

to be as detailed design moves forward. It should also be noted that the review ensures that preservation values are factored into federal and state agency planning and project decision making, but does not ultimately mandate preservation.

State and Federal agencies conduct the process and consult with the State Historic Preservation Office (SHPO) and other appropriate parties throughout the review. In order to successfully complete the Section 106 review, state and federal agencies must:

- Identify which properties in the area may be affected by the project and whether they are listed, or are eligible for listing, in the National Register of Historic Places (thereby meeting the definition of “historic properties”)
- Determine how those historic properties might be affected
- Explore measures to avoid or reduce harm (“adverse effect”) to the historic properties

- Reach agreement with the SHPO and other appropriate parties to resolve adverse effects, or, if unable, enter into an agreement with the SHPO and other parties on what measures will be taken to mitigate adverse effects.

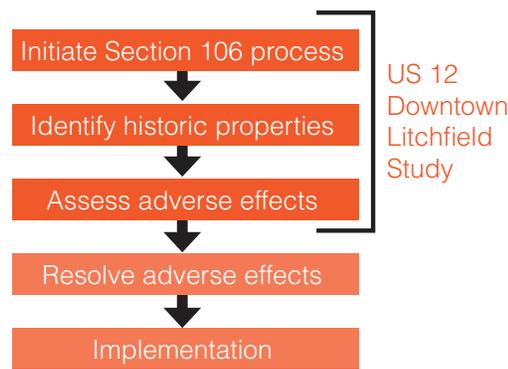


Figure 3. Section 106 Review Process

Figure 3 outlines this process and where in the process this planning study falls.

Public input is especially important when an agency is trying to identify historic properties that might be affected by a project and considering ways to protect and preserve them. In addition to seeking views of the public, State and Federal agencies must actively consult with certain organizations and individuals during the review:

- Advisory Council on Historic Preservation
- SHPO
- Local governments – the City of Litchfield and its Heritage Preservation Commission
- Applicants for federal assistance, permits, licenses, and other approvals – MnDOT and City of Litchfield (depending on the permit process for utility work)

Each of these entities were engaged throughout the stakeholder engagement process and will be involved in the outreach during the continuing Section 106 consultation. Figure 4 indicates the boundary of the identified Litchfield Downtown Historic area.



Figure 4. Litchfield Historic Downtown Area

Historic Properties in the Study Area

There are several historic properties within and near the project's US 12 corridor limits:

- Litchfield Historic Commercial District (listed on the National Register)
- Trinity Episcopal Church (listed on the Nation Register)
- Great Northern Railroad Corridor (eligible for the National Register)

In addition, the National Register eligibility of Central Park is under evaluation.

The period of significance for the Historic Commercial District is 1882-1945. Sibley Avenue and its sidewalks have been at their current width since about 1915. The street was first paved in 1922. The concrete sidewalks were originally scored in approximately four foot squares. From circa 1915-1930 Sibley Avenue had five-globe street lights (about four per block face). The lights were replaced about 1930 with acorn-style fixtures mounted on the same metal poles. Around 1960 the ornamental lights were replaced with aluminum hooded mercury vapor streetlights.

Parking Inventory

The City of Litchfield provides public parking throughout downtown, the majority of which is on-street parking. There is one organized, dedicated off-street parking lot west of US 12 between 2nd Street and 3rd Street. The focus of this study, related to parking, is within the study limits and along US 12 itself, although side-street parking inventory has been provided for context in order to understand whether adequate parking would be available in the event parking was removed from US 12 as a concept alternative consideration.

The information collected was inventory only; how the parking is utilized was not collected or assessed. The parking inventory data was presented to the guiding stakeholders and the general public for feedback regarding its importance and potential impact of

removing parking along US 12 as an alternative. Figure 5 presents the parking inventory along US 12 and the adjacent side-streets.

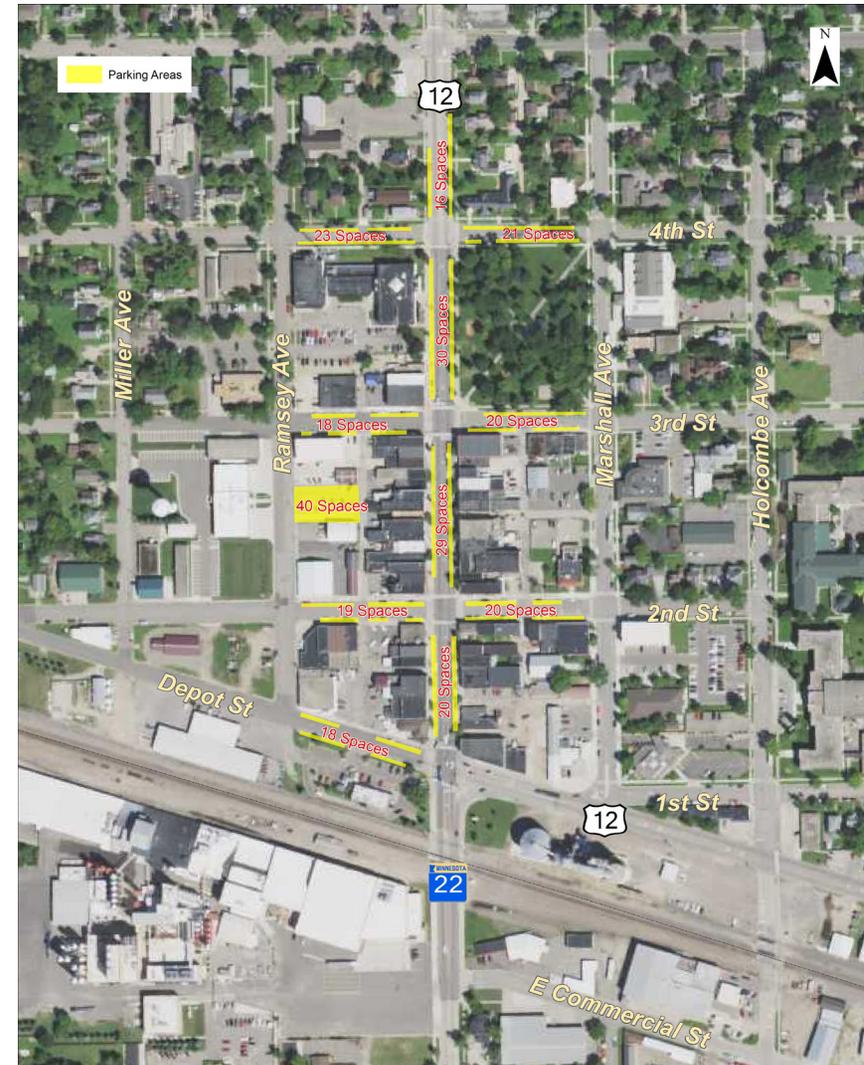


Figure 5. US 12 Study Limits – Parking Inventory

Roadway Geometrics

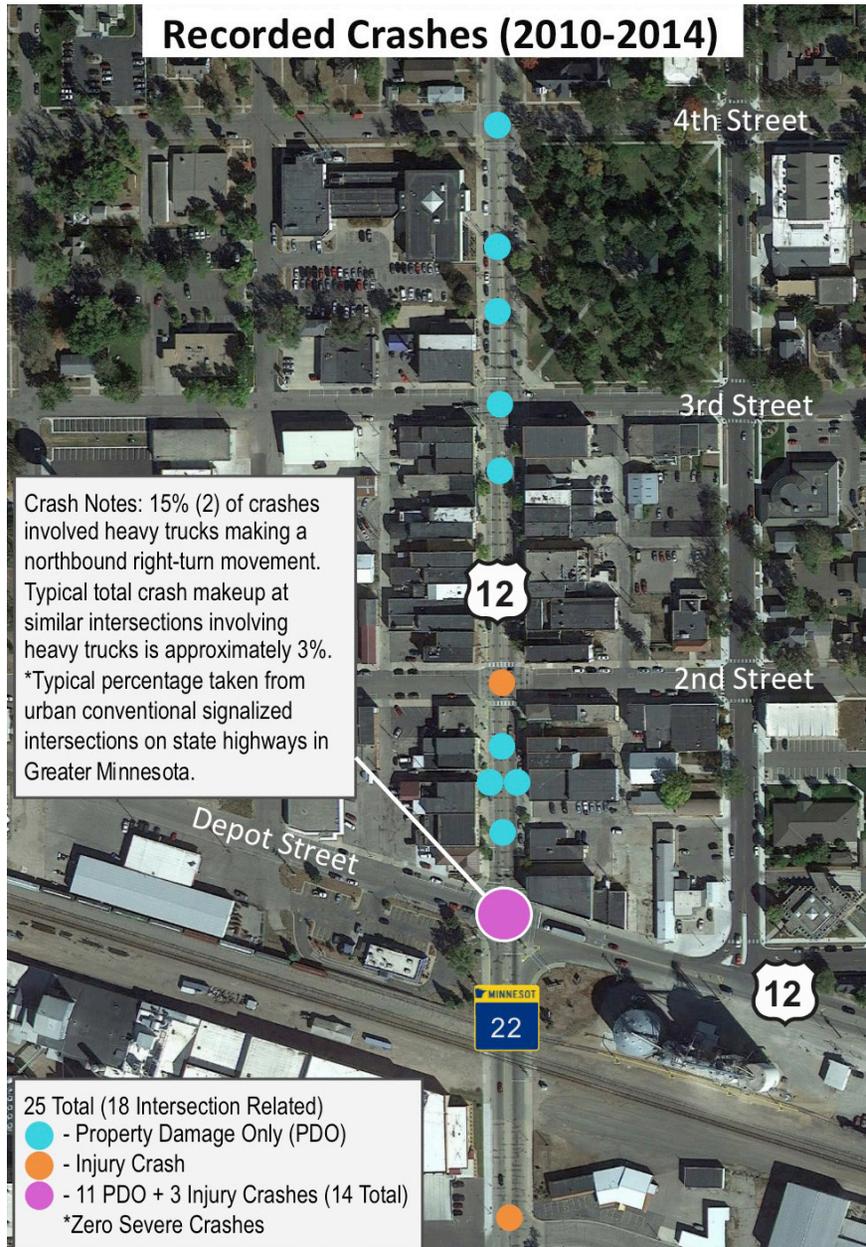
The US 12 corridor within the study limits is a three-lane roadway with on-street parking and adjacent sidewalk space. The three-lane roadway includes a center two-way left-turn lane. The MN 22 portion south of US 12 accommodates a northbound left-turn lane, but is striped with two travel lanes up to Commercial Street and no dedicated left-turn lane. The intersection geometry at the US 12 and MN 22 intersection is challenging due to the roadways meeting at an angle, buildings placed close to the roadway behind the sidewalk, and the amount of truck traffic that travels this corridor. Westbound to northbound and southbound to eastbound turning movements are difficult for heavy commercial vehicles.

Crash History

A crash history review was performed for the corridor as a whole and the key intersections, based on data obtained from the MnDOT crash database for the five year period of January 2010 to December 2014. Table 1 summarizes the 25 crashes reported that occurred on this section of US 12 (see Figure 6). Review of the crash types indicates that half of the crashes along this section of US 12 are rear end crashes. These types of crashes are typical along rural-urban roads with signalized intersections and adjacent commercial access.

Table 1. Summary of Crash Types

US 12 Intersections	Left Turn	Angle	Rear End	Side-Swipe	Runoff	Total
Commercial Street			1			1
TH 22	1	3	6	3	1	14
2nd Street		1				1
3rd Street			1			1
4th Street			1			1
US 12 Segments						
3rd to 4th Street			2			2
2nd to 3rd Street				1		1
TH 22 to 2nd Street			2	1	1	4



There were no severe injury crashes and five potential injury crashes. More than half of the recorded crashes along this corridor occurred at the US 12/MN 22 intersection. Four of these crashes involved left-turning vehicles failing to yield or driving into an improper lane. Another four involved northbound right-turning vehicles striking other motorists. Fifteen percent of crashes here involved heavy trucks making the northbound right-turn movement (two crashes). While this frequency number is not significant the percentage is noteworthy; typical total crash makeup at similar intersections involving heavy trucks is approximately three percent when considering urban conventional signalized intersections on state highways in Greater Minnesota.

Figure 6. Corridor Crash Data

Rail Grade Crossing

The MN 22 at-grade rail crossing of the BNSF rail line (crossing ID 067809K) was reviewed as well, to understand its existing safety standing. In the event there are safety issues, the 2019 reconstruction project would have the opportunity to improve conditions at this location. The crossing was reviewed using three general evaluation criteria: existing conditions, safety, and sight distances.

The risk index of each crossing was calculated using the Federal Railroad Administration's (FRA) online risk calculator. The FRA tool is typically used for risk analysis related to the implementation of quiet zones. It was used in this case to compare the estimated risk at the crossing to the national average (14,347) as well as the average risk for the City of Litchfield.

Sight distance guidelines for the crossing were calculated following the procedure outlined in the Minnesota Department of Transportation Traffic Engineering Manual 2009 Version, Chapter 13 Miscellaneous Traffic Items, Section 13-5.07 Railroad Crossing Review. The existing conditions, safety analysis, and sight distance analysis indicate the MN 22 BNSF at-grade rail crossing to be a safe crossing. While the crossing has a higher than average risk index as compared to the national average, and Litchfield average, there has not been a crash in nearly 25 years.

Current active warning devices such as gates, constant warning time circuitry, and flashing lights have sufficiently prevented vehicles from entering the crossing as a train is approaching. Additional safety measures could be installed at this location, such as passive warning devices – advanced warning signs or pavement markings. Additional flashing lights mounted on a cantilever structure over the crossing could also provide advanced warning to vehicles approaching the crossing. Installation of non-traversable medians that are a minimum of 100 feet long on the north and south approach to the tracks could reduce the risk of a crash by preventing vehicles from circumventing the gate. While not required, these treatments could be implemented when improvements are made to

the crossing if additional safety measures are desired.

Existing Traffic Volumes and Operations

The US 12 corridor is a heavily traveled route through downtown Litchfield. It is a significant route that provides regional connectivity east-west across the state and local access to the community. Within the study limits there are five key intersections with US 12:

1. Commercial Street
2. TH 22
3. 2nd Street
4. 3rd Street
5. 4th Street

The amount of existing traffic that uses the road dictates what lane configuration is needed, whether turn lanes are needed, and what type of intersection control is necessary. There are currently two intersections within the corridor limits along US 12 with traffic signals –MN 22 and 3rd Street. The other three intersections are side-street stop controlled intersections (stop signs).

The purpose of the operations analysis is to determine how the corridor currently operates, assess capacity, effects on safety, and recommend potential improvements where necessary. Traffic operations were reviewed at four of the five key intersections under existing conditions during the a.m. and p.m. peak hour.

Corridor Capacity

Overall corridor congestion can be assessed based on the daily traffic volume compared to the roadway capacity (volume to capacity ratio). The ratio of volume to capacity provides a measure of congestion along a stretch of roadway and can help determine where roadway improvements are necessary. It does not provide a basis for determining specific intersection improvements.

Roadway capacity differs based on the number of lanes and turn lanes that are provided. The typical planning-level average daily traffic (ADT) capacity ranges for a roadway such as US 12 (two-lane roadway with center two-way left-turn lane / three-lane roadway). A range is used since the maximum capacity of any roadway design ($v/c = 1.0$) is a theoretical measure that can be affected by its functional classification, traffic peaking characteristics, speed, vehicle type/mix, and other roadway characteristics. Eighty-five percent of a roadway theoretical capacity is often considered approaching capacity. A three-lane roadway capacity ranges from 14,000 to 17,000 vehicles per day. It approaches capacity at approximately 14,500 vehicles per day. The daily traffic volume of US 12 ranges from 8,000 to 8,800 north-south along the corridor study limits. Therefore, the v/c ratio for US 12 is approximately 0.55 to 0.60, well below the approaching capacity threshold. Figure 7 presents the daily traffic volumes for the immediate area.

Heavy commercial vehicles account for nine percent of daily vehicle traffic in this corridor, which is slightly above the state average for similar roadway types. The southbound left-turn and westbound right-turn movements at the US 12 / MN 22 intersection exceed fifteen percent heavy vehicles during the a.m. peak hour. This higher percentage of truck traffic can increase the v/c ratio given that heavy commercial vehicles account for approximately 1.5 regular passenger cars. Therefore, the v/c ratio can be adjusted to approximately 0.57 to 0.63, which is not significant enough to considerably affect the overall capacity of the roadway.

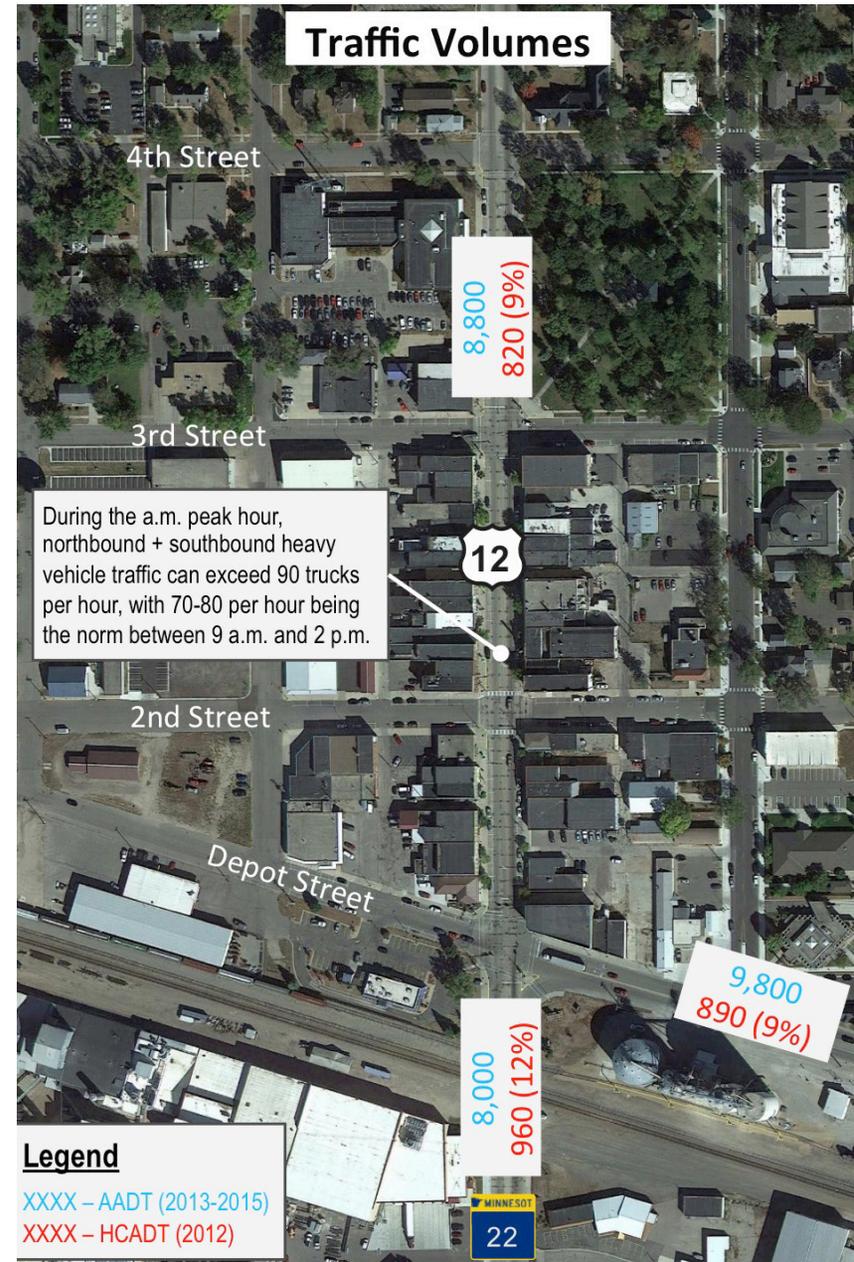


Figure 7. US 12 Daily Traffic Volumes

Intersection Capacity Analysis

A review of the existing conditions was completed to determine if any operational or geometric issues currently exist along the US 12 corridor. To determine the existing intersection capacity, a.m. and p.m. peak hour turning movement counts were reviewed. Traffic data was collected in October 2015 at the key intersections. An operations analysis was conducted. Detailed capacity thresholds are set based on the traffic control of the intersection (signalized intersection versus a side-street stop controlled intersection). Level of service (LOS) letter grades are reported to indicate whether an intersection is under, at, or over capacity (LOS A through C is generally considered acceptable by drivers in the Litchfield area). LOS D is considered at capacity and LOS E-F is considered over capacity.

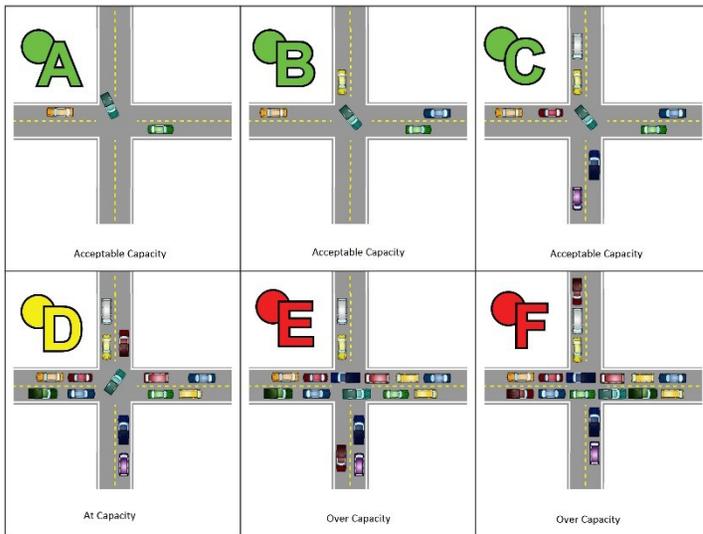


Figure 8 depicts the operations analysis and indicates that all key intersections currently operate under capacity during the a.m. and p.m. peak hours. There are sporadic backups at the US 12/ MN 22 intersection that may be the result of difficult truck turning movements at this location.

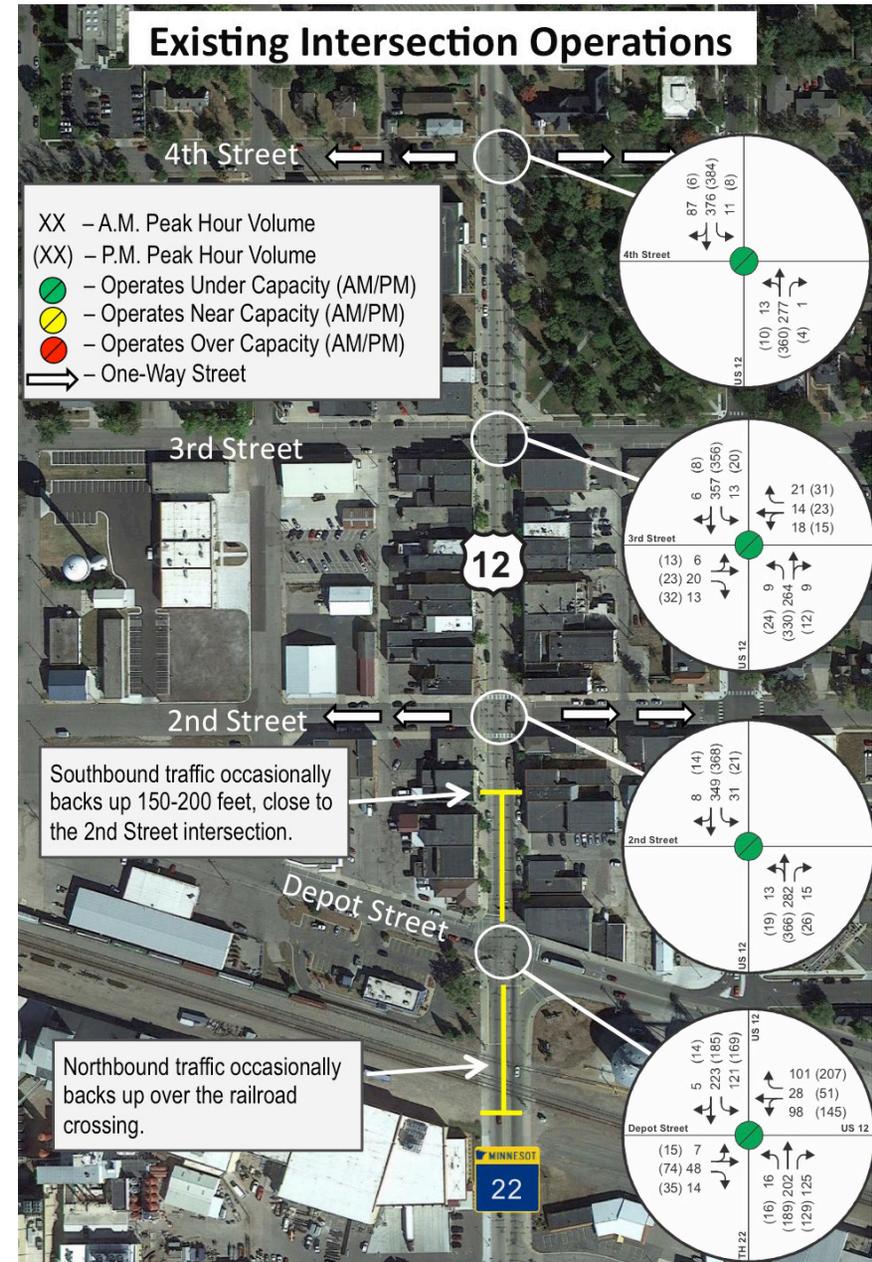


Figure 8. Existing Intersection Operations

Bicycle / Pedestrian Facilities

While there are sidewalks on both sides of the roadway, there are no bicycle facilities along this corridor. The City of Litchfield does not allow bicycles on the sidewalks in downtown; bicyclists need to travel on the roadway or dismount and walk their bicycle. Parallel routes do not have dedicated bicycle routes, but are more conducive to bicycle activity in the street because traffic volumes are lower and conflicts are less.



The sidewalks along US 12 through the downtown area are fairly wide with approximately eight (8) feet of walkable space and four (4) feet of utility buffer or amenity space.



There are a couple of locations where the sidewalk narrows (north-west corner of the US 12 and MN 22 intersection) or provides a slightly different experience than the main portion of the downtown area (south of the US 12 along MN 22). However, these areas still provide for pedestrians on either side of the roadway and crossing accommodations at the key intersections.

Corridor Concept Alternatives

Corridor concept alternatives were developed based on input from the public and various stakeholders. These alternatives address the goal statements and address issues and needs identified through the study process. In order to satisfy the project's goal of building consensus and acceptance for a locally preferred corridor cross section, a range of conceptual alternatives were developed that are a direct byproduct of public and stakeholder feedback. This chapter documents the iterative development process, elements that were considered along the way, and products that were produced through the study.

Concept Alternative Development Process

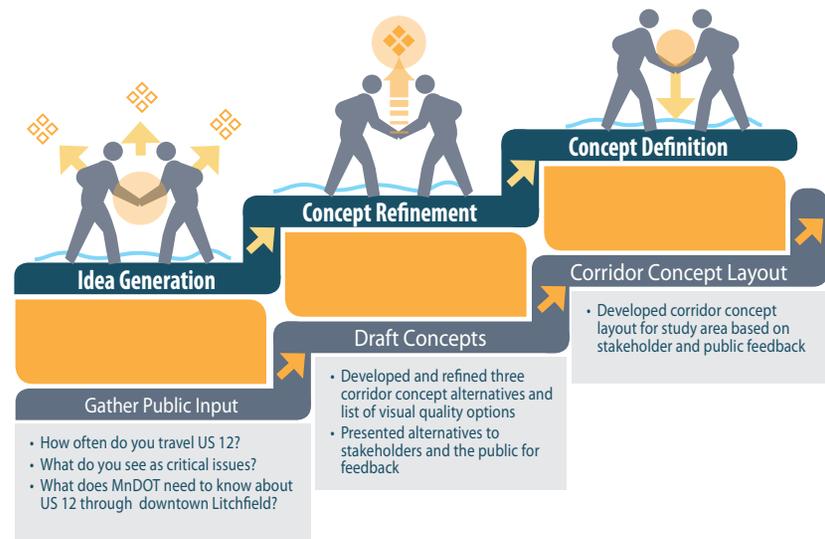
The development process was multifaceted using a range of inputs, including technical data, goal statement guidance, design parameters, historical preservation, direction from the PMT and PAT, and ultimately public stakeholder engagement (general public, focus groups, and targeted organizations). Concept alternatives were developed in a three step process:

Step 1 – gathered public input regarding what street elements were important for US 12 (i.e., travel lanes, turn lanes, parking lanes, bicycle lanes, sidewalks). Gathered public input regarding what visual quality elements were a priority for the corridor cross section (i.e., lighting fixtures, sidewalk pavement type, street trees, movable planters, bicycle racks, trash receptacles, benches, curb extensions, banners). This process did not yet screen for historic property effects (step 1 was considered an all-inclusive “brainstorming session”).

Step 2 – developed draft corridor concept alternatives based on public and stakeholder input/feedback. Prepared a refined list of visual quality options to apply to the typical roadway cross sections. Screened concept alternatives down to three representative typical sections and honed in the list of visual quality options based on stakeholder guidance so that more focused

input/feedback could be solicited from the public. Presented the draft corridor concepts to the public and stakeholders for input/feedback.

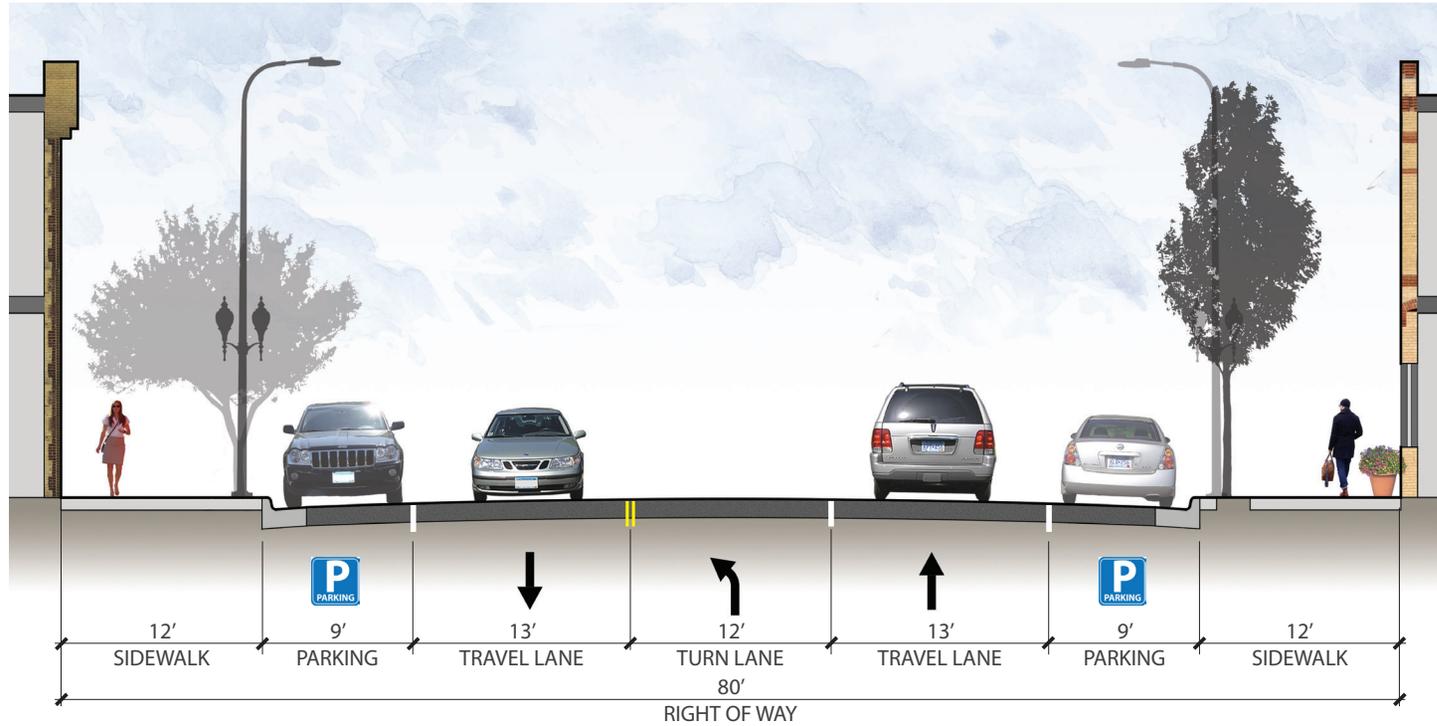
Step 3 – refined the corridor concept alternatives based on public and stakeholder feedback. Presented the refined corridor concept alternatives to focus groups, the PAT and PMT, and the City Council to gauge respective recommendations and receive guidance for selecting a locally preferred corridor concept alternative. Developed a corridor concept layout for the entire four block study area.



Description of Concept Alternatives

Initial Concept Alternatives – Step 1

The existing corridor cross section consists of:

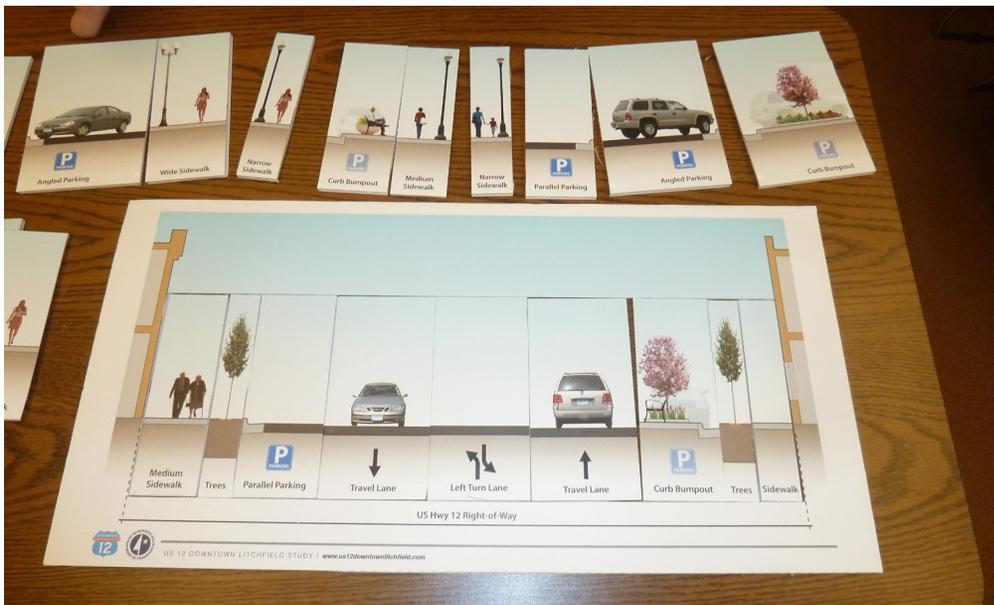


Existing Cross Section (Mid-Block)

EXISTING CONDITIONS			
LANE WIDTHS	TREES	LIGHTING	STREET FURNITURE
13' Travel Lanes 12' Turn Lane	Yes	Tall, modern "cobra head" style lights with historic acorn style lights attached	Used sparingly; Primarily movable concrete flower planters



Knowing what is included in the existing corridor cross section, the public was asked to develop initial corridor concepts of their own using an interactive puzzle exercise or by voting on the representative photos with elements that are most important to them with respect to the roadway.





Representative Picture 1



Representative Picture 2



Representative Picture 4



Representative Picture 5



Representative Picture 3



Representative Picture 6

		Vote Tally						
		9	6	5	14	10	0	
Picture #		1	2	3	4	5	6	
Sidewalk	Wide Sidewalk	1			1			2
	Medium Sidewalk							0
	Narrow Sidewalk							0
	Concrete Sidewalk							0
	Paver Sidewalk			2	5			7
	Special Pavement					1		1
	Curb Bumpouts	2	1	2	2			7
Parking	Parallel Parking	1			1			2
	Angled Parking					1	1	2
Furnishings	Waste Receptacles	1						1
	Benches in Furnishing Zone							0
	Benches next to Buildings					2		2
	Moveable Planters							0
	Built-in Planters							0
	Trees	2	2					4
	No Trees							0
	Bike Racks							
	Electrical Outlets	2						2
	Decorative Lighting				1	1		2
	Banners on Street Lights							0
Hanging Flower Baskets					2		2	

 Options Presented in Picture

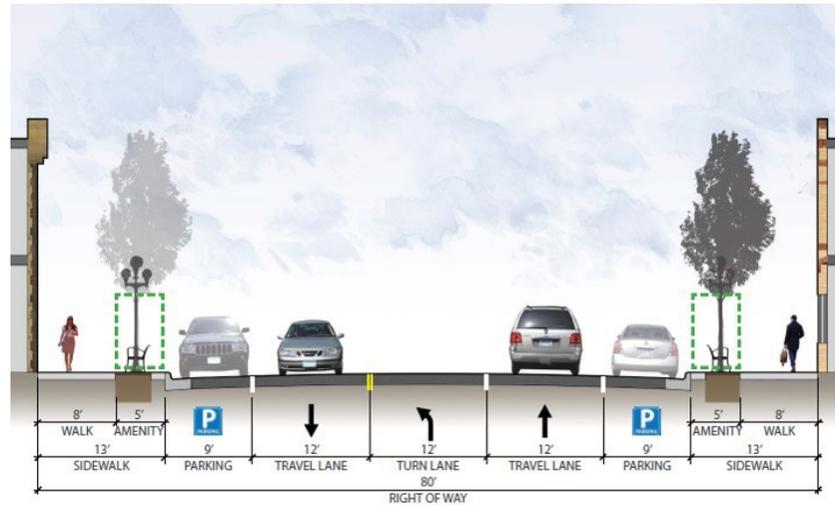
- Picture 4 received the most votes, followed by Pictures 5 and 1. Picture 6 received no votes.
- Curb bumpouts and paver sidewalks were initially identified as highly desirable streetscape features by the public.
- Wide sidewalks were more desirable than medium or narrow sidewalks.
- Initially more votes for “Trees” than “No Trees” (note this is a summary of the first public engagement meeting; additional survey data was collected).
- It was made clear to the public and stakeholders that the elements considered beyond standard design and reconstruction components of the project can be included at additional city cost (i.e., special sidewalk pavement or street furnishings).

Preliminary Concept Alternatives – Step 2

Three representative mid-block typical sections and one intersection typical section were developed based on input and feedback received during step 1. In addition, refined visual quality and streetscape elements were identified for further review and comment from the public and stakeholder groups. At this step of concept development, potential effects to historic properties received more attention. Visual quality elements (i.e., trees, lighting fixtures, sidewalk pavement type) were screened for their compatibility with the historic corridor. Concepts that include elements least disruptive to the historic integrity were included so that feedback could be specifically received about these components and their importance to the community.

Lighting was a significant contributor at this stage of the concept development process. The existing cobra head light with the combination acorn light attachments mixes functionality (cobra head) with historic character (acorn fixture). The five-globe light fixture offered for consideration during this step is considered significantly historic.

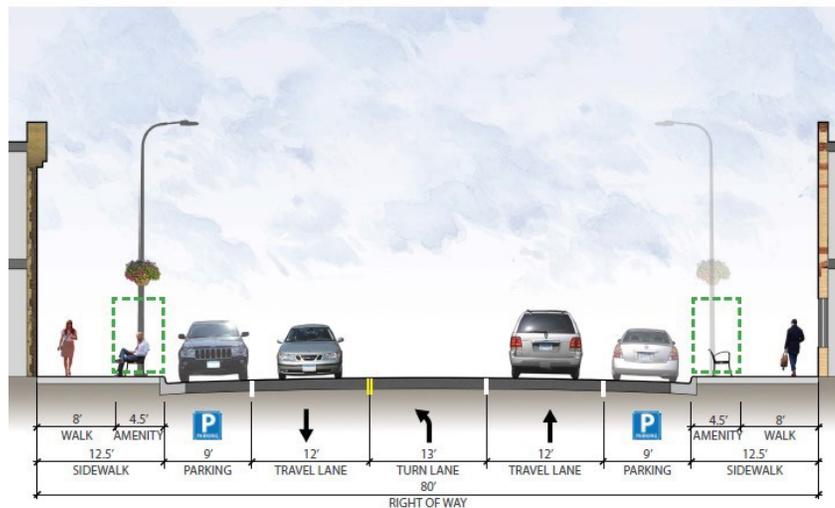
CONCEPT A SECTION



Typical Section Concept A - 12' Lanes with Trees (Mid-Block)

Concept A Features	
Lane Widths	12' Travel Lanes 12' Turn Lane
Trees	Tall, narrow trees with a dense canopy
Lighting	Historic 5-globe lights
Street Furniture	Movable benches in amenity zone

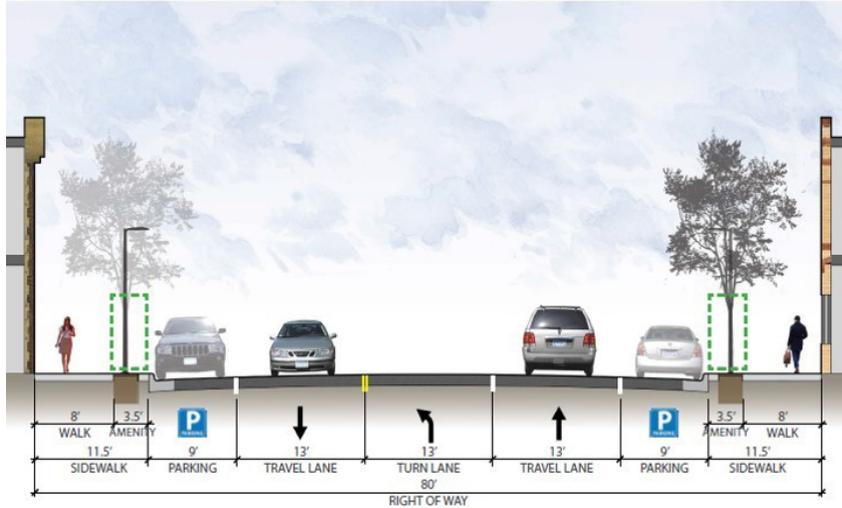
CONCEPT B SECTION



Typical Section Concept B - 12' Lanes with No Trees (Mid-Block)

Concept B Features	
Lane Widths	12' Travel Lanes 13' Turn Lane
Trees	None
Lighting	Tall, modern "cobra head" lights
Street Furniture	Movable benches in amenity zone

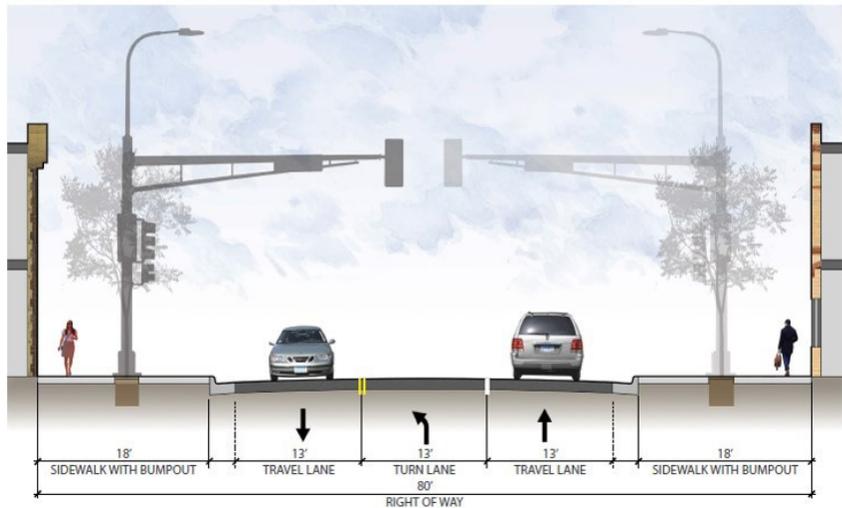
CONCEPT C SECTION



Typical Section Concept C - 13' Lanes with Trees (Mid-Block)

Concept C Features	
Lane Widths	13' Travel Lanes 13' Turn Lane
Trees	Tall trees with wide and open canopies
Lighting	Modern pedestal-mounted lights
Street Furniture	None

BUMPOUT CONCEPT



Typical Section Concept C - 13' Lanes with Trees (With Bumpouts, at Intersection)

Bumpout Concept
<p>This concept features curb extensions (bumpouts) at intersections. Bumpouts can increase safety by reducing the roadway width for pedestrian crossings and can also reduce travel speed by visually constricting the roadway for motorists.</p>

TREES

TREES		
	NO	YES
DESCRIPTION	Excluding trees provides more visibility for the building facades. Trees were not common during the period of historic significance (1882 – 1945).	Trees add greenery to the streetscape and also provide a physical barrier between the walking space and the roadway.
ADDITIONAL CITY COST	No	Yes
HISTORICAL INTEGRITY	High	Low

LIGHTS

LIGHT TYPE					
	EXISTING COMBINATION	5-GLOBE PEDESTAL	ACORN PEDESTAL	MODERN COBRA HEAD	MODERN PEDESTAL
DESCRIPTION	These fixtures are currently used in downtown Litchfield and combine the greater lighting ability of the tall cobra head lights with the historic aesthetics of the acorn style lamps.	Lights of this style are appropriate to Litchfield's period of historic significance (1882 - 1945).	Lights of this style are appropriate to Litchfield's period of historic significance (1882 - 1945).	These modern tall lights are able to illuminate a wider area of the roadway. This style of lighting will be used at all intersections regardless of the style chosen for the remainder of the corridor.	Modern pedestal lighting may be used if the fixtures have a simple and inconspicuous design
ADDITIONAL CITY COST	No	No	No	No	No
HISTORICAL INTEGRITY	Medium	High	High	Medium	Medium

PAVEMENT

PAVEMENT TYPE		
	STANDARD CONCRETE	AMENITY ZONE TREATMENT
DESCRIPTION	Standard gray concrete is the most historically appropriate option for this corridor and is also the least expensive option.	The use of colored pavement, pavers, or unique scoring pattern in the amenity zone highlights this area and creates a visual buffer between the walking space and the road surface.
ADDITIONAL CITY COST	No	Yes
HISTORICAL INTEGRITY	High	Medium

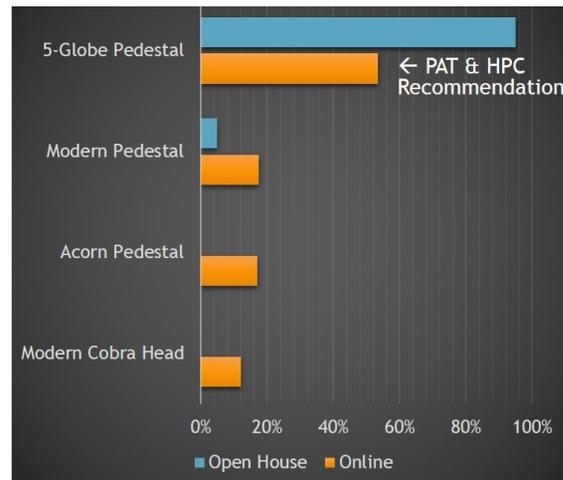
STREET FURNITURE AND AMENITIES

STREET FURNITURE TYPE						
	BENCHES	TRASH RECEPTACLE	HANGING BASKETS	REMOVABLE CONCRETE PLANTERS	BANNERS/ FLAGS	WAYFINDING SIGNS
DESCRIPTION	Benches can be placed in the amenity zone or adjacent to the building face.	Trash receptacles may discourage people from littering, but require regularly scheduled maintenance to replace bags.	Hanging flower baskets can be very visually appealing, but require daily watering and other maintenance.	The planters provide visual appeal and have the advantage of being easy to remove if they are no longer desired. Many concrete planters are currently located in the corridor.	Banners and flags provide additional visual aesthetic options and can be changed to match various seasons and regional events.	These signs direct downtown visitors to key locations such as parks, historic buildings, schools, and other public buildings.
ADDITIONAL CITY COST	Yes	Yes	Yes	Yes	Yes	Yes
HISTORICAL INTEGRITY	Medium	Medium	Medium	Medium	Medium	Medium

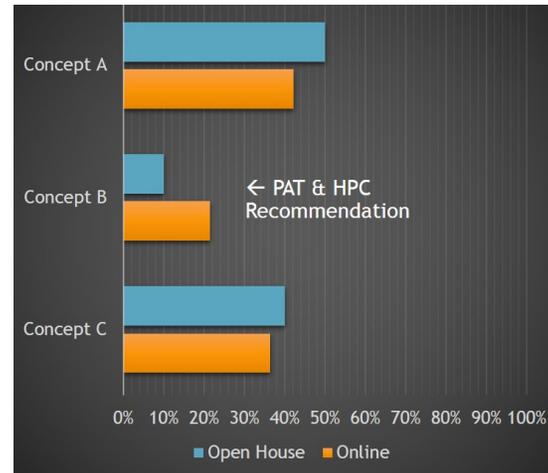
Corridor Concept Alternatives for Recommendation Selection – Step 3

Focus group engagement and PMT guidance assisted with refining and screening the preliminary concepts. The intersection typical section with the bump out was screened from further consideration due to the lack of pedestrian crossing safety issues and the potential impact on historic integrity. Screening the concepts down presented the various stakeholders with alternatives that best capture the elements most important to the City of Litchfield. Respective stakeholder meetings were held to discuss the various typical sections and elements with a group recommendation provided by each. What follows is the result of this engagement and what ultimately led to the locally preferred corridor concept alternative for both the

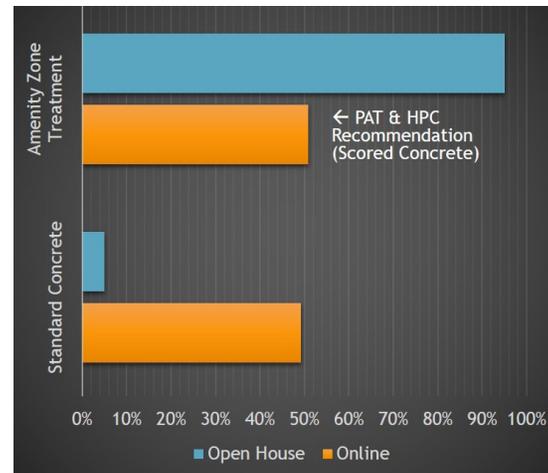
typical section and streetscape elements that have been prioritized for implementation with the 2019 reconstruction project.



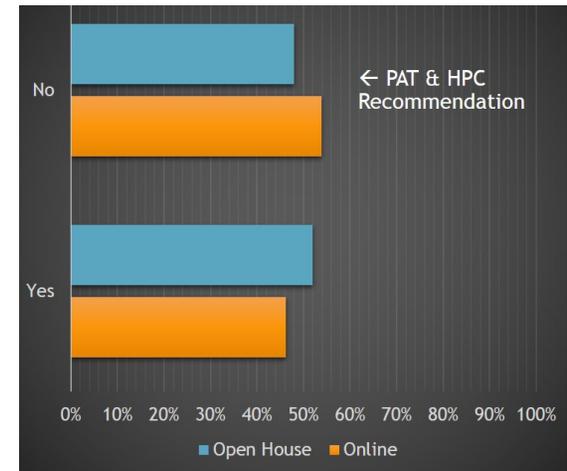
Open House/Online Survey Feedback – Lighting Fixture Style



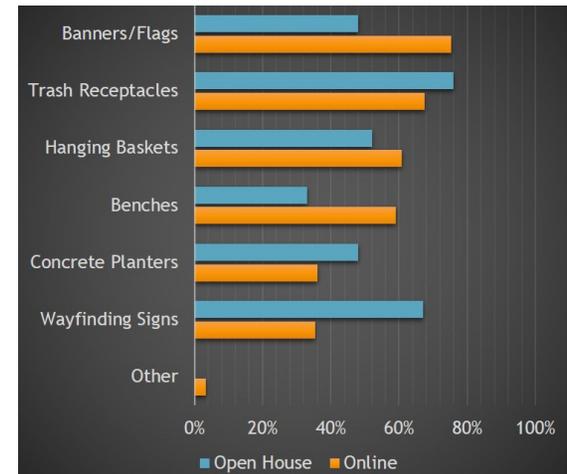
Open House/Online Survey Feedback – Concept Preference



Open House/Online Survey Feedback – Sidewalk Pavement Treatment



Open House/Online Survey Feedback – Trees



Open House/Online Survey Feedback – Streetscape Furniture and Amenities

Based on this feedback, direction from the PMT, as well as presentation and discussion of the study outcomes with the Litchfield City Council, defined recommendations were made for a locally preferred corridor concept alternative.

Findings and Recommendations

The culmination of this effort is the findings and recommendations for the study. The findings from the public and stakeholder input are contained in this chapter, specifically as they relate to items that are not definitively recommended but prioritized for future consideration as the detailed design of the corridor progresses. In addition, the corridor concept recommendation is presented here as a typical section and corridor layout for the four blocks of US 12 / MN 22.

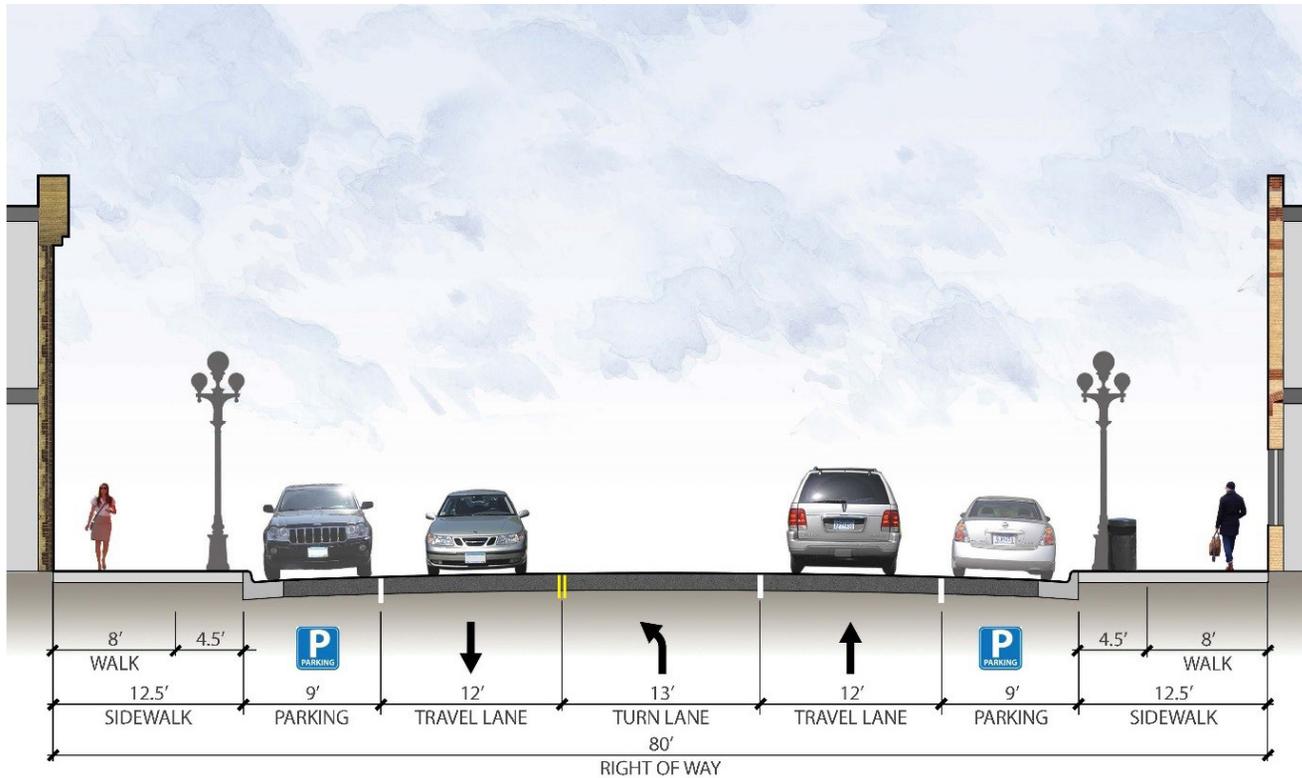
Study Findings

Through the study process, various engagement activities solicited input from the general public, focus groups, businesses and the like. All of this information informed the decisions that were made and ultimately the study recommendation contained herein. The general consensus of the community and those that participated in the process is that the US 12 corridor should continue to provide efficient vehicular travel for through traffic and commercial/retail access for downtown businesses. Any improvement to the downtown environment, with the inclusion of additional amenities was welcomed as well, but not at the expense of business opportunities or preserving the historic character of the downtown.

The public and all stakeholders that participated were very active and engaged in the process. Their involvement was invaluable to the success of the study. As the detailed design process continues from this point moving forward, maintaining this momentum will be key to ensuring that the ideas generated as part of this effort are not lost – but nurtured and seen through to construction. The attached appendices provide detailed summary of the feedback received and the findings from all outreach efforts.

Recommendations

The proposed typical section and its supporting information is presented on the following pages for the US 12 corridor. In addition, the four block layout of this recommendation is provided for future use in developing the detailed design plans for reconstruction. Also included is a summary of the streetscape elements that should be considered by the City and MnDOT as detailed design plans are developed. There is time yet to incorporate these elements into the design; the City of Litchfield needs to decide which elements they would like to incorporate and how to fund their installation and maintenance.



Typical Cross Section - 12' Lanes with No Trees (Mid-Block)

PROPOSED STREETScape FEATURES			
LANE WIDTHS	TREES	LIGHTING	STREET FURNITURE
12' Travel Lanes 13' Turn Lane	None	Tall, modern "cobra head" lights at intersections & historic 5-globe lights midblock	Historic ornamental lights and waste receptacles in Amenity Zone behind curb

Figure 9. Recommended Mid-Block Typical Section