Cheyenne Lincolnway Placemaking
Conceptual Downtown Pedestrian and Urban Design Plan
Final

JANUARY 2016
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The Cheyenne Lincolnway Placemaking Downtown Pedestrian and Urban Design Plan is focused on creating a more pedestrian friendly, comfortable and aesthetic streetscape that complements Cheyenne’s ‘Main Street’ and improves the likelihood of revenue increases, new businesses and redevelopment in Downtown. The plan identifies needs and prioritizes improvements to make it easier, safer and more appealing to walk within and through the Downtown Corridor. Key stakeholders and downtown businesses were engaged through a comprehensive Public Outreach process. The outreach included individual business interviews, a walking tour of the corridor, on-line surveys, three community outreach workshops, and a Public Open House as well as presentations to the Cheyenne DDA. The public outreach component of this project helped identify preferences for aesthetics, design strategies ad evaluated alternative designs for the Corridor.

EXISTING CONDITIONS

The vehicular Level of Service analysis indicates that the intersections along the corridor are operating without significant delay. Pedestrians face significant challenges currently due to crossing distances, narrow sidewalks relative to other Downtown environments and vehicle speeds. In addition, a high number of trucks use the corridor and reduce overall pedestrian comfort. Issues that were identified by stakeholders include:

- Limited on street parking
- Vehicle speeds on Lincolnway too high - (Posted speed limit 20 MPH)
- Lack of street trees
- Lack of perceived pedestrian crossing opportunities
- Insufficient lighting, particularly pedestrian-scale
- Lack of street furniture
- Narrow and attached sidewalks

CORRIDOR IMPROVEMENTS

Based on results from the existing conditions analysis and community outreach, a number of improvements were identified to address basic pedestrian and bicycle safety and mobility in the corridor, and were considered in the development of all concept alternatives:

- Implement street trees, protected bulbouts with planting and seatwalls and additional pedestrian-scale lighting
- Widen sidewalks and add a landscaped buffer wherever feasible
- Decrease crossing distances wherever possible through extended bulb-outs
- Develop a gateway intersection at Warren and Central Ave. Intersections with reconstructed wayfinding signage, elimination of pork-chop islands (free right turns) and gateway medians
- Provide pedestrian refuges at medians wherever possible
- Add additional on-street parking wherever possible

Two alternative corridor plans were developed including a three lane and a five lane option:

- The five lane option includes on-street parking, north/south/east/west extended bulb-outs with planting and seatwalls, medians and pedestrian refuges, wider sidewalks, street trees with buffer planting and gateway treatments at Warren/Central Ave intersections.
- The three lane option includes on-street parking, north/south/east/west extended bulb-outs with planting and seatwalls, medians and pedestrian refuges, wider sidewalks, street trees with buffer planting and gateway treatments at Warren/Central Ave intersections.

LEVEL OF SERVICE (LOS)/VEHICULAR DELAY ANALYSIS

The two alternative corridor plans were analyzed using both Synchro modeling and VISSIM modeling. Synchro is recognized as the industry standard for LOS analysis, while VISSIM provides overall visualization of traffic patterns as well as pedestrian movements. The VISSIM models depict a decrease in delay as compared to the Synchro results.

It should be noted that specific intersections LOS results are less meaningful in this analysis due to the close intersection spacing and interdependency of coordinated signals. Travel time is provided in the analysis to give a sense of the delay seen along Lincolnway over our study segment. Also, this analysis assumes that all traffic will remain on Lincolnway and that there will continue to be a conservative growth of one percent annually. This analysis focused on the PM peak hour, which is the worst case scenario and these delays will occur only during peak times and not throughout the rest of the day. Overall vehicular delay analysis is as followed:

1. The existing scenario was simulated to validate the simulation model and provide a baseline to compare future year scenarios.
2. The five lane option analysis indicates that all intersections and approaches will operate at acceptable LOS.
3. The three lane option analysis indicates:
   - In 2035 the non-signalized intersections (O’neil Ave., Bent Ave., Thomas Ave.,) are failing with a rating of LOS E or lower depending on signal timing adjustments. These intersections should be evaluated for their potential as signalized intersections if there is a desire to implement the three lane option in the future. However it should be noted that the signalization of these intersections may affect vehicle progression along Lincolnway.

ADDITIONAL ALTERNATIVES EVALUATION

Beyond vehicular operational analysis, the alternatives were evaluated relative to one another based on other metrics derived from the initial goals of the project including Downtown Business Enhancements, Pedestrian and Safety Experience, Downtown Gateway Effectiveness, Cost Effectiveness and Public/Stakeholder Preferences. Most of these criteria are immediately measurable such as crossing distances, sidewalk width, number of parking spaces, etc.:  

1. The five lane option ranks lower than the three lane option in terms of Downtown Business Enhancements and Pedestrian Safety and Experience, similar to the three lane option for Downtown Gateway Effectiveness, higher than the three lane option in cost effectiveness, and lower than the three lane option in Public/Stakeholder preferences.
2. The three lane option ranks higher than the five lane option in terms of Downtown Business Enhancements, Pedestrian Experience, Downtown Gateway Effectiveness and Public/Stakeholder preferences, and lower than the five lane option in terms of cost effectiveness.

RECOMMENDATION

The three lane and the five lane options both represent viable alternative concepts for Lincolnway, with clear trade-offs for each. The intent of this plan is to fully represent each option. This document is intended to be used as a guide for future decisions as Downtown Cheyenne continues to grow and change over time. The first phase of the project can be implemented at any time, as it is flexible in its adaptation to both options, requiring restringing only to adapt to the three lane or 5 lane alternative.

IMPLEMENTATION

The costs of implementing and maintaining these longer term improvements identified within this document are significant and would require phasing over time. The plan breaks out these potential future improvements into phases which can be implemented through a variety of creative public and private funding sources in the future. The intent is however to have a plan or a road map for this area so that if and when funding opportunities arise, the City and community leaders have a vision and corresponding design ideas that they can utilize to move forward. No funding is currently available for construction of the improvements represented in this document.
INTRODUCTION
PROJECT GOALS AND OBJECTIVES
1. Activate ground floors to inspire business development. This will be done by:
   - Improving the overall character and ‘sense of place’;
   - Creating outdoor gathering and seating areas and;
   - Utilizing alley connections where appropriate
2. Improve comfort and safety for pedestrians
   - Expand sidewalks where possible
   - Develop ‘edge’ at pedestrian spaces
3. Balance needs and traffic demands of Federal/State Highway with needs of a thriving downtown
4. Highlight/Celebrate history of Lincolnway
5. Create an environment to inspire more diverse land-uses

PROJECT CRITERIA
1. Accessibility
2. Visibility and effective lighting for safety
3. Facilitate safe pedestrian movement
4. Community identity and ‘sense of place’
5. Respect and celebrate historic context
6. Allow for flexibility and change
7. Capacity for gathering and event areas
8. Year round appeal and use
9. Ease of maintenance
10. Create balance of vehicular and pedestrian spaces
11. Support and stimulate business growth

PROJECT CHARACTER
The images below reflect generalized aspects of the project character that are desirable including enhanced pedestrian streetscape conditions, a consistent street tree canopy, intersection/bulbout enhancements, medians along streetscapes, pedestrian lighting and safety enhancements and design elements from Downtown Cheyenne and the Depot Plaza at Lincolnway and Capitol Ave.

PROCESS
STAKEHOLDER INTERVIEWS AND WORKSHOPS
Design concepts within this document were developed through a collaborative process of stakeholder interviews and discussions, walk throughs and workshops incorporating input from the City of Cheyenne Staff, MPO Staff, WYDOT Staff, Boards and Commissions members and property owners. Beyond regular meetings with MPO and City Staff, the stakeholder and public involvement process is represented below.

SITE WALKTHROUGH - STAKEHOLDERS AND MPO/CITY STAFF
The process began with a series of individual discussions and a site walk-through from which feedback was incorporated into preliminary issues and opportunities diagrams and image boards reflecting project character and examples. This material became the foundation for the first workshop.

WORKSHOP 1
Stakeholder/public meeting to review project goals, purpose, issues and opportunities diagrams, with visual preferencing exercise to begin to establish character preferences.
1. Early in project process - feedback on opportunities, issues, concepts.
2. Focus on pedestrian realm/traffic and potential to improve safety, comfort, and ‘sense of place’.
3. Parking - assuming no net change.

WORKSHOP 1 SUMMARY COMMENTS
1. Celebrate Lincolnway Anniversary.
2. Tie with Westedge Project.
3. Like outdoor gathering/sense of place.
4. Medians on Lincolnway could be replicated.
5. Free right turn at Lincolnway from Warren unsafe.
6. Median should - unify north and south sides of Lincolnway.
7. Consider pedestrian safety during events.
8. Left turn at Capitol and Lincolnway during events is an issue.
9. Like idea of extending the plaza space on to Capitol Ave.
10. Like idea of enhancing alleyways.
11. Diagonal parking should be explored on Carey, Pioneer or Thomas. Maybe back in diagonal parking?
12. Need for benches/seating and bike racks is critical.

WORKSHOP 2
Community meeting, design concept workshops identifying proposed alternative with open discussion and live survey polling results.
1. Feedback on alternative design concepts
2. Feedback on project details, i.e. lighting, seating, street trees, etc.
3. Determine preferred alternative.

WORKSHOP 2 SUMMARY COMMENTS
The results of the survey from Workshop 2 are provided in the Design Alternatives section of this document.

FARMERS MARKET AND ON-LINE SURVEY
The survey provided during Workshop 2 was also provided during a Farmers Market event at the Depot Plaza as well as on-line. Results of the survey are combined with Workshop 2 results and provided in the Design Alternatives section of this document.

WORKSHOP 3
Community meeting, design concept workshops for 17th and 18th Streets and review of alternatives for Lincolnway.

PUBLIC OPEN HOUSE
Open house format meeting intended to solicit final feedback on Lincolnway alternatives and design concepts for 17th and 18th Streets.
The primary scope of the project extends along Lincolnway (U.S. 30) from Warren Ave to the railroad, approximately 1/2 of a mile in length. Within this area, the Depot Plaza and existing Downtown Core play a key role in the character and uses that influence streetscape design.

PRIMARY SCOPE

SCOPE OF PROJECT
Lincolnway (U.S. 30) runs in an east-west through the historic downtown of Cheyenne. At the project’s eastern edge I-80 feeds traffic into the downtown area. Along the southern portion of the site, the Union Pacific Railroad (UPRR) runs. Crow Creek and natural area surrounding the creek make up the western edge of the project boundary.

Opportunities for enhanced gateway conditions exist at the intersection of Warren/Central and Lincolnway near the Depot Plaza and at Bent Ave. near the intersection of Lincolnway and the future West Edge project.

Potential for redevelopment exists to the west of Pioneer with the goal of expanding the Downtown Core to the west. Intersections at all north south streets should be enhanced in order to facilitate safe and effective pedestrian crossings throughout the project extents.
During public events at the Depot Plaza pedestrian traffic flows from the north along Capital Ave. and Central Ave. Pedestrian flow from the west along 15th Street is another key factor to consider for events. The existing parking structure at Lincolnway and Carey Ave. feeds additional pedestrian flow from the north and along Lincolnway. This north south movement implies a need for a potentially enhanced alley connection from Carey Ave. to Capitol Ave. as an additional pedestrian corridor with the potential for event use with vendor tents along the alley.
Potential to enhance/expand bulb-outs to facilitate pedestrian crossing.

Potential enhanced crosswalks - indicate pedestrian activity.

Potential building facade enhancements to activate edge.

Potential to enhance streetscape.
  • Street trees
  • Lighting enhancements
  • Enhanced paving
  • Widen sidewalks if possible

Potential to enhance bulbouts.
  • Planting
  • Seatwalls
  • Paving
  • Increase width if possible

Potential median.
  • Replication or variation of existing design
  • Minimal planting
  • Narrow trees where possible

Potential enhanced alley connections.
  • Underground utilities
  • Enhanced paving
  • Lighting
  • Planting

QUESTIONS
1. Should existing bulbouts be improved?
2. Are medians appropriate as gateway element?
3. Should sidewalks be improved/widened if possible?
4. Should alleys be enhanced?
Depot Plaza
15TH STREET

Potential Enhanced Alley Connections
- Underground utilities
- Enhanced paving
- Lighting
- Planting

Consider options to continue median or widen sidewalk in this zone

Light turn conflicts at intersection

Potential Median
- Replication or variation of existing design
- Minimal planting
- Narrow trees where possible

Potential To Enhance Bulbouts
- Planting
- Seatwalls
- Paving
- Increase width if possible

Potential To Enhance Streetscape
- Street trees
- Lighting enhancements
- Enhanced paving
- Widen sidewalks if possible

Consider modifying plaza for small events

Consider modifying plaza for small events

Consider long-term plan for enhanced paving/removable bollards for event closure

QUESTIONS
1. Should left turns continue to be allowed onto Capitol?
2. Are medians desirable west of Capitol?
3. Should sidewalks be improved/widened if possible?
4. Should Capitol be improved near depot plaza?

LEGEND:

POTENTIAL STRATEGIES AND OPPORTUNITIES

Potential To Enhance Streetscape
- Street trees
- Lighting enhancements
- Enhanced paving
- Widen sidewalks if possible

Potential To Enhance Bulbouts
- Planting
- Seatwalls
- Paving
- Increase width if possible

Potential Median
- Replication or variation of existing design
- Minimal planting
- Narrow trees where possible

Potential Enhanced Alley Connections
- Underground utilities
- Enhanced paving
- Lighting
- Planting
QUESTIONS
1. Should more street trees be added?
2. Are medians desirable west of capitol?
3. Should sidewalks be improved/widened if possible?
4. Should crosswalks be paved w/colored concrete/asphalt?

LEGEND - POTENTIAL STRATEGIES AND OPPORTUNITIES

Potential To Enhance Bulbouts
- Planting
- Seatwalls
- Paving
- Increase width if possible

Potential To Enhance Streetscape
- Street trees
- Lighting enhancements
- Enhanced paving
- Widen sidewalks if possible

Potential Median
- Replication or variation of existing design
- Minimal planting
- Narrow trees where possible

Potential Enhanced Alley Connections
- Underground utilities
- Enhanced paving
- Lighting
- Planting

ISSUES / OPPORTUNITIES ANALYSIS
(CAREY AVE. TO THOMES AVE.)
Inspire redevelopment to extend downtown

Potential for west downtown gateway medians

QUESTIONS
1. West downtown gateway at bent?
2. Are gateway medians appropriate here?
3. Should alleys be enhanced here?
4. Should sidewalks be improved/widened if possible?

LEGEND:

POTENTIAL STRATEGIES AND OPPORTUNITIES

Potential To Enhance Streetscape
• Street trees
• Lighting enhancements
• Enhanced paving
• Widen sidewalks if possible

Potential To Enhance Bulbouts
• Planting
• Seatwalls
• Paving
• Increase width if possible

Potential Median
• Replication or variation of existing design
• Minimal planting
• Narrow trees where possible

Potential Enhanced Alley Connections
• Underground utilities
• Enhanced paving
• Lighting
• Planting

ISSUES / OPPORTUNITIES ANALYSIS
(CAREY AVE. TO THOMES AVE.)
Establish West Downtown Gateway

Pedestrian scale highway signage or treatments

Analyze access points through this zone where possible

Potential for west downtown gateway medians

QUESTIONS
1. West downtown gateway at bent?
2. Are gateway medians appropriate here?
3. Should alleys be enhanced here?
4. Should sidewalks be improved/widened if possible?

LEGEND - POTENTIAL STRATEGIES AND OPPORTUNITIES

Potential To Enhance Bulbouts
- Planting
- Seatwalls
- Paving
- Increase width if possible

Potential Median
- Replication or variation of existing design
- Minimal planting
- Narrow trees where possible

Potential Enhanced Alley Connections
- Underground utilities
- Enhanced paving
- Lighting
- Planting

Potential To Enhance Streetscape
- Street trees
- Lighting enhancements
- Enhanced paving
- Widen sidewalks if possible

ISSUES / OPPORTUNITIES ANALYSIS
(THOMES AVE. TO BENT AVE.)
The above photos taken during public events at the Depot Plaza illustrate the need for safe, enhanced pedestrian crossings at Lincolnway and Capitol Ave., Lincolnway and Central Ave. while considering potentially closing Capitol Ave. for events, to ease pedestrian flow along 15th street while expanding vendor opportunities onto Capitol Ave.
Lighting of any space plays a crucial role in how that space is used at night. Lighting is critical for pedestrian environments to ensure the area feels safe at night and to transform spaces from daytime to night time use. The example images below display how lighting creates safe pedestrian environments while also creating dynamic places.

Pedestrian Safety

Alleys are often perceived as unsafe environments and places where pedestrians should not venture, especially at night. This is likely due to the fact that alleys are frequently poorly lit, and isolated environments. There are a number of strategies that can be employed to counter this for the downtown alleys in Fort Collins.

The first would be to provide a well lit environment that provides clear views of the entire alley. This would include illuminating all recessed doorways and other alcoves that could provide places to hide. On-alley building entrances and increasing the number of on-alley residential units would also increase the perception of a safe environment while providing additional surveillance. A final way to help in the reassurance of a pedestrian’s safety would be the introduction of safety surveillance cameras.

Vehicular traffic can make alleys feel unsafe as well. Service and personal vehicles should perceive the alleys as pedestrian oriented spaces through design cues. The confines of the alleys inherently reduce possible dangerous speeds. Through design, shared spaces will help create a safer environment.

The images above summarize the results from the Visual Preferencing exercise provided during Workshop 1. Attendees were asked to place a limited number of red and green dots on images they find most appropriate or inappropriate. In general, traditional streetscape elements were preferred as well as elements consistent with current Downtown streetscapes and spaces.
The 5 Lane Plan proposes to retain the existing 5 lanes of traffic along Lincolnway (U.S. 30). Intersections are enhanced with bulb-outs while the existing east-west curbs remain in their existing locations. Mid block bulb-outs are added along the south side of Lincolnway within the parallel parking zone. To the north of Lincolnway parking (some parallel and some diagonal) are added to the north-south feeder streets to help alleviate parking issues for the downtown area. This alternative retains existing tree locations with additional trees to be added for a more uniform effect. Irrigation to trees would be bored through existing tree root zones in a shared trench with electric lines at the back of curb.
Street Light

Proposed Street Tree

Seatwall Planters

Median Treatment

Existing Street Tree

Pavers or Colored Concrete

10.5' Travel Lane

11' Travel Lane

Median with 1' Gutter

11' Travel Lane

11' Travel Lane

8' Sidewalk

10' Sidewalk

10.5' Travel Lane

Lincolnway - U.S. 30

O'NEIL AVE.

THOMES AVE.

10' Sidewalk

9' Parking

8' Sidewalk

SECTION A

DESIGN ALTERNATIVES

5 LANE PLAN

BASIC FRAMEWORK (O’NEIL TO THOMES)
Designated Left Turn Lane

Potential Median if Parade Route Altered

Potential Paving with Removable Bollards

5 LANE PLAN
HOUSE AVE. TO RAILROAD TRACKS
PAVEMENT OPTION 1

- Colored Concrete w/ 2’ score lines
- 2’ Paver Band
- Sidewalk
- Cafe Seating Opportunity

PAVEMENT OPTION 2

- Colored Concrete w/ 2’ score lines
- 2’ Paver Band
- Side walk
- Cafe Seating Opportunity
The above renderings depict the addition of medians at pioneer and central, acting as a pedestrian refuge for street crossings. Stone seatwalls, similar to those in the Depot Plaza, with planting beds facing roadways are added at bulbouts, for seating and to create the perception of safety and separation from roadways. Where possible, permanent umbrellas, tables and chairs are added for cafe type seating, creating additional corner activation. Pedestrian scale, LED, full cut-off streetlights with fixed hanging baskets and adjustable banners are added for safety, and streetscape uniformity, while allowing banners to be changed according to events or seasons as needed.
CAREY AVE. LOOKING NORTH AT THE LINCOLNWAY U.S. 30 INTERSECTION

DESIGN ALTERNATIVES

5 LANE PLAN
AERIAL VIEWS

Diagonal Parking
Planting Area
Street Lights
Cafe Seating
Street Trees
Seatwalls

STREET VIEW LOOKING AT A CAFE SEATING AREA
The 3 Lane Plan proposes to remove two of the existing lanes traffic along Lincolnway (U.S. 30). Intersections are enhanced with bulb-outs to provide for pedestrian space, reduce pedestrian crossing time and create additional seating. Sidewalks increase in width by approximately four feet on either side of Lincolnway, creating additional opportunities for seating and planting. A consistent tree canopy adds character, provides structure and shade, and softens the street edges. Parallel parking is added to the north and south sides of Lincolnway to serve downtown businesses and increase the potential for additional retail. To the north of Lincolnway parking (some parallel and some diagonal) is shown along the north-south feeder streets.
Potential Median if Parade Route Altered

Forced Right Turn creates the shift from 5 lanes to 3 lanes

WARREN AVE.
HOUSE AVE.
CAPITOL AVE.
DEPOT PLAZA
LINCOLNWAY- U.S. 30

Potential Paving with Removable Bollards

Forced Right Turn creates the shift from 5 lanes to 3 lanes

PARKING GARAGE
CENTRAL AVE.
BENT AVE.
O'NEIL AVE.
THOMES AVE.
PIONEER AVE.
LINCOLNWAY- U.S. 30

3 LANE PLAN - HOUSE AVE. TO RAILROAD TRACKS
PAVEMENT OPTION 1

Cafe Seating Opportunity
2' Paver Band
Concrete Pavers
Sidewalk

PAVEMENT OPTION 2

Cafe Seating Opportunity
2' Paver Band
Colored Concrete with 2' Score Lines
Side Walk

DESIGN ALTERNATIVES

3 LANE PLAN
CORNER ENLARGEMENTS
The above renderings depict the addition of medians, acting as a pedestrian refuge for street crossings. Bulbouts are significantly enlarged in comparison to the 5-Lane plan, with more opportunity for social seating in nooks and additional cafe seating opportunities. Corner activation potential is significantly greater in this alternative with the creation of true pedestrian scale intersections that provides a safe environment and reduces pedestrian crossing time at intersections. In this alternative, pedestrian scale, LED, full cut-off streetlights are again shown with fixed hanging baskets and adjustable banners are added for safety, and streetscape uniformity, while allowing banners to be changed according to events or seasons as needed.
CAPITOL AVE. LOOKING WEST ALONG LINCOLNWAY U.S. 30

STREET VIEW LOOKING EAST ALONG LINCOLNWAY U.S. 30

DESIGN ALTERNATIVES

3 LANE PLAN
AERIAL VIEWS
Additional 3D views of the corridor can be seen at [http://www.dhmdesign.com/WE/LN/West_Edge_Tour.html](http://www.dhmdesign.com/WE/LN/West_Edge_Tour.html)

**5 LANE PLAN - HOUSE AVE. TO RAILROAD TRACKS**
The above plan shows a potential plan for an enhanced multi-use alley from Carey Ave. to Capitol Ave. Diagonal parking is provided outside of the ROW to accommodate the needs of property owners. During events at the Depot Plaza, the parking spaces could be used for vendor tents with the alley closed for pedestrian use only. A courtyard with cafe seating is shown to the north of the Albany restaurant and parking is depicted along the remainder of the private property edge. Striped access points are shown for vehicular access to this area. The alley ROW is enhanced with concrete or pavers, streetlights with hanging baskets and string lights spanning the ROW. Removable bollards at the intersection of Lincolnway and Capitol Ave. allow this segment of roadway to be closed during events, providing additional vendor space and enhancing east west pedestrian safety with a permeable crossing condition.
This hybrid plan depicts a 3-lane roadway configuration from Bent Ave. to Carey Ave. and a 5-Lane configuration from Carey Ave. extending to the east. This concept allows for a 3-lane condition in the signalized zone to enhance traffic flow. Forced right turns that facilitate the 3-lane condition are shown at Bent Ave. and Carey Ave.
<table>
<thead>
<tr>
<th>Corridor Alternative</th>
<th>Downtown Business Enhancements</th>
<th>Pedestrian Safety and Experience</th>
<th>Downtown Gateway</th>
<th>Vehicular</th>
<th>Other</th>
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<tr>
<td></td>
<td>Streetscape Opportunities, i.e. café seating</td>
<td>Streetscape Enhancements</td>
<td>Parking Availability</td>
<td>Crossing Distance and Convenience</td>
<td>Sidewalk Refuge</td>
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<td>Existing Roadway</td>
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<td>Lower</td>
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<tr>
<td>Alternative A - 3 Lane Plan</td>
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<tr>
<td>Alternative B - 5 Lane Plan</td>
<td>Average</td>
<td>Average</td>
<td>Lower</td>
<td>Average</td>
<td>Average</td>
</tr>
</tbody>
</table>

**Legend**

- Higher: Higher Relative Rating
- Average: Average Relative Rating
- Lower: Lower Relative Rating
VISSIM SIMULATION

Fehr & Peers conducted a simulation analysis of Lincolnway between Pioneer and Warren Avenue to determine the potential for redevelopment of the roadway. The analysis included the following intersections:

1. Carey Avenue (signalized)
2. Capitol Avenue (signalized)
3. Central Avenue (signalized)

Balanced volumes for existing and future scenarios were drawn from previous analysis of the corridor. Scenarios

The following scenarios were evaluated and compared for the PM Peak Hour:

Scenario 1. Existing (2014)
   (A) With the existing lane configuration, signal timing, and counts.

Scenario 2. Future (2035)
   (A) With the existing lane configuration, 60 second cycle length, optimized signal timing, and future projected counts.
   (B) 3-Lane configuration with the future projected counts, 75 second cycle length, and optimized signal timing.

Simulation Analysis

The simulation analysis of Lincolnway modeled in VISSIM (version 7) was conducted to give a sense of the relative traffic conditions now and in the future under alternative scenarios. The analysis also provides intersection levels-of-service (LOS) and travel time with the existing conditions and proposed redevelopment options. The LOS results from this analysis generally agreed with the Synchro results reported before, with an overall decrease in delay in the simulation versus the deterministic Synchro approach. The study intersections in all three scenarios had previously been reported with acceptable intersection LOS although some approaches reported LOS E conditions.

It should be noted that specific intersections LOS results are less meaningful in this analysis due to the close intersection spacing and interdependency of coordinated signals. That is why travel time is also provided to give a sense of the delay seen along Lincolnway over our study segment. Also, this analysis assumes that all traffic will remain on Lincolnway and that there will continue to be a conservative growth of one percent annually. This analysis focused on the PM peak hour, which is the worst case scenario and these delays will occur only during peak times and not throughout the rest of the day.

Findings

Level of Service

Table 1 details the LOS for each of the listed scenarios for each intersection and approach. Here are a few highlights from the capacity analysis:

Scenario 1. Existing (2014)
The existing scenario was simulated to validate the simulation model and provide a baseline to compare future year scenarios.

Scenario 2. Future (2035)
With the 60 second cycle length, all intersections and approaches will operate at acceptable LOS.

The 3-Lane configuration is a viable option with optimization of the signal timing. In 2035 the westbound left movement at Capitol Ave is failing with 85 seconds of delay. A protected left turn phase would reduce this delay and minimally impact eastbound progression along Lincolnway.

Travel Time

The travel time segments for this analysis stretch from Pioneer to Warren Avenue. With eastbound and westbound segments defined as:
- Eastbound - the segment is from just east of Pioneer to just east of Central Avenue
- Westbound - the segment is from just west of Warren to just west of Carey Avenue.

These segments were chosen to most accurately capture delay seen on the three study intersections. Compared to existing conditions, average peak hour travel time through the segments could increase by 4 seconds in the 2035 3-lane cross-section and 25 seconds in the 2035 3-lane cross-section (36 seconds EB, 14 seconds WB).

Simulation Video

A snapshot of the Existing Scenario can be seen at the following link – [link to YouTube video]

As seen in the three lane option snapshot queues do extend into upstream intersections at times and will cause delays for side-street approaches.

Table 1: Average Travel Time (seconds)

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Existing Time</th>
<th>2030 Future Existing</th>
<th>2030 Future Roadway - PM</th>
<th>Optimized Time</th>
<th>Optimized Roadway - PM</th>
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</thead>
<tbody>
<tr>
<td>360 seconds</td>
<td>0.86</td>
<td>0.91</td>
<td>1.12</td>
<td>0.93</td>
<td>1.12</td>
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</tbody>
</table>

Table 2: Level of Service

<table>
<thead>
<tr>
<th>No.</th>
<th>Intersection</th>
<th>Control</th>
<th>Approach</th>
<th>Existing Time</th>
<th>Optimized Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Carey Avenue</td>
<td>Signal</td>
<td>Overall</td>
<td>7 A 8 B</td>
<td>17 B</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>EB</td>
<td>6 A 7 B</td>
<td>21 C</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>WB</td>
<td>5 A 8 B 9 A  A</td>
<td>21 C</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>NB</td>
<td>18 B 15 B 32 C</td>
<td>32 C</td>
</tr>
<tr>
<td>2</td>
<td>Capitol Avenue</td>
<td>Signal</td>
<td>Overall</td>
<td>7 A 8 B 15 B</td>
<td>17 B</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>EB</td>
<td>5 A 4 A 12 B</td>
<td>17 B</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>WB</td>
<td>7 A 9 A 12 B</td>
<td>17 B</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>NB</td>
<td>18 B 16 B 27 C</td>
<td>27 C</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>BR</td>
<td>24 C 24 C 37 D</td>
<td>37 D</td>
</tr>
<tr>
<td>3</td>
<td>Central Avenue</td>
<td>Signal</td>
<td>Overall</td>
<td>17 B 23 B 32 C</td>
<td>32 C</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>EB</td>
<td>13 B 16 B 30 C</td>
<td>30 C</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>WB</td>
<td>27 C 37 D 36 D</td>
<td>36 D</td>
</tr>
</tbody>
</table>

Simulation Video

A snapshot of the Existing Scenario can be seen at the following link – [link to YouTube video]

As seen in the three lane option snapshot queues do extend into upstream intersections at times and will cause delays for side-street approaches.
Lincolnway Intersection Level-of-Service Comparison Table

Summary: Lincolnway was analyzed with the existing lane configuration and with a 3-lane option between Pioneer Avenue and Warren Avenue (downtown). The analysis also evaluated various cycle length options for the 3-lane option.

<table>
<thead>
<tr>
<th>Intersection</th>
<th>2014 Existing – PM Peak Hour</th>
<th>2035 Future – PM Peak Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bent Avenue</td>
<td>SS</td>
<td>Ex. Timing 60-65 sec</td>
</tr>
<tr>
<td>O’Neil Avenue</td>
<td>SS</td>
<td>Ex. Timing 60-65 sec</td>
</tr>
<tr>
<td>Thomas Avenue</td>
<td>SS</td>
<td>Ex. Timing 60-65 sec</td>
</tr>
<tr>
<td>Pioneer Avenue</td>
<td>SS</td>
<td>Ex. Timing 60-65 sec</td>
</tr>
<tr>
<td>Carey Avenue</td>
<td>SS</td>
<td>Ex. Timing 60-65 sec</td>
</tr>
<tr>
<td>Capitol Avenue</td>
<td>SS</td>
<td>Ex. Timing 60-65 sec</td>
</tr>
<tr>
<td>Central Avenue</td>
<td>SS</td>
<td>Ex. Timing 60-65 sec</td>
</tr>
<tr>
<td>Warren Avenue</td>
<td>SS</td>
<td>Ex. Timing 60-65 sec</td>
</tr>
<tr>
<td>House Avenue</td>
<td>SS</td>
<td>Ex. Timing 60-65 sec</td>
</tr>
<tr>
<td>Evans Avenue</td>
<td>SS</td>
<td>Ex. Timing 60-65 sec</td>
</tr>
<tr>
<td>Morrie Avenue</td>
<td>SS</td>
<td>Ex. Timing 60-65 sec</td>
</tr>
<tr>
<td>Dunn Avenue</td>
<td>SS</td>
<td>Ex. Timing 60-65 sec</td>
</tr>
<tr>
<td>Logan Avenue</td>
<td>SS</td>
<td>Ex. Timing 60-65 sec</td>
</tr>
</tbody>
</table>

Legend:
- PM Peak LOS
- LOS A or B
- LOS C
- LOS D
- LOS E
- LOS F

Key Level of Service Findings

1. The capacity analysis focused on the PM Peak Hour since the volumes were the highest and this would be the most critical time period.

2. The 3-lane configuration is a viable option with optimization of the signal timing:
   - In 2014 with either the 75-second or 90-second cycle length, all intersections and approaches will operate at acceptable LOS except for the following:
     - O’Neil Avenue: The side-street stop-controlled intersection will have LOS E on the southbound approach with both cycle lengths. The 95th percentile queue will be two cars in the peak hour.
     - Warren Avenue (westbound approach): This approach will operate at LOS F with either cycle length since the lane drop occurs here. The delay is reduced with the 90-second cycle length. The overall intersection operates at LOS D with both cycle lengths.
   - In 2035 with either the 75-second or 90-second cycle length, all intersections and approaches will operate at acceptable LOS except for the following:
     - Bent Avenue: The side-street stop-controlled intersection will have LOS E on the southbound approach with both cycle lengths. The 95th percentile queue will be two cars in the peak hour.
     - O’Neil Avenue: The side-street stop-controlled intersection will have LOS F on the southbound approach with both cycle lengths. The 95th percentile queue will be four cars in the peak hour.
     - Thomas Avenue: The side-street stop-controlled intersection will have LOS F on the southbound approach with both cycle lengths. The 95th percentile queue will be two cars in the peak hour.
     - Warren Avenue: This intersection will operate at LOS E with either cycle length since the lane drop occurs here. The westbound and northbound approaches experience the highest delays.

To estimate the 20-year horizon volumes, data from U.S. Census and WYDOT were collected and compared. Recent traffic counts and population estimates show a 1 percent annual growth rate over the past ten years. This was applied to the existing counts to estimate the future volumes. The existing and future volumes are shown in Figures 1 and 2. Lincolnway was modeled in Synchro (version 7.0) to determine the intersection and movement levels-of-service (LOS) with the existing conditions and proposed redevelopment options. The City of Cheyenne’s Synchro models for the downtown area were updated with the most recent signal timing plans (provided by WYDOT), lane assignments, storage lengths, adjacent parking maneuvers, Peak Hour Factor (PHF), and balanced turning movement counts.
The 5 Lane Plan option expands average sidewalk widths along Lincolnway by a marginal amount (< 1'). Additional pedestrian spaces are only gained at intersection bulb-outs. This option also provides an additional 40 parking spaces along Lincolnway to serve downtown business and event parking.

The 3 Lane Plan option expands average sidewalk widths along Lincolnway by 5', thus creating more area for amenities such as benches, planters and cafe seating along bulb-outs at intersections. The drive time for this option would be increased by an estimated 2 minutes from Pioneer Ave. to Warren Ave. This option also provides an additional 61 parking spaces along Lincolnway to serve downtown business and event parking.
Additional street trees are to be planted along Lincolnway in both the 5 Lane and 3 Lane options. A 6’ wide excavation zone will be cleared to accommodate the tree root ball and non compacted topsoil where new trees are proposed. Concrete above this zone is proposed to be reinforced at 12” O.C., creating a ‘bridge’ effect. Aeration pipes may be included as well to provide additional oxygen to roots. Between this additional oxygen to roots, the prevention of root binding and irrigation, the street trees should reach full growth potential, unlike the existing trees, which have likely become root bound, do not receive adequate oxygen to roots and do not likely receive adequate and consistent irrigation.

A 2’ wide paver band will be installed between the tree grate and curb & gutter of Lincolnway. All of the street trees will have a tree grate to protect tree from soil compaction due to pedestrian activity.
Street lighting is a key streetscape element both for safety and aesthetics. New street lighting is proposed along Lincolnway that will help create a sense of place with banners and hanging baskets while adding consistency, repetition and rhythm to the downtown streetscape. Full cut-off LED street lighting will both provide cost effective lighting for the city and light surfaces rather than the sky beyond, eliminating most of the point source lighting effect that currently dominates the downtown area.
SURVEY RESULTS

PROCESS
A series of survey questions were provided to assess public and stakeholder opinions regarding use frequency, interest in the project, perception of the current conditions along Lincolnway and agreement or disagreement with concepts within the overall plan alternatives. Respondents were then asked to state which alternative they feel is most appropriate - the 5 Lane Plan or 3 Lane Plan.

The survey was provided at several times throughout the project including a Farmer’s Market event at the Depot Plaza, at Workshop #2, in a live polling format, and it was available on-line for several months.

Information was gathered from a total of eighty one respondents, although not all respondents answered all survey questions.

SUMMARY
The numerical results of the survey are shown on the following pages. They can be summarized with the following statements:

1. Most respondents feel that as residents, they would like to see Lincolnway better reflect Cheyenne’s history, values and civic pride.

2. Most respondents travel through the Downtown section of Lincolnway 3-5 times per week.

3. Most respondents feel that the travel and Main Street functions of Lincolnway are equally important.

4. Most respondents feel moderately safe/comfortable when walking along or crossing Lincolnway.

5. Most respondents feel it is very important to provide additional street trees, benches, plantings and other pedestrian amenities in the Downtown area along Lincolnway.

6. Most respondents are very willing would you be to spend 2 additional minutes driving down Lincolnway in order to improve pedestrian comfort and safety in the Downtown area.

7. Most respondents feel it is very important to provide additional parking along Lincolnway in the Downtown area.

8. Most respondents feel it is very important to foster business growth and economic vitality along Lincolnway in the Downtown area.

9. Most respondents feel that more stores and a stronger retail environment would most likely to encourage you to come Downtown more often.

10. Most respondents feel that they would most like to see the 3-lane cross section implemented along Downtown Lincolnway.
### What is your main interest in the Downtown section of Lincolnway? (Multiple Choice)

<table>
<thead>
<tr>
<th>Responses</th>
<th>Percent</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I own a business along the corridor or in Downtown</td>
<td>15%</td>
<td>5</td>
</tr>
<tr>
<td>2. I frequently patronize Downtown restaurants and businesses</td>
<td>24%</td>
<td>8</td>
</tr>
<tr>
<td>3. I like to come Downtown for events</td>
<td>5%</td>
<td>3</td>
</tr>
<tr>
<td>4. As a resident I would like to see Lincolnway better reflect Cheyenne’s History, values, and civic pride</td>
<td>53%</td>
<td>18</td>
</tr>
<tr>
<td>Totals</td>
<td>100%</td>
<td>34</td>
</tr>
</tbody>
</table>

### On average, how often do you travel to or through the Downtown section of Lincolnway? (Multiple Choice)

<table>
<thead>
<tr>
<th>Responses</th>
<th>Percent</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Daily (or multiple times each day)</td>
<td>35%</td>
<td>12</td>
</tr>
<tr>
<td>2. 3-5 times per week</td>
<td>50%</td>
<td>17</td>
</tr>
<tr>
<td>3. Once a week</td>
<td>6%</td>
<td>2</td>
</tr>
<tr>
<td>4. Once a month</td>
<td>6%</td>
<td>2</td>
</tr>
<tr>
<td>5. Almost never</td>
<td>3%</td>
<td>1</td>
</tr>
<tr>
<td>Totals</td>
<td>100%</td>
<td>34</td>
</tr>
</tbody>
</table>

### Which of the following statements best describes how you feel about the Downtown Lincolnway corridor? (Multiple Choice)

<table>
<thead>
<tr>
<th>Responses</th>
<th>Percent</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Lincolnway is/should remain primarily a “through” or “travel” corridor – a way to get from point A to point B</td>
<td>6%</td>
<td>2</td>
</tr>
<tr>
<td>2. Lincolnway should function more like a Main Street, with a “park once” or “stop and shop” environment</td>
<td>45%</td>
<td>15</td>
</tr>
<tr>
<td>3. The travel and Main Street functions of this corridor are equally important</td>
<td>48%</td>
<td>16</td>
</tr>
<tr>
<td>Totals</td>
<td>100%</td>
<td>33</td>
</tr>
</tbody>
</table>

### How safe/comfortable do you feel when walking along or crossing Lincolnway in the Downtown area? (Multiple Choice)

<table>
<thead>
<tr>
<th>Responses</th>
<th>Percent</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Very safe/comfortable</td>
<td>19%</td>
<td>15</td>
</tr>
<tr>
<td>2. Moderately safe/comfortable</td>
<td>68%</td>
<td>54</td>
</tr>
<tr>
<td>3. Not at all safe/comfortable</td>
<td>14%</td>
<td>11</td>
</tr>
<tr>
<td>Totals</td>
<td>100%</td>
<td>80</td>
</tr>
</tbody>
</table>
How important is it to provide additional street trees, benches, plantings and other pedestrian amenities in the Downtown area along Lincolnway? (Multiple Choice)

<table>
<thead>
<tr>
<th>Responses</th>
<th>Percent</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Very important</td>
<td>66%</td>
<td>27</td>
</tr>
<tr>
<td>2. Moderately important</td>
<td>27%</td>
<td>11</td>
</tr>
<tr>
<td>3. Not at all important</td>
<td>7%</td>
<td>3</td>
</tr>
<tr>
<td>Totals</td>
<td>100%</td>
<td>41</td>
</tr>
</tbody>
</table>

How willing would you be to spend 2 additional minutes driving down Lincolnway in order to improve pedestrian comfort and safety in the Downtown area? (Multiple Choice)

<table>
<thead>
<tr>
<th>Responses</th>
<th>Percent</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Very willing</td>
<td>71%</td>
<td>55</td>
</tr>
<tr>
<td>2. Moderately willing</td>
<td>26%</td>
<td>20</td>
</tr>
<tr>
<td>3. Not at all willing</td>
<td>4%</td>
<td>3</td>
</tr>
<tr>
<td>Totals</td>
<td>100%</td>
<td>78</td>
</tr>
</tbody>
</table>

How important is providing additional parking along Lincolnway in the Downtown area? (Multiple Choice)

<table>
<thead>
<tr>
<th>Responses</th>
<th>Percent</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Very important</td>
<td>41%</td>
<td>33</td>
</tr>
<tr>
<td>2. Moderately important</td>
<td>36%</td>
<td>29</td>
</tr>
<tr>
<td>3. Not at all important</td>
<td>23%</td>
<td>19</td>
</tr>
<tr>
<td>Totals</td>
<td>100%</td>
<td>81</td>
</tr>
</tbody>
</table>

How important is it to foster business growth and economic vitality along Lincolnway in the Downtown area? (Multiple Choice)

<table>
<thead>
<tr>
<th>Responses</th>
<th>Percent</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Very important</td>
<td>85%</td>
<td>70</td>
</tr>
<tr>
<td>2. Moderately important</td>
<td>15%</td>
<td>12</td>
</tr>
<tr>
<td>3. Not at all important</td>
<td>0%</td>
<td>0</td>
</tr>
<tr>
<td>Totals</td>
<td>100%</td>
<td>82</td>
</tr>
</tbody>
</table>
Which of the following factors would be most likely to encourage you to come Downtown more often? (Multiple Choice)

<table>
<thead>
<tr>
<th>Responses</th>
<th>Percent</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>An enhanced pedestrian environment</td>
<td>12%</td>
<td>4</td>
</tr>
<tr>
<td>More stores/stronger retail env</td>
<td>44%</td>
<td>15</td>
</tr>
<tr>
<td>Greater selection of restaurants</td>
<td>38%</td>
<td>13</td>
</tr>
<tr>
<td>More events (e.g. Farmers Market,</td>
<td>6%</td>
<td>2</td>
</tr>
<tr>
<td>Fridays on the Plaza)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td>100%</td>
<td>34</td>
</tr>
</tbody>
</table>

Which of the following cross sections would you most like to see implemented along Downtown Lincolnway? (Multiple Choice)

<table>
<thead>
<tr>
<th>Responses</th>
<th>Percent</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Proposed 3 Lane Alternative</td>
<td>70%</td>
<td>14</td>
</tr>
<tr>
<td>The Proposed 5 Lane Alternative</td>
<td>25%</td>
<td>5</td>
</tr>
<tr>
<td>Make no changes to the existing</td>
<td>5%</td>
<td>1</td>
</tr>
<tr>
<td>roadway</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td>100%</td>
<td>20</td>
</tr>
</tbody>
</table>

Public Survey Results
May 7, 2013
Keypad Polling and On-Line Survey
3 Lane Striping Implementation
- Remove Warren and Central Ave. porkchop turn lanes
- Gateway medians
- Gateway wayfinding structure
- Corner treatments and bulb-outs
- New Street Furniture
- Striping

5 Lane Striping Implementation
- Remove Warren and Central Ave. porkchop turn lanes
- Gateway medians
- Gateway wayfinding structure
- Corner treatments and bulb-outs
- New Street Furniture
- Striping

In an effort to develop a flexible phase I plan for Lincolnway that will allow either the three lane or five lane alternatives to be implemented west of Capitol Ave., the above diagram depicts features that are consistent with both plans. All intersection, median, and sidewalk improvements can be made to accommodate either alternative, with modifications in lane striping only, to allow for either alternative. This concept allows an adaptability as downtown conditions change over time or funding becomes available.
The phasing plan above depicts implementation of the Lincolnway improvements over time as funding becomes available. Phase 1 is designed as a flexible condition that can allow Phase 2-Phase 4 to be built out in either a three or 5 Lane condition. Phasing of the project is envisioned in three block increments, with prioritization near and around the Depot Plaza, and gradually developing to the west, with Phase 4 being lower priority alley improvements and plaza improvements. Costs for each phase are shown above per alternative in addition to key features that each alternative provides. An immediate short term improvement that can be completed with little or no investment includes pedestrian signal time modifications to allow for greater crossing times for pedestrians.

**Phase One**
- 3 Lane: $2,658,461
- 5 Lane: $2,658,461

**Phase Two**
- 3 Lane: $3,142,693
- 5 Lane: $2,518,466

**Phase Three**
- 3 Lane: $2,344,455
- 5 Lane: $1,511,153

**Phase Four**
- TOTAL: $871,569

**Phase One: 3 Lane and 5 Lane**
- $2,658,461
  - Remove Porkchop @ Warren Ave. and Central Ave.
  - Reconstruct corner bulb-outs.
  - Utility relocations.
  - Median treatment.
  - Mid-block bulb-outs.
  - Crosswalk enhancements.
  - Utility relocation.
  - Curb and gutter.
  - Utility relocation.
  - Median treatment.
  - Utility relocation.
  - Median treatment.
  - Crosswalk enhancements.
  - Lane and Parking striping.
  - Street trees and planting beds.
  - Site furnishings and new street lighting.
  - Corner wall and enhancement features.
  - Lane and parking striping.
  - Street trees and planting beds.
  - Site furnishings and new street lighting.
  - Corner wall and enhancement features.
  - Lane and parking striping.
  - Street trees and planting beds.
  - Site furnishings and new street lighting.

**Phase Two: 3 Lane**
- $3,142,693
  - Utility relocation.
  - Curb and gutter.
  - Corner bulb-outs w/ planters.
  - Median treatment.
  - New sidewalks.
  - Lane and Parking striping.
  - Street trees and planting beds.
  - Site furnishings and new street lighting.

**Phase Two: 5 Lane**
- $2,518,466
  - Utility relocation.
  - Curb and gutter.
  - Corner bulb-outs w/ planters.
  - Median treatment.
  - New sidewalks.
  - Crosswalk enhancements.
  - Lane and Parking striping.
  - Street trees and planting beds.
  - Site furnishings and new street lighting.

**Phase Three: 3 Lane**
- $2,344,455
  - Utility relocation.
  - Curb and gutter.
  - Corner bulb-outs w/ planters.
  - Median treatment.
  - New sidewalks.
  - Crosswalk enhancements.
  - Lane and Parking striping.
  - Street trees and planting beds.
  - Site furnishings and new street lighting.

**Phase Three: 5 Lane**
- $1,511,153
  - Utility relocation.
  - Curb and gutter.
  - Corner bulb-outs w/ planters.
  - Median treatment.
  - New sidewalks.
  - Crosswalk enhancements.
  - Lane and Parking striping.
  - Street trees and planting beds.
  - Site furnishings and new street lighting.
  - Corner wall and enhancement features.

**Total Costs:**
- 3 Lane: $8,856,166
- 5 Lane: $6,688,080
- Alley: $871,569

[PHASING/COST DIAGRAM]
The Downtown Core streetscapes along 17th and 18th Streets from Warren Ave. to Pioneer Ave. were analyzed in terms of extending recommended streetscape improvements for Lincolnway into these streets in order to enhance potential for pedestrian activity and promote successful business development and increase the viability of this area for retail use. The analysis included streetscape enhancements on 17th, 18th and north/south streets, as well as identifying gateway locations and concepts at the intersections of Warren Ave. and Central Ave.

**SCOPE OF PROJECT - Downtown Core**

- **Primary Scope - Extend concepts from Phase 1 to streetscapes along 17th/18th streets and North/South Connectors.**
- **Identify gateways into the Downtown Core.**

The Downtown Core streetscapes along 17th and 18th Streets from Warren Ave. to Pioneer Ave. were analyzed in terms of extending recommended streetscape improvements for Lincolnway into these streets in order to enhance potential for pedestrian activity and promote successful business development and increase the viability of this area for retail use. The analysis included streetscape enhancements on 17th, 18th and north/south streets, as well as identifying gateway locations and concepts at the intersections of Warren Ave. and Central Ave.
A variety of funding sources are possible to achieve streetscape improvements along 17th and 18th streets, and it is likely that a combination of the above strategies will need to be employed to implement the overall project. Funding is currently available to construct most of the 17th Street improvements. A business district or DDA based maintenance program should be established to maintain improvements in the Downtown Core and along Lincolnway.

POTENTIAL FUNDING SOURCES FOR 17th and 18th STREET STREETSAPES

- Downtown stakeholders such as DDA or Visit Cheyenne
- 6th Penny/ 5th Penny Funding
- State/Federal Grants
- State Consensus Funds
- Wyoming Business Council’s Downtown Development Grant
- Dinneen Model

POTENTIAL FUNDING SOURCES FOR DOWNTOWN CORE IMPROVEMENTS
Land uses within the Downtown Core include primarily retail uses along 17th Street and primarily Commercial/Business with some retail along 18th Street. An identifiable gateway should be established with enhanced corner treatments at the intersections of Warren and Central with 17th and 18th Streets. Streetscape improvements should focus on enhancing corner treatments at all north/south intersections and filling in gaps in existing street trees throughout the project extents. Potential locations for pedestrian plazas should be investigated as well, possibly as a public/private partnership on underutilized private land.
The diagram above shows locations of gaps within current street tree locations within the Downtown Core. Significant gaps exist along 17th Street and Central Avenue. Additional gaps are located along 18th Street and other north/south connectors. A number of curb cuts exist along 18th Street and side streets, which should be consolidated if possible to increase safety for pedestrians.
The above photos capture a summary of existing conditions within the general area of 17th and 18th Streets. There are currently major gaps in street tree locations, a general lack of site furnishings and pedestrian separation from the street and pavement is in need of repair or replacement in some cases. The overall street framework is effective and can be modified slightly to create a safer, more pedestrian friendly environment with a greater level of pedestrian amenities that are conducive to retail land uses. This is especially important along 17th street, which is primarily retail in it's use.
The diagrams above illustrate two concepts for intersection improvements including an additive/retrofit concepts, which utilizes existing curb and gutter, while incorporating seatwalls, plantings and street trees, as well as a reconstruction option that utilizes existing north/south street curbs with additional pedestrian space provided on the north and south sides of the corner bulb-out. The reconstruction option decreases crossing distances for pedestrians and provides more pedestrian space, however, represents a higher cost.

**ADDITIVE AND RECONSTRUCTION COMPARISON TO EXISTING CONDITIONS**
EXISTING CONDITION

PROPOSED CONDITION

ADDITIVE/RETROFIT CAPITOL AVE. AND 17TH STREET
17TH AND 18TH STREET STREETSCAPE CONCEPTS

RECONSTRUCTED FRAMEWORK PLAN
17TH AND 18TH STREET STREETSCAPE CONCEPTS

EXISTING CONDITION

PROPOSED CONDITION

RECONSTRUCTED CAPITOL AVE. AND 17TH STREET
ADDITIVE/RETRO-FIT OPTION:

Avg. Sidewalk width 11.3’

Avg. crosswalk 39.2’

RECONSTRUCTION OPTION:

Avg. Sidewalk width 14.5’

Avg. crosswalk 30.3’

Note: Turning radii should be analyzed further for final design.
Fehr & Peers conducted a capacity analysis on Lincolnway in Cheyenne, WY, to determine the potential for redevelopment of the roadway. The redevelopment area extends from Bent Avenue to Logan Avenue. Previously traffic counts for stop-controlled intersections were not available and from the previous results WYDOT requested further analysis for signalized intersections on Lincolnway to the east of the project. Cheyenne MPO provided updated turning movement counts for the following intersections:

1. Bent Avenue (stop-controlled)
2. O’Neil Avenue (stop-controlled)
3. Thomas Avenue (stop-controlled)
4. Pioneer Avenue (signalized)
5. Carey Avenue (signalized)
6. Capitol Avenue (signalized)
7. Central Avenue (signalized)
8. Warren Avenue (signalized)
9. House Avenue (stop-controlled)
10. Evans Avenue (signalized)
11. Morrie Avenue (signalized)
12. Dunn Avenue (signalized)
13. Logan Avenue (signalized)

Volumes were balanced between intersections where necessary. The existing volumes were significantly unbalanced between Pioneer Avenue and Carey Avenue; therefore, the volumes were compared to the 2013 counts and balanced by increasing the appropriate movement volumes.

To estimate the 20-year horizon volumes, data from U.S. Census and WYDOT was collected and compared. Recent traffic counts and population estimates show a one percent annual growth rate over the past ten years. This was applied to the existing counts to estimate the future volumes. The existing and future volumes are shown in Figures 1 and 2.

Capacity Analysis

Lincolnway was modeled in Synchro (version 8.0) to determine the intersection and movement levels-of-service (LOS) with the existing conditions and proposed redevelopment options. The City of Cheyenne’s Synchro models for the downtown area were updated with the most recent signal timing plans (provided by Cheyenne MPO), lane assignments, storage lengths, adjacent parking maneuvers, intersection Peak Hour Factor (PHF), and balanced turning movement counts.

The capacity analysis focused on the PM Peak Hour since the volumes were the highest and this would be the most critical time period.

The following scenarios were evaluated and compared for the PM Peak Hour:

Scenario 1. Existing (2014)

(A) With the existing lane configuration, signal timing, and counts.
(B) 3-Lane configuration with the existing signal timing and counts.
(C) 3-Lane configuration with the existing counts and optimized signal timing.

Scenario 2. Future (2035)

(A) With the existing lane configuration, signal timing, and future projected counts.
(B) 3-Lane configuration with the existing signal timing and future projected counts.
(C) 3-Lane configuration with the future projected counts and optimized signal timing.

Findings

Table 1 provides the LOS for each of the listed scenarios for each intersection and approach. Here are a few highlights from the capacity analysis:

Scenario 1. Existing (2014)

- With either the 75-second or 90-second cycle length, all intersections and approaches will operate at acceptable LOS except for the following:
  - O’Neil Avenue: The side-street stop-controlled intersection will have LOS E on the southbound approach with both cycle lengths. The 95th percentile queue will be two cars in the peak hour.
  - Warren Avenue (westbound approach): This intersection will operate at LOS E with either cycle length since the lane drop occurs here. The delay is reduced with the 90-second cycle length. The overall intersection operates at LOS D with both cycle lengths.

- Travel time could increase by 2 minutes through the study area in the PM peak hour.

Scenario 2. Future (2035)

- With either the 75-second or 90-second cycle length, all intersections and approaches will operate at acceptable LOS except for the following:
  - Bent Avenue: The side-street stop-controlled intersection will have LOS E on the southbound approach with both cycle lengths. The 95th percentile queue will be two cars in the peak hour.
  - O’Neil Avenue: The side-street stop-controlled intersection will have LOS F on the southbound approach with both cycle lengths. The 95th percentile queue will be four cars in the peak hour.
  - Thomas Avenue: The side-street stop-controlled intersection will have LOS E on the southbound approach with both cycle lengths. The 95th percentile queue will be two cars in the peak hour.
  - Warren Avenue: This intersection will operate at LOS E with either cycle length since the lane drop occurs here. The westbound and northbound approaches experience the highest delays.

- Travel time could increase by 3 minutes through the study area in the PM peak hour.
Lincolnway Placemaking Project
Comparison of Current and 3-Lane Configurations

Existing Configuration

Proposed 3-lane Configuration
### Table 1
Lincolnway Intersection Delay and Level-of-Service Comparison Table for Each Scenario

<table>
<thead>
<tr>
<th>No.</th>
<th>Intersection</th>
<th>Control Approach</th>
<th>2014 Existing - PM</th>
<th>2014 Existing: 3-lane Option - PM</th>
<th>2035 Future - PM</th>
<th>2035 Existing: 3-lane Option - PM</th>
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<tr>
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<td>Existing Timing 60-65 seconds</td>
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<td>Optimized 75 seconds</td>
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</table>

**Notes:**
- LOS and delay results for signalized intersections are reported for the overall delay.
- LOS and delay results for stop-controlled intersections are reported for the delay per vehicle in seconds.
Wyoming Department of Transportation

MEMORANDUM

To: Tom Mason, MPO Director
From: Jeffrey E. Brown, P.E., Assistant State Traffic Engineer
Date: November 23, 2015
Re: Downtown Lincolnway Pedestrian and Urban Design Plan (Traffic Analysis Phase)

WYDOT has reviewed Phase I & Phase II of the traffic analysis performed by Fehr & Peers as well as the overall plan in general. We offer the following comments.

Although not part of the consultant’s scope, it is important to note the study does not define the overall impacts to the state highway system. Delays to Lincolnway were shown however the additional delays to Central & Warren north of Lincolnway are not addressed.

The proposed 3 lane concept increases delay at several movements throughout the system and has significant impacts to the Warren Avenue intersection as shown in Table 1 of the study. As shown in Phase II of the report, the VISSIM model shows a 5 fold increase in travel time just on the 3 intersections simulated. The proposed 3 lane with a 90 second cycle length is not acceptable and does not meet WYDOT mobility goals.

WYDOT acknowledges the benefits of some concepts presented in the plan and support improving the pedestrian environment as well as the community as a whole. We would support removal of the free right turns at Central & Warren as well as some of the other enhancements shown on the 5 lane option at the public meetings.

We support the idea of increasing pedestrian clearance times in the downtown area. Increasing pedestrian clearance times on Lincolnway will require a cycle length change. WYDOT has agreed to work with the City to have the core CBO area analyzed for coordination based on a new cycle length.

We appreciate the opportunity to comment.

Cc: Pat Persson, District Engineer, WYDOT
Landy Griesbach, District Traffic Engineer, WYDOT
Tom DeHoff, District Construction Engineer, WYDOT
Joel Meena, State Traffic Engineer, WYDOT
File
### FHWA Road Diet Guideline

- 29% reduction of vehicle crashes when roadway travel lanes are reduced

<table>
<thead>
<tr>
<th>CASE STUDY</th>
<th>LOCATION</th>
<th>PROJECT FACTS</th>
<th>PEDESTRIAN SAFETY</th>
<th>VEHICLE SPEED</th>
<th>VEHICLE CRASHES</th>
<th>ECONOMIC BENEFITS</th>
</tr>
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<tr>
<td>Fourth Plain Boulevard</td>
<td>Vancouver, WA</td>
<td>• Principal Arterial             • Posted Speed 30 MPH  • 1 mile  • Residential/Res.</td>
<td>• Crossings safer</td>
<td>• Decreased by 18%  • No traffic diversion</td>
<td>Decreased by 52%</td>
<td>• Economic growth in gross revenue of 3.1%</td>
</tr>
<tr>
<td>U.S. 18</td>
<td>Clear Lake, IA</td>
<td>• State Highway                 • Posted Speed 45 MPH  • 1.1 miles • Commercial/Res.</td>
<td>• No data</td>
<td>• Decreased vehicles over the speed limit by 32%  • Decreased aggressive speeding by 52%</td>
<td>Decreased by 65%</td>
<td>• No data</td>
</tr>
<tr>
<td>U.S. Route 62</td>
<td>Hamburg, NY</td>
<td>• State Highway                 • Main Street                  • 1 mile       • Commercial</td>
<td>• More street crossings  • Decreased crossing distances</td>
<td>• Speed limit reduced  • Decreased by 66%  • Decreased injuries by 60%</td>
<td></td>
<td>• Business owners spent $ 7 Million on 33 building projects  • Building permits increased from 15 to 96 in 5 yrs.  • Property values doubled in 5 yrs.</td>
</tr>
<tr>
<td>W. Lancaster Boulevard</td>
<td>Lancaster, CA</td>
<td>• Major Arterial                 • .6 miles       • Commercial</td>
<td>• Improved ped. safety</td>
<td>• Speed limit reduced  • Decreased by 50%</td>
<td></td>
<td>• 49 new local businesses  • Addition of 800 jobs  • New housing  • Revitalized buildings</td>
</tr>
<tr>
<td>Bridgeport Way</td>
<td>University Place, WA</td>
<td>• Principal Arterial                  • 1.5 miles       • Commercial/Res.</td>
<td>• More street crossings  • Wider sidewalks  • Increase in ped. use</td>
<td>• Decreased by 13%</td>
<td>Decreased by 60%</td>
<td>• Sales revenue increased by 7% compared to 5% city wide  • New business developed  • Existing business redevelopment</td>
</tr>
</tbody>
</table>

The above matrix illustrates five case studies where road diets/three lane cross sections have been implemented throughout the U.S. and subsequent results have been documented including pedestrian safety and use increases, speed reduction, vehicle crash decreases and economic growth increases. In general, the case studies outline a pattern of decreased vehicle speeds and decreased vehicle crashes as well as increased pedestrian safety and increased economic benefits. The FHWA has documented an overall average of a 29% reduction of vehicle crashes where roadway travel lanes are reduced.
RESOLUTION NO. 5766

ENTITLED: “A RESOLUTION ADOPTING THE LINCOLNWAY PLACEMAKING:
DOWNTOWN PEDESTRIAN AND URBAN DESIGN PLAN”

WHEREAS, downtown Lincolnway is a heavily used pedestrian corridor to access
downtown businesses but is also an important thoroughfare for state highway operations; and

WHEREAS, the Cheyenne Metropolitan Planning Organization was tasked to come up
with design recommendations to activate businesses and enhance the walking environment in the
downtown area; and

WHEREAS, the Cheyenne MPO retained Russell and Mills Studio to create the
Lincolnway Placemaking Plan which applies to Lincolnway between Bent Avenue and Logan
Avenues, 17th Street and 18th Street, and Carey Avenue and Pioneer Avenue from 15th Street to
Pershing Boulevard; and

WHEREAS, the Lincolnway Placemaking Plan included extensive coordination with
WYDOT and other downtown stakeholders including the Downtown Development Authority
and business owners; and

WHEREAS, the Lincolnway Placemaking Plan analyzes traffic, suggests design
guidelines for the general downtown area north of Lincolnway, and makes recommendations to
increase pedestrian safety; and

WHEREAS, the Lincolnway Placemaking Plan also includes a menu of urban design,
streetscape and traffic recommendations which will improve and enhance the walkability and
overall experience of the downtown area; and

WHEREAS, the Cheyenne MPO Citizen’s Advisory Committee and MPO Technical
Committee both reviewed the Plan and recommended its adoption to the MPO Policy
Committee; and

WHEREAS, the City of Cheyenne Planning Commission held a Public Meeting on
January 19, 2016, accepted public comments, and recommended that the Governing Body of the
City of Cheyenne approve the Lincolnway Placemaking Plan.

NOW, THEREFORE, BE IT RESOLVED BY THE GOVERNING BODY OF THE
CITY OF CHEYENNE, WYOMING:

THAT, the Lincolnway Placemaking Plan dated January 2016, is hereby approved as a
guide for future improvements to Lincolnway and the core downtown Cheyenne area.

PRESENTED, READ AND ADOPTED THIS 6th DAY OF February 2016.

Richard L. Kayser, Mayor
City of Cheyenne

(Seal)

ATTEST:
Carol Intskefek, City Clerk