Land Use Change and Economic Development

Major two-way arterials require more lanes to manage the same traffic, and they also require center-turn lanes to help manage traffic. So their footprint is very large, which leaves little room for any Complete Street uses, and makes them most compatible with auto-oriented businesses rather than higher density mixed-use environments. Given that the historic downtown is already pedestrian-oriented, and most of the rest of the auto-oriented Main Street outside of Downtown is ripening for redevelopment and higher densities, it makes sense that options involving 5-lane auto-oriented arterials do not fare well in terms of fostering land use intensification and mixed uses. Alternative C, which reroutes traffic around Main, and the Alternative E options, which employ two couplets, both were ranked highest here, and are each addressed in detail.

Alternative C: This concept may be the best able to foster the most land use change, because it reroutes all through traffic around Main, leaving Main itself to re-emerge as it once was generations ago, with angle parking, trees, streetscape, etc. Perhaps this is why it is shown in the Downtown Plan as the preferred concept. The rerouting of traffic most likely would require the removal of several homes and businesses, seemingly more on 100 East than on 100 West, but several nonetheless. That is a major negative accounted for elsewhere, but also potentially positive for land use change and economic development in that it removes many less compatible uses and opens parcel remnants for more compatible uses.

Because of its impacts, Alternative C overall is not one of the top three concepts overall, but it is not far behind and could emerge in first place eventually depending on the community's interests and the development of a program that successfully addresses the negatives. The rerouting of traffic, and subsequent reinvention of Main is a radical change but not necessarily a bad change. It would clearly hurt businesses such as gas stations on Main. They'd still be accessible via Main and cross streets, but they would no longer have any significant amount of traffic passing by. But, the reinvention of Main could easily elevate the value of those parcels,

making it attractive to sell to more compatible higher density uses. They could then move elsewhere, perhaps a block over to where auto traffic has been rerouted.

This concept has high potential, but also comes with serious consequences. If the potential is ever to have a serious chance of emerging, then a program will have to be carefully crafted and could include a market analysis of the potential value of land after the change, perhaps a redevelopment area declaration that will enable you to acquire businesses and other properties that will be seriously affected. Perhaps the project itself could set up a revolving fund to purchase properties from anyone who would not want to remain, and then pay back the fund once those properties are resold for more compatible uses. Animations, artistic renderings, market analysis, and program details would need to exist before public opinion solidifies against the idea, as they may tend to focus on the obvious negatives unless those negatives have been addressed adequately in advance.

Alternative E: The 3-lane concept means there would be three traffic lanes on Main and 100 West, but just 2 on 100 East and 200 East. The 4-lane concept raises Main / 100 West to 4 lanes, but still leaves 100/200 East as 2-lanes each. With Main at just 3-lanes, existing pavement can be converted to Complete Street uses, which will make it attractive to redevelop existing auto-oriented uses into higher-density mixed uses. Also, the upgrade of 100 West will likewise encourage the expansion of Downtown to that street. The overall ability of the four streets combined to handle a lot more multimodal traffic trips will likewise help ensure that development that otherwise would have went to suburban locations will instead find it attractive to locate in the historic core. Many of the other couplet concepts do this as well, but E is the most pronounced. Most of the others also require 4-lanes on Main/100 West to operate well, but E operates well-enough on just 3-lanes, because the other couplet is able to carry any spillover. E is a good compromise between the RTP, with its serious problems on Main, and Alternative C, which routes all traffic away from Main. E maintains enough volume on Main for the auto visibility that existing businesses may be dependent on, but also opens opportunities on Main for it to emerge as an attractive Complete Street corridor. A more detailed study with microsimulation analysis should determine if 3 or 4 lanes are ultimately needed on Main, but either way this may be the best bridge to move from today's reality to tomorrow's vision.

Minimize Neighborhood and Environmental Impacts

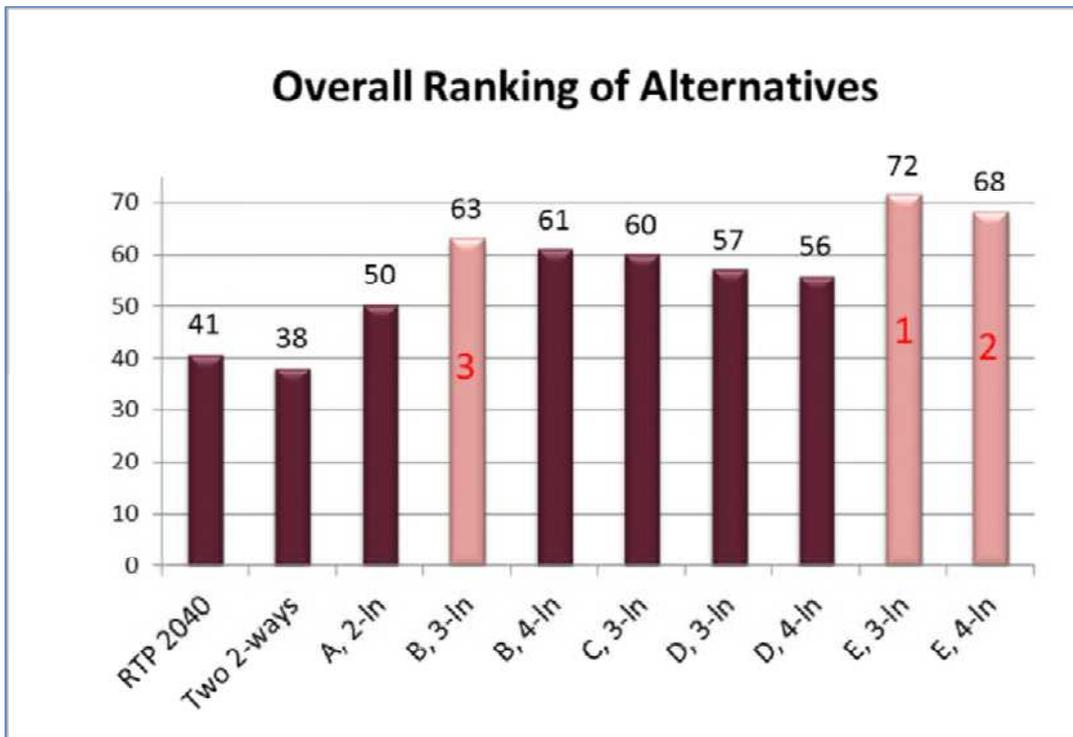
It almost goes without saying that since the RTP and smaller locally-implemented couplet concepts require very little effort to implement, they also score very well in terms of their ability to minimize impacts. But they also fail to adequately address the significant impact of congestion on Cache's livability and economy. Outside of these minimalist strategies, Alternative E 3-lanes scores well in this category, primarily because it fits well within existing right-of-way, but also because in many places it will need less pavement than is already there, which positively affects neighborhoods and helps most places become more walkable.

Minimize Overall Cost of Implementation

Minimizing costs also tends to minimize the effectiveness of the alternative at solving the congestion problem. So not unexpectedly the default RTP, and the locally implemented couplets score highest here. But as discussed earlier, while Alternative A does relatively little to solve long-term congestion, it also doesn't cost much to implement, so it has a high return on investment. The more effective options regarding long-term congestion are also expected to be among the most expensive options. Even those that can largely stay within the existing right-of-way may still need pavement and utility reconstruction, and ideally there would be a considerable effort aimed at beautification and upgraded multimodal amenities.

Overall Ranking of Alternatives

Given the criteria and weighting selected by the steering committee, along with both the quantitative and qualitative assessment of each alternative relative to each criteria, a comprehensive score was given to each alternative, which is visible in the above table and also shown graphically for each alternative in the figure below. Alternatives E 3-lane and E 4-lane were rated first and second respectively. The B alternatives, which are sub-elements of the E alternatives, are rated third and fourth. Alternative C, which routes traffic around Main, has great potential to be the best overall driver of economic development, but it also has significant impacts that push it to 5th place overall.

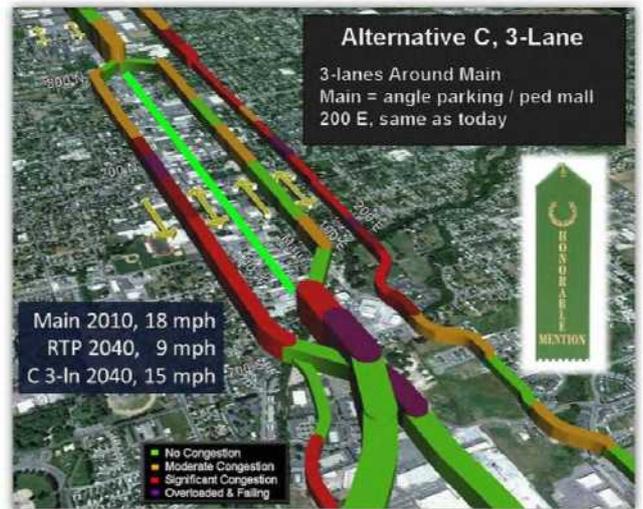
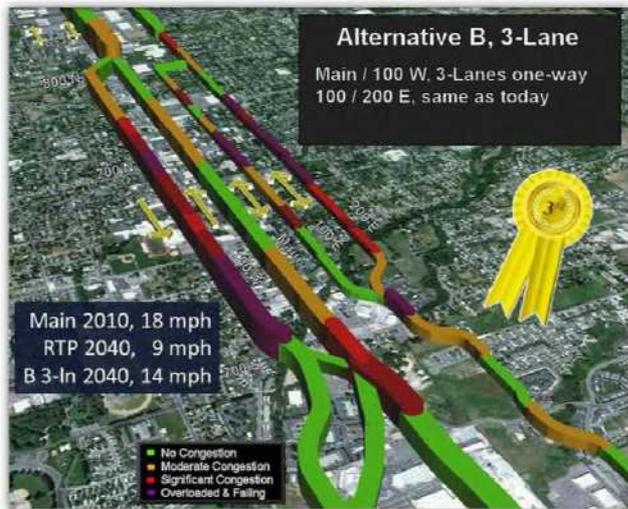
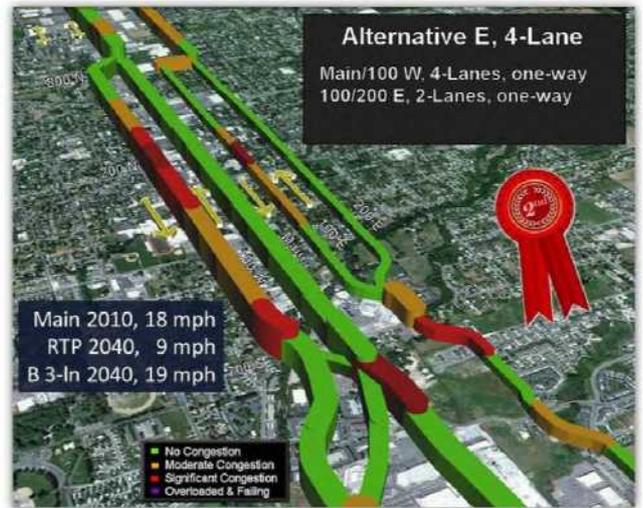
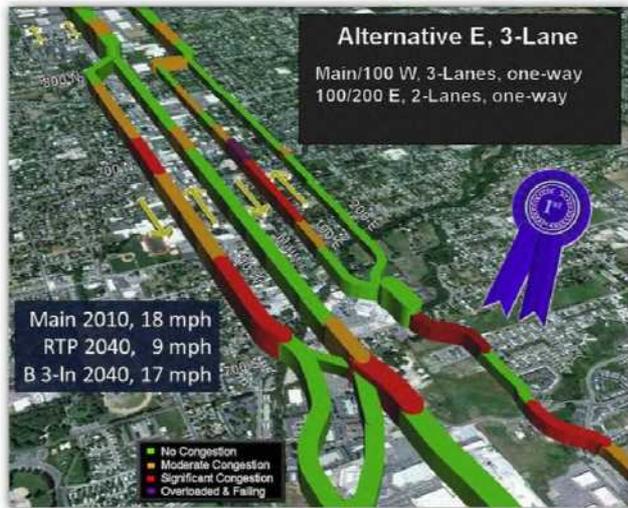
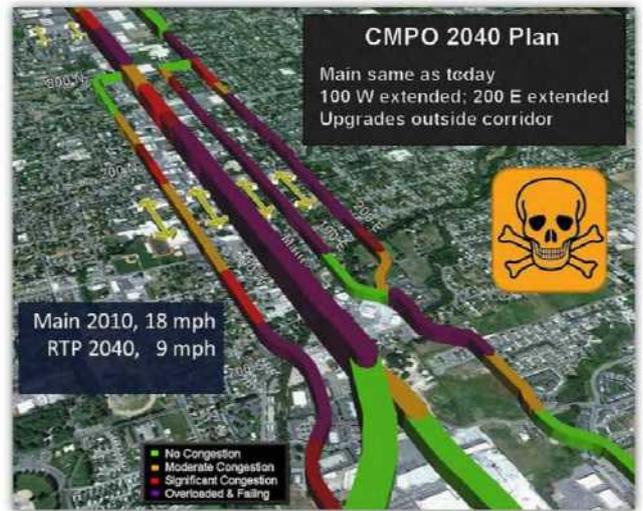
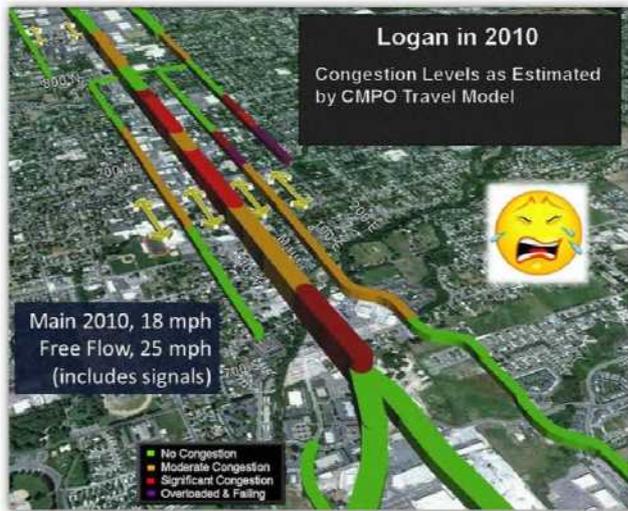


Bird's Eye View of 2040 Congestion Levels

A good way to comprehend results is a simple bird's eye view of congestion. The series on the next page shows the way things are today (as understood by the model, and may not exactly match up with driver experience), the way they will be in 2040 if only the CMPO Plan is implemented, and then how they would perform given the highest rated alternatives. Today's driver experience may seem poor, but it is actually much better than what will happen if all streets in question remain two-way streets by 2040. The best overall alternative reduces congestion back to no worse than it is today, even though there is significantly higher regional demand and also much higher local circulation demand generated by impressive infill and redevelopment within the corridor.

Note that the second-place Alternative E with 4-lanes on Main and 4-lanes on 100 West performs slightly better in terms of congestion reduction than the first-place alternative (identical, but with just 3-lanes on each street). But it still ranks second-place overall because the extra lane is significantly more expensive and impactful.

Bird's Eye View of 2040 Congestion Levels



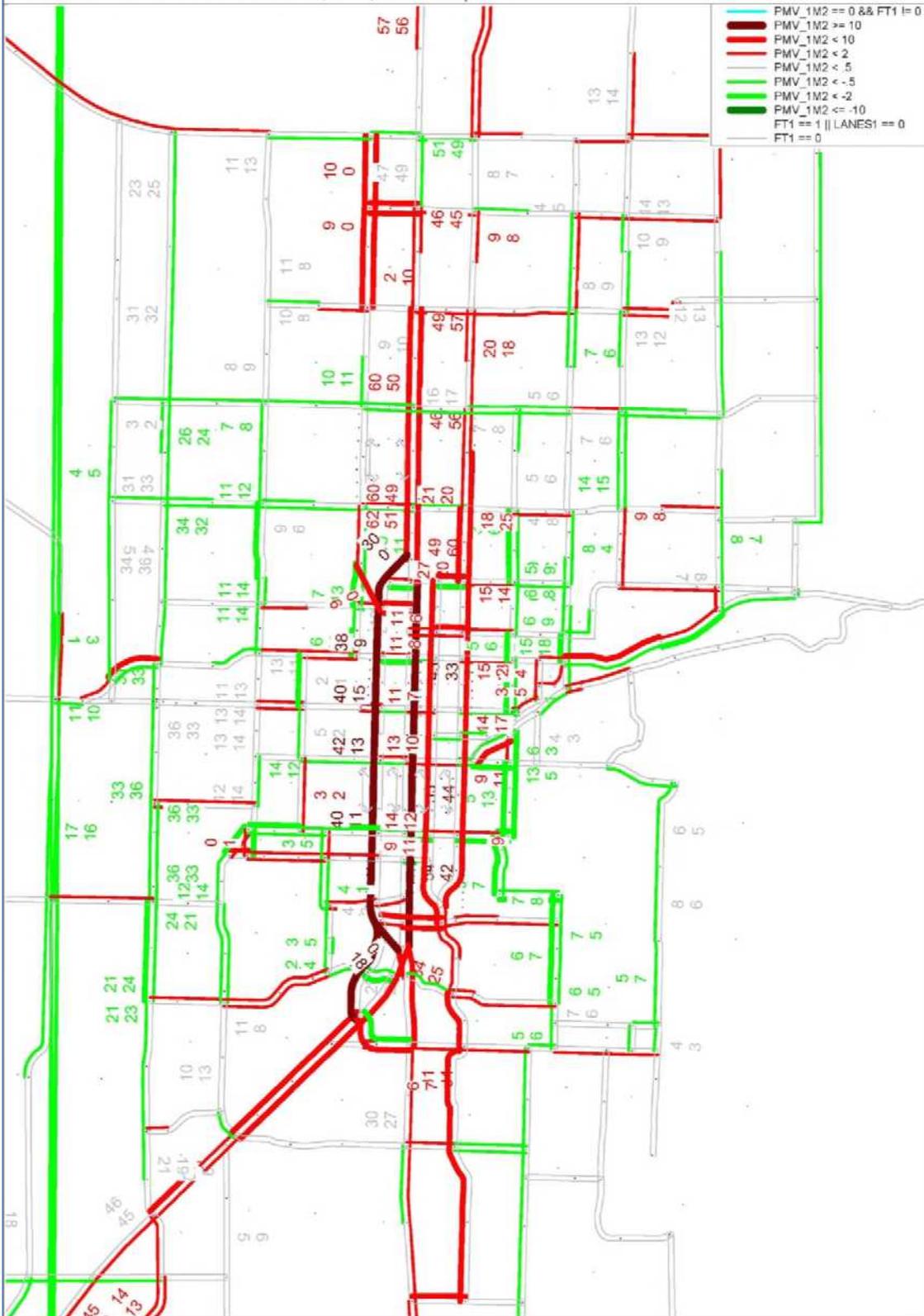
Citywide Effects of Alternative E

When streets like Main Street become overloaded, many drivers divert to parallel streets, which in turn overloads those streets, and causes spill over to roads even further away. The net effect on Logan is that as Main Street congestion gets worse, there will be a lot more traffic on neighborhood streets and collectors, often more than a mile away from Main Street. Any proposal that reduces delay on Main and increases overall capacity in the Main Street corridor will tend to pull that “latent demand” back into the Main Street corridor. That is a good thing for collectors of residential character such as 600 East and 600 West.

The figures on the next pages show the PM peak hour volumes of the currently preferred couplet strategy, Alternative E, compared to the CMPO RTP scenario for the 2040 time period. Green means Alt E causes volumes and congestion to go down on those streets significantly. Red means volumes go up, but congestion usually goes down – hence the reason more traffic was attracted to those corridors. Each half of the road is shown independently. Alternative E employs four streets in a couplet configuration. Notice that on those streets, one half of the road is red, and the other is grey. The grey means that direction carries zero traffic, while the other direction often carries double what it did before, because it has more lanes in that direction. So there is not necessarily much more overall traffic on those streets, but in the couplet direction there is much more, and the effect is to appear like there is much more in this figure.

Both figures are the same, but the second is zoomed in to show the labels more clearly, and the first lets you see the big picture effect on all of Logan. Labels represent daily volume in thousands. The label nearest the link is the RTP volume, and the next is the couplet volume. Looking at the big picture, the couplets generally increase traffic volumes within the corridor, and reduce traffic in all the rest of Logan. Both green and red appear to be desirable. Green because it draws down traffic in areas where the city wants it down, and red because higher volumes and better accessibility help support additional infill and positive redevelopment.

Daily volume changes, post 2040, Couplet E vs. RTP
 Red = more traffic, Green = less.
 Near label = DY volume in thousands, RTP; Far = Couplet E



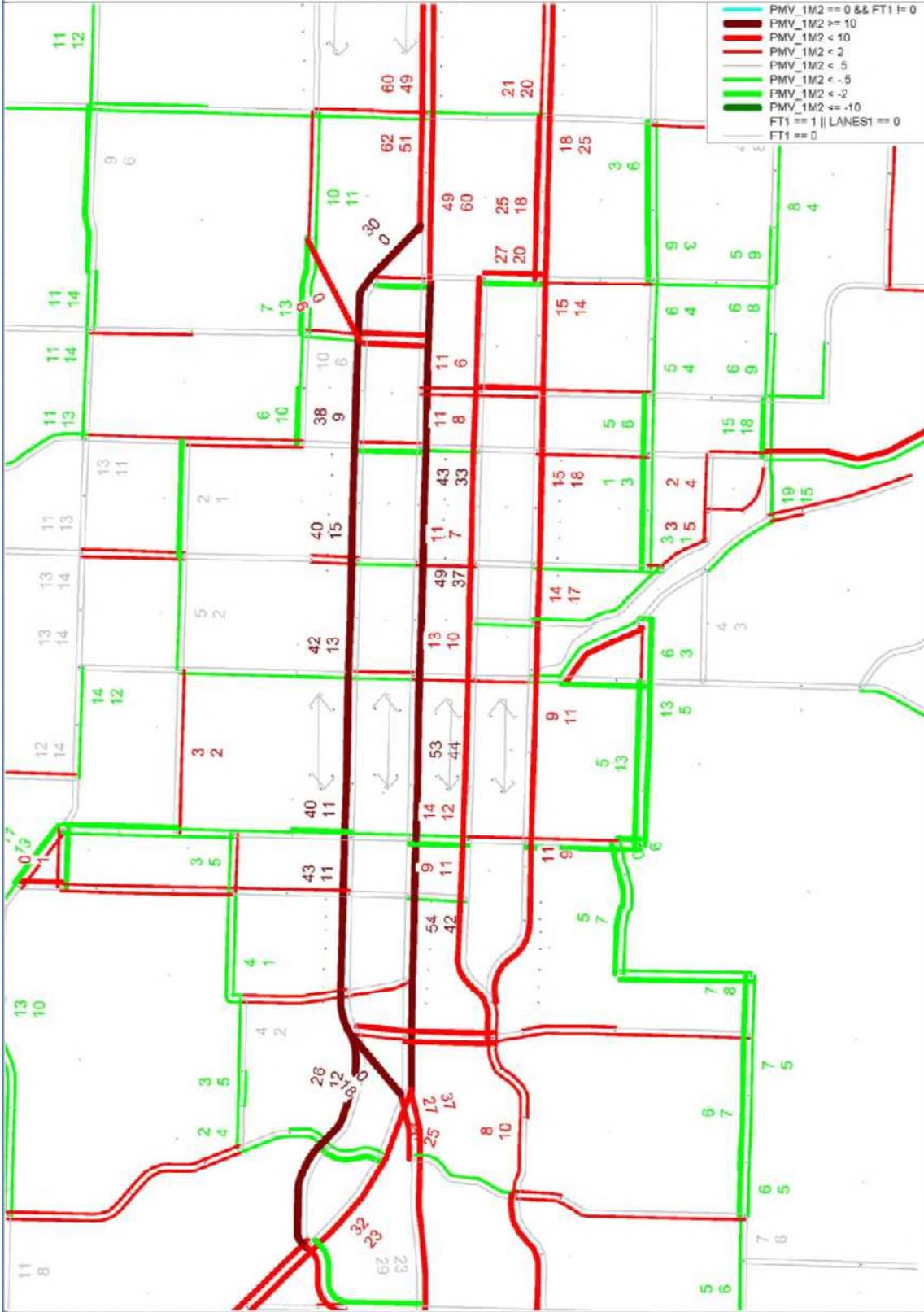
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Daily volume changes, post 2040, Couplet E vs. RTP

Red = more traffic, Green = less.

Near label = DY volume in thousands, RTP; Far = Couplet E



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Pedestrian Effects of Alternative E

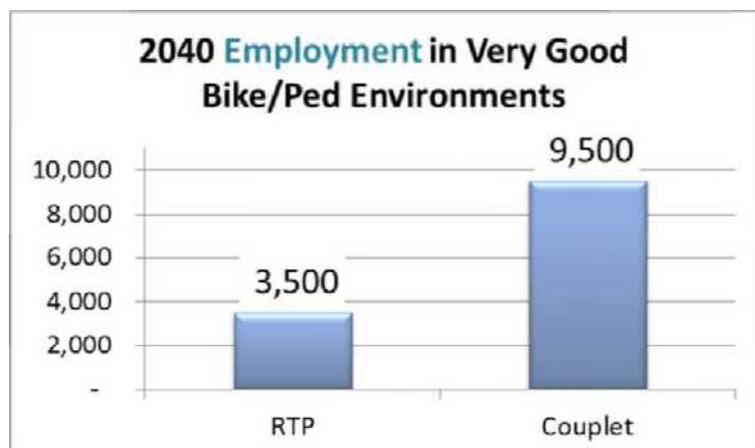
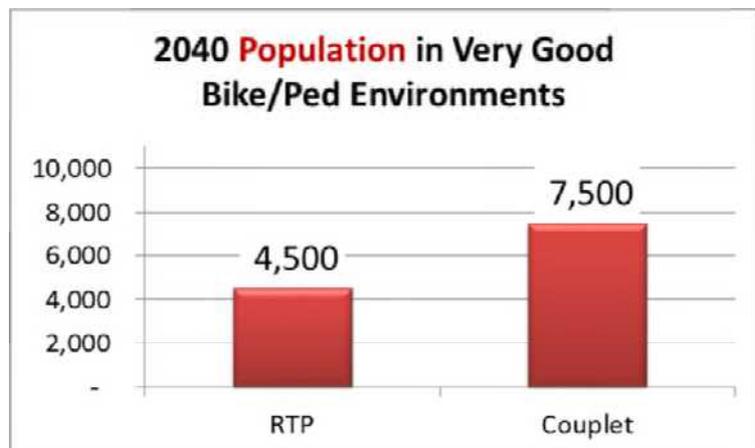
Alternative E has numerous positive results for pedestrians. Shorter cycle lengths for traffic also means the pedestrian walk-phase comes around much faster. Only 3-lanes of traffic on Main also means pedestrian crossings are shorter and less intimidating. It is also much easier to install mid-block pedestrian signals in the downtown area. These signals can be perfectly coordinated with signals at intersections, which means they will not impede traffic (i.e., a pedestrian can push the button, but it will not turn green until the signal's computer determines the right time). Further, because the couplet allows a huge amount of pavement to revert back to the pedestrian environment, a significant beautification project becomes possible, perhaps with outdoor restaurants, premium streetscape, taco carts and street vendors, etc. Over time, a true mixed-use environment with wall to wall buildings and ground-floor retail can emerge in an environment like this. All of this translates into shorter, safer, more pleasant walking environment.

TranspoGroup, a firm on our team, invented ViaCity which we used to measure all of these factors. ViaCity can measure the effects of a wide range of proposals on the pedestrian environment. The Regional Transportation Plan for 2040 was compared against Alternative E using ViaCity to see the effects.

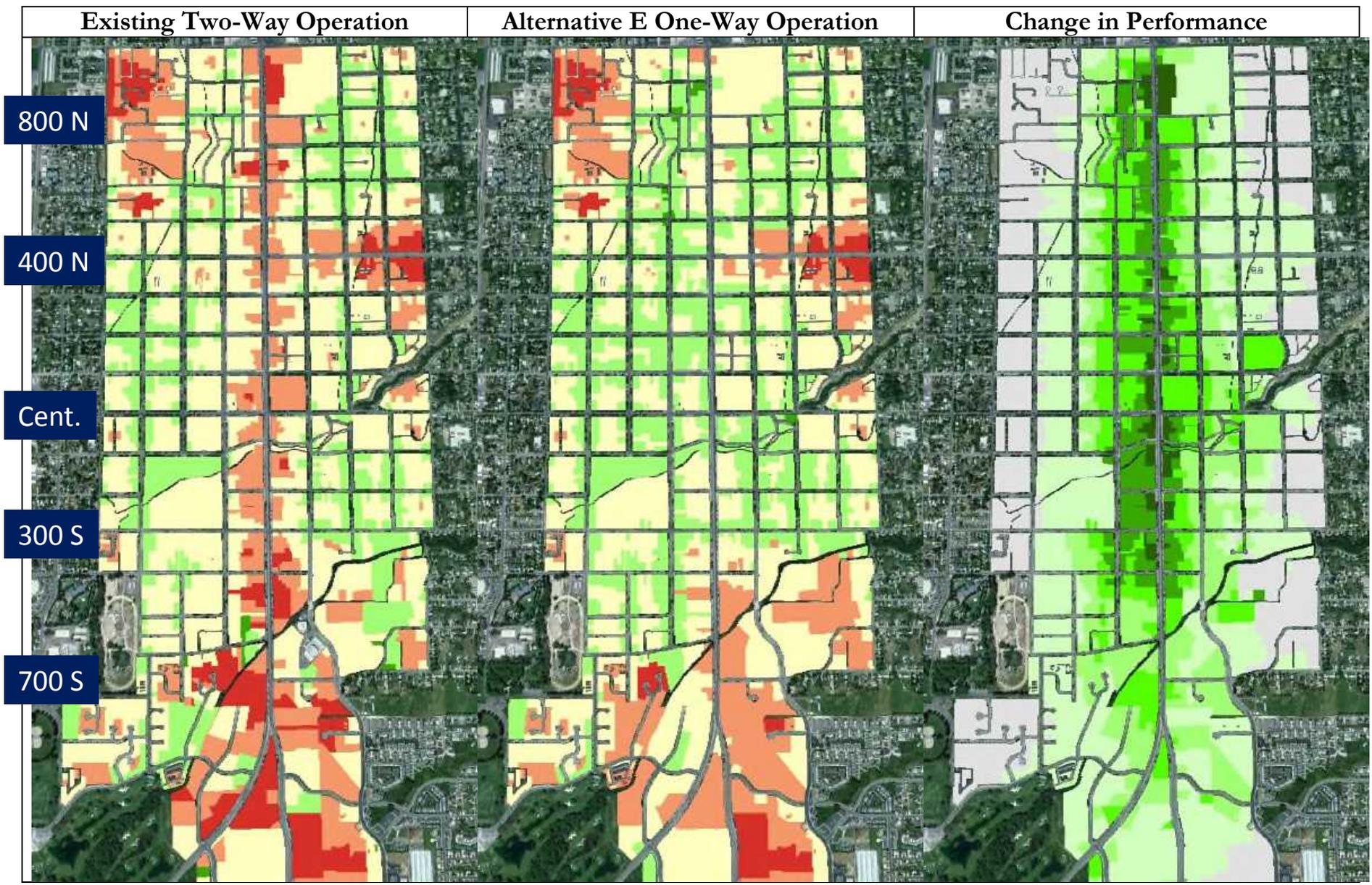
The study area in general already has many excellent pedestrian characteristics. The good connectivity between blocks makes walking paths generally short relative to more suburban locations with winding streets and many cul-de-sacs. But Main Street itself is a serious impediment that separates the east side from the west side. Further, extreme levels of traffic and inferior pedestrian space and amenities also mean there is room for improvement.

For 2040 within the study area, ViaCity determined that the existing two-way street configuration results in roughly 4,500 residents experiencing very good bike/ped conditions immediately near their residence, but that number nearly doubles to 7,500 with Alternative E. The effect on businesses is even more dramatic. Roughly 3,500 employees are within a very good environment, and that number nearly triples to 9,500 with the couplets.

Though “employees” was the measurement, what it is really saying is that the overall walk environment surrounding where these employees are located has become much more attractive. That in turn means modern mixed-use development, which needs both good automobile access as well as a safe and inviting bike/ped / transit environment, will be much more motivated to locate within the Main Street corridor after the project is implemented.

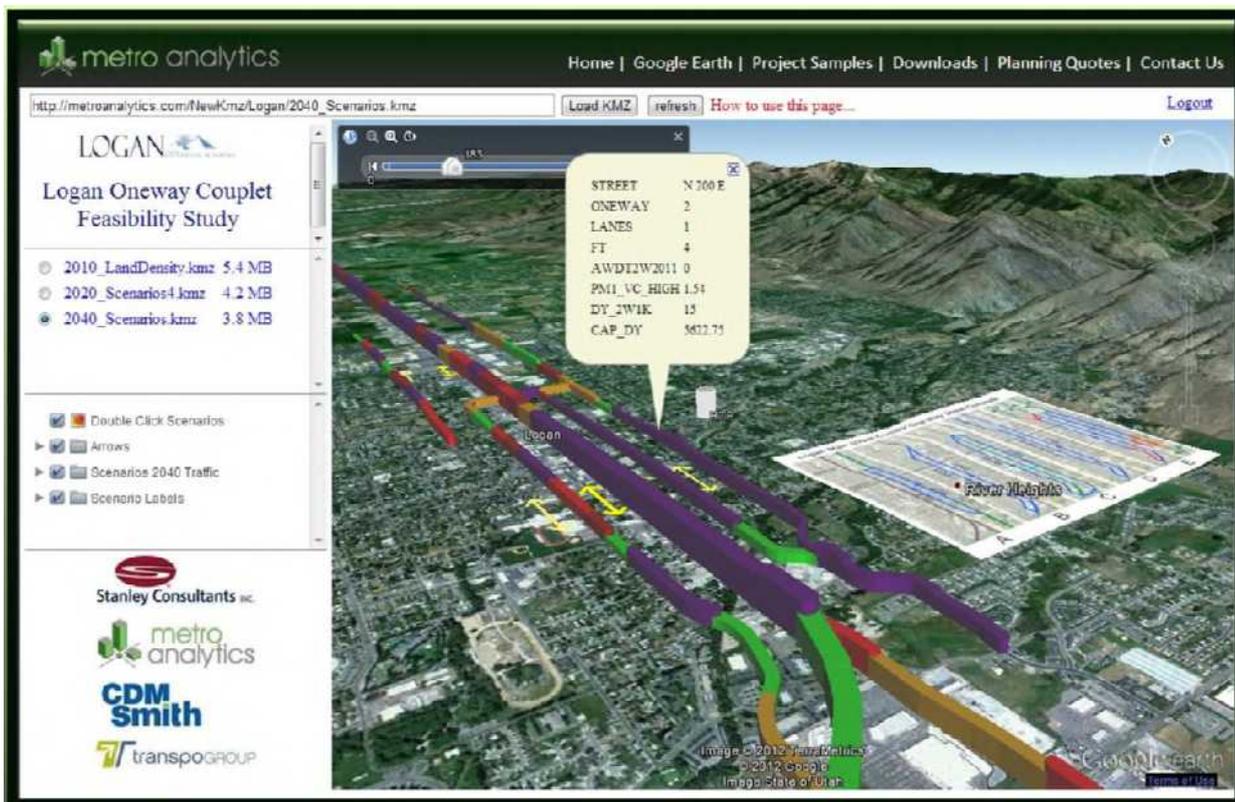


Pedestrian Parcel Analysis: ViaCity's assessment of pedestrian conditions in the study area. Green is good, red is poor, beige is in between. The change map (right) shows which parcels are better off. Grey parcels had no significant change, while dark green parcels are significantly better off.



Scenario Performance via Google Earth

CMPO model results of each scenario are available at the following link: <http://metroanalytics.com/kmlapp/>. Once there, click the “Login” at the top-right. Username = Logan; Password = Couplet. This will load a project results page. You may first need to install the Google Earth plugin. Select any .kml file from the list on the left, then “Load kml” button. After data is loaded, double click on “Double Click Scenarios”, to zoom to the Logan area. Once there, you can use standard Google Earth navigation. Use Shift+Click+drag to spin in 3D, and “R” to return to plan view. Use the time slider to slide between views of each alternative. Click on a feature, and a popup balloon shows statistics. A “white column” label will show you which alternative you are viewing. If it works, you should see something like this figure. Green means traffic is fine. Red means the link is congested but could be worse, and purple means it is failing badly. The height and thickness of the link represent the volume on the link. Arrows next to the link show whether the link is one-way or two-way, and the color/thickness of the arrow tells how many lanes there are.



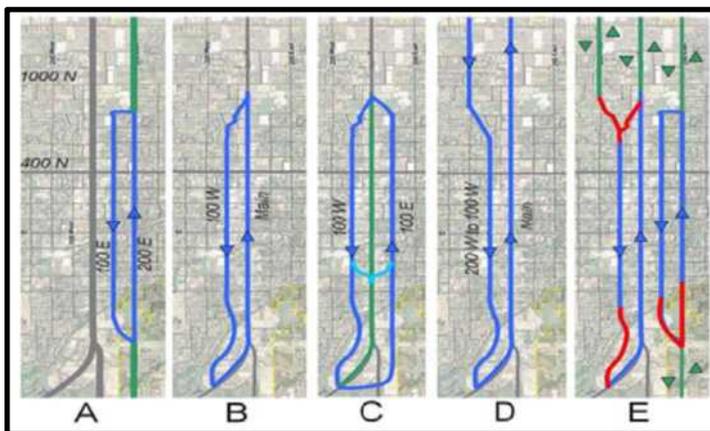
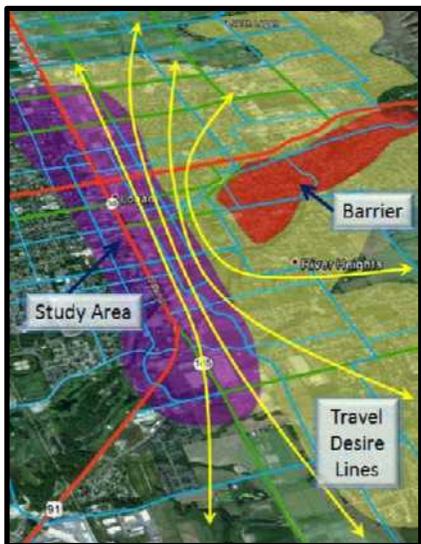
Appendix C

Public Involvement Materials



Hand Outs

Volumes are growing because we and our neighbors are developing, and there aren't many roads available.



One-way couplets can handle more traffic with less pavement, saving homes, businesses, and trees.

Residents requested further study of the options recommended for study in Logan's Transportation Master Plan as a means of meeting transportation needs and minimizing impacts.



Above represents 2040 congestion if we keep Main at 5-lanes as it is today (left), vs. converting to a couplet system where Main and 100 West are each 3-lanes, and 100/200 East are each 2-lanes (right).

Travel time between 1200 South and 1400 North for CMPO 2040 is 21 minutes vs. just 11 minutes for the Alternative E, 3-Lane option. This is about 48% travel time savings.

Please visit www.loganutah.org, for complete details.



Positive Aspects of Couplets in Logan

- ✚ **More Green Time:** No left-turn arrows means more time for travel through intersection.
- ✚ **More Capacity:** Each lane can carry up to 30% more traffic.
- ✚ **Less Pavement:** Main has 5-lanes. Option E couplets serve 2040 traffic with just 3-lanes on Main.
- ✚ **More Room:** Space for bike lanes, diagonal parking, better streetscape, outdoor restaurants, etc.
- ✚ **Synchronization:** Signals are easy to coordinate. Get through 4-6 signals every time.
- ✚ **Speed Control:** Perfect timing = speed compliance, so set speed limits fast, medium, or slow.
- ✚ **Shorter cycle lengths:** Cross traffic and pedestrians can cross much faster.
- ✚ **Safer:** Fewer conflict points, and more gaps in traffic for pedestrians and traffic to cross.
- ✚ **Destination Businesses:** Usually improves or unaffected. Property values increase in long run.

Negative Aspects of Couplets in Logan

- ✚ **Out-of-Direction Travel:** Almost insignificant when separated by just 1-block. Reduced congestion saves much more time than the time lost due to out-of-direction travel.
- ✚ **Risk of turning wrong way:** True, but 95% of drivers become aware within first year. Lower speed limits help reduce the severity of accidents.
- ✚ **Convenience/Drive Thru Businesses:** Possible sales reductions when volumes initially drop, but volumes will increase over time, with more efficient use of pavement width causing less congestion. Additional study of the effects to all businesses is recommended.

Neighborhood Effects

Handles *more* traffic, but seems like *less* traffic? Why?

- ✚ With two-way streets, it is hard to get a gap in both directions, making it hard to get out of your driveway even at relatively low volumes. With one-ways, it is easier to get out of the driveway because the gaps are created from one direction.
- ✚ 100 East and 200 East each need 3-lanes today, but with couplets just 2-lanes are needed, since center-turn lane is not needed.

Key Statistics

- ✚ Roughly 40,000 vehicles/day today; 50,000 by 2040, plus spillover to neighborhoods.
- ✚ Couplets drop Main to ~34,000 in 2020 (1990's levels), returning back to roughly 40,000 by 2040.
- ✚ 1400 N to Y via Main: ~7.5 minutes if no congestion; 22 in 2040 CMPO improvements; 10 minutes in 2040 with couplets.

Next Steps

- ✚ Amend Plans to show Alternative E as the preferred configuration.
- ✚ Work with State and Local officials to complete an environmental analysis and identify funding options.
- ✚ Incorporate public input in to Feasibility Study findings and recommendations.

Email comments to holmesdana@stanleygroup.com by July 31, 2013.

Although the Cache Metropolitan Planning Organization model results were an important factor in helping determine the best concepts to carry forward, there are also many other factors. The steering committee for this effort utilized a spreadsheet to help account for various factors important to the community, and to place a relative importance on each factor.

Alternatives	Multi-Modal Circulation		Economic Development		Minimize Impacts		Totals w/o Costs		Costs		Total plus Costs		Alternatives
	Total Points	Rank	Total Points	Rank	Total Points	Rank	Total Points	Rank	Total Points	Rank	Total Points	Rank	
Possible Points	37		27		24		88		10		97.7		Possible Points
RTP 2040	6	10	7	10	17	2	31	10	10	1	40.8	9	RTP 2040
Two 2-ways	16	8	15	8	4	10	35	9	3	6	38.2	10	Two 2-ways
A, 2-In	12	9	9	9	20	1	41	8	9	2	50.3	8	A, 2-In
B, 3-In	22	7	21	4	14	4	57	3	6	3	63.2	3	B, 3-In
B, 4-In	26	4	21	4	10	7	57	4	4	5	61.0	4	B, 4-In
C, 3-In	22	5	24	1	8	8	55	7	6	4	60.1	5	C, 3-In
D, 3-In	22	6	21	4	11	6	55	6	3	7	57.2	6	D, 3-In
D, 4-In	28	3	21	4	7	9	56	5	0	9	55.9	7	D, 4-In
E, 3-In	30	2	24	2	16	3	70	1	2	8	71.6	1	E, 3-In
E, 4-In	33	1	23	3	13	5	68	2	0	9	68.3	2	E, 4-In

The below goals and objectives were evaluated in order to compare each couplet scenario:

Goal: Promote Regional Multi-Modal Mobility

Objectives:

- Solve the immediate problem (or prevent it from getting worse by 2020)
- Find the best performing scenarios over the long run (post 2040) and minimize delay times
- Improve Level of Service (LOS) on Main Street
- Improve LOS on adjacent roadways
- Meet Local and State Requirements and Standards
- Improve mobility for bikes, pedestrians, and transit
- Develop logical termini to roadways that can handle future traffic
- Address “missing links” in the transportation grid with project areas

Goal: Foster Positive Land Change and Economic Development

Objectives:

- Good access to local businesses (multi modal)
- Compatible with related/approved plans (*Transportation Master Plan, Downtown Specific Plan, Envision Cache*)
- Foster quality commercial and residential development
- Reduce pavement required for managing traffic

Goal: Minimize Neighborhood and Environmental Impacts

Objectives:

- Community support
- Maintain effective emergency service access
- Minimize displacements and relocations
- Maintain or improve parking for businesses
- Minimize noise and air quality impacts (surrounding neighborhoods)
- Minimize impacts to parks, schools, and recreation areas
- Avoid or minimize impacts to historic buildings/properties

Goal: Minimize Overall Cost of Implementation

Assumptions/Objectives:

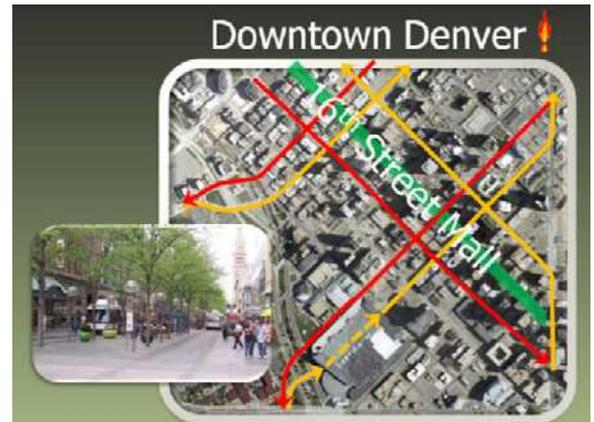
- Existing local roads will require only regular scheduled pavement maintenance (No pavement cost for implementation)
- 100 West will be constructed to meet minimum pavement standard for an arterial facility
- Main Street will require only regular scheduled pavement maintenance (No pavement cost for implementation)
- Main Street will not be widened (No cost for implementation)
- Sidewalk, curb and gutter will only be replaced in locations that the roadway is widened
- Right of way will be acquired only if roadway (Asphalt Pavement) requires widening (No Right of way will be acquired for sidewalk, park strip, or curb and gutter)

Couplet scenarios were evaluated in the context of how well they fulfill the project's goals and meet its objectives. The public input gathered during this outreach process will also be factored in to the evaluation matrix and overall findings of the Feasibility Study.

Thank you for your time and input!

Common Arguments in Support of One-Way Couplets

- 1. Frees up Right-of-Way!** Couplets do not need a center turn lane or left-turn arrow. This can result in up to 30% more overall green-time. The former turn lane can be put to other uses, and you may even be able to move the same traffic with fewer through lanes and avoid widening!
- 2. Drive Slower, Travel Faster!** Couplets can have near-perfect signal coordination. People quickly discover that if you drive exactly the speed limit, you will hit all the green lights! With 11ft or even 10ft lanes capacity is barely reduced, but still calms traffic through sensitive areas. Plus you may still end up traveling faster because congestion delay is minimized.



- 3. Multi-modal flexibility.** Incorporating couplets can be a tool to create mixed-use “Places” using narrower, pedestrian-friendly streets that also allow good traffic circulation. It may become more feasible to implement Complete Streets uses and improved transit amenities within the existing right-of-way.

- 4. Friendlier and safer for pedestrians and cyclists!** Narrower one-way streets are easier to cross than two-way arterials with left-turn arrows. Pedestrian and cyclists have far fewer movements that threaten to strike them and slower traffic is less intimidating.

- 5. Town Center, “Place Making:”** Couplets expand the grid and increase accessibility. Good visibility from more streets encourages mixed-use growth beyond just a single arterial. Couplets keep traffic in the Town Center instead of diverting traffic away due to bypasses or road-diets that may cause businesses to suffer. Portland, Denver, Boulder, Palm Springs, New Orleans – couplets are much of the reason some of the most popular high-density, mixed use environments are succeeding.



Common Arguments *Against* One-Way Couplets

1. **Couplets require out-of-direction travel!** This is an extremely minor issue when couplets are separated by only a block or two, but becomes more of an issue with wider separation. Inconvenience may be minor compared to travel time improvements from reduced congestion.

2. **Couplets create blight!** With some older couplets, land uses and multi-modal features were completely ignored resulting blight. Recent couplet success in Palm Springs, Boulder, Portland and a myriad of other locations demonstrates how it is possible to integrate modern couplets with adjacent land uses and multi-modal environments to support economic development.

3. **Couplets will cut traffic counts in half, and be bad for business!** Couplets do not cut traffic in half. Actually, traffic may be the same as before, even with fewer lanes. If traffic does drop initially, there is some evidence that convenience businesses such as gas stations and fast-food restaurants that depend on high counts at their front door may see a slight reduction.

Couplets use two streets to carry a lot more people. The secondary street may go up, which is good for business expansion on that street, and elevates the overall area's activity and importance.

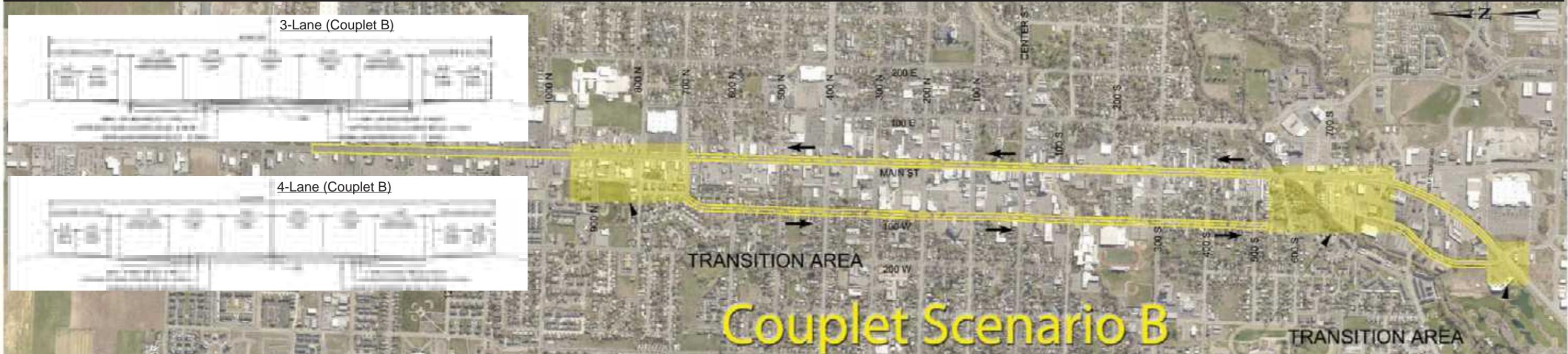
4. **Couplets increase traffic near homes!** Couplets usually increase traffic on at least one of the two streets. This can be good if the intent is to expand a Town Center to that street, but controversial if it is mostly owner-occupied single-family homes. But even in residential areas, more traffic can seem like less traffic. It is easier to get out of the driveway, since you need a gap in just one direction.

5. **Couplets increase the number of signals & violate access management guidelines!** Couplets can result in more signals than the two candidate streets have already. But couplets actually move traffic better with more signals, because it is easier to hold automobile platoons together and synchronize signals. Frequent signals create more crossing opportunities for pedestrians. It is often possible to demonstrate within highly accurate simulation software that even with more signals and less stringent access management rules, the overall amount of system delay will be significantly less with a couplet system than with a large two-way arterial system.



Email comments to holmesdana@stanleygroup.com by July 31, 2013.

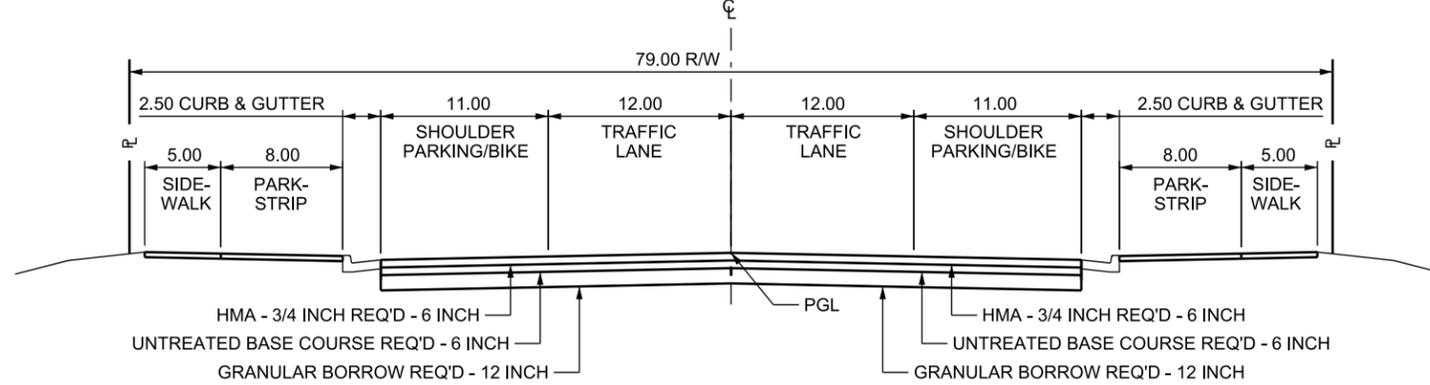
Display Boards



TYPICAL SECTION 1

LOGAN COUPLET

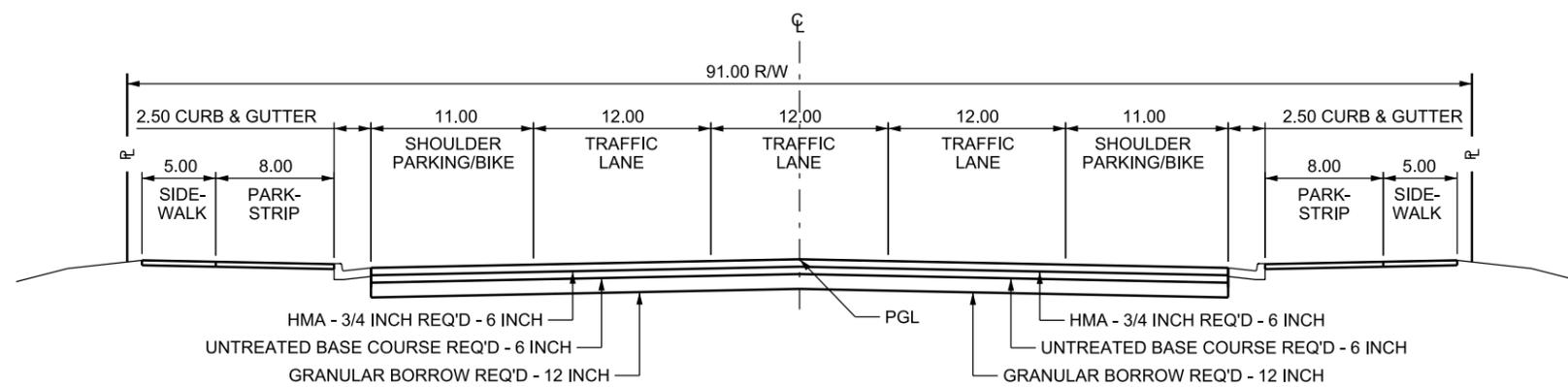
2 LANES
COUPLET A, COUPLET E - 3 LANE (A), COUPLET E - 4 LANE (A)



TYPICAL SECTION 2

LOGAN COUPLET

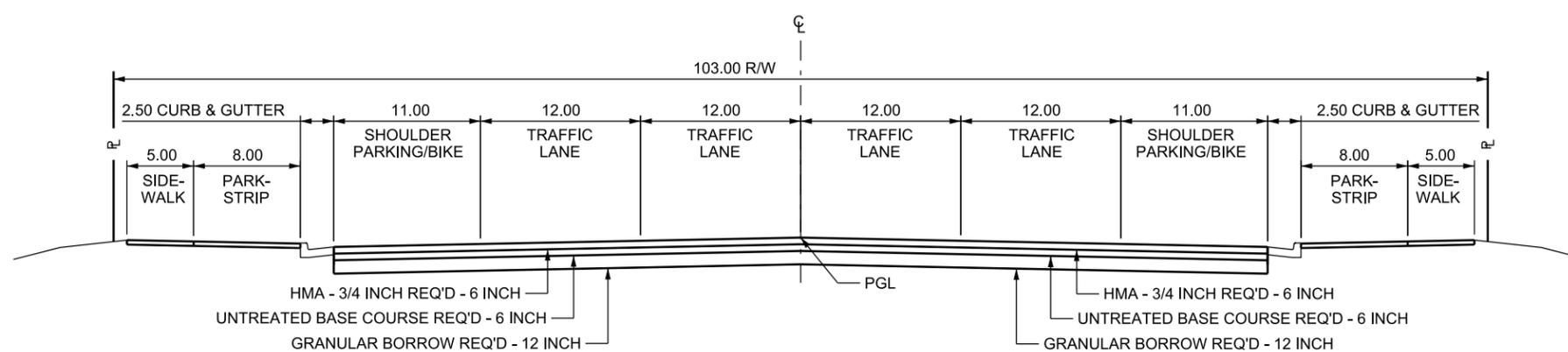
3 LANES
COUPLET B - 3 LANE, COUPLET C - LOCAL, COUPLET C - UDOT, COUPLET D - 3 LANE, COUPLET E - 3 LANE (B)



TYPICAL SECTION 3

LOGAN COUPLET

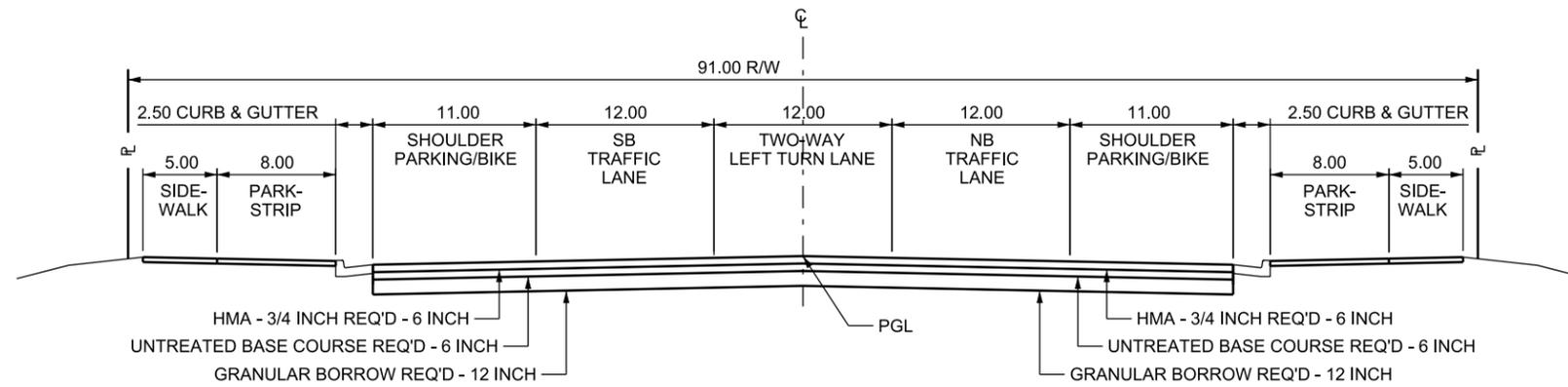
4 LANES
COUPLET B - 4 LANE, COUPLET D - 4 LANE, COUPLET E - 4 LANE (B)



TYPICAL SECTION 4

LOGAN COUPLET

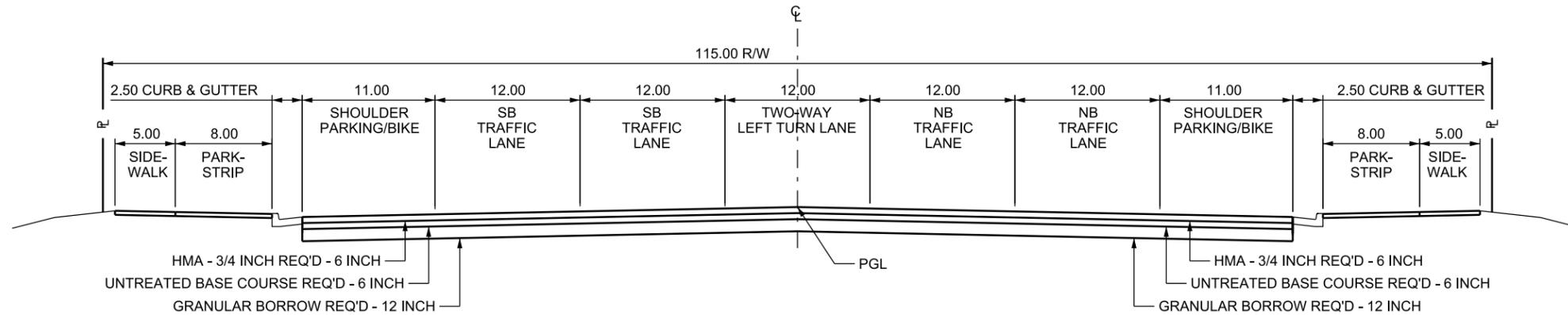
1 LANE (TWO-WAY)



TYPICAL SECTION 5

LOGAN COUPLET

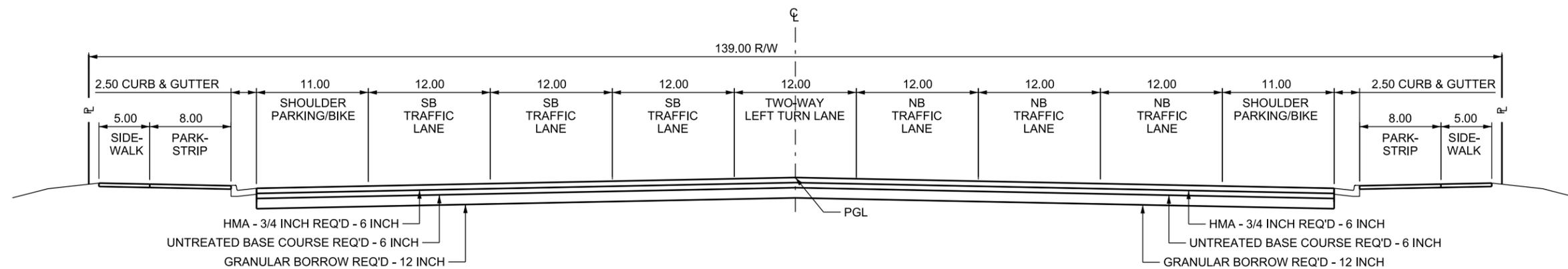
2 LANES (TWO-WAY)
TWO 2-WAY



TYPICAL SECTION 6

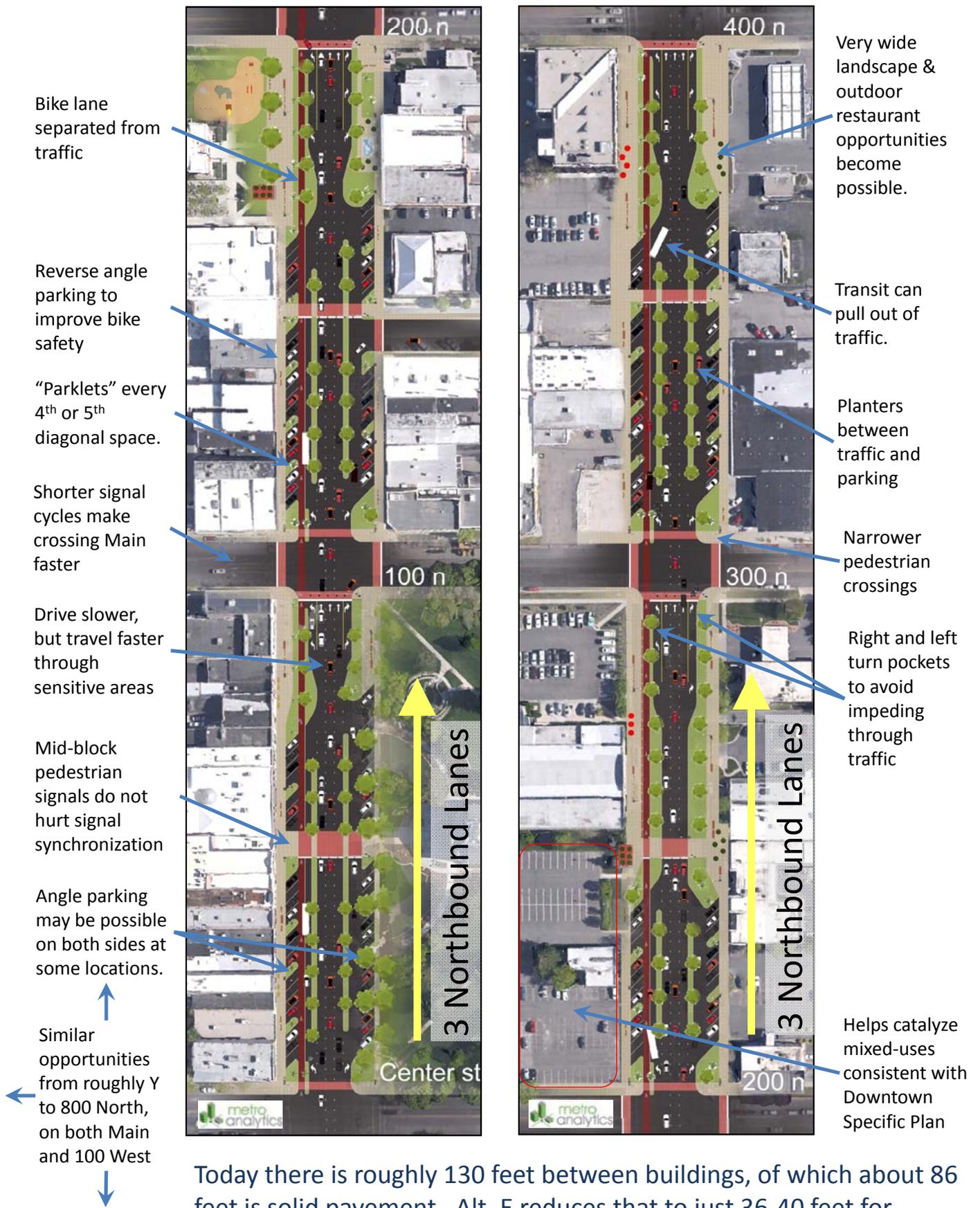
LOGAN COUPLET

3 LANES (TWO-WAY)



Concept Sketch for Main

One of dozens of ways it could be arranged under Alternative E



Today there is roughly 130 feet between buildings, of which about 86 feet is solid pavement. Alt. E reduces that to just 36-40 feet for traffic, leaving roughly 90 feet available for the imagination!

Main Street

As it could be...



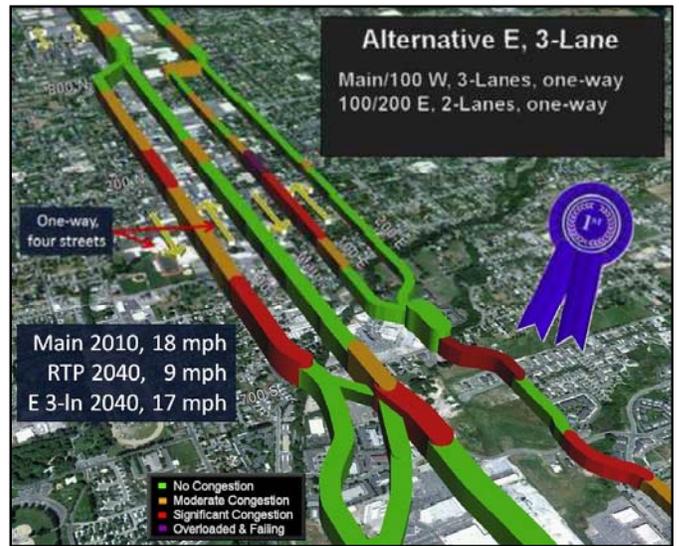
As it is...



Pedestrian Scale

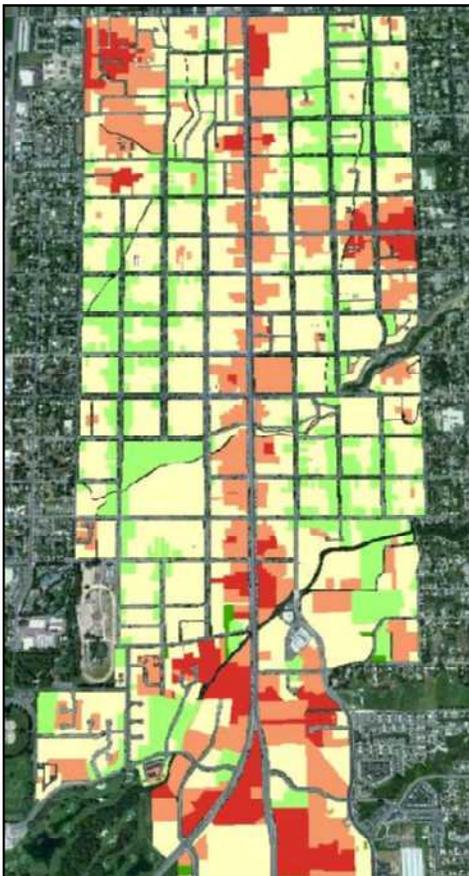


Predicted Congestion

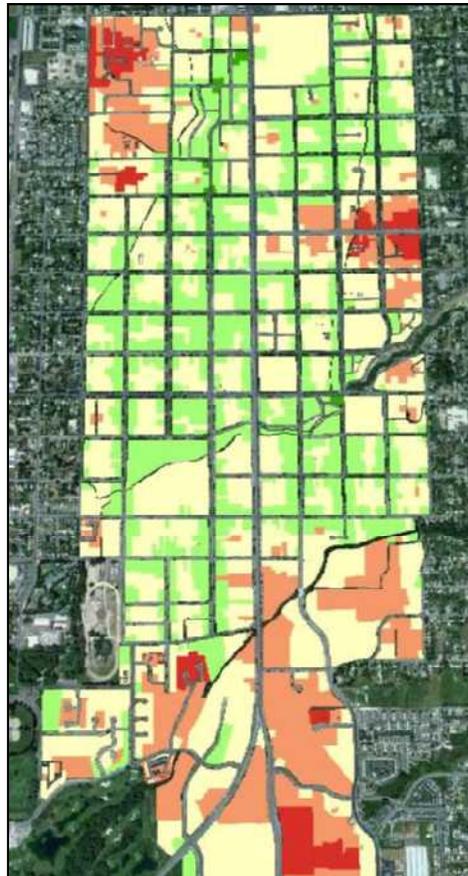


Change in Pedestrian Environment

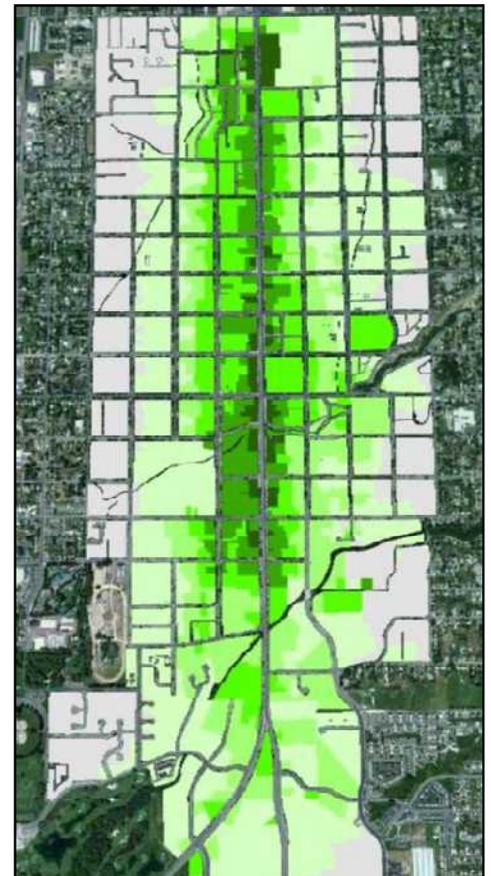
Before



After



Change



Green = Pleasant, safe, direct walk experience to/from each property.
Red = Unpleasant, less safe, slow, and circuitous walk experience.

Green = significant improvements
Grey = no significant effect

Sign In Sheets

Sign In Sheet
Public Meeting
July 17, 2013

Name	Address	Affiliation
Randy Park	758 East Anderson Ave Hyrum	CVTD
Anne Hedrich	397 N 300 W Logan	Ellis Neighborhood Area
Theo Thomas	1361 Mt Logan Hwy	Wilson Westside Area
Gene Needham	141 No. Main Logan Ut.	Downtown Alliance
LAURIE JOHNSON	410 S. 200 W. LOGAN	WOODRUFF NEIGHBORHOOD
Ray Robison	335 N. 400 W Logan	Ellis Neighborhood
TOM WEAVER	1766 E 1140 N LOGAN	HILLCREST + WOODRUFF
Marilyn Griffin	630 W 200 E Logan	Adams Neighborhood
John Powell	160 W 500 N, wellsville	County Resident

Sign In Sheet
Public Meeting
July 17, 2013

Name	Address	Affiliation
Peter	911 W 400 S Logan	Logan Resident
Jennifer Rembertson	91 W 400 S Logan	citizen
Jeff Gunther	116 W 500 N Logan	Resident
Katie Wylarz	116 W 500 N Logan	Resident
Brent Nyman	1155 E. 1900 N. Logan.	Resident
Ted Nyman	524 E 1100 N Logan	Resident
Janai Serinowski	109 E. 100 N Logan	Planning Commission
Josh Reinhart	179 RAIL WAY, LOGAN	Carter County
Steve Sturgeon	85 E 100 N Logan	St. John's Episcopal Church

Sign In Sheet
Public Meeting
July 17, 2013

Name	Address	Affiliation
Kee Hale	862 W. 330 S. Logan	Resident
JARED LEATHAM	1554 Talon Dr Logan	Resident
MARTIN CARRILLO	485 W 880 N LOGAN	RESIDENT
JAMES OLSON	50 Brookside Logan	Resident
GARY SAXTON	160 N MAIN STREET	LOGAN DOWNTOWN ALLIANCE
Amanda Castillo	190 W 500 S	Resident/ ^{Downtown} Business emp.
Grant + Linda Bergsjö	109 E 300 S	RESIDENTS
Shirrie Mitchell	135 W 400 S	Resident
JOY REYES	343 W 400 N	Resident



Comments Received

holmeskna@stanleygroup.com

Comment Form
Public Meeting
July 17, 2013

Name:

RUSSELL GOODWIN

Address:

1505 EAST 1900 NO.

Comment:

ONE-WAY STREETS ARE HORRIBLY
AN EXTREMELY BAD IDEA. WE
CANNOT AFFORD THESE GRANDiose
EXTRAVAGANZAS ANYMORE!

Comment Form
Public Meeting
July 17, 2013

Name: Melissa Wegener

Address: 405 S. 100 W.

Comment: Our south Logan neighborhood is struggling. There are lots of rentals & properties (including commercial) that are unkempt. People like us, who want to live in ~~Logan~~ downtown & have improved & maintained our homes are being pushed out. What is the use of a "walkable" community if no one lives within walking distance?! We support turning 100 W into a one way street, but any plan that calls for stealing land from our front yard will be vigorously opposed. The end result will ~~also~~ push south Logan into more of an inner city slum than it already is. Why do I feel like the downtown businesses, bikers etc. have a voice, but the people who LIVE here don't?

Comment Form
Public Meeting
July 17, 2013

Name:

Jeff Gunther

Address:

116 W 500 N Logan

Comment:

- Bicycle infrastructure seems like an afterthought (put with parking, left of travel lanes, no way to turn) and either not existing on 100w or requiring taking property).

- Truck traffic on 100w is a concern

- ~~A~~ 3 lanes on 100w is a lot of traffic in a residential area

Comment Form
Public Meeting
July 17, 2013

Name:

JARED LEATHAM

Address:

1554 Talon Dr Logan

Comment:

I am excited and hopeful for this progressive step. The couplet option is the proper way to go. I would like to see the project scope expanded further north. The concepts for main street from center to 400 North would be an amazing realization in function and aesthetics.

Comment Form
Public Meeting
July 17, 2013

Name: MARTIN CARILLO	Address: 485 W 880 N. LOGAN
Comment: I AGREE THAT THE COUPLETS SCENARIOS WOULD BE OUR BEST OPTION FOR ALLEVIATING TRAFFIC CONGESTION IN LOGAN. THE QUESTION AREAS MAY NEED TO BE RESEARCHED THOROUGHLY BEFORE ANYONE BUYS OFF ON IT. YOU HAVE MY SUPPORT.	

Comment Form
Public Meeting
July 17, 2013

Name: Bergsjø's (Grant/Marfy)	Address: 250 S. 100 E 109 E 300 S.
Comment: Make main a 6 lane hwy. Leave residential alone. Main is the logical thorough fare through Logan. Don't cut traffic from Main. Right now we can't back out of our driveway on 100 East.	

Comment Form
Public Meeting
July 17, 2013

Name:	Tom Tweet	Address:	440 N 200E P.O. Box 749 Millville, VT 05326
Comment:	Thank you for finally taking a potentially serious look at the concept one way couplets in Logan. I have been convinced for years that this is the only real solution to Main St. traffic issues. Please keep looking even though only short steps are probably feasible at first.		

Here are my thoughts from this evening. I think the Stanley Group brought some great ideas to the table. I am, however, disappointed that our council members waited until this point to solicit public input. I would hope that some of the following ideas would garner serious thought. I am no engineer or city planner. I have lived in this city for 32 years. I grew up east of the university, I attended USU, my wife and I lived for four years on Main Street, and in 2008 we bought a home on 100W. We choose to live in Logan.

We need a multi-faceted approach to solve this issue. Essentially asking 100W to bear the extreme negative quality of life change is inequitable because it means the sure destruction of our neighborhood. In some ways we are already hanging by a thread down here (socio-economically). Moving all/most southbound traffic from Main Street to 100W would, well, turn us into the homes currently on south Main Street... blighted and depressed (we know because we lived in the basement of one of them). The quality of life costs must be shared by more than just one street.

I don't think that any of the three current options solve *the problem*. The problem is simply that there is only one way to traverse Logan effectively, and that way is still Main Street. A multiple option approach allows for traffic redundancy and choice based on origin and destination. I have come up with a plan that could potentially solve many of the issues discussed tonight and provide better overall options for future proofing access to Logan.

- 1.) Leave Main essentially as is. If, in the future, more lanes are necessary, look at removing parking and adding two extra lanes. But the following options might make it unnecessary. Certainly don't remove lanes... unless this works better than I think it will.
- 2.) Complete the couplet on 100E and 200E.
- 3.) Connect 100W through the existing church on 600S. Leave it two-way. Yes I know that it is the church I attend, and I know that would increase flow on 100W but I'm serious about everyone needing to share the load. Traffic will increase, but not nearly as bad as the other options.

Here is the key: If Logan has a beastly traffic problem.... *stop feeding the beast*. Change the artery and you change the game. Logan has rarely had an east-west flow problem. It has a north-south flow problem.

- 1.) Coming from SLC, make US Highway 89/91 divert to 1000 W. Connect them. If you want to proceed to Logan directly, make an exit or a light that makes you go that way. But flow traffic from the south onto 1000W.
- 2.) 1000W could connect to 2500 N via a large curve.
- 3.) 2500N would connect with Main Street (US Hwy 91) as it does now only via a large curve. Traffic coming to Logan from Smithfield would be routed to 1000 W. Traffic from the north should be incentivized to traverse the valley via 1000W, but could divert to Logan.
- 4.) Beef up 600W. Make it a traversable north south artery. Focus on the north end of 600W connecting to 2500N and the other E-W arteries.
- 5.) 1000 West could feed Logan at the following points: 200N, 400N, 1000N, 1400N, 1800N, 2200N

- 6.) A couplet could be created using 200 N and 400 N running east and west all the way to 200E. Also 1000N and 1400N could do something similar. Future access streets could be completed along 600S, 200S-300S, and Center Street.

You could remove a significant portion of traffic from central Logan that never intended to go there by changing the artery from Wellsville - Smithfield. Traffic could be metered into the city from 1000W depending on destination. The 100E - 200E couplet would serve a good portion of the east side of Logan. Traffic from northbound from Hyrum, Providence, or Nibley would have the option of Main St., 100W, or 200E depending on your origin. Southbound out of Logan would be similar (except it would be 100E) and your choice would again depend on your destination. Three options are better than one. Northbound traffic out of Logan could use traditional routes with the only significant barrier being the interchange at 2500N. Logan's East - West traffic could receive a boost from the couplet and traffic leaving Logan for SLC could travel west to 1000W much more smoothly.

I understand that business on Main might not like this idea. It seems like traffic is too busy now, which is apparently bad for business. Increasing lanes and removing parking might be bad for business too, but apparently reducing traffic is also bad for business. Change is what businesses fear, and I get that. But I'd rather see Main Street a destination rather than the main thoroughfare.

It's just an idea. Main Street will still be busy, which businesses will like, but if it reduced loads by 20% or more (pure guess) I imagine great gains could be had.

Local Press

Logan officials eye one-way street couplets as possible traffic solution

By Lis Stewart | Posted: Saturday, July 13, 2013 9:39 pm

An open house to discuss the feasibility of making certain major roads in Logan one-way streets has been scheduled from 5:30 to 7:30 p.m. Wednesday at the Logan council chambers at 290 N. 100 West.

Three scenarios in which two major Logan streets, a “couplet,” are made one-way to decrease north and southbound traffic congestion near Main Street will be presented to the public, according to Jeff Gilbert, Transportation Planner for the Cache Metropolitan Planning Organization.

“The bottom line is, (one-way couplets) seem to have some potential for dealing with the volume of traffic issues we have and will continue to have for years and years,” Gilbert said.

However, the meeting is only to decide whether the idea could work, Gilbert said. Turning major roads into one-way streets would require land purchases, cooperation with UDOT and a lot of money, he said.

“The idea now is to not just be afraid of the big idea and explore its potential and see if it has value,” Gilbert said.

The roads being considered are 100 West, Main Street, 100 East and 200 East. Three scenarios using these four streets as one-way couplets will be available for public review at the open house.

The blocks east and west of Main Street are already used as alternative routes to Main Street, said Tom Jensen, a Logan councilman involved with the operation.

One scenario makes 100 East and 200 East one-way streets, Jensen said. Another scenario uses 100 West and Main Street. The third option considers 100 West and Main Street as a one-way couplet.

A draft report that lists the scenarios in question is on Logan Public Works’ webpage, according to Gilbert.

A couple of projects to improve mobility, such as widening 200 East, are already underway, but unless more is done the traffic problems will only increase as the years go by, Jensen said.

Gilbert said there are pros and cons to a one-way couplet street system. On one hand, a one-way street is more efficient and better for neighborhoods, since people only have to worry about watching one direction of traffic when crossing and pulling out of the driveway. The lights can also be timed so there are surges of traffic and minutes when no traffic is moving.

A downside is that people have to think further ahead when considering where to go and when to turn, Gilbert said. If someone misses the entrance to a parking lot, they would have to go around the block and come back the same way. This brings into consideration of what the impact on businesses would be, Gilbert said. Making a street like 100 West a main thoroughfare could increase traffic through the back of the businesses, where many people park already, he said.

Jensen said one-way streets could make it more difficult for people to access businesses, though.

Jensen said he is optimistic about one-way couplets being implemented in the far future.

“I think that these are good alternatives,” Jensen said. “Some are not so optimistic, but I think that based on what I know I think that they have a good probability of implemented.”

lstewart@hjnews.com

Twitter: @CarpetComm

4 comments:

Top of Form

•

Bottom of Form

- [Reader](#) posted at 8:36 am on Wed, Jul 17, 2013.

Posts: 159

They aren't interested in increasing volume of traffic, they are interested in REDUCING the lanes on main street to promote walking, biking, and public transport.

- [Log In](#) to report.
- [Link](#)
- [Reply](#)

- [PeterBrunson](#) posted at 7:56 am on Wed, Jul 17, 2013.

Posts: 2598

What is the problem being solved by the "Big Idea"?

IF it is the volume of traffic on Main then Denver Doug identifies the best option. 100 West one way south, 100 East one way North, Main stays two way.

If my memory serves, Denver did something like this decades back.

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- [AceOfSpadesKB](#) posted at 8:45 am on Mon, Jul 15, 2013.

Posts: 447

I've never considered 1st West a major transportation street given that it doesn't go all the way through Logan.

How about disallowing parking on Main street and making it a 6 lane road with a median? I'm sure there are issues, but to my ignorant knowledge on the topic matter it makes sense at first glance. Given I don't shop at any of the over priced mom and pap stores, and I'm sure I'll anger a lot of people with this suggestion.

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- **DenverDoug** posted at 1:59 pm on Sun, Jul 14, 2013.

Posts: 597

What about just leaving Main as a two-way, and making 1st E. & 1st W. one-way couplets, giving drivers the option of one-way or two-way? What is the difference between option 2 and option 3 above? Does option 2 keep Main as two-way and convert 1st W. to one-way?

Logan resident reaction mixed on one-way street issue

By Lis Stewart | Posted: Friday, July 19, 2013 1:15 am

Community leaders were met with mixed reactions at Wednesday night's open house for a study to determine if a pair of one-way streets in Logan is the solution to downtown traffic problems.

"It's kind of like roundabouts," said Mark Nielsen, Logan Public Works director. "Some people like them, some people don't."

Three couplet options were presented at the open house. The first is making 100 East a southbound one-way street and 200 East a northbound one-way street. Both would be two lanes.

The 100 East/200 East option is the easiest to implement because the roads wouldn't have to be widened, said Brad Humphreys, the senior transportation project manager for Stanley Consultants, part of the team that worked on the Logan one-way couplet feasibility study.

"The problem is, if you just do those on 100 East and 200 East, you don't get a whole lot of congestion relief on Main Street," Humphreys said.

The second couplet option would make Main Street a one-way, three-lane northbound road, and 100 West a three-lane southbound one-way road.

The third option combines the first two.

Humphreys said the third option, which uses all four roads, would provide the most traffic relief.

As residents examined the models of the three options chosen by the feasibility study group, many talked about how the increase of traffic on side roads could impact their neighborhoods and businesses. Several said that while they did see a problem with traffic on Main Street, bringing more traffic to neighborhoods was not ideal.

Humphreys said while there has been concern that making 100 West a three-lane one-way road could increase traffic, traffic will increase on that road anyway as the years go by.

People like the benefits that a one-way, three-lane couplet on Main Street and 100 West could bring, Humphreys said. Since the road already has four traffic lanes and a turning lane, the extra space could be used to implement a bus lane, bike lane and slanted parking, he said.

Making Main Street and 100 West both one-way streets could affect businesses as well, said Grey Turner, who worked on the feasibility study team.

"A lot of people say it's going to hurt the businesses, but I think that can be turned into a positive," Turner said.

Another issue under consideration is how to construct the transition from one-way to two-way streets. According to maps of the couplet options provided by Humphreys, 100 West would need to be connected from where it ends at 600 South by the nearby LDS church and Ellis Equipment so it goes uninterrupted to U.S. Highway 89.

Turner said he brought up one-way couplets seven years ago when he was working on Logan's transportation master plan. Five scenarios for one-way couplets were presented, three of which are the options the later one-way couplet feasibility study chose.

"It was not well received because it was something that was new, and people had a mindset of what it would be, and that it didn't fit here in Logan," Turner said.

That mindset, however, has changed over the years, Turner said. Just the fact that a feasibility study was done shows that city leaders are warming to the idea of one-way couplets.

The next step for the potential project is to examine public comment, the environmental impact and possible funding, Turner said.

Nielsen, the Logan public works director, said the open house was conducted to see how the public feels about the matter.

"We're just trying to plan for the future and see if this is a possibility, and it might not," Nielsen said.

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10 comments:

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- [texashta](#) posted at 12:11 pm on Sat, Jul 20, 2013.

Posts: 1

I could not be more dismayed my this possibility. My family chose to live in the historic district because it is a pleasant, walkable, mixed use neighborhood. I'm sure that this type of redirection of traffic would never be considered through more affluent neighborhoods. The last thing we need is an increased amount of traffic channeling down the residential streets. Traffic will only continue to grow until city planners have killed all of the side streets through the historic neighborhoods. They should figure out a way to encourage 600 West and 1000 West routes and to improve mass transit options.

I am also horrified by the destruction of 200 East, which was formerly a charming residential street filled by sweet bungalows, ripe for redevelopment. Why is Logan city killing its historic neighborhoods to facilitate commuting by people in surrounding townships?

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- [stranger](#) posted at 2:25 pm on Sat, Jul 20, 2013.

Posts: 3262

Nimby Jennifer.

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- [AceOfSpadesKB](#) posted at 4:41 pm on Sun, Jul 21, 2013.

Posts: 447

Planners have obviously done all they can to encourage use of 10th west. The problem is that the source of a lot of main street traffic is from the east side of main street. Between residential areas, the university and places of work, there needs to be some relief on the East side. For instance, I work on the east side of main. I also live on the East side of the valley. There is no way I'm going all the way to 6th or 10th west to drive home.

All that said, there is no perfect answer. This is why I chose not to live in downtown "historic" Logan.

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- **scientia posted at 2:10 pm on Mon, Jul 22, 2013.**

Posts: 28

I live in "historic" downtown Logan (close to 100 W) and would welcome a 100 W/ 100 E solution. I don't think you would see the overwhelming influx of traffic one might think. I think we would still find our neighborhood pleasant and walkable, and perhaps it would spur some mixed use development, much like what occurs on 100 E. In the end traffic will increase on these streets. It would be nice to have some sort of plan and control in place prior to the situation getting out of hand and the city patching something together quickly and with little thought.

One thing, which has only a little to do with the one-way issue, is the use of road-center planting strips. Many cities use these to slow traffic and beautify neighborhoods. I think Logan would do well to install these on some select streets such as Center (east and west), 100 North (east to 200 E and west to 600 W), and, in my opinion, I would like to see them on Main Street starting as far south as the SpringHill Suites and as far North as 1400 N. Likely wishful thinking, but one can dream. And yes, I realize it costs money and takes time to manage these "green" areas.

I do agree with the sentiment on 200 E. Having also lived on that side of Main, the neighborhood currently resembles a war zone.

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- **PeterBrunson posted at 9:39 pm on Fri, Jul 19, 2013.**

Posts: 2598

What is the problem that needs to be solved?

Is it the amount of traffic?

Is it not the amount of traffic that will grow?

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- **kimmette1 posted at 12:44 pm on Fri, Jul 19, 2013.**

Posts: 3

I live just a couple houses off of 100 West, and am sickened by the idea. I am well aware of how congested Main is, but putting in a 3-lane road (which will probably be with speeds faster than 25 mph) seems really, really awful to me. I don't want my young children so close to traffic. This is a low-income area, which is going to greatly impact residents and their properties. Surely homes are going to be destroyed to make room for the widened road. Where will they go? I love that our family can go on walks/bike rides on 100 West, because it is a quiet street. I love that we can walk to church just down the street. I love living in a quiet neighborhood, because I feel that my children are safe and protected. I know that traffic is a problem, but I'm really reluctant to give up the quiet street that is a part of my neighborhood.

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- **Jazz posted at 8:16 pm on Sun, Jul 21, 2013.**

Posts: 18

The couplet idea as a whole seems reasonable. It would not require widening of the streets (100 West, 100 East, 200 East) since they already have 5 lanes. Also parking can remain on both sides of the street. Traffic, while higher volume, could be pulsed and kept at a moderate speed. There would be gaps in the car flow due to the one way and timing of signals. This is better for neighborhoods than two way.

I think Main needs to remain two-way. Probably should try the east couplet and see how it works. It shows no loss of property.

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• [scientia](#) posted at 9:50 am on Fri, Jul 19, 2013.

Posts: 28

I'm sure there is a reason that the option of leaving Main a two way street (as it should be) and using 100 West (South) and 100 East (North) as one way streets wasn't on the table, right? Having lived in that general part of Logan for a number of years, those seem like reasonable options to me. Maybe someone can fill me in on the details.

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• [AceOfSpadesKB](#) posted at 11:36 am on Fri, Jul 19, 2013.

Posts: 447

1 way couplets work best when they adjacent.

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• [DenverDoug](#) posted at 1:51 pm on Sat, Jul 20, 2013.

Posts: 597

Without having had a chance to review the data, the 100 E. / 100 W. couplet (leaving Main two-way) seems like the logical conclusion to me as well.

Congestion on Main has been an issue for many years. I'm mystified that now there are so many apparently denying this congestion issue.

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Appendix D
Model Assumptions and
Findings

Volumes in the network are based on Logan City counts from previous years. Those counts consisted of approach volumes for one to two days constant traffic recordings done in the past. No intersection turning movements were available.

Stanley consultants conducted traffic counts for the PM peak hour on 500N and 200E to obtain turning movements. Current turning movement percentage was then applied to Logan City counts to obtain more accurate volumes (historical traffic volumes on 200E shows steady volumes over past several years). Turning movement volumes on other streets are based on assumptions and observations, not actual counts.

2040 volumes are based on simple projection of 2% increase volume per year from 2013 to 2040.

Turning movement ratios are assumed to be the same as for 2013 year.

Following is a list of conclusions and possible improvements based on visual observation during Vissim model runs:

1. Existing 2013 layout: network performs poorly in SB direction in a peak hour.
2. Both one-way couplets and roundabout operates well with 2013 volumes.
3. Existing geometry layout fails heavily SB with 2040 volumes (adding second SB lane might improve operations. In addition, adding a signal would improve operations as well)
4. Roundabout layout fails with 2040 volumes (adding second SB lane will most likely improve operations, especially if second roundabout lane in SB direction is added)
5. One-way couplets operate well with 2040 volumes, except at 800N where it goes back to one lane. In addition, SB direction from 1000N to 100E and WB on 800N experience heavy delays.
6. Adding a second lane at 800N (either two lanes WB, one lane EB, or just two lanes WB) improves operations significantly for one-way couplets year 2040. Pavement width at 800N is about 30ft.
7. Adding a second lane for SB direction at 200E between 800N and 1000N improves operations significantly for one-way couplets year 2040. Pavement width on 200E is about 40ft.

Following table shows different videos recorded for several scenarios:

Video Name	Configuration	Volume year
Baseline	Current conditions	2013
Baseline_Roundabout	Current conditions except for 500N@200E which was replaced by one-lane roundabout	2013
Couplets	One-Way Couplets	2013 (combined NB/SB volumes from 100E and 200E)
Baseline_2040	Current conditions	2040
Baseline_Roundabout_2040	Current conditions except for 500N@200E which was replaced by one-lane roundabout	2040

Video Name	Configuration	Volume year
Couplets_2040	One-Way Couplets	2040 (combined 2040 NB/SB volumes from 100E and 200E)
Couplets_2040_Improvements	One-Way Couplets. Added second lane SB from 1000N to 800N to mitigate high peak volume.	2040
Couplets_2040_2Lanes_800N	One-Way Couplets. Added second lane WB at 800N. No EB direction provided between 100E and 200E.	2040