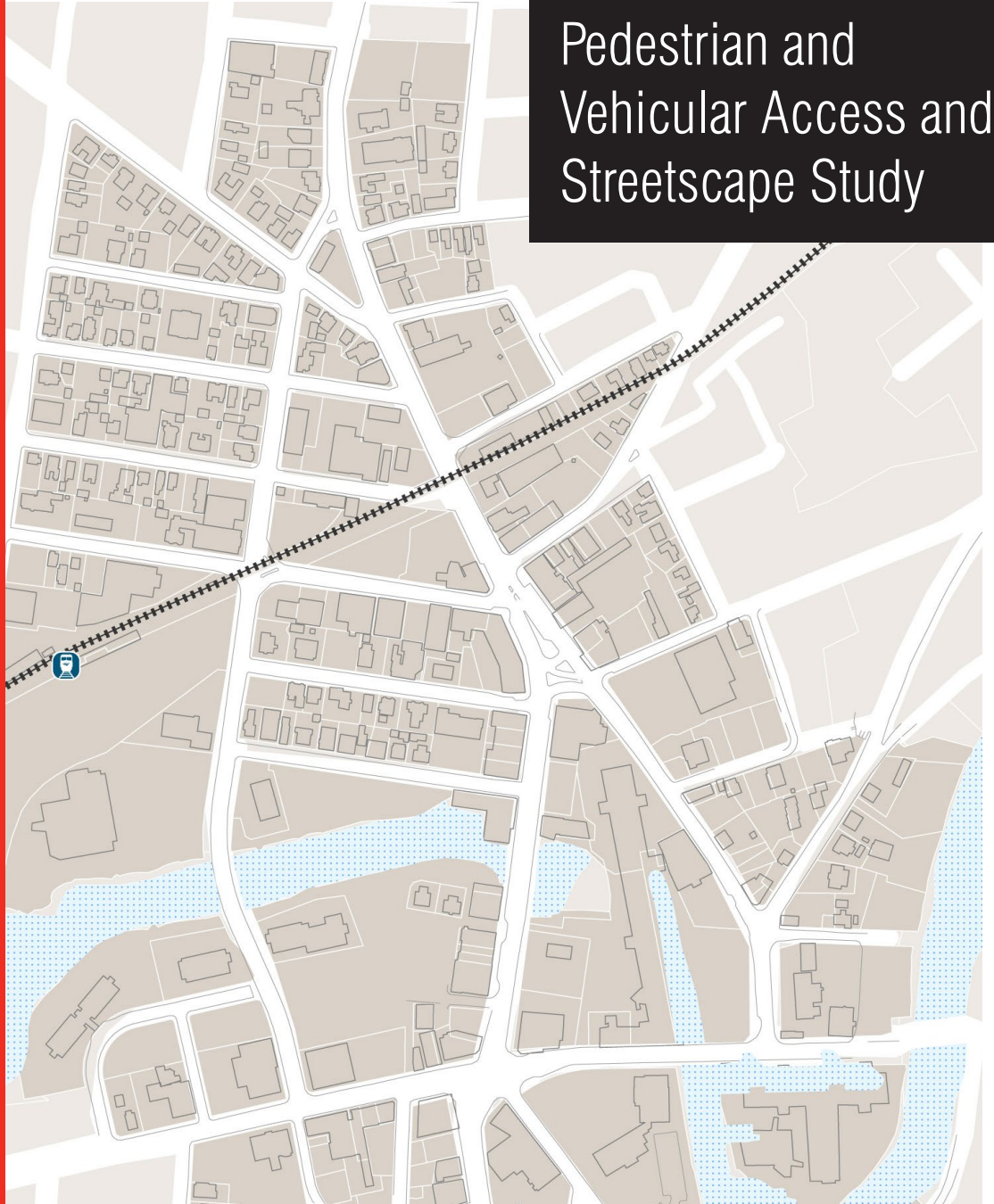


PREFERRED DESIGN

**Downtown Dover
Pedestrian and
Vehicular Access and
Streetscape Study**



**March
2015**

Prepared for **The City of Dover**
by **The Cecil Group** with **Resource Systems Group** and **Gibbs Planning Group**



Undated aerial photograph of downtown Dover, courtesy of the Dover Public Library.

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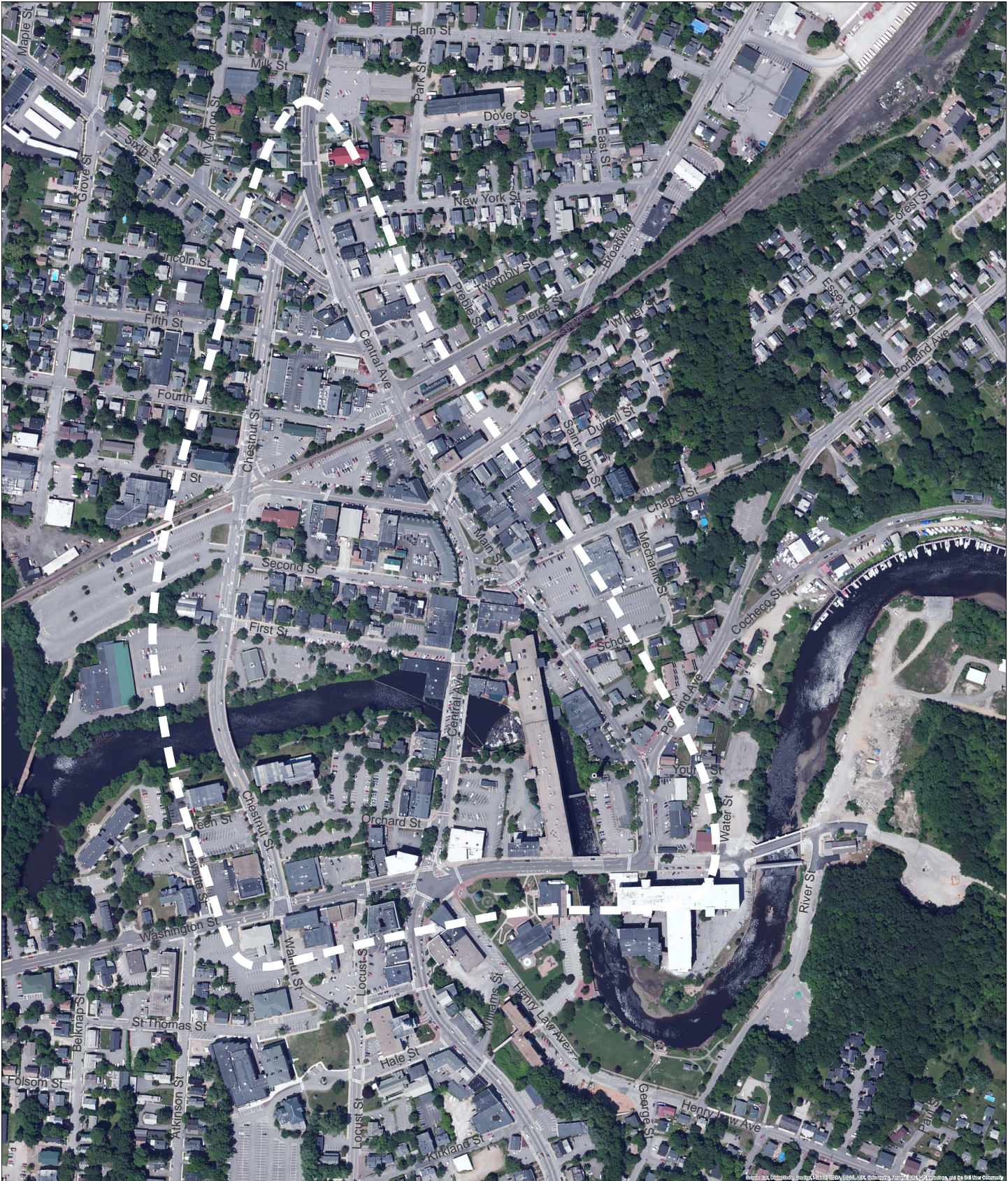


Figure 1. Aerial Photograph with Study Area

1 SUMMARY

1.1 PROJECT OVERVIEW

The City of Dover conducted this study to rebalance the circulation within downtown Dover while preserving and enhancing the neighborhood's character, businesses, and pedestrian and vehicular experience.

The study identifies and addresses existing and projected circulation issues associated with all modes of transportation. However, the recommendations are framed within the larger context of the City's plans for the economic and civic future of the downtown. The findings and recommendations consider the contributions that can flow from phased investments in the pedestrian streetscape and downtown circulation infrastructure.

This summary describes key findings and recommendations and includes the following:

- **LAYOUT AND CIRCULATION** – This section includes descriptions and graphics indicating how the major infrastructure components can be reconfigured and improved to meet community goals.
- **STREETScape AND URBAN DESIGN** – This section focuses on the pedestrian experience and the implications for the urban design of the public realm in the downtown, including materials, signage, lighting, landscaping, amenities, and public art.
- **PARKING STRATEGY** – This section provides recommendations regarding a parking strategy for the downtown that would be consistent with the other improvements and meet future needs.
- **IMPLEMENTATION** – The final section includes a phasing strategy and cost estimates.

Separate technical information, prepared as part of this study, included the following:

- **PLANS** – A series of drawings corresponding to a 25% design level for the surface layouts of sidewalks, crosswalks, intersections, streets, and on-street parking.
- **LEVEL OF SERVICE** – Technical calculations based on the vehicular movements associated with the recommended improvements at each intersection within the study area.
- **PUBLIC PROCESS** – The consultant's process of public input and discussion regarding each community meeting, and includes the meeting graphics, observed community input, and suggestions to the process.
- **ALTERNATIVES** – Descriptions and graphics associated with the supplementary recommended circulation patterns for the study area.

This summary is preceded by the *Downtown Access and Streetscape Study Existing Conditions Report (2014)*. That document contains a substantial amount of relevant information and analysis that has been used as a basis for these recommendations and conclusions.

Study Overview

The City of Dover is undertaking a study to rebalance the circulation within downtown Dover while preserving and enhancing the neighborhood's character, businesses, and pedestrian and vehicular experience. While the study will include all of downtown, it will primarily focus on the northern portion with specific care given to the intersection of Washington Street and Central Avenue, Chestnut Street from Washington Street to Central Avenue, and Central Avenue from Sixth Street to Washington Street. As shown in **Figure 1**, the boundaries of the study are as follows (and include properties on both sides of these streets):

- Sixth Street to the north
- Washington Street to the south
- Main Street to the east
- Chestnut Street to the west

At the conclusion of the study, cost estimates for streetscape improvements were also provided for Central Avenue from Lower Square to Silver Street.

The study has two other associated products. An *Existing Conditions Report* was prepared in 2014 that provided evaluations and findings regarding all of the topics covered in these recommendations. This *Report* is accompanied by 25% design plans, which are computer drafted drawings conforming to City Standards to serve as a reference and resource for future design.

Goals

This study was undertaken to help accomplish a series of goals to continue the revitalization of Dover's historic urban core, including rebalancing the entire circulation and streetscape network within the downtown so that future conditions will support a mixed-use environment that is more convenient, pleasant, and economically vibrant. These goals include the following:

- Creating a more attractive pedestrian-oriented environment
- Making vehicle circulation more clear and convenient
- Simplifying links to parking
- Expanding bicycle and transit links to and through the downtown

Process

The process included a series of technical evaluations and design efforts, punctuated with public input and discussion. The technical steps associated with this study include the following:

- Review of previous plans and study
- Updated information on traffic circulation conditions
- Inventory and evaluation of both existing land use and development patterns, and projected future conditions
- Review of market conditions
- Evaluation of streetscape and other design considerations
- Observations and evaluation of existing and future parking patterns
- Design studies of preliminary alternatives approaches to a revised pedestrian streetscape and circulation patterns. Preparation of three alternative choices for design alternatives
- Refinement of alternatives
- Preparation of Draft recommendations
- Preparation of Final Report

Steps in the community engagement and civic discussion include the following:

- Meeting and briefings with the City Council's Transportation Advisory Commission
- Interviews with a range of stakeholders, including downtown merchants, institutions, and organizations.
- Workshops on existing conditions
- Workshop and meetings with business organizations and business people
- Two public workshops to review and discuss alternative approaches
- Public meeting to present and discuss final recommendations

In addition to the meetings and workshops, the project presentations and video presentations and other information were made available through the City's website. A survey of public opinion and preferences was conducted to complement other efforts. Notes and documents associated with the public outreach program are included in the Appendices.

Context: Conditions and Trends

Evaluation of existing conditions and trends considered all of the topics that are subject to this study. These were documented in the *Existing Downtown Access and Streetscape Study Existing Conditions Report (2014)* and have served as a foundation and reference for the subsequent design alternatives and rec-

ommendations. Several of the relevant observations and findings include the following:

- **TRAFFIC PATTERNS** – The Dover area has shown a 1% decline of general vehicular traffic patterns over the past decade. Using reasonable assumptions about regional trends and development that may occur in Dover center, somewhat higher traffic volumes should be anticipated in the future and have been estimated as a basis for planning and design of the vehicle circulation network.
- **CONGESTION AND SAFETY**– Congestion and safety issues coincide with certain intersections and street segments, including both Upper and Lower Square and segments of Chestnut Streets. Strategies to improve these locations and calm traffic should be focused in these locations, as a result.
- **TRANSIT OPPORTUNITIES** – Many transit opportunities exist within the study area and monthly ridership trends tend to remain steady.
- **PEDESTRIAN CONNECTION** – Existing pedestrian circulation is fractured due to an irregular occurrence of defined crosswalks and excessive crosswalk lengths. Handicapped accessibility in the study area is incomplete and will need to be addressed in the future.
- **BICYCLE INFRASTRUCTURE** – Limited bicycle infrastructure is present in the downtown district such as bike racks or lockers, bike lanes, or shared lanes or paths.
- **PARKING STRATEGY** – An overabundance of both on- and off-street parking inventory has led to low levels of utilization throughout the downtown study area. While there are areas where demand is concentrated during certain times of the day, the new municipal garage will help provide additional capacity for central portions of the downtown. Over the long term, additional parking in the form of parking decks or structures may be required, in association with new development.
- **DEVELOPMENT OPPORTUNITIES** – Future mixed use development and parking requirements need to be taken into consideration with the current parking inventory, but the trend for new trip generation for the potential development would be negligible relative to other traffic flows.
- **EXISTING STREETScape CONDITIONS** – Inconsistency in the existing streetscape conditions has created a segmented landscape and a general lack of streetscape amenities.

1.1 SUMMARY OF FINDINGS AND RECOMMENDATIONS

Layout and Circulation

The City of Dover should advance a two-way circulation pattern within the downtown study area. This circulation pattern would consist of reconfigured intersections, adjusted street profiles, and the creation of a complete and safe sidewalk and crosswalk network.

The overall circulation pattern for the downtown has significant implications with regard to the other elements of this study; as a result, emphasis was placed on evaluating alternative approaches in order to reach this recommendation.

Among the alternatives considered, an approach which maximizes two-way circulation within the downtown is recommended (see **Figure 2**) because it best meets goals for the downtown. The overall layout of the intersections and sidewalks conforms to this overall approach as well as accomplishing other purposes. Many of the same improvements could be accomplished while retaining a revised one-way loop along several streets (portions of Washington Street, Main Street and Central Avenue). This pattern has certain drawbacks relative to a more predominant two-way system. However, should the one-way loop be retained, there are limited locations where some lane and intersection configurations would need to be altered relative to the recommended layout.

The summary below focuses on the recommended circulation pattern throughout the downtown. However, a set of alternate plans have also been provided to indicate how the overall layout should be altered to achieve improvements and retain a one-way loop.

The preferred approach has been advanced for the following reasons:

- **ECONOMICS** – Two-way streets provide more convenient and direct access to destinations and the ability to locate parking close to destinations, rather than requiring visitors to “loop” through the downtown. The purpose is to achieve higher average sales and higher valuations for both businesses and real estate.
- **SAFETY** – Vehicular speeds tend to be lower on two-way streets to accommodate on-coming traffic flows and left turns at intersections and curb cuts.
- **PEDESTRIAN ORIENTATION** – Vehicles stop more frequently in two-way networks, making it easier for pedestrians and bicyclists to cross vehicle lanes.

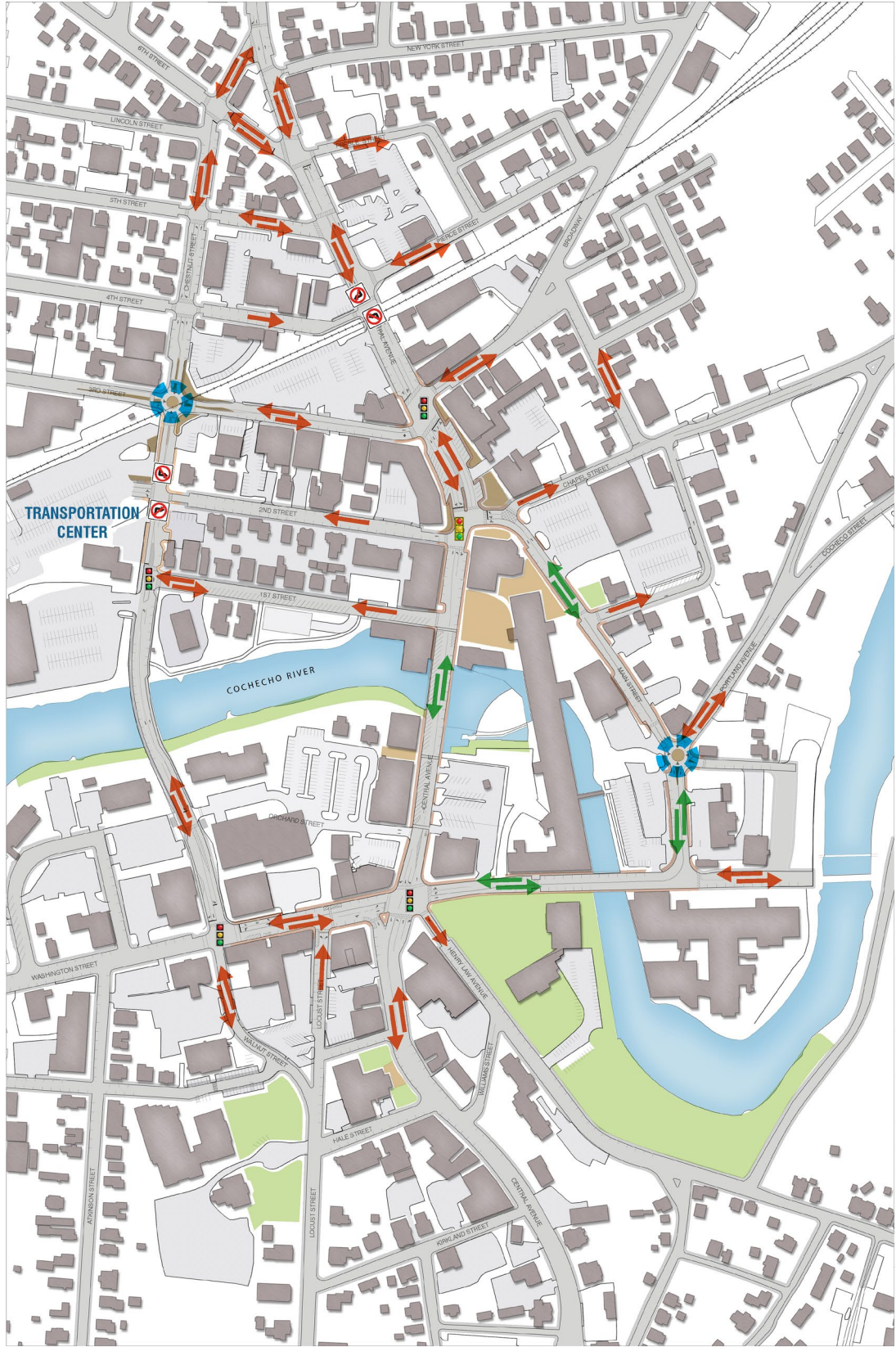


Figure 2: Recommended Circulation Plan

- **NAVIGATION AND WAYFINDING** – One-way street networks tend to be confusing for visitors, who may need to take long and indirect routes to reach their destinations, and may require extended detours if they do not find their destination or convenient parking at first. One-way circulation also tends to separate bus stops for the arrival and departure trips. In two-way systems, bus stops can be opposite each other on the same street.
- **LOADING** – Under any scenario, provisions need to be made to prevent loading and unloading from occurring in moving lanes; the general approach is the same in either one-way or two-way systems. It is important to provide a range of options that does not burden either the merchants or parking during periods of peak parking demand.

The detailed elements of the recommendation for the two-way circulation pattern include the following topics:

- Vehicular Circulation
- Level of Service
- Pedestrian Connectivity
- Bicycle Infrastructure Improvements
- Transit Connectivity
- Delivery and Loading Areas

Vehicular Circulation

Overall Patterns

The overall pattern is intended to increase the number of potential routes available to motorists and remove barriers such as one-way streets and prohibitions on turning movements, unless safe intersections require limitations. Principles employed to create the overall patterns include:

- Improvements converting one-way circulation patterns to two-way circulation for the length of Central Avenue, Washington Street and Main Street.
- One-way segments retained in other locations due to constraints in the widths of the right-of-way.
- Left-hand turns permitted wherever the intersection geometry will allow.

Lower Square

A thorough reorganization of the Central Avenue and Washington Street intersection, shown in and could provide a variety of benefits, which include the following:

- Substantially shortened walking distances across the intersection
- Improve the pedestrian connections to and from the Children’s Museum and Henry Law Park
- Increased capacity at intersection for northbound traffic on Central Avenue

Upper Square

The current condition of the Central Avenue and Main Street intersection is confusing and has created a series of unusable open spaces. This study recommends consolidation of existing open spaces at the Main Street and Central Avenue intersection to the eastern side of Central Avenue. This configuration provides a variety of benefits including:

- Creation of a usable civic space
- Connections within the area using short, well-controlled crosswalks
- Creation and signalization of an efficient, three-way intersection, substantially improving safety and operations
- Retention of diagonal parking

Portland Avenue and Lower Main Street

Portland Avenue serves as one of the main thoroughfares to enter and exit the downtown, but currently the configuration is vehicular oriented and unsafe for most users. A mini-roundabout traffic calming condition should be implemented in combination with the two-way circulation pattern, see. This will accommodate all vehicle sizes and turns while regulating entrance and exit speeds to make a safer condition for pedestrians.

Chestnut Street

This study recommends that Chestnut Street be narrowed in some locations to provide two continuous through-traffic lanes with left hand turn channels where appropriate. The reallocation of the right-of-way would allow for a variety of public improvements including:

- Widening of sidewalks
- Installation of additional of street trees
- Improvement of existing and installation of additional of crosswalks and lighting
- Creation of a paved island with seasonal planting on the bridge
- Reorganization of curb cuts and creation of better pedestrian connections at the Transportation Center
- Organization of turning lanes, crosswalks, bus stops and shelters around the new entrance to the City parking garage to facilitate safe crossings and avoid traffic congestion

The existing intersection of Chestnut and Third Streets should also be reconfigured to allow a mini-roundabout for safety and circulation purposes.

Level of Service

Levels of Services (LOS) is a methodology used as a standard of measurement by traffic engineers. Based on the recommendations for the downtown study area, the benefits of a two-way circulation pattern include more efficient intersections, such as the following:

- Relative to the existing network, the preferred circulation plan will have five major intersections with reduced delays and improved performance
- Five other major intersections will have no change in performance levels
- Levels of Service will not be reduced for any intersection

Pedestrian Connectivity

A series of connectivity improvements will reinforce a pedestrian-oriented downtown. These improvements include the following:

- Provision of special paving treatment in Upper Square, Lower Square, along the “triangle,” and near the transit hub
- Completion of missing sidewalks, repaired or rebuilt damaged sidewalks, and compliance of all sidewalks with the requirements of the Americans with Disabilities Act (ADA)
- Completion of the crosswalk network with painted crosswalks at all locations (with the exception of those that are currently unsafe)
- Installation of pedestrian-level wayfinding signage to link different destinations

Bicycle Infrastructure Improvement

Due to the limited existing infrastructure and minimal street profiles the preferred recommendations focus on providing increased opportunities for bicycle facilities to support the use of bicycles in the area. The City should consider using a shared street scenario, or sharrow, whenever possible and leverage connections between proposed infrastructure and existing nearby recreational trails.

Transit Connectivity

There is a need for convenient and safe bus stops and for better and safer pedestrian connections to the Dover Transportation Center, particularly at Chestnut and Third Streets. These connections could be achieved through the following strategies:

- A complete network of enhanced sidewalks and crosswalks which address ADA accessibility
- Visible lateral connections on First, Second, and Third Streets

- An updated wayfinding and signage strategy to direct visitors and residents between the downtown area and the Dover Transportation Center

Delivery and Loading Areas

A successful and vibrant downtown district relies on the ability of goods and services to be delivered and received at any time of the day. The locations and circulation patterns of delivery and loading should not change. To better facilitate the circulation of two-way traffic that is not related to deliveries, the City should provide dedicated spaces from the existing on-street parking stock for delivery-only purposes. These spaces should have restrictions on the amount of allowable time for each use. The preferred two-way approach should be properly dimensioned to facilitate double parking and the ability for southbound Central Avenue traffic to pass with minimal congestion. The City should note that the purpose of the recommendation is to better facilitate traffic circulation in certain areas – not to allow illegal double parking.

Streetscape and Urban Design

The City should address the new public areas that will be created as a result of intersection reconfiguration and areas that do not now appropriately address streetscape and landscape needs. The following urban design elements will create an identity for the downtown that is consistent with the history and values of the City of Dover and will establish an environment that is more attractive for pedestrians. These recommendations include the following:

- **PAVING MATERIALS AND TREATMENT** – These improvements would include ornamental paving materials to match the traditions of the historic mill district.
- **TRAFFIC CALMING** – Traffic calming principles have been used as an integral part of the concept design. This has been taken into account in the recommended circulation patterns that would introduce two-way traffic, realignment and signalization of intersections, provision of additional crosswalks and features such as “bumpouts” (curb extensions) to slow traffic where pedestrian conflicts exist.
- **SIGNAGE AND WAYFINDING** – Signage and wayfinding that is appropriate for both vehicles and pedestrians will link the destinations within the downtown, and indicate transit options, parking areas, and the locations of local businesses.
- **LIGHTING** – Ornamental street lighting can provide both safe conditions for pedestrians and vehicles and illuminate the historic architecture. The ornamental acorn style fixtures along Water Street can be extended throughout the downtown.
- **LANDSCAPE** – Species of trees and shrubs should complement the existing conditions and provide interest throughout all seasons.

- **STREET AMENITIES** – Benches, trash receptacles, and bike racks should be consistent throughout the downtown and complementary in style.
- **PUBLIC ART** – Public art within a downtown provides an opportunity for the City to display art that embraces the character, personality, and spirit of Dover’s culture. The City should provide opportunities and areas for public art to celebration the local art community.

Parking Strategy

The parking strategy for on-street spaces seeks to retain a substantial stock of such spaces throughout the downtown. The recommended plan seeks the reallocation of some spaces resulting in a better distribution of spaces along Chestnut Street and Main Street. Some spaces will be re-organized as a result of intersection reconfiguration, the installation of new crosswalks, and the creation of enhanced pedestrian amenities, including additional landscaped areas. The preferred plan is generally “parking neutral” relative to existing conditions with a net decrease of 18 spaces due to enhanced safety or to provide a better pedestrian environment.

The new City parking structure (between the Cochecho River and Washington Street) will add significantly to the supply of parking. There may be future opportunities to sponsor public, or public/private shared parking lots to help support growth. Some locations will also support private sector parking decks to accommodate additional parking.

Implementation

Costs

This *Report* includes concept-level cost estimates for the improvements described within the plan recommendations. The cost estimate includes construction and soft costs. The City's preferred level of improvement will affect the cost estimates for implementing the recommendations. The components of the cost estimates and relevant assumptions are provided within the *Report* and the Appendices.

The estimated total project cost is indicated in **Table 1**. Further breakdowns of costs into potential phases are described in the Report.

Table 1. Estimated Project Costs

CONSTRUCTION COSTS	
Subtotal Streetscape and Roadway Costs	\$7,313,300
Mobilization and General Conditions @ 8%	\$585,064
Subtotal Construction Costs	\$7,898,364
Construction and Design Contingency @ 25%	\$1,974,591
Total Construction Costs	\$9,872,955
OTHER COSTS	
Survey @ 1.5%	\$148,094
Design, Engineering and Permitting @ 15%	\$1,480,943
Traffic Control @ 5%	\$493,647
Resident Engineering and Inspection @ 10%	\$987,295
Total Project Costs***	\$12,982,936

Note: Detailed allocation of areas and unit costs are provided in **Appendix E**.

Phasing

The design and construction of these improvements will require several years to accomplish. Two major phases are anticipated. The first phase would consist of improvements along Chestnut Street. Phase 2 would consist of the changes in Upper and Lower Square and improvements to connecting streets. Phase 2 would be divided into two sequential construction sequences (Phase 2A and Phase 2B) to facilitate traffic flows and reduce construction phase impacts. The phases are depicted on the attached diagram, and include:

- PHASE 1 – Chestnut Street from Central Avenue to Washington Street.
- PHASE 2A – Upper Square; mini-roundabout at Main Street and Portland Avenue; Central Avenue north of Upper Square to New York Street; and the connecting streets between Central Avenue and Chestnut Street, excluding 1st Street.
- PHASE 2B – Lower Square; the street segments of Central Avenue from Upper Square, across Washington Street, and south to Silver Street; Washington Street from Chestnut Street to Portland Avenue; and Main Street from Upper Square to Washington Street.

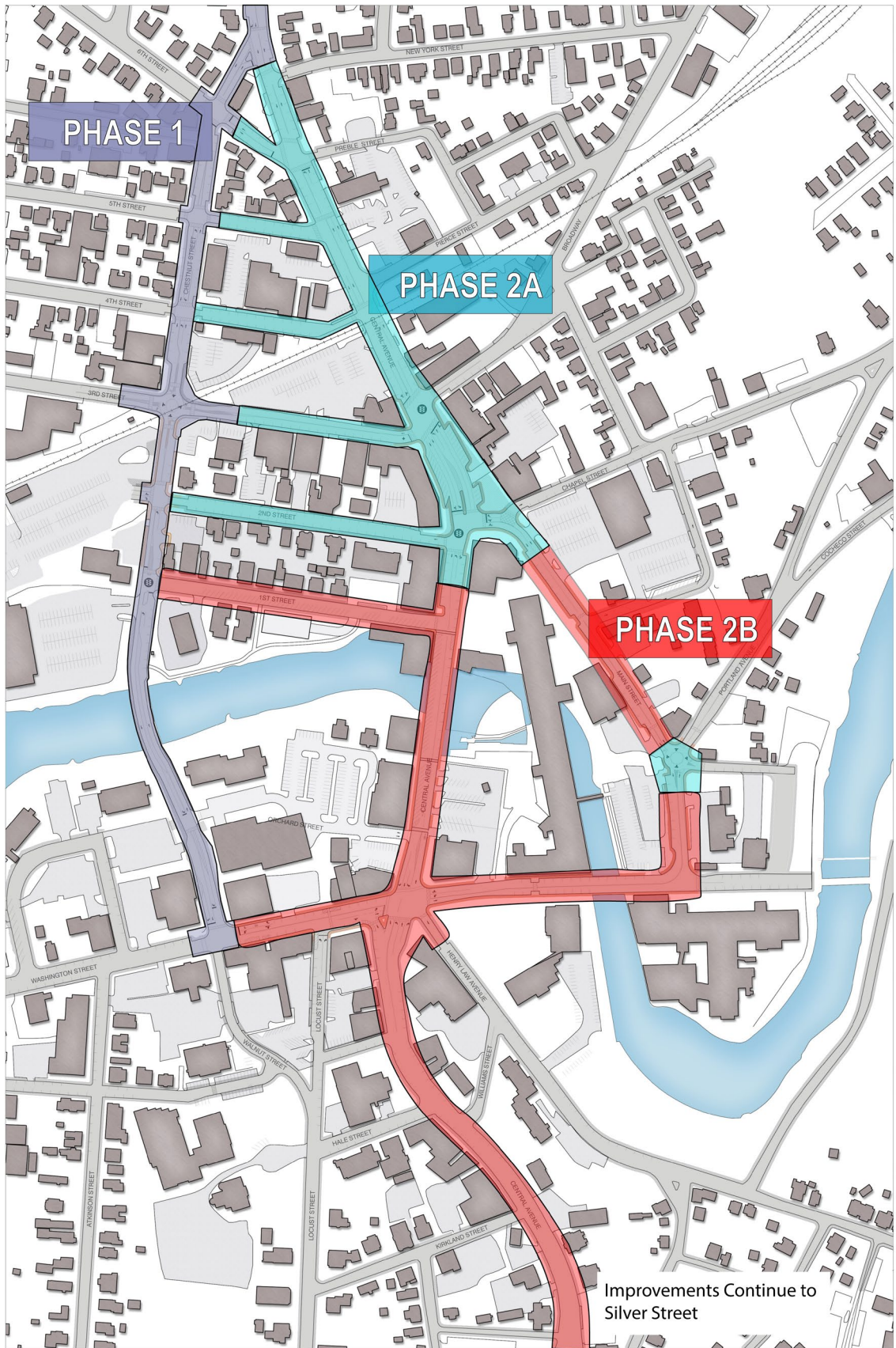


Figure 3: Overall Phasing Strategy

2 LAYOUT AND CIRCULATION

2.1 RECOMMENDED APPROACH

The recommended circulation pattern within the study area would consist of altered intersections and reconfigured street segments to promote safety, convenient circulation, and convenient access to and from destinations within the downtown. The recommended patterns including the location of signals and lanes are indicated on **Figure 4**. Principal features of this circulation pattern have been considered for all transportation modes and is described below. For comparison purposes the existing circulation patterns are provided in **Figure 5**.

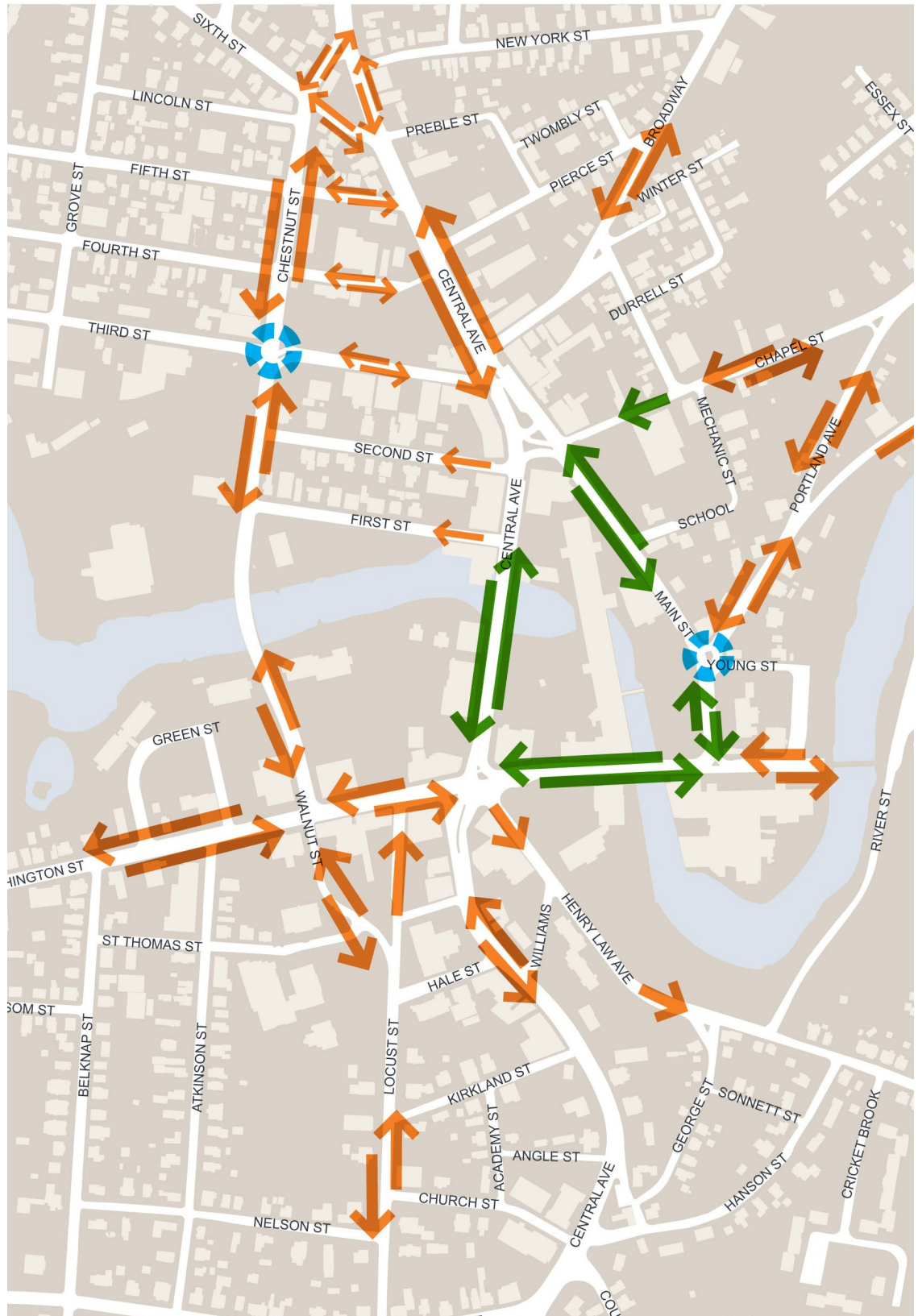


Figure 4: Preferred Circulation Pattern



Figure 5: Existing Circulation Pattern

Vehicular Circulation

The vehicle circulation is designed to distribute traffic throughout the downtown to the greatest degree practical and provide multiple choices so that motorists can use the most convenient route to reach their destination. This approach reduces the number of one-way streets and replaces several one way segments with two-way traffic. However, certain one-way street segments need to be retained because of the specific geometry of the streets and intersections.

Within this overall approach several changes from the existing conditions are recommended, and include:

- The intersections at Lower and Upper Square would be revised to create more efficient and safe intersections.
- Central Avenue between Upper and Lower Square would be converted to allow two-way traffic.
- Similarly, Main Street between Upper Square and Washington Street would be converted to a two way street
- Washington Street would become a two way street along its entire length.
- Chestnut Street would be narrowed in some locations so that it becomes a consistent along its entire length.

Certain street segments should remain one-way because of narrow widths and the configuration of the operation of particular intersections. These one-way segments would result in turning restrictions to prevent wrong-way traffic. One way segments would persist on portions of:

- First Street
- Second Street
- Portions of School/Mechanic Street
- Fifth Street
- Chapel Street
- Locust Street northbound
- Henry Law Avenue

The circulation patterns should allow left hand turns unless there are intersection geometries or queuing conditions that restrict safe operations. So, for example, the revised patterns would allow a left hand turn onto Broadway for vehicles moving southbound on Central Avenue.

New mini-roundabouts would be provided in two locations to facilitate traffic distribution and ease congestion, including:

- Intersection of Portland Avenue and Main Street
- Intersection of Third Street and Chestnut Street

The revisions in the circulation system would include an additional signalized intersection as part of a reconfigured Upper Square. All of the signals would be provided with electronic management and coordination devices to manage operations, adjust flows to accommodate different conditions throughout the day, and generally reduce congestion.

Lower Square

A thorough reorganization of the Central Avenue and Washington Street intersection would be accomplished as illustrated in **Figure 6** and **Figure 7**. Principal features of this re-organization include:

- A new right hand turn channel would be created on Central Avenue northbound to facilitate turns onto Washington Street eastbound, and reduce congestion.
- Turning lanes would be provided including exclusive left turn channels on each leg of the intersection.
- Henry Law Avenue would remain open to southbound traffic.
- The configuration of lanes will allow two-way operations in and out of the City parking areas that would connect to Central Avenue.
- The curbing would be extended into the intersection to confine the vehicular lanes to properly configured channels and turning radii, thereby significantly expanding the sidewalks and landscape open space opportunities. This would result in significantly enhance operations, by reducing the size of the intersection and reducing pedestrian crossing distances.



Figure 6: Lower Square Preferred Circulation Plan

The reconfiguration would provide a variety of benefits, which include the following:

- Substantially shortened walking distances across the intersection
- Improve the pedestrian connections to and from the Children’s Museum and Henry Law Park
- Increased capacity at intersection for northbound traffic on Central Avenue

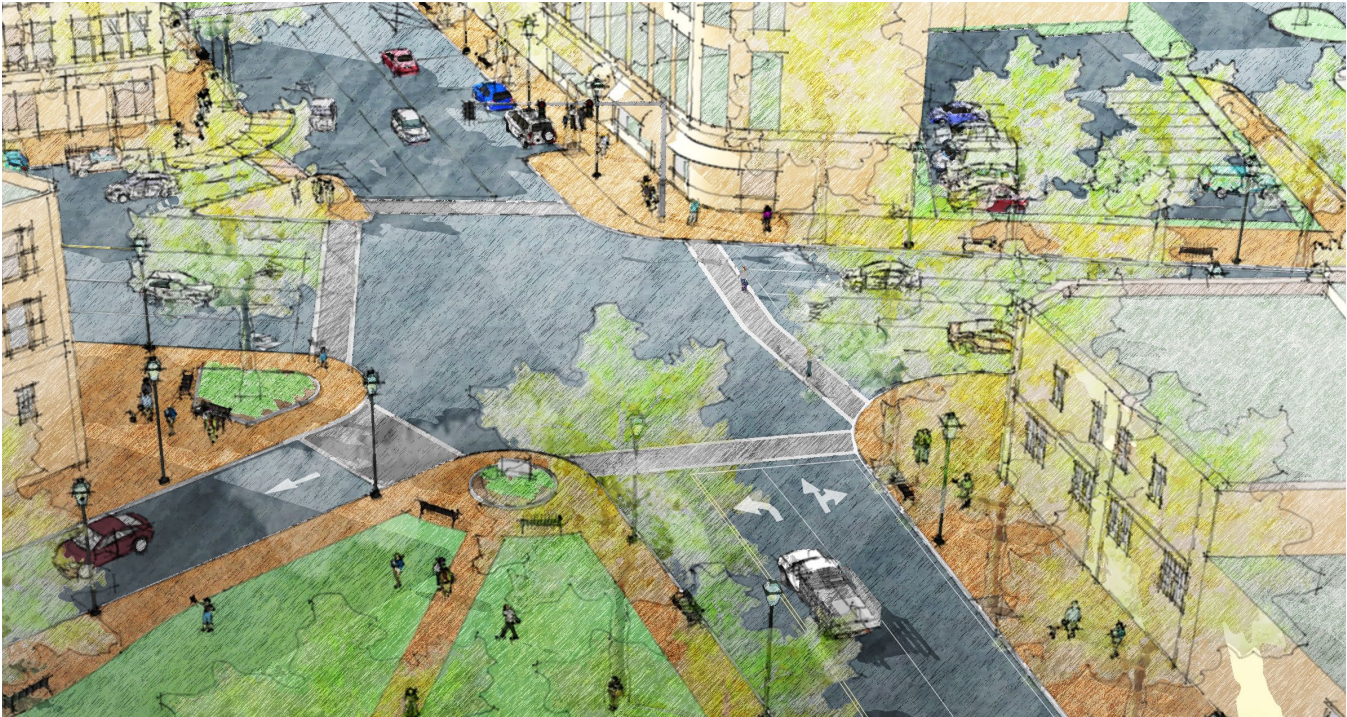


Figure 7: Lower Square Rendered

Upper Square

The current condition of the Central Avenue and Main Street intersection is confusing and has created a series of unusable open spaces. This study recommends consolidation of existing open spaces at the Main Street and Central Avenue intersection to the eastern side of Central Avenue. Principal features of this re-organization are illustrated in **Figure 8** and **Figure 9**, and include the following elements:

- A compact and signalized intersection would be created connecting Main Street and Central Avenue.
- A second signalized intersection would be located to manage movements to and from Third Street and Broadway. This signal would be coordinated to facilitate movements through both intersections and reduce potential congestion.

- Chapel Street would be connected to Main Street and remain one-way in its current direction. Left hand and right hand turns would be permitted for vehicles seeking to enter Chapel Street.
- A median strip would be provided to help channelize traffic along Central Avenue, but have a break so that southbound traffic on Central Avenue can enter the existing curb cut in the block between Chapel Street and Broadway.
- Second Street would remain one way westbound.
- Channelization would be organized to facilitate turns.
- Pavement for vehicles would be provided to the extent needed for proper channelization and appropriate turning radii. Expanding the sidewalks and landscape open space opportunities. This would result in significantly enhance operations, by reducing the size of the intersection and reducing pedestrian crossing distances.



Figure 8: Upper Square Preferred Circulation Plan

This configuration provides a variety of benefits including:

- Creation of a usable civic space
- Connections within the area using short, well-controlled crosswalks
- Creation and signalization of an efficient, three-way intersection, substantially improving safety and operations
- Retention of diagonal parking



Figure 9: Upper Square Rendered

Portland Avenue and Lower Main Street

Portland Avenue serves as one of the main thoroughfares to enter and exit the downtown, but currently the configuration is vehicular oriented and unsafe for most users. A mini-roundabout traffic calming condition should be implemented in combination with the two-way circulation pattern. This will accommodate all vehicle sizes and turns while regulating entrance and exit speeds to make a safer condition for pedestrians.

Principal features of this re-organization are illustrated in **Figure 10** and include the following elements:

- Provision of a mini-roundabout configured to allow for truck turning movements.

- Alteration of curb lines to accommodate curb cuts and provide parking where the lane alignments will allow.
- Provision for crosswalks along all intersecting streets

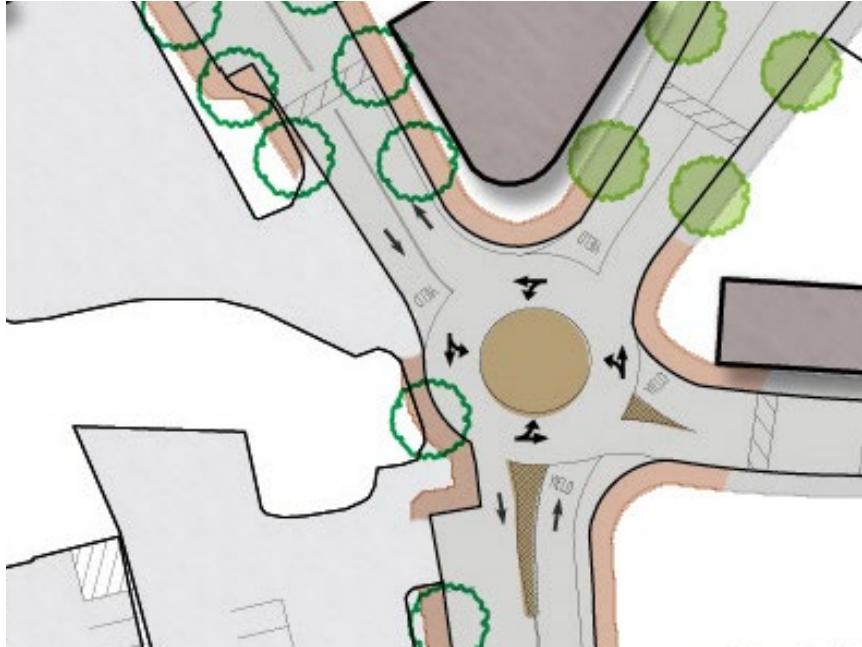


Figure 10: Main Street at Portland Avenue Mini-Roundabout

Chestnut Street

This study recommends that Chestnut Street be narrowed in some locations to provide two continuous through-traffic lanes with left hand turn channels where appropriate. Principal features of this re-organization are illustrated in **Figure 11** and **Figure 12**. The reallocation of the right-of-way would allow for a variety of public improvements including:

- Widening of sidewalks in specific areas
- Installation of additional of street trees
- Improvement of existing and installation of additional of crosswalks and lighting
- Addition of parallel parking spaces on the bridge extending to 1st Street
- Reorganization of curb cuts and creation of better pedestrian connections at the Transportation Center
- Organization of turning lanes, crosswalks, bus stops and shelters around the new entrance to the City parking garage to facilitate safe crossings and avoid traffic congestion.

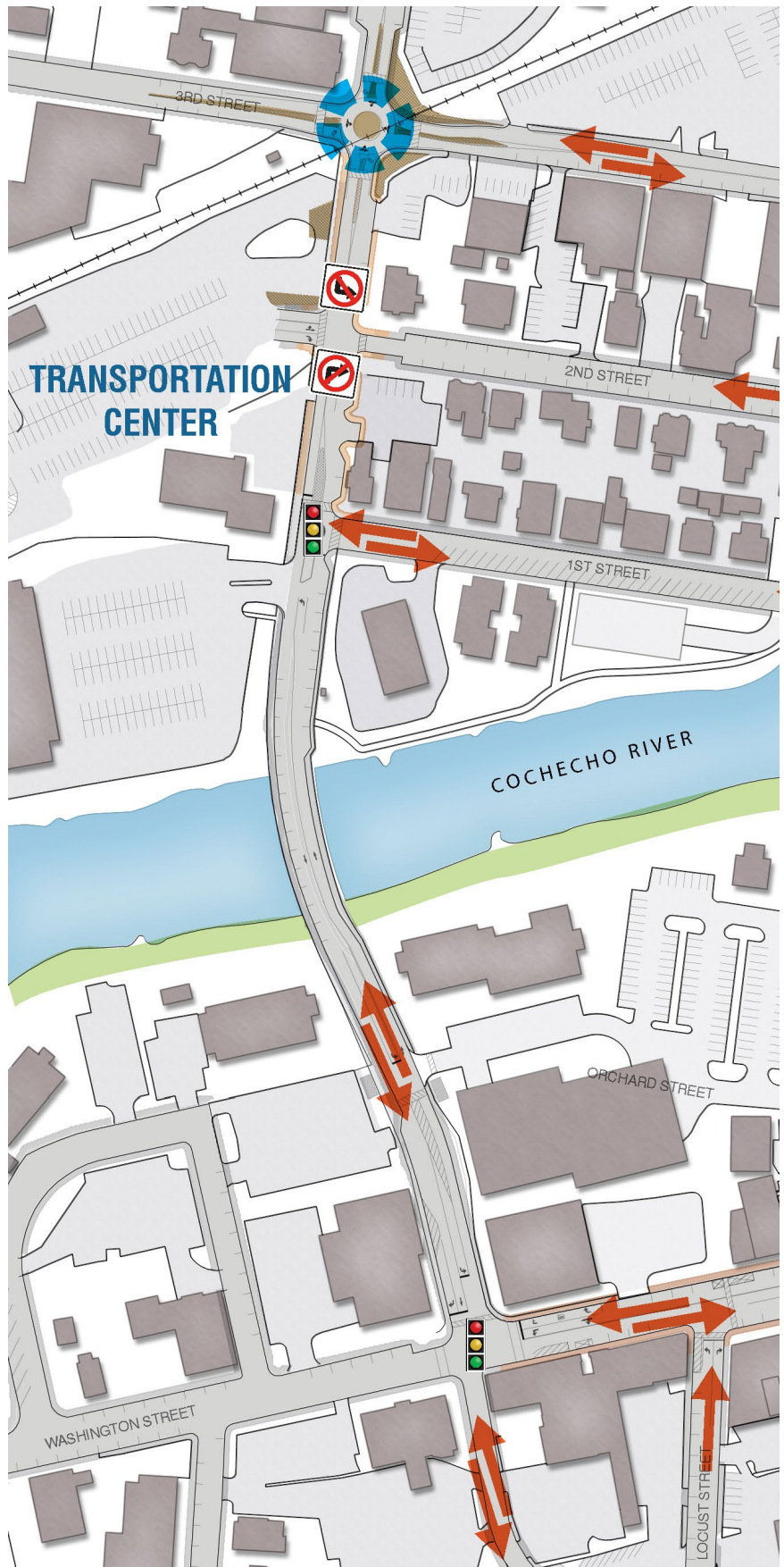


Figure 11: Preferred Chestnut Street Circulation Plan

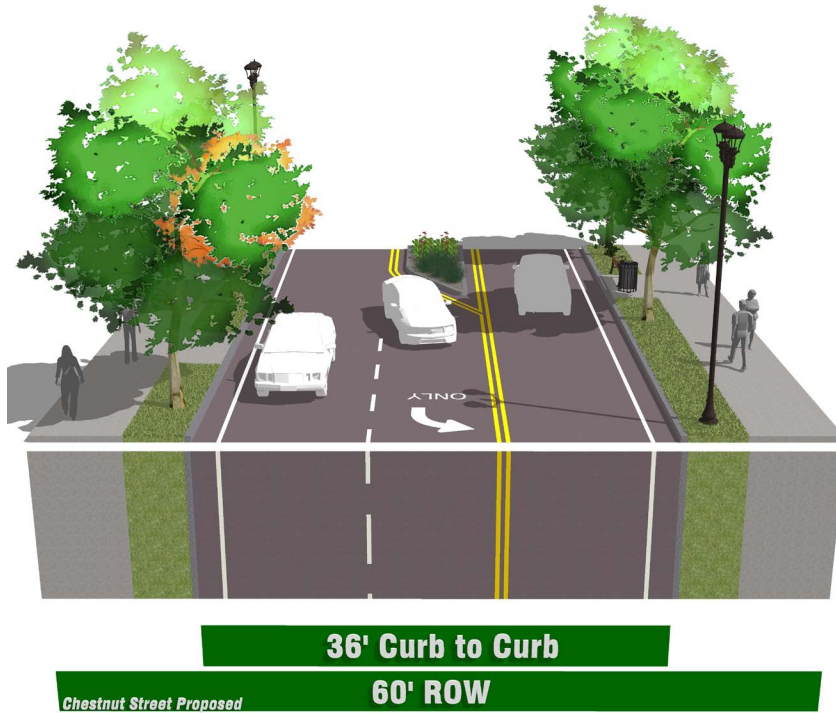


Figure 12: Preferred Chestnut Street Road Diet

The configuration of the intersection of the City parking lot and Chestnut Street is needed to allow for southbound turning movements that will not impeded Chestnut Street traffic, and also provide for safe crosswalks with excellent sight lines. This configuration would allow a mid-street pedestrian island on Chestnut Street, so that pedestrians could make safer crossings.

Concerns have been raised about the safety at the intersection of the small street (Fayette Street) which connects parking areas to Washington Street because of restricted sight lines. Suggestions were made to re-connect Green Street to Chestnut Street. However, the City no longer controls the land where Green Street once extended to Chestnut Street. However, the curb lines should be extended into Washington Street at the intersection with Fayette Street. This adjustment would allow the stop line to be moved southward and improve the sight lines towards oncoming traffic.

The existing intersection of Chestnut and Third Streets should be reconfigured to allow a mini-roundabout for safety and circulation purposes. This reconfiguration would provide for the at-grade rail crossing, and distribute crosswalks around its perimeter, see [Figure 13](#) and [Figure 14](#).



Figure 13: Third Street at Chestnut Street Circulation Pattern



Figure 14: Mini-roundabout Model

Level of Service

Levels of Service (LOS) is a methodology used as a standard of measurement by traffic engineers to indicate the levels of congestion at intersections. By evaluating the LOS within an overall network, existing problems can be identified and future conditions can be projected.

The recommended circulation configuration was compared to conditions that are projected if no improvements are made. These calculations took into account the increase in traffic volumes that should be taken into account over the next 20 years.

Based on the recommendations for the downtown study area, **Figure 15** shows the benefits of a two-way circulation pattern including:

- More efficient intersections
- Relative to the existing network, the preferred circulation plan will have five major intersections with reduced delays and improved performance
- Five other major intersections will have no change in performance levels

- Levels of Service will not be reduced for any intersection

Calculations of the LOS that will result from the recommended changes have been provided in the **Appendix** of this *Report*.

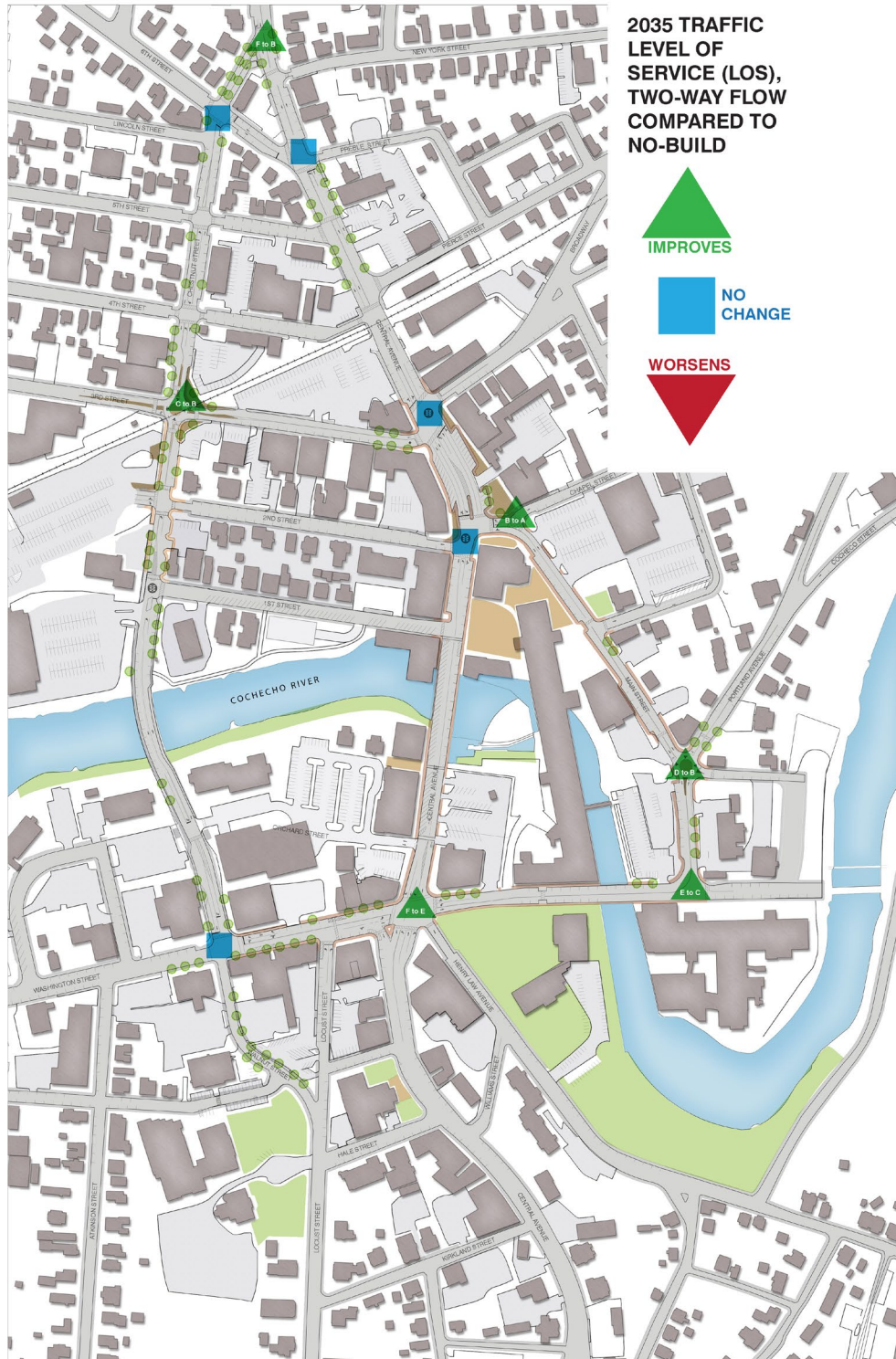


Figure 15: 2035 Traffic Level of Service

Pedestrian Connectivity

A series of connectivity improvements will reinforce a pedestrian-oriented downtown. The diagram in **Figure 16** conveys the concepts and locations for some of the principal recommendations.

Overall pedestrian network improvements include:

- Completion of the crosswalk network with painted crosswalks at all locations (with the exception of those that are currently unsafe)
- Completion of missing sidewalks, repaired or rebuilt damaged sidewalks, and compliance of all sidewalks with the requirements of the Americans with Disabilities Act (ADA)
- Extension of pedestrian-scaled ornamental fixtures to the streets in the area to create a more consistent lighting level geared to pedestrian needs as well as vehicular requirements
- Installation of pedestrian-level wayfinding signage to link different destinations, as described in the discussion of wayfinding

Recommended improvements to specific portions of the downtown include:

- Significantly expanded sidewalks and adjacent landscaped area at Lower and Upper Square associated with realignment of the intersections
- Shorter crosswalks at the Lower and Upper Square intersections associated with the intersection improvements
- Improved sight lines at the pedestrian crossing where Henry Law intersects Lower Square by moving the curb lines northwards, in conjunction with the changes in the intersection
- Provision of special paving treatment and streetscape design to enhance the pedestrian experience in Upper Square, Lower Square, along the “triangle,” comprised of Central Avenue, Main Street, and Washington Street and near the transit hub
- Provision of a crosswalk across Washington Street near the entrance to the Children’s Museum to serve pedestrians and patrons of the museum
- Focused improvements in the vicinity of the Dover Transportation Center, including simplifying and limiting the curb cuts across the sidewalk, placement of crosswalks in locations that create direct links across the intersections and around the proposed mini-roundabout
- Improvements to both sides of Chestnut Avenue as required to provide consistent, high quality sidewalks on both sides of the street
- Reorganization of the crosswalks along Chestnut Street south of the bridge to facilitate safe crossing locations relative to turning vehicles, and to provide a mid-crossing safety area so that pedestrians may pause if needed as they cross the street

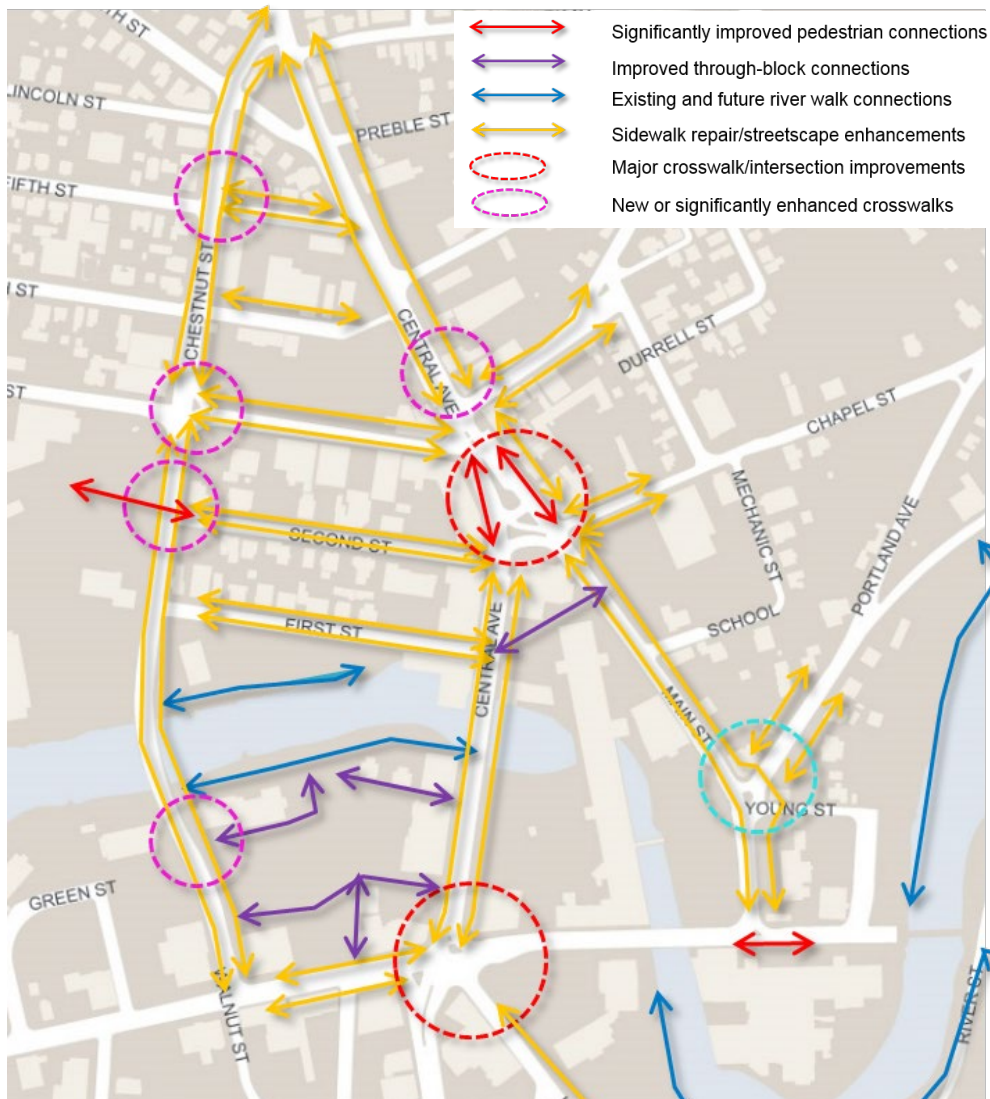


Figure 16: Enhanced Pedestrian Connection Opportunities

Bicycle Infrastructure Improvement

This study considered a variety of improvements to the bicycle environment in the downtown, and concluded that the most appropriate improvements will be associated with enhancing the facilities for parking and storing bicycles. The City should indicate where vehicles should anticipate sharing the right-of-way with bicycles with “sharrows” painted in the pavement. There are no significant stretches of street that are appropriate for designated bike lanes, as is frequently the case in historic downtowns.

Specific recommendations in regards to bicycles include:

- Provide bike racks within the improved Upper Square intersection.
- Provide bike racks near the entrance to the Children’s museum.

- Include interior space for bike parking and bike racks in the ground floor of the new parking facility, and in future parking facilities.
- Provide covered spaces and racks or enclosed bike lockers at the Transit Center.

As part of the planning for riverfront links and regional bike networks, the City should provide opportunities for connections within and to the downtown for shared paths that can readily accommodate both bicycles and pedestrians.

Transit Connectivity

There is a need for convenient and safe bus stops and for better and safer pedestrian connections to the Dover Transportation Center, particularly at Chestnut and Third Streets. These connections could be achieved through the following strategies:

- A complete network of enhanced sidewalks and crosswalks which address ADA accessibility, as described above , including sidewalk segments leading to the transit hub from Chestnut Street
- Visible lateral connections on First, Second, and Third Streets with continuous sidewalks, crosswalks and lighting
- An updated wayfinding and signage strategy to direct visitors and residents between the downtown area and the Dover Transportation Center

The final locations of the bus stops will need to be determined by the transit providers, but the circulation recommendations are intended to provide increased flexibility in the allocation of curb site space. The proposed re-organization of the circulation system should facilitate more convenient stops in the central blocks by allowing locations on both sides of a single street rather than separating “in-bound” and “out-bound” buses routing on Central Avenue and Main Street.

The redesign of Chestnut Street south of the bridge provides for protected pull-out areas for buses close to the crosswalk. Bus shelters should be located at convenient spots near the stopped buses.

Delivery and Loading Areas

A successful and vibrant downtown district relies on the ability of goods and services to be delivered and received at any time of the day. The locations and circulation patterns of delivery and loading that exists today should not change, and should be enhanced with additional spaces to provide additional opportunities in several locations.

On Central Avenue, additional truck loading areas can be provided to augment the existing loading zone that is on the east side of the street. These can

be provided by restricting parking during the day to allow for loading and unloading in locations where there are underutilized parking spaces. These loading and unloading zones would be converted to parking spaces in the evenings, when parking demand along Central Avenue is at its peak. This would allow for convenient loading and unloading opportunities for both northbound and southbound traffic during normal working hours.

Candidate locations for southbound loading and unloading include space along the edge of the bridge crossing the river; these spaces are not directly in front of a shop or business.

A candidate location for an additional northbound parking space is along the sidewalk where the large surface lot is located, just south of the bridge. This parking lot has been configured without internal circulation, so that vehicles seeking a parking space need to use Central Avenue, resulting in multiple curb cuts. This is an undesirable traffic pattern and should be revised, if possible, so that there are fewer curb cuts. The additional curbside space created could be used to provide an additional truck loading zone. Alternatively, additional curb length could be used to add more on-street parking.

The City should consider providing a loading/unloading space for small trucks within the parking and circulation associated with the surface parking that will be adjacent to the new parking structure, behind the buildings on Central Avenue.

The revision in the circulation patterns would provide additional convenience for trucks accessing various areas of the downtown. For example, trucks moving southbound on Central Avenue could take a left turn at Broadway rather than having to negotiate turns at Upper Square, although turns in that location would still be available.

It should be noted that the revised layout of Central Avenue anticipates adequate paving width to accommodate movements around a double-parked vehicle on the west side of the street, as occurs today if a truck stops in the westernmost lane along Central Avenue. However, double parking should not be encouraged as a practice, since adequate provisions for loading areas can be provided reasonably near businesses.

2.2 One-way Circulation Alternative

An alternative circulation pattern has also been evaluated which would retain aspects of the current one-way loop using Central Avenue, Washington Street, and Main Street. Layouts of this alternative have been provided in [Appendix D](#).

In many respects, this alternative could be designed and constructed to accomplish many of the recommended changes described in the preceding portions of this *Report*. In particular, Upper and Lower Square could be reorganized with very similar configurations to the two-way alternative in order to gain safety, traffic flow, pedestrian and open space benefits. However, certain aspects of the channelization, signalization and timing would need to be altered.

Other alterations would include different geometries and cross sections on Main Street in order to accommodate the benefits of the mini-roundabout.

In evaluating the relative qualities and drawbacks of this alternative, it was found that several characteristics are less desirable than the recommended approach relative to the goals that guided this study.

- **LEVEL OF SERVICE** – The one-way circulation alternative would not perform as well as the two-way circulation system, resulting in more congestion. Even with enhanced intersection configurations, a one-way loop would have fewer improvements in traffic conditions than if the two-way system were to be instituted. Taking into account increased volumes over the long run, only one major intersection would have an improved Level of Service (Lower Square), rather than 5 improved conditions that would occur if the two-way network is instituted. The intersection of Washington Street and Main Street would have a worse Level of Service than would occur with the recommended configuration.
- **ECONOMIC FACTORS** – From a retail and business perspective, one-way networks are less desirable than two-way systems as a general principal. Two-way systems allow patrons to go directly to their destinations without confronting “do not enter” signs. If a motorist passes a destination and wishes to return, they must navigate an entire one-way loop rather than having more options that are provided in a two-way system. One-way systems often promote higher speed traffic because of the unbroken lengths of street without on-coming traffic, such as can be observed along lower Washington Street, where vehicles can accelerate between Lower Square and Main Street. Calmed, managed traffic is more suitable to a downtown commercial district than higher speed flows.
- **SAFETY CONSIDERATIONS** – For pedestrians on streets with crosswalks, two-way traffic patterns tend to be safer than one-way systems.

3 STREETScape AND URBAN DESIGN

Downtown environments must be designed with people in mind. The experience each person will have with the street, the sidewalk, the buildings, and the surrounding environment is what helps define the unique character of a place. Dover's streetscape should be of a traditional style and respect the City's unique industrial past as a historic mill town.

Paving, landscaping, lighting and public art are all crucial design elements that should be integrated into a comprehensive vision for a downtown. The streetscape and urban design of the downtown should not only be attractive, but safe and convenient for pedestrians and bicyclists. Traffic calming measures, amenities, and wayfinding strategies ensure that a downtown and its businesses are easily accessible by locals and visitors alike.

Downtown Dover is composed of a unique mix of architecture, plazas and parks that together constitute the character inherent within Dover. The selected streetscape materials and components should respond to these unique areas, but should also share similar stylistic elements so that they form a cohesive theme throughout the downtown. The variety of streetscape treatments and elements selected as part of this report are all of a similar family stylistically, but have subtle differences that vary by the unique context of the location.

3.1 Paving Materials and Treatments

The preferred design puts forth specific design recommendations to build upon the existing paving framework to create a network of sidewalks and plazas that are safe, accessible, and of a unified aesthetic. The streetscape paving should consist of a combination of concrete, brick, and brick banding as shown in **Figure 17**. The upper and lower squares should have larger areas dedicated to brick paving to help distinguish them apart as public spaces of interest, as shown in **Figure 18**.

Figure 17: Ornamental paving opportunities



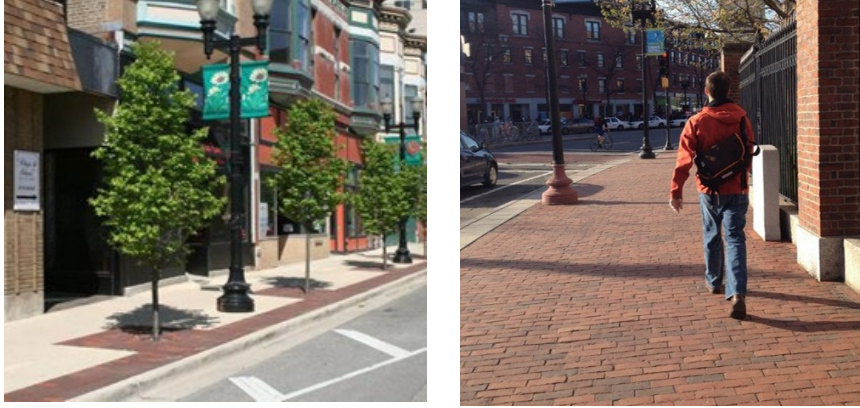


Figure 18: Sidewalk paving improvements

3.2 Traffic Calming

Traffic calming is a system of design and management strategies that aim to balance traffic on streets with other uses. In general, they help reduce traffic speeds and improve pedestrian safety which is paramount to creating a thriving accessible downtown environment. The following traffic calming measures are recommended as part of the preferred plan:

- Changing one-way streets to two-way streets flanked by parking when possible decreases the speed of traffic and creates less driving in general to get to a destination. This creates a circulation network that is safer for pedestrians. As noted earlier, this plan recommends changing the one-way sections of Central Avenue, Main Street, and Washington Street to two-way configuration.
- Narrowed streets and traffic lanes help reduce traffic speed and allow for more of the right-of-way to be dedicated to pedestrian use and landscaping. This plan recommends reducing the street widths of Chestnut Street, Washington Street and Main Street.
- Marked crosswalks (see [Figure 19](#)) at intersections and mid-block crossings provide for the safe crossing of pedestrians by giving vehicular users a cue to yield to potential crossing pedestrians. The crosswalks should be accessible and positioned in preferred locations that are convenient to pedestrians and highly visible to vehicular traffic. In addition to crosswalks, pedestrian refuge islands in traffic medians allow for shorter crossing distances and provide a resting area. The plan gives recommendations for locating several crosswalks and refuge islands in strategic locations.
- Mini-roundabouts (see [Figure 20](#)) help slow traffic through intersections and remind drivers that they must proceed with caution. This plan recommends locating mini-roundabouts at the intersection of Portland Avenue and Main Street and Third and Chestnut Street.

- Curb extensions at intersections, (see **Figure 21**) create a shorter crossing distances for pedestrians, deflect traffic at corners, define parking bays, and also serve as ideal areas for streetscape amenities. The plan recommends curb extensions at several key intersections.
- Reduced curb corner radii help inhibit the speed of turning vehicles and allows pedestrians to see and be seen by approaching traffic. This plan recommends reduced curb corner radii where possible.
- Well-spaced street trees help reduce the “optical width” of streets and therefore reduce the likelihood of speeding. The plan recommends augmenting the existing trees with new trees where possible to create a more consistent street tree pattern throughout the downtown.



Figure 19: Example crosswalk paving patterns and materials



Figure 20: Typical mini-roundabout configuration

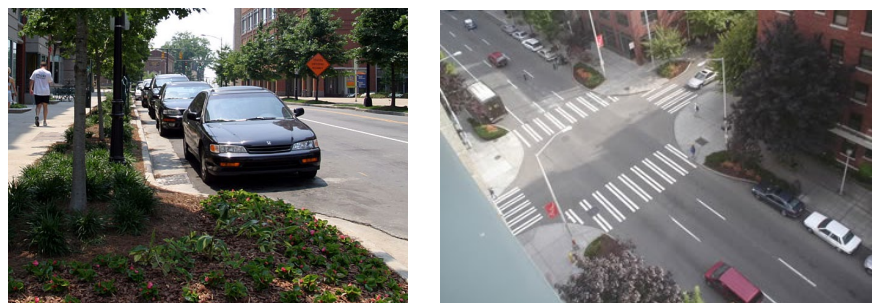


Figure 21: Curb extensions at intersections

3.3 Signage and Wayfinding

Providing a comprehensive system of clear and concise wayfinding helps inform pedestrians and vehicular users of surroundings in a downtown environment and ultimately allows for logical decisions. Effective wayfinding and signage design is strongly correlated with human behavior and the wayfinding system should be comprised of a hierarchical family of signs that are comprehensive, clear, and consistent in graphic design. In addition to providing valuable information, the graphic design of the signage provides an opportunity for branding that relates to Dover's downtown identity.

Vehicular and pedestrian signage should be provided to designate landmarks and places of specific importance, and to orient people towards these landmarks and established key routes.

- **VEHICULAR SIGNAGE** – In a two-way traffic system is critical for vehicular users to efficiently determine directions to their destination. Signage should be provided to designate the location of and directions to key places in the downtown that include the Transit Center, Children's Museum, and central parking structures.
- **PEDESTRIAN SIGNAGE** – Should be provided at key junctures within the downtown and give pedestrians information and direction to additional destinations including transit, public spaces and buildings, and business clusters. An example of successful wayfinding signage can be seen in [Figure 22](#).



Figure 22: Wayfinding and Street Signage Examples

The location and design of the signage should fit the context of the intended user (see [Figure 23](#)). Vehicular signs should be located in areas, such as intersection, that are clearly visible from the roadway. The fonts and graphic design of vehicular signs should be of a sufficient size and distinguishable color so that it easily visible from a distance. Pedestrian signage should be located at key pedestrian nodes, such as plazas or crossings, and should be of a height and graphic design that relates to a pedestrian. When appropriate, signage should be attached to light fixture poles or building faces to reduce the appearance of clutter within the streetscape.



Major wayfinding signage



Approach signage, secondary signage



Figure 23: Wayfinding and Signage Suggested Locations



3.4 Lighting

Proper street lighting can improve the appearance of the downtown and enhance safety for pedestrians and vehicular users. Light poles should be placed in regular patterns and should fit within the spatial context of the streetscape. Poles should be placed between trees and positioned to avoid excessive dark or bright spots over areas. Fixtures should be compliant with the recommendations of the International Dark-Sky Association or meet Illuminating Engineering Society of North America (IESNA) guidelines. Additionally, the light pole heights and fixture illumination should fit the context and needs of the specific area.

Lighting in the study area should be full-spectrum, low-wattage lamps on poles that are pedestrian scaled. Lighting levels should be achieved by altering the spacing between lamps, rather than increasing the wattage or height whenever permissible. The Hancock series light poles from Spring City Electrical with a traditional lantern luminaire have been selected for use along Silver Street, and this model or similar is recommended for use throughout downtown improvements (see [Figure 24](#)). The selected light pole should be specified to have electrical outlets to accommodate holiday lighting needs and also provide for an option of attachments for banners that could be used in the Upper and Lower Square areas. As a long-term strategy, LED lighting sources will provide lower operating costs. The fixtures used for street lighting should have the capability to use retrofitted LED luminaires in the future, if LED technology is not employed in the initial installations.



Figure 24: Pedestrian Scale Lighting

Bollard lights are excellent for use in areas where low level lighting is needed, such as lighting near an entryway or within a plaza. The Annapolis model from Landscape Forms or a similar model that is stylistically adaptable to different locations is recommended.

Some streets and intersections may require fixtures lights that are taller, higher wattage and spaced further apart. If supplemental lighting is required, the City should first consider double luminaire configurations. However, if additional lighting is required a simple, tall contemporary pole and high-cut-off luminaire could be used that would not visually compete with the more traditional and ornate pedestrian-scaled fixtures. The need for such lighting can be determined as part of the technical evaluations and development of the concept designs.

3.5 Landscape

Trees and landscaping provide numerous benefits, and street trees are a critical component of a downtown environment. They provide numerous benefits, including shelter for pedestrians, traffic speed reduction, ecological enhancement and the establishment of a sense of place. They can also help identify and delineate areas of interest or entries.

Downtown Dover has a wide variety of tree species that are mature and generally in good health. It is the purpose of this plan to provide new trees where there is opportunity because of construction and to preserve existing trees wherever possible. The selection of trees should complement the downtown's traditional appearance and be composed of trees that thrive in a New England urban environment. **Figure 25** shows suggested street trees.

Chestnut Street serves as a major thoroughfare through the downtown and is also bordered by several expansive parking lots. This stretch of roadway has a relatively small amount of trees and therefore is a prime candidate for the establishment of a single large canopy trees species to help define the corridor. *Zelkova serrata* is a hardy specimen that has an upward branching pattern that would eventually form a canopy of the roadway. It is recommended that these trees be planted on both sides of the roadway no more than 50 feet apart when possible. The location of the trees should not interfere with the utility poles and/or lighting. Adequate distance should be left at the intersections to ensure the sight lines for the drivers.

Upper and Lower Squares are areas of special interest within the downtown. These areas are surrounded by numerous shops and have a fair amount of pedestrian traffic. The selection of trees planted along the street and within the larger landscape areas should provide adequate shade for pedestrians, require little maintenance, and highlight the significance of the area. *Gleditsia triacanthos* var. *inermis* is recommended as a shade tree along the street and *Pyrus calleryana* 'Chanticleer' is recommended as a shade tree within the larger landscaped beds. These shade trees should be planted no more than 40 feet apart along the street and should also be planted in landscaped areas adjacent to seating. *Amelanchier Canadensis* is an ornamental flowering tree that is native and recommended for planting in the larger landscaped beds.



Ulmus americana 'American Liberty'



Pyrus calleryana 'Chanticleer'



Amelanchier canadensis



Zelkova serrata



Zelkova serrata



Ulmus americana 'American Liberty'



Gleditsia triacanthos var. *inermis*



Pyrus calleryana 'Chanticleer'



Acer rubrum



Acer rubrum

Figure 25. Recommended street tree types

There are a healthy number of existing mature trees along Central Street, Main Street, Washington Street and First through Sixth Streets. These trees should be preserved and infilled with appropriate tree species where there is a sufficient gap or a dying tree needs replaced. *Quercus rubra*, *Ulmus americana* 'American Liberty' and *Acer rubrum* are recommended species that are adaptable and well suited to filling in voids within the composition of trees along a street.

Placement of street trees should complement the architecture and should not block important views of businesses. **Figure 26** indicates potential locations for tree placement as filled green circles.

In some locations, seasonal planting might be provided within containers that could be removed during winter months. In many communities, seasonal plantings of this sort are sponsored and maintained by local businesses or organizations. Locations could include broad street corners in Upper and Lower Squares, along the approaches or in the center island of the mini-round about at Portland Avenue, and along the sidewalks or approaches to the bridges within the downtown.



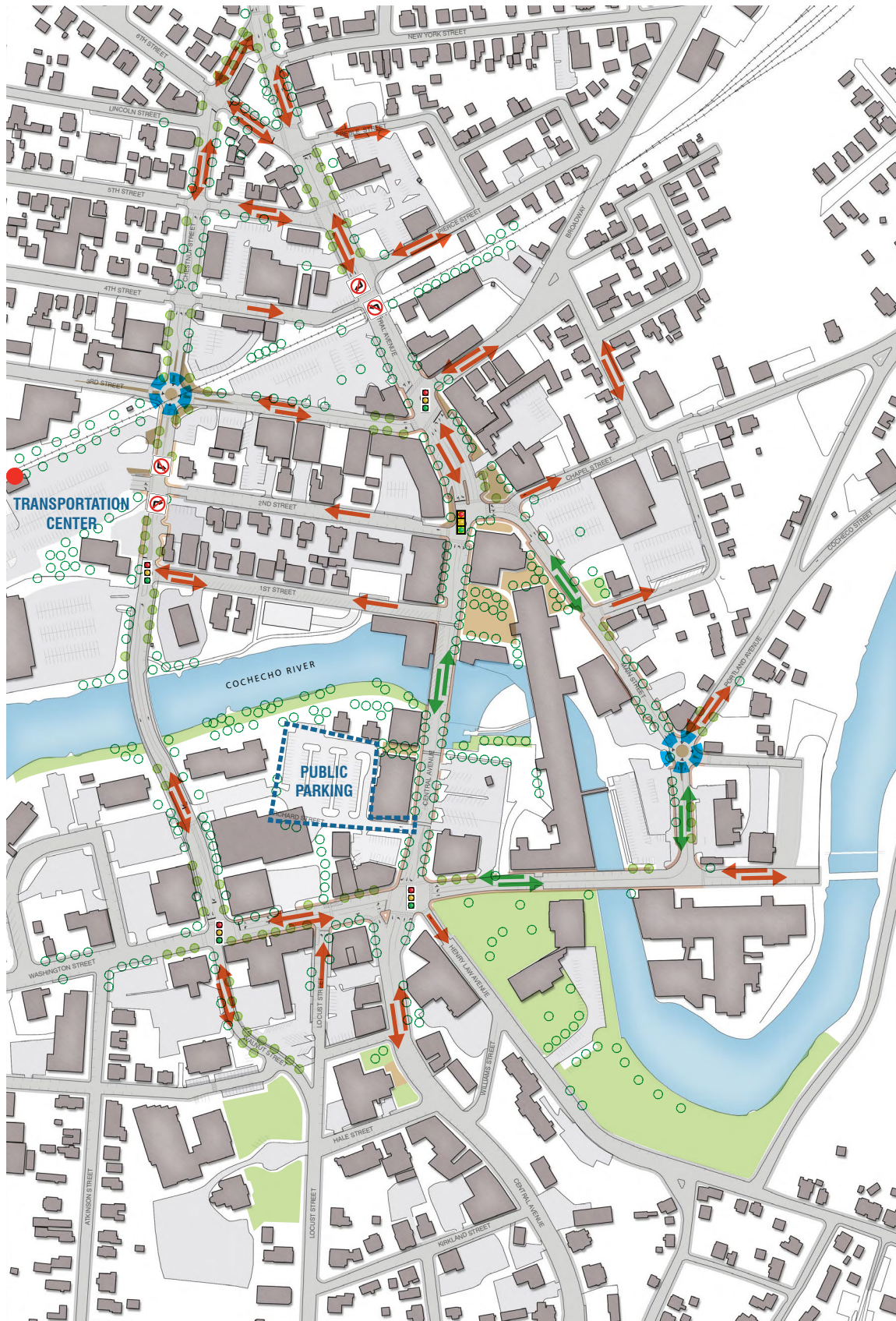


Figure 26: Opportunities for Enhanced Landscape

3.6 Amenities

Public amenities such as benches, bike racks, and trash receptacles are a necessity in a downtown environment. They not only serve functional needs, but provide pedestrians with an opportunity to engage and interact with others in the immediate area. This engagement helps create a vibrant and lively downtown environment.

The City has begun reconstructing a span of Silver Street from the Spaulding Turnpike Exit 8 ramp to Central Avenue. As part of this reconstruction, the City has selected furnishings (new lighting, benches, trash receptacles and bike racks) for use in this area. The general style and character of these furnishings is appropriate to continue throughout downtown. These amenities have a style that compliments Dover's traditional downtown aesthetic and collectively form a family of elements to thematically build from throughout the downtown environment. Accordingly, the following suggested amenities for streetscape improvements within the downtown include selected furniture from the Silver Street improvements, as well as other selections that are similar stylistically.

- **BENCHES** – Pedestrians should have the opportunity to rest, socialize, and experience their immediate environment. Benches should be placed in locations that are convenient and comfortable for pedestrians, such as near entrances and key nodes. A variety of bench positioning and arrangements provides users with options that suit their particular need. A variety of benches has been recommended that are similar in style and fit the traditional character of the downtown, as shown on in **Figure 27**. The selected bench model should fit the need and aesthetic of the specific location. The Scarborough Bench or Parc Vue Bench is recommended at Upper and Lower Squares. Models RB-12 and RB-28 from Victor Stanley are recommended for use along street segments and Model C-140 is an excellent choice for park perimeters or heavily landscaped areas.
- **BIKE RACKS** – Storage for bicycles is a key accommodation for users that access the downtown via bicycle. Storage facilitates this alternative means of transportation and are a key ingredient towards making a street complete for a variety of mobility means. Bike racks should be placed in visible areas near public parking, public facilities, parks, and businesses. The style of the bike rack should be simple, provide adequate security, and fit the traditional aesthetic of the City. Suggested examples are shown in **Figure 28**. Bike hitches, such as the model from Dero, are useful in narrow or busy areas where space is crucial. Larger capacity bike racks, such as the 5 Loop Bike Rack from Victor Stanley, are best located near public facilities, parking and park areas.
- **TRASH RECEPTACLES** – To discourage littering, trash and recycling receptacles should be placed at key intersections and near public spaces. The receptacle should be of a traditional style and allow for easy trash removal by City maintenance workers, similar to those shown in **Figure 29**.



Model C-140, Victor Stanley



Model RB-12, Victor Stanley



Model RB-28, Victor Stanley

Figure 27. Benches



Scarborough Bench, Landscape Forms



Parc Vue Bench, Landscape Forms



Figure 28. Bicycle Racks

Bike Hitch, Dero



5 Loop bike Rack, Victor Stanley



Scarborough Receptacle, Landscape Forms



S-42 Receptacle, Victory Stanley



SD-242 Recycling Receptacle, Victory Stanley

Figure 29. Trash and Recycling Receptacles

3.7 Public Art

Public art within a downtown provides an opportunity for the City to display art that embraces the character, personality, and spirit of Dover’s culture. Public art should be integrated into the streetscape and public spaces whenever appropriate and possible. Samples are shown in **Figure 30**. Gateways and active public spaces are prime locations for public art. Locations such as the Upper and Lower Squares would serve as excellent locations for art installations.

The City of Dover has a very active artist community and Arts Commission that promotes awareness of the local arts and culture. The Arts Commission would serve as an excellent body to advertise and manage a public commissioning process that ultimately leads to art in public spaces.

Figure 30 Public Art Opportunities



4 PARKING STRATEGY

4.1 Parking Management

This study confirms the general conditions and assumptions associated with previous plans and studies with regards to the parking downtown. In general, there are adequate number of spaces downtown in several locations where parking demand is concentrated. The new parking structure on the block bounded by Chestnut Street, Washington Street, and Central Avenue will significantly increase the public parking available in the core of the downtown in the near term.

Over the long term, additional parking opportunities are likely to be needed in conjunction as significant new redevelopment occurs. As part of the study, general areas were considered for future parking decks, if needed. These general locations are shown in [Figure 31](#) and could include facilities east of Main Street, north of Second Street, and west of Chestnut Street.

The parking strategy for on-street spaces seeks to retain a substantial stock of on-street spaces throughout the downtown. The recommended plan seeks the reallocation of some spaces resulting in a better distribution of spaces along Chestnut Street and Main Street. Limited reductions in on-street parking spaces will be needed in order to accommodate four different circumstances:

- **EXISTING CROSSWALK LOCATIONS** – In some cases, existing parking spaces are too close to crosswalks resulting in limited sight lines and hazardous conditions. As a result several spaces will have to be removed.
- **NEW CROSSWALK LOCATIONS** – In several cases, new crosswalks are proposed to promote safe pedestrian routes. For example a new crosswalk is recommended opposite the Children’s Museum. For the same reasons noted above, some parking spots will need to be removed adjacent to any new crosswalk.
- **INTERSECTION RECONFIGURATIONS** – In some cases, parking spaces will be too close to the reconfigured intersections and will create hazardous conditions. In such circumstances, the reconfiguration will result in the need to remove and relocate spaces.
- **ENHANCEMENT OF LANDSCAPE AND PEDESTRIAN AREAS** – In some areas it will be desirable to reduce the number of parking spaces in order to provide landscape and sidewalk amenities as assets to the downtown.

The estimated total change in parking and on-street parking counts for the recommended circulation plan is as follows.

- Total existing on-street parking spaces – 425
- Remaining on-street spaces – 417
- Net decrease in parking spaces – 8
- Percent decrease of on-street spaces – 1%

Table 2. Allocation of Parking Changes by Street Segment

STREET SEGMENT	PARKING CHANGE
Central Avenue	-13
Main Street	-2
Chestnut Street	+19
Washington Street	-7
First Street	0
Second Street	-3
Third Street	0
Fourth Street	0
Fifth Street	-2
Sixth Street	+9
Total	-8

4.2 Future Parking Demands

The method for calculating future parking demands is provided in the *Existing Conditions – Downtown Dover Pedestrian and Vehicular Access and Streetscape Study (2014)*. The method included spreading potential developments among subareas in the downtown, taking into account developable land and potential projects based on previous proposals, and discussions with city staff. The analysis indicated that many projects would be developed with on-site parking to meet their needs. However, certain constrained sites may benefit from shared parking solutions on nearby larger sites, as shown in **Figure 31**. As a result, the city retains substantial flexibility to provide off-street parking solutions in conjunction with future development activity.

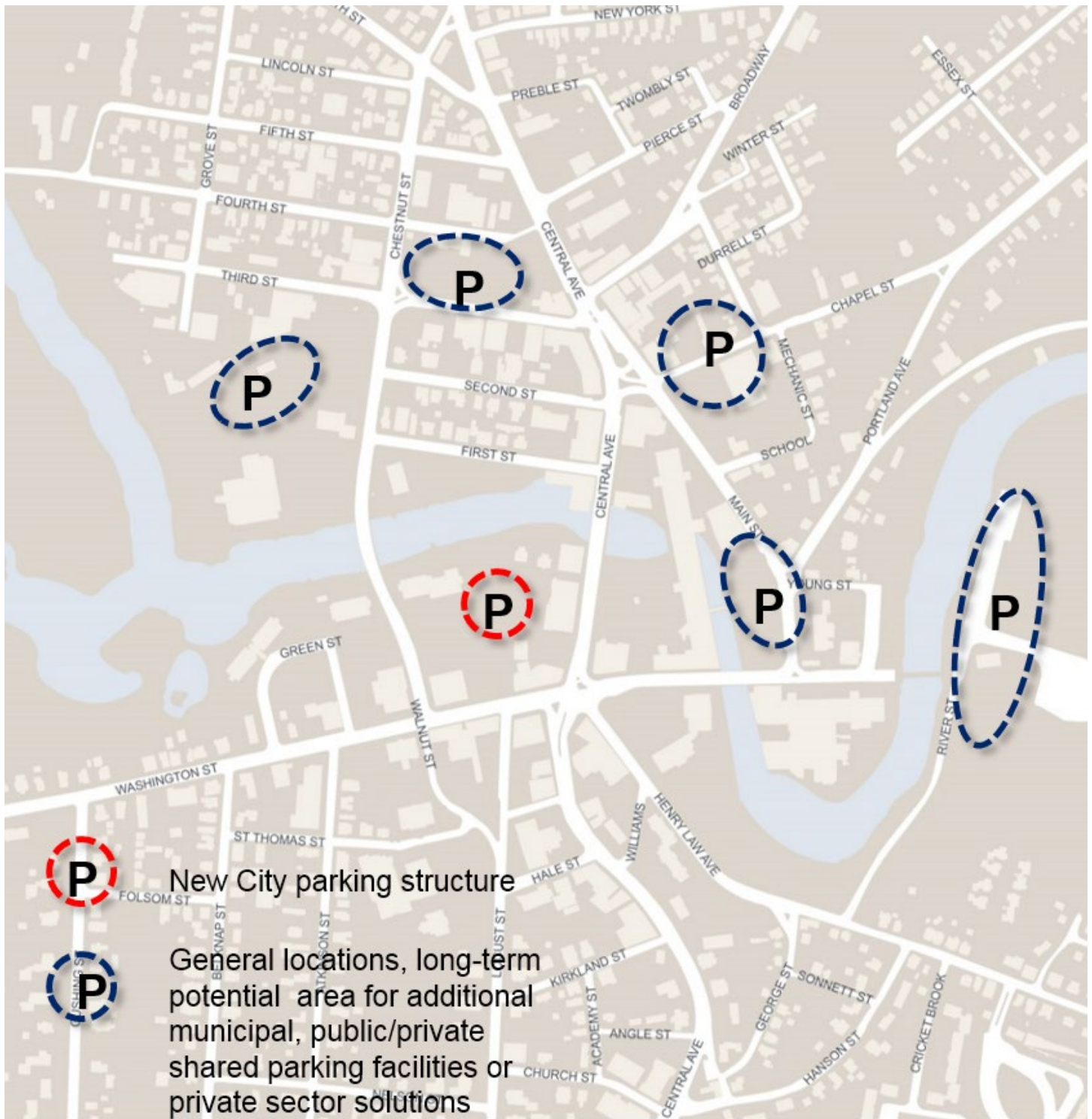


Figure 31: Overall Future Parking Strategy

5 IMPLEMENTATION

5.1 Phasing

Several basic, but important, principles determine a logical and efficient approach to a construction phasing sequence for the recommended improvements in Downtown Dover:

- It is not financially or logistically feasible to construct all of the identified improvements at one time, so a phasing plan for improvements is a reasonable approach
- Specific construction phases should be delineated and defined so as to always provide detours and alternate routes that accommodate all vehicle, bicycle, and pedestrian desire lines and minimize the overall travel disruptions on residents, business-owners, and the traveling public

With these principles in mind, we suggest that the recommended traffic circulation, roadway, and streetscape improvements be phased in the following manner, as shown in [Figure 32](#):

- **PHASE 1: ENHANCEMENTS TO CHESTNUT STREET FROM WASHINGTON STREET TO CENTRAL AVENUE** – These improvements include modifications to the street cross-section, streetscape enhancements, and landscaping enhancements, as well as improvements to the Central Avenue/Third Street intersection and the Dover Transportation Center. During Phase 1 construction, local north-south traffic can be directed to use Central Avenue and Main Streets while more regional north-south traffic can be directed to use the Spaulding Turnpike.

The second phase encompasses the reconfiguration of Upper and Lower Squares and portions of Central Avenue and Main Street as an integral network of connected improvements. The entire Phase 2 project must be designed as a whole, to ensure that the roadway and intersection configurations are fully compatible and coordinated, including contemporary signal management technology. However, it will be necessary to construct Phase 2 in a sequence, rather than at the same time. The difference is needed to create intersection configurations and street capacity that will allow operations to continue along these streets without undue disruption. The recommended sequence for construction is as follows:

- **PHASE 2A: ENHANCEMENTS TO UPPER SQUARE AND THE MAIN STREET/PORTLAND AVENUE INTERSECTION** – These roadway, streetscape, and landscaping improvements will largely be concentrated in Upper Square and the Main Street/Portland Avenue intersection. Given the importance of both of these junctions to both local and regional traffic flow patterns, it is recommended that construction not take place in both locations concurrently and that local traffic be permitted to proceed through both locations during construction. Local and regional detours should be es-

established to keep the majority of traffic from flowing through these areas during construction.

In conjunction with Upper Square improvements, streetscape and related intersection and roadway improvements would be completed for Central Avenue north of Upper Square, and along the connecting streets between Central Avenue and Chestnut Street (Second, Third, Fourth, Fifth, and Sixth Streets).

- PHASE 2B: ENHANCEMENTS TO CENTRAL AVENUE, WASHINGTON STREET, AND MAIN STREET – Roadway, streetscape, and landscape improvements to the downtown “loop” will likely be the most disruptive to the traveling public. To minimize disruptions, work on Central Street should be processed first (re-directing southbound traffic onto Chestnut Street). Once Central Street is complete, it can be opened to two-way traffic and both Central Street and Chestnut Street can process north-south traffic. This will reduce the demands on both Washington Street and Main Street to allow construction on both of those streets to proceed.

Streetscape enhancements could be accomplished within this same Phase for street segments linked to Lower Square. These would include extending streetscape improvements on Central Avenue south to Silver Street. Enhancements to connecting segments of Washington Street and First Street would be accomplished at the same time.

If desired, the streetscape enhancements along the connecting streets (First through Sixth Streets) and the streetscape improvements on Central Avenue south to Silver Street could be funded, designed, and constructed in a different sequence than indicated in the phasing diagram. However, the design of the streetscape improvements needs to anticipate future changes in intersections with Upper and Lower Squares and along Chestnut and Central Avenue if they are implemented in a different sequence.

Timing

Depending upon the availability of resources, construction is likely to occur over several years. For initial planning purposes, the following schedule milestones represent potential mid-points of construction for each of the three components, with approximately two years for design and construction of each. All components would be completed by 2023.

- PHASE 1– year 2018
- PHASE 2A– year 2020
- PHASE 2B– year 2022

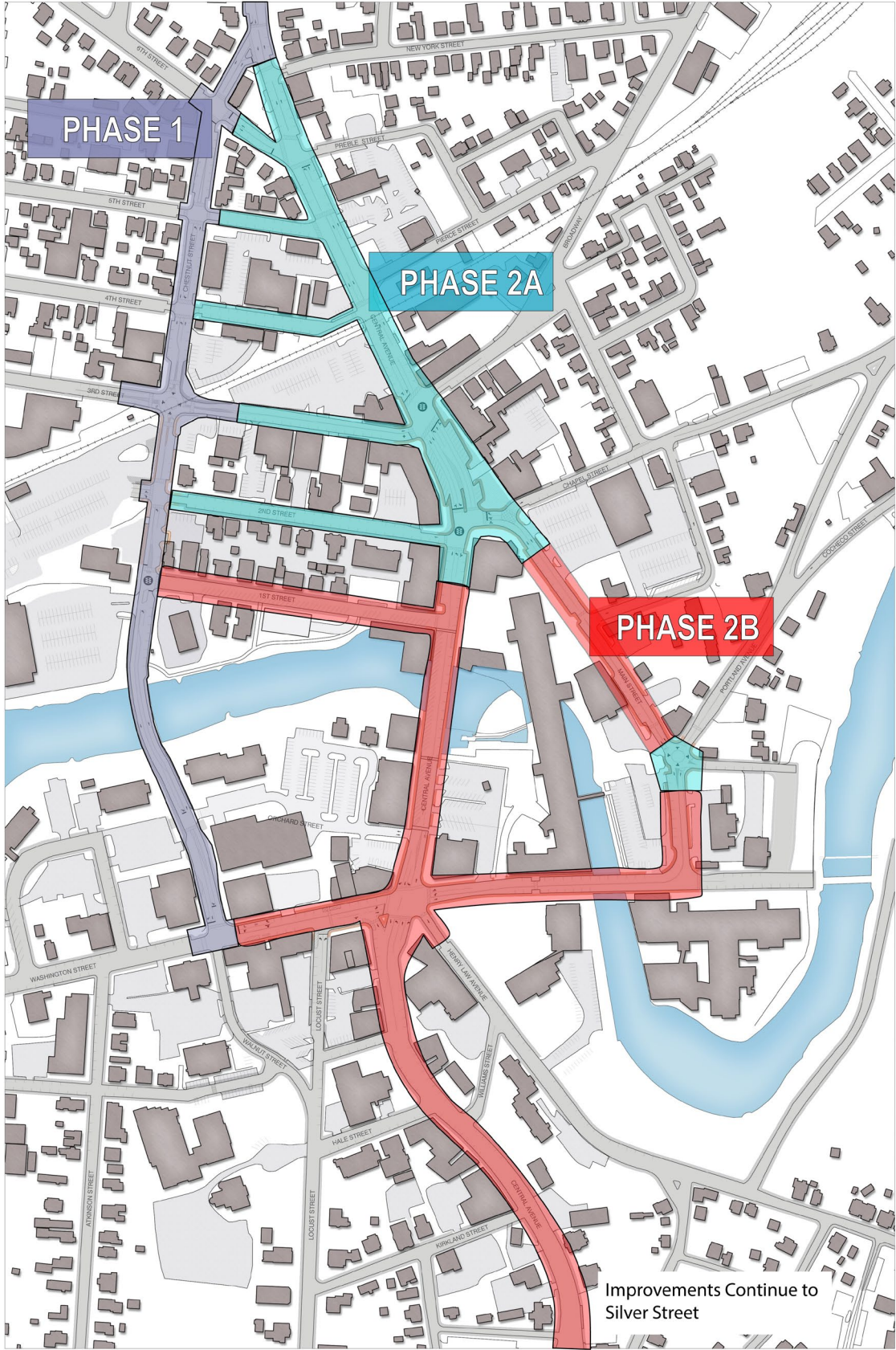


Figure 32: Overall Phasing Strategy

5.2 Costs

Implementing the recommendations in this study will entail a sequence of design and construction projects over several years. The following cost estimates (shown in [Table 3](#)) provide a summary of the component costs for each of the elements and phases of future construction, along with the soft costs that will be associated with designing, permitting, and managing the construction process. The cost estimates have been derived from the concept-level designs for streetscape and roadway improvements contained in this report. These cost estimates have been provided for initial budgeting purposes, but will need to be refined as the level of detail and technical investigations are undertaken in the future.

The tables below summarize the total estimated cost for all of the projects, and then provide a break out of the prospective phases (Phase 1 and Phase 2A and 2B). More detailed cost estimate worksheets are contained in [Appendix E](#).

The method used to create this estimate calculated construction costs that would be associated with the areas, linear feet, and amounts of various items and then applying current construction costs associated with similar projects, using current (2015) factors.

The following considerations should be taken into account in reviewing these estimates:

- **LEVEL OF ACCURACY** – The cost estimates are based on layouts that were prepared on general base maps that are currently available, and indicate the approximate location of existing curb lines and buildings. The base maps were not generated from surveyed information. Important characteristics such as the width of the right-of-way, distance between curb and back of sidewalk, and widths to property lines may vary considerably from the locations indicated on the mapping. As a result, the calculation of the amount of improvements is very approximate, and is based on the mapping, photographs and assumptions. The estimates do not specifically take into account the type of detailed information that will be developed in the next phase of design, such as the condition and elevations of curb and sidewalks, drainage, utility conditions and many other conditions that will influence design and costs at specific locations. As a result, the cost factors represent typical conditions in similar projects.
- **CONSTRUCTION COSTS** – the Construction Costs are an estimate of the bid costs for construction by contractors, and include factors for mobilization and general conditions for each phase. Actual mobilization and general conditions will vary according to the extent of the projects and sequence of bid packages.

- **DESIGN AND CONSTRUCTION CONTINGENCY** – The contingency includes a factor that increases the prospective construction cost to take into account additional information that will be available during the design phase, once survey and technical studies are completed. It also includes potential increases that would be due to field conditions associated with construction that cannot be fully predicted in advance of typical streetscape construction. For budgeting purposes, it is best to include a substantial contingency, due to the concept-level of design, in the event that the design and construction circumstances result in greater costs than assumed in the generalized cost factors that can reasonably be employed at this level of design.
- **SURVEY** – The survey costs would be confirmed through competitive proposals and must be accomplished prior to undertaking the next level of design and engineering.
- **DESIGN AND ENGINEERING** – These costs include engineering, landscape architecture, graphic design and other services, including preparation of permitting. The costs include all fees through construction phases.
- **OTHER PROJECT COSTS** – The estimate includes factors for the types of traffic control and field inspection/clerk-of-the works expenditures typically associated with similar construction projects in Dover for public safety, third-party professional or staff project support.
- **ESCALATION** – These estimates do not include escalation. The cost of construction is likely to increase over time. Cost estimates will need to take into account the typical costs occurring at the estimate dates of construction, when they are determined.

Pre-Construction Costs

Certain expenditures need to occur prior to construction. These include the design, engineering, and permitting activities leading to construction bids. During the course of these activities, the cost estimates will need to be refined as the existing condition information and specific design layouts are confirmed.

In concert with the phasing sequence, the survey for Phase 1 should be accomplished as a first step, followed by the design and engineering services. The survey, design, and engineering for both Phase 2A and Phase 2B should be accomplished simultaneously. The design should anticipate two separate construction packages, recognizing that construction will need to occur over a multi-year process.

Table 3. Estimated Project Costs

CONSTRUCTION COSTS	
Streetscape Costs*	
<i>Central St.</i>	\$1,711,850
<i>Main St.</i>	\$586,750
<i>Washington St.</i>	\$658,750
<i>Chestnut St.</i>	\$985,750
<i>Central St. (Washington to Silver St.)</i>	\$699,750
<i>Lateral Segments (1st,2nd,3rd,4th,5th,6th St.)</i>	\$282,950
Roadway Costs**	
Segments	
<i>Central St.</i>	\$77,000
<i>Main St.</i>	\$70,500
<i>Washington St.</i>	\$80,700
<i>Chestnut St.</i>	\$383,500
Intersections	
<i>Central/Chestnut</i>	\$48,100
<i>Central/Sixth</i>	\$22,600
<i>Central/Broadway/Main (Upper Square)</i>	\$958,300
<i>Central/Washington (Lower Square)</i>	\$269,700
<i>Chestnut/Sixth</i>	\$13,600
<i>Chestnut/Third</i>	\$261,500
<i>Main/Portland</i>	\$202,000
Subtotal Streetscape and Roadway Costs	\$7,313,300
Mobilization and General Conditions @ 8%	\$585,064
Subtotal Construction Costs	\$7,898,364
Construction and Design Contingency @ 25%	\$1,974,591
Total Construction Costs	\$9,872,955
OTHER COSTS	
Survey @ 1.5%	\$148,094
Design, Engineering and Permitting @ 15%	\$1,480,943
Traffic Control @ 5%	\$493,647
Resident Engineering and Inspection @ 10%	\$987,295
Total Project Costs***	\$12,982,936

Note: Detailed allocation of areas and unit costs are provided in [Appendix E](#).

Notes for Table 3

Streetscape Elements

* Components of the streetscape costs include the following elements, based on the requirements for each location.

Roadway Lighting
Pedestrian Lighting
Bollard Lights
Shade Trees
Ornamental Trees
Shrubs
Groundcover/Perennials
Brick Paving
Concrete Paving
Repaired Paving
Standard Crosswalks
Decorative Crosswalks
Wayfinding/Signage
Benches
Trash/Recycling Receptacles
Bike Racks

Roadway Elements

** Components of the roadway costs include the following elements, based on the requirements for each location.

Clearing and Grubbing
Common Excavation
Compacted Gravel
Crushed Gravel
Hot Bituminous Paving
Cold Plaining Bituminous Paving
Polyethylene Pipe
Catch Basins
Repair/Adjust Catch Basins
Granite Curbing
Remove & Reset Granite Curbing
Traffic Signals

*** Estimates are all based on current costs (2015).

Table 4. Summary of Project Costs: Phase 1

CONSTRUCTION COSTS	
Streetscape Costs	
<i>Chestnut</i>	\$985,750
Roadway Costs	
<i>Segments</i>	
<i>Chestnut Street</i>	\$383,500
<i>Intersections</i>	
<i>Central/Chestnut</i>	\$48,100
<i>Chestnut/Sixth</i>	\$13,600
<i>Chestnut/Third</i>	\$261,500
Subtotal Streetscape and Roadway Costs	\$1,692,450
<i>Mobilization and General Conditions @ 8%</i>	\$135,396
Subtotal Construction Costs	\$1,827,846
<i>Construction and Design Contingency @ 25 %</i>	\$456,962
Total Construction Costs	\$2,284,808
OTHER COSTS	
Survey @ 1.5%	\$34,272
Design, Engineering and Permitting @ 15%	\$342,721
Traffic Control @ 5%	\$114,240
Resident Engineering and Inspection @ 10%	\$228,481
Total Project Costs	\$3,004,522

Table 5. Summary of Project Costs: Phase 2A

CONSTRUCTION COSTS	
Streetscape Costs	
<i>Central (New York St. to 2nd St.)</i>	\$749,953
<i>Main (Segment south of Chapel St.)</i>	\$43,463
<i>Lateral Segments (2nd, 3rd, 4th, 5th, 6th St.)</i>	\$213,784
Roadway Costs	
<i>Segments</i>	
<i>Central Street (New York St. to 2nd St.)</i>	\$33,733
<i>Main Street (Segment south of Chapel St.)</i>	\$5,222
<i>Intersections</i>	
<i>Central/Sixth</i>	\$22,600
<i>Central/Broadway/Main (Upper Square)</i>	\$958,300
<i>Main/Portland</i>	\$202,000
Subtotal Streetscape and Roadway Costs	\$2,229,056
<i>Mobilization and General Conditions @ 8%</i>	\$178,325
Subtotal Construction Costs	\$2,407,381
<i>Construction and Design Contingency @ 25 %</i>	\$601,845
Total Construction Costs	\$3,009,226
OTHER COSTS	
Survey @ 1.5%	\$45,138
Design, Engineering and Permitting @ 15%	\$451,384
Traffic Control @ 5%	\$150,461
Resident Engineering and Inspection @ 10%	\$300,923
Total Project Costs	\$3,957,132

Table 6. Summary of Project Costs: Phase 2B















CONSTRUCTION COSTS	
Streetscape Costs	
<i>Central (2nd St. to Washington St.)</i>	\$961,897
<i>Central (Washington to Silver St.)</i>	\$699,750
<i>Main (South of Chapel St. to Washington St.)</i>	\$543,287
<i>Washington</i>	\$658,750
<i>Lateral Segments (1st St.)</i>	\$69,166
Roadway Costs	
<i>Segments</i>	
<i>Central (2nd St. to Washington St.)</i>	\$43,267
<i>Main (South of Chapel St. to Washington St.)</i>	\$65,278
<i>Washington</i>	\$80,700
<i>Intersections</i>	
<i>Central/Washington (Lower Square)</i>	\$269,700
Subtotal Streetscape and Roadway Costs	\$3,391,794
<i>Mobilization and General Conditions @ 8%</i>	\$271,343
Subtotal Construction Costs	\$3,663,137
<i>Construction and Design Contingency @ 25 %</i>	\$915,784
Total Construction Costs	\$4,578,922
OTHER COSTS	
Survey @ 1.5%	\$68,684
Design, Engineering and Permitting @ 15%	\$686,838
Traffic Control @ 5%	\$228,946
Resident Engineering and Inspection @ 10%	\$457,892
Total Project Costs	\$6,021,282

A PLANS

Please see the following pages for 25% Design Plans

B LEVEL OF SERVICE DATA

Please see the following pages for the Level of Service (LOS) data prepared by RSG for all intersection within the Downtown Study Area.

Intersections	2034 PM Peak Hour							
	No Build			Build (2-Way)				
	LOS	Delay	v/c	LOS	Delay	v/c		
Central Ave/Chestnut St								
Overall					B	10	0.62	
EB, exiting Chestnut St		F	>100	1.15		B	20	-
NB, along Central Ave					A	10	-	
SB, along Central St					A	8	-	
Chestnut St/Sixth St								
EB, along Sixth St		E	46	0.88		E	46	0.88
WB, along Sixth St		C	20	0.48		C	20	0.48
NB, along Chestnut St		F	71	1.22		F	71	1.22
SB, along Chestnut St		F	53	0.91		F	53	0.91
Chestnut St/Third St								
Overall						B	16	0.76
EBL, exiting Third St		F	51	0.17		A	9	0.12
EBR, exiting Third St		B	14	0.10		A	9	0.12
WBL, exiting Third St		F	>100	1.28		B	12	0.32
WBR, exiting Third St		B	14	0.11		B	12	0.32
NB, along Chestnut St		A	9	0.06		B	17	0.76
SB, along Chestnut St		A	9	0.00		B	18	0.74
Chestnut St/Orchard St								
WB, exiting Orchard St		D	27	0.38		E	47	0.55
SBL, exiting Chestnut St		A	9	0.05		A	9	0.05
Chestnut St/Washington St								
Overall		D	37	0.68		D	37	0.68
EB, along Washington St		D	41	-		D	41	-
WB, along Washington St		D	47	-		D	47	-
NB, along Chestnut St		E	56	-		E	56	-
SB, along Chestnut St		C	25	-		C	25	-
Washington St/Locust St								
NBL, exiting Locust St		C	15	0.10		C	15	0.10
NBR, exiting Locust St		B	12	0.35		B	12	0.35

Intersections	2034 PM Peak Hour							
	No Build			Build (2-Way)				
	LOS	Delay	v/c	LOS	Delay	v/c		
Central Ave/Washington Street (Lower Square)								
Overall		F	>100	0.94		E	58	0.77
EB, along Washington St		F	>100	-		E	65	-
WB, along Washington St						F	84	-
NB, along Central St		F	>100	-		C	32	-
SB, along Central St		E	66	-		E	70	-
Central Ave/Preble St								
EB, from Sixth St		D	25	0.55		D	25	0.55
WB, from Preble St		F	55	0.21		F	55	0.21
NBL, along Central Ave		A	10	0.19		A	2	0.19
SBL, along Central Ave		A	9	0.00		A	9	0.00
Central Ave/Third St								
Overall		D	49	0.67		C	35	0.68
EB, along Third St		C	27	-		D	43	-
WB, along Broadway		E	59	-		E	55	-
NB, along Central Ave		D	39	-		C	23	-
SB, along Central Ave		E	57	-		D	35	-
Central Ave/Second St								
Overall						D	51	0.90
WB, exiting Main St		F	97	1.09		E	74	-
NB, along Central St						D	50	-
SB, along Central St						D	46	-
Intersections	2034 PM Peak Hour							
	No Build			Build (2-Way)				
	LOS	Delay	v/c	LOS	Delay	v/c		
Main St/Chapel St								
Overall		B	12	0.31				
EBL, entering Chapel St						A	4	0.17
NB, along Main St		B	10	-				
SB, along Main St		C	27	-				
Main St/Portland Ave								
Overall						B	19	
WB, exiting Portland Ave		D	28.0	0.69		A	7	0.34
NB, along Main St						C	32	0.87
SB, along Main St						A	9	0.44
Main St/Washington St								
WBR, from Washington St		E	49.4	0.79		D	32	0.66
SBL, from Main St						A	9	0.01

HCM Signalized Intersection Capacity Analysis
1: Central Avenue & Chestnut Street

2034 PM

Alt 3



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	190	52	0	547	538	381
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0	6.0	6.0
Lane Util. Factor	1.00			1.00	1.00	1.00
Fr _t	0.97			1.00	1.00	0.85
Fl _t Protected	0.96			1.00	1.00	1.00
Satd. Flow (prot)	1740			1863	1863	1583
Fl _t Permitted	0.96			1.00	1.00	1.00
Satd. Flow (perm)	1740			1863	1863	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	211	58	0	608	598	423
RTOR Reduction (vph)	17	0	0	0	0	203
Lane Group Flow (vph)	252	0	0	608	598	220
Turn Type	Prot			NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases						6
Actuated Green, G (s)	11.7			25.6	25.6	25.6
Effective Green, g (s)	11.7			25.6	25.6	25.6
Actuated g/C Ratio	0.24			0.52	0.52	0.52
Clearance Time (s)	6.0			6.0	6.0	6.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	412			967	967	822
v/s Ratio Prot	c0.14			c0.33	0.32	
v/s Ratio Perm						0.14
v/c Ratio	0.61			0.63	0.62	0.27
Uniform Delay, d ₁	16.8			8.5	8.4	6.6
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d ₂	2.7			1.3	1.2	0.2
Delay (s)	19.5			9.7	9.6	6.8
Level of Service	B			A	A	A
Approach Delay (s)	19.5			9.7	8.4	
Approach LOS	B			A	A	

Intersection Summary

HCM 2000 Control Delay	10.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	49.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	52.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection

Intersection Delay, s/veh 53.5
Intersection LOS F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Vol, veh/h	0	9	174	183	0	31	138	2	0	254	230	11	0	3	340	34
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	10	193	203	0	34	153	2	0	282	256	12	0	3	378	38
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	45.7	20.3	71.4	52.7
HCM LOS	E	C	F	F

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	51%	2%	18%	1%
Vol Thru, %	46%	48%	81%	90%
Vol Right, %	2%	50%	1%	9%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	495	366	171	377
LT Vol	254	9	31	3
Through Vol	230	174	138	340
RT Vol	11	183	2	34
Lane Flow Rate	550	407	190	419
Geometry Grp	1	1	1	1
Degree of Util (X)	1	0.88	0.48	0.918
Departure Headway (Hd)	8.002	7.786	9.09	7.892
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	451	464	395	461
Service Time	6.082	5.835	7.157	5.947
HCM Lane V/C Ratio	1.22	0.877	0.481	0.909
HCM Control Delay	71.4	45.7	20.3	52.7
HCM Lane LOS	F	E	C	F
HCM 95th-tile Q	12.9	9.3	2.5	10.4

Intersection				
Intersection Delay, s/veh	16.3			
Intersection LOS	C			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	62	171	825	689
Demand Flow Rate, veh/h	63	174	841	703
Vehicles Circulating, veh/h	797	734	18	173
Vehicles Exiting, veh/h	79	125	842	735
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	8.8	11.5	16.6	17.7
Approach LOS	A	B	C	C
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	63	174	841	703
Cap Entry Lane, veh/h	509	542	1110	950
Entry HV Adj Factor	0.984	0.983	0.981	0.980
Flow Entry, veh/h	62	171	825	689
Cap Entry, veh/h	501	533	1089	931
V/C Ratio	0.124	0.321	0.758	0.740
Control Delay, s/veh	8.8	11.5	16.6	17.7
LOS	A	B	C	C
95th %tile Queue, veh	0	1	8	7

Intersection

Int Delay, s/veh 2.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	38	50	584	51	40	826
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	160	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	42	56	649	57	44	918

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1684	677	0 0 706 0
Stage 1	677	-	- - - -
Stage 2	1007	-	- - - -
Critical Hdwy	6.42	6.22	- - 4.12 -
Critical Hdwy Stg 1	5.42	-	- - - -
Critical Hdwy Stg 2	5.42	-	- - - -
Follow-up Hdwy	3.518	3.318	- - 2.218 -
Pot Cap-1 Maneuver	104	453	- - 892 -
Stage 1	505	-	- - - -
Stage 2	353	-	- - - -
Platoon blocked, %			- - - -
Mov Cap-1 Maneuver	99	453	- - 892 -
Mov Cap-2 Maneuver	99	-	- - - -
Stage 1	505	-	- - - -
Stage 2	336	-	- - - -

Approach	WB	NB	SB
HCM Control Delay, s	47.4	0	0.4
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 178	892	-
HCM Lane V/C Ratio	-	- 0.549	0.05	-
HCM Control Delay (s)	-	- 47.4	9.2	-
HCM Lane LOS	-	- E	A	-
HCM 95th %tile Q(veh)	-	- 2.8	0.2	-

HCM Signalized Intersection Capacity Analysis
5: Walnut Street/Chestnut Street & Washington Street

2034 PM

Alt 3



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	285	338	46	13	139	54	0	296	18	94	319	450
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	6.0		6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00		1.00	1.00	1.00
Fr _t	1.00	0.98			1.00	0.85		0.99		1.00	1.00	0.85
Fl _t Protected	0.95	1.00			1.00	1.00		1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1829			1855	1583		1848		1770	1863	1583
Fl _t Permitted	0.36	1.00			0.93	1.00		1.00		0.18	1.00	1.00
Satd. Flow (perm)	671	1829			1737	1583		1848		332	1863	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	317	376	51	14	154	60	0	329	20	104	354	500
RTOR Reduction (vph)	0	4	0	0	0	0	0	2	0	0	0	267
Lane Group Flow (vph)	317	423	0	0	168	60	0	347	0	104	354	233
Turn Type	pm+pt	NA		Perm	NA	pt+ov		NA		pm+pt	NA	pt+ov
Protected Phases	1	6			2	2 3		4		3	8	8 1
Permitted Phases	6			2						8		
Actuated Green, G (s)	36.8	36.8			15.8	27.8		24.5		36.5	36.5	51.5
Effective Green, g (s)	36.8	36.8			15.8	27.8		24.5		36.5	36.5	51.5
Actuated g/C Ratio	0.33	0.33			0.14	0.25		0.22		0.33	0.33	0.47
Clearance Time (s)	6.0	6.0			6.0			6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	372	609			248	398		410		187	615	738
v/s Ratio Prot	c0.12	0.23				0.04		c0.19		0.03	c0.19	0.15
v/s Ratio Perm	c0.17				0.10					0.15		
v/c Ratio	0.85	0.69			0.68	0.15		0.85		0.56	0.58	0.32
Uniform Delay, d ₁	31.1	31.9			44.9	32.1		41.2		28.4	30.5	18.4
Progression Factor	1.00	1.00			1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d ₂	16.9	3.4			7.1	0.2		14.9		3.6	1.3	0.2
Delay (s)	48.0	35.4			52.0	32.3		56.1		32.0	31.9	18.7
Level of Service	D	D			D	C		E		C	C	B
Approach Delay (s)		40.7			46.8			56.1			25.0	
Approach LOS		D			D			E			C	

Intersection Summary			
HCM 2000 Control Delay	37.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	110.4	Sum of lost time (s)	28.0
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Intersection

Int Delay, s/veh 3.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	451	0	0	170	36	236
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	20	-	-	70	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	501	0	0	189	40	262

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	501	0	690	251
Stage 1	-	-	-	-	501	-
Stage 2	-	-	-	-	189	-
Critical Hdwy	-	-	4.14	-	6.63	6.93
Critical Hdwy Stg 1	-	-	-	-	5.83	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.22	-	3.519	3.319
Pot Cap-1 Maneuver	-	-	1059	-	395	749
Stage 1	-	-	-	-	575	-
Stage 2	-	-	-	-	843	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1059	-	395	749
Mov Cap-2 Maneuver	-	-	-	-	395	-
Stage 1	-	-	-	-	575	-
Stage 2	-	-	-	-	843	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	12.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	395	749	-	-	1059	-
HCM Lane V/C Ratio	0.101	0.35	-	-	-	-
HCM Control Delay (s)	15.1	12.4	-	-	0	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	0.3	1.6	-	-	0	-

HCM Signalized Intersection Capacity Analysis
7: Central Avenue & Washington Street

2034 PM
Alt 3



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	299	271	116	243	34	31	46	433	392	103	609	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1787	1881	1599	1805	1764		1770	1863	1583	1787	1881	1599
Flt Permitted	0.46	1.00	1.00	0.36	1.00		0.10	1.00	1.00	0.24	1.00	1.00
Satd. Flow (perm)	874	1881	1599	679	1764		191	1863	1583	446	1881	1599
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	305	277	118	248	35	32	47	442	400	105	621	91
RTOR Reduction (vph)	0	0	95	0	29	0	0	0	224	0	0	47
Lane Group Flow (vph)	305	277	23	248	38	0	47	442	176	105	621	44
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	2%	2%	2%	1%	1%	1%
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	7	4	5	3	8		5	2	3	1	6	7
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)	37.2	18.2	23.2	24.2	11.2		44.0	39.0	52.0	44.0	39.0	59.0
Effective Green, g (s)	37.2	18.2	23.2	24.2	11.2		44.0	39.0	52.0	44.0	39.0	59.0
Actuated g/C Ratio	0.31	0.15	0.19	0.20	0.09		0.36	0.32	0.43	0.36	0.32	0.49
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	418	282	306	256	163		134	599	757	217	605	857
v/s Ratio Prot	0.12	c0.15	0.00	c0.10	0.02		0.01	0.24	0.02	c0.02	c0.33	0.01
v/s Ratio Perm	0.10		0.01	0.09			0.11		0.09	0.16		0.02
v/c Ratio	0.73	0.98	0.07	0.97	0.23		0.35	0.74	0.23	0.48	1.03	0.05
Uniform Delay, d1	35.3	51.3	40.2	46.1	51.0		30.4	36.6	21.9	28.1	41.1	16.4
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.3	48.4	0.1	47.0	0.7		1.6	4.7	0.2	1.7	43.5	0.0
Delay (s)	41.6	99.8	40.3	93.1	51.8		32.0	41.3	22.1	29.8	84.6	16.4
Level of Service	D	F	D	F	D		C	D	C	C	F	B
Approach Delay (s)		64.4			84.3			32.2			70.0	
Approach LOS		E			F			C			E	

Intersection Summary

HCM 2000 Control Delay	57.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	121.2	Sum of lost time (s)	27.0
Intersection Capacity Utilization	83.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Intersection

Int Delay, s/veh 5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	7	4	177	5	4	8	164	532	17	2	533	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	0	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	4	197	6	4	9	182	591	19	2	592	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1570	1572	594	1664	1565	601	596	0	0	610	0	0
Stage 1	598	598	-	965	965	-	-	-	-	-	-	-
Stage 2	972	974	-	699	600	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	90	110	505	77	111	500	980	-	-	969	-	-
Stage 1	489	491	-	306	333	-	-	-	-	-	-	-
Stage 2	304	330	-	430	490	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	73	89	505	39	90	500	980	-	-	969	-	-
Mov Cap-2 Maneuver	73	89	-	39	90	-	-	-	-	-	-	-
Stage 1	398	490	-	249	271	-	-	-	-	-	-	-
Stage 2	239	269	-	259	489	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	25.1	55.3	2.2	0
HCM LOS	D	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	980	-	-	383	90	969	-
HCM Lane V/C Ratio	0.186	-	-	0.545	0.21	0.002	-
HCM Control Delay (s)	9.5	-	-	25.1	55.3	8.7	0
HCM Lane LOS	A	-	-	D	F	A	A
HCM 95th %tile Q(veh)	0.7	-	-	3.1	0.7	0	-

HCM Signalized Intersection Capacity Analysis
 9: Third Street & Central Avenue

2034 PM
 Alt 3



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations			↗		↔		↖	↕			↔			
Volume (vph)	0	0	122	354	49	45	20	547	205	20	663	22		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Total Lost time (s)			6.0		6.0		6.0	6.0			6.0			
Lane Util. Factor			1.00		1.00		1.00	0.95			0.95			
Frbp, ped/bikes			1.00		1.00		1.00	0.99			1.00			
Flpb, ped/bikes			1.00		1.00		1.00	1.00			1.00			
Frt			0.86		0.99		1.00	0.96			0.99			
Flt Protected			1.00		0.96		0.95	1.00			1.00			
Satd. Flow (prot)			1644		1782		1768	3384			3540			
Flt Permitted			1.00		0.96		0.17	1.00			0.91			
Satd. Flow (perm)			1644		1782		308	3384			3230			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	0.71	0.84	1.00	1.00	0.96	0.79		
Adj. Flow (vph)	0	0	122	354	49	45	28	651	205	20	691	28		
RTOR Reduction (vph)	0	0	115	0	4	0	0	25	0	0	3	0		
Lane Group Flow (vph)	0	0	7	0	444	0	28	831	0	0	736	0		
Confl. Peds. (#/hr)	6		5	5		6	24		12	12		24		
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	2%	2%	2%	1%	1%	1%		
Turn Type			Over	Split	NA		pm+pt	NA		pm+pt	NA			
Protected Phases			5	8	8		5	2		1	6			
Permitted Phases							2			6				
Actuated Green, G (s)			5.1		25.6		38.4	38.4			27.3			
Effective Green, g (s)			5.1		25.6		38.4	38.4			27.3			
Actuated g/C Ratio			0.05		0.27		0.41	0.41			0.29			
Clearance Time (s)			6.0		6.0		6.0	6.0			6.0			
Vehicle Extension (s)			3.0		3.0		3.0	3.0			3.0			
Lane Grp Cap (vph)			89		484		204	1379			936			
v/s Ratio Prot			0.00		c0.25		0.01	c0.25						
v/s Ratio Perm							0.05				c0.23			
v/c Ratio			0.07		0.92		0.14	0.60			0.79			
Uniform Delay, d1			42.3		33.3		18.7	21.9			30.8			
Progression Factor			1.00		1.00		1.00	1.00			1.00			
Incremental Delay, d2			0.4		22.0		0.3	0.7			4.4			
Delay (s)			42.7		55.3		19.0	22.7			35.2			
Level of Service			D		E		B	C			D			
Approach Delay (s)		42.7			55.3			22.5			35.2			
Approach LOS		D			E			C			D			
Intersection Summary														
HCM 2000 Control Delay			34.6									HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio			0.68											
Actuated Cycle Length (s)			94.2								21.0			
Intersection Capacity Utilization			75.2%										ICU Level of Service	D
Analysis Period (min)			15											
c Critical Lane Group														

HCM Signalized Intersection Capacity Analysis
 11: Central Avenue & Second Street/Chapel Street

2034 PM
 Alt 3



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖	↗			↖↗		↖	↗	
Volume (vph)	0	0	0	169	15	66	88	599	76	299	712	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				6.0	6.0			6.0		6.0	6.0	
Lane Util. Factor				1.00	1.00			0.95		1.00	1.00	
Fr _t				1.00	0.88			0.99		1.00	0.99	
Fl _t Protected				0.95	1.00			0.99		0.95	1.00	
Satd. Flow (prot)				1770	1636			3467		1770	1838	
Fl _t Permitted				0.95	1.00			0.58		0.20	1.00	
Satd. Flow (perm)				1770	1636			2035		379	1838	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	188	17	73	98	666	84	332	791	76
RTOR Reduction (vph)	0	0	0	0	65	0	0	10	0	0	3	0
Lane Group Flow (vph)	0	0	0	188	25	0	0	838	0	332	864	0
Turn Type				Split	NA		pm+pt	NA		pm+pt	NA	
Protected Phases				8	8		5	2		1	6	
Permitted Phases							2			6		
Actuated Green, G (s)				10.0	10.0			38.0		50.0	50.0	
Effective Green, g (s)				10.0	10.0			38.0		50.0	50.0	
Actuated g/C Ratio				0.11	0.11			0.42		0.56	0.56	
Clearance Time (s)				6.0	6.0			6.0		6.0	6.0	
Vehicle Extension (s)				3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)				196	181			859		303	1021	
v/s Ratio Prot				c0.11	0.02					0.07	c0.47	
v/s Ratio Perm								0.41		c0.54		
v/c Ratio				0.96	0.14			0.98		1.10	0.85	
Uniform Delay, d ₁				39.8	36.1			25.5		18.5	16.8	
Progression Factor				1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d ₂				51.9	0.4			24.5		79.8	8.6	
Delay (s)				91.7	36.5			50.0		98.3	25.4	
Level of Service				F	D			D		F	C	
Approach Delay (s)		0.0			73.8			50.0			45.6	
Approach LOS		A			E			D			D	

Intersection Summary

HCM 2000 Control Delay	50.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	87.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Intersection			
Intersection Delay, s/veh	18.8		
Intersection LOS	C		
Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	468	646	420
Demand Flow Rate, veh/h	468	652	420
Vehicles Circulating, veh/h	130	409	164
Vehicles Exiting, veh/h	931	175	434
Follow-Up Headway, s	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	9.2	32.2	8.8
Approach LOS	A	D	A
Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193
Entry Flow, veh/h	468	652	420
Cap Entry Lane, veh/h	992	751	959
Entry HV Adj Factor	1.000	0.990	1.000
Flow Entry, veh/h	468	646	420
Cap Entry, veh/h	992	743	959
V/C Ratio	0.472	0.869	0.438
Control Delay, s/veh	9.2	32.2	8.8
LOS	A	D	A
95th %tile Queue, veh	3	11	2

Intersection

Int Delay, s/veh 7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	462	177	10	151	158	61
Conflicting Peds, #/hr	0	0	0	0	16	18
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	513	197	11	168	176	68

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	728
Stage 1	-	-	630
Stage 2	-	-	190
Critical Hdwy	-	-	4.11
Critical Hdwy Stg 1	-	-	5.4
Critical Hdwy Stg 2	-	-	5.4
Follow-up Hdwy	-	-	2.209
Pot Cap-1 Maneuver	-	-	880
Stage 1	-	-	535
Stage 2	-	-	847
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	880
Mov Cap-2 Maneuver	-	-	337
Stage 1	-	-	527
Stage 2	-	-	835

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	32.1
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	367	-	-	880	-
HCM Lane V/C Ratio	0.663	-	-	0.013	-
HCM Control Delay (s)	32.1	-	-	9.1	0
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	4.6	-	-	0	-

C PUBLIC PROCESS

Please see the following pages for all meeting notes, graphics, and survey results from the three community meetings that occurred during this process. All notes were a compilation of observations and notes taken by The Cecil Group and RSG during community meeting breakout groups.

The public process for the downtown vehicular and streetscape study consisted of progression of studies, discussions, input, alternatives, and responses over a period of approximately 12 months, concluding in this *Report*. The community input and discussions involved three community meetings, the focus of which included the existing conditions and data analysis, alternative circulation patterns, and a preferred design. Each meeting had the same schedule of a presentation or video followed by breakout groups, which facilitated community input. The following sections provide the graphics presented and public input received in each community meeting. The purpose of these notes is to summarize typical comments, questions and responses from each community meeting breakout group. It has been compiled from the notes of the group facilitators, which have been assembled according to topics.

Community Meeting #1 – Data and Analysis

January 21, 2014

This meeting was held to present the data and analysis in the existing conditions *Report*. The presentation briefly described a variety of topics in the *Report* including the following: employment trends, town destinations, traffic volumes, existing intersection level of service, accident data, parking supply and demand, downtown development potential, existing vehicular and pedestrian circulation patterns, transit infrastructure, and streetscape conditions.

Following the presentation, working group sessions offered the community its first opportunity to discuss the information presented and provide personal issues and opportunities with the current downtown pedestrian and vehicular configurations. These opinions were taken by The Cecil Group and RSG to better formulate alternatives to be discussed in the next community meeting. The community input was as follows:

Meeting Graphics

The following graphics, **Figure 33** and **Figure 34**, were used in the promotion and facilitation of the community workshop.



Public Workshop #1

Dover Downtown PEDESTRIAN AND VEHICULAR ACCESS AND STREETScape STUDY

Tuesday, January 21, 2014, 6 PM
 City Council Chambers, City Hall
 288 Central Avenue, Dover



For more information, please contact Christopher Parker, AICP, Director of Planning and Community Development, City of Dover, 603.516.6008, c.parker@dover.nh.gov.

DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
DATA COLLECTION AND EVALUATION OF EXISTING CONDITIONS		DEVELOPMENT AND REFINEMENT OF ALTERNATIVES			DEVELOPMENT OF PREFERRED DESIGN		DEVELOPMENT OF FINAL REPORT		

The City of Dover is undertaking a study to continue the revitalization of Dover's historic urban core. The study will focus on rebalancing the entire circulation and streetscape network within the downtown so that future conditions support a mixed-use environment that is more convenient, pleasant, and economically vibrant. The study will result in a revitalization plan with four key goals: create a more attractive pedestrian-oriented environment, make vehicle circulation more clear and convenient, simplify links to parking, and expand bicycle and transit links to and through the downtown.

The City of Dover's Planning Department is guiding this study, which is funded through the City's Capital Improvements

Program. The Cecil Group, a professional planning and design firm, has been retained to help carry out the planning study.

Community input is important to this process. The team needs to understand the issues and opportunities in the downtown to help shape revitalization strategies for the area. We will be holding stakeholder interviews, monthly meetings with the Transportation Advisory Committee (TAC), and three Public Workshop Meetings, and **we want to hear from you**. The first workshop is January 21. Key milestones in the process are shown in the time line above.



Figure 33: Community Workshop #1 Promotional Flier



Figure 34: Community Workshop #1 Breakout Board

Patterns

Vehicle

- Heavy trucking circulation is prominent from Maine (Portland Avenue and Cochecho Street) heading west passing through downtown to Chestnut Street then Walnut and Locust Streets in order to bypass tolls

- Truck maneuvering issues occur at intersection of Chestnut and Washington
- Truck turning movements southbound on Chestnut are difficult
- Tend to drive through downtown to get to other destinations, but then return to visit
- Busiest traffic occurs during afternoon from 12 to 8pm on Central Avenue
- Congestion is not prolonged but only between 3-4pm
- Orchard Street backs up to Third Street occasionally
- Some backups in the morning between 7:30 and 8:15, but limited
- Vehicles tend to stop for crossing pedestrians
- Vehicles travel fast on Washington Street at one way section at river crossing, makes for difficult/dangerous pedestrian crossing at Main/Water Street intersection

Pedestrians

- Pedestrian circulation from the northwest neighborhoods to train station
- Heavier pedestrian circulation from Central Avenue to Washington Street to Children's Museum
- Concert series at Children's Museum creates pedestrian activity along Washington Street on a periodic basis during summer months
- The Cochecho Mill generates pedestrian traffic to and from the Mill
- People like to walk to Janetos
- Parking meter access during winter months can be difficult due to snow embankments
- Bicycle circulation tends to use the sidewalk on Central Avenue and also Chestnut Street to Washington Street heading west

Rail

- Freight trains can occasionally cause traffic problems (15-20 minute wait)

Parking

- Orchard Street parking lot fills up during the day
- The Third Street parking lot tends to fill up during the evening hours

Issues

- Signals in Upper Square tend to be confusing and cannot understand meaning; "No Turn on Steady Red Arrow" signal is not clear or effective
- The left turn from Chapel Street onto Central Avenue at Second Street is a hazard because drivers are looking north up Central Avenue and often do not notice pedestrians crossing Central Avenue just south of the intersection.

- Way-finding signage is a major issue (for parking and destinations)
- No apparent gateways or way-finding signage at:
 - Columbus Avenue and Route 9
 - Spaulding and Exit 7
- Lighting is not sufficient; it is dim and creates an unsafe downtown atmosphere
- The downtown defined by district transitions areas at the railroad/Pierce Street north, the downtown core at mid Central Avenue and Washington Street south to Hale Street, and the less desirable district at Hale Street south
- Vehicles become disoriented trying to locate parking with no signage and one-way circulation pattern
- Miracle Mile is located to the north and includes Shaws, Hannaford, and other retail shops that attract more vehicles to travel through downtown
- The preferred downtown area is perceived as just south of the River on Central Avenue
- Large trucks travel through downtown from the east
- Fast traffic along the one way section of Washington Street near Brew pub at Mill building
- Liquor store on Chestnut creates a traffic problem with no turning lane
- The train station parking lot is undifferentiated and difficult for pedestrians to navigate

Priorities

- Fix Upper Square
- Traffic calming at Chestnut Street, particularly at the train station
- Add more trees and landscaping
- Provide better lighting
- Clean up garbage
- Make waterfront a primary feature
- Improve Ladder Park and its identity
- Slow traffic at one way section along Washington Street
- Improve streetscape edge along large parking lot on Central Avenue at the Mill
- Dover lacks a prominent central area/space within downtown

Community Meeting #2 – Alternatives and Survey

April 21, 2014 and May 15, 2014

This meeting was held to discuss the baseline improvements and alternatives suggested by the consultant team. Following a presentation of the recommendations, the community was asked to break into groups to provide input on the alternatives. It was noted that there was an online survey that could be found on the city’s website.

Meeting Graphics

The following graphics, **Figure 35** through **Figure 37**, were used in the promotion and facilitation of the community workshop.

Public Workshop #2

Dover Downtown PEDESTRIAN AND VEHICULAR ACCESS AND STREETScape STUDY

Monday, April 21, 2014, 6 PM
 City Council Chambers, City Hall
 288 Central Avenue, Dover

DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
DATA COLLECTION AND EVALUATION OF EXISTING CONDITIONS		DEVELOPMENT AND REFINEMENT OF ALTERNATIVES			DEVELOPMENT OF PREFERRED DESIGN		DEVELOPMENT OF FINAL REPORT		

The City of Dover is undertaking a study to continue the revitalization of the historic urban core. The study focuses on rebalancing the entire downtown circulation and streetscape network so that future conditions support a mixed-use environment that is more convenient, pleasant, and economically vibrant. The study will result in a revitalization plan with four key goals: create a more attractive pedestrian-oriented environment, make vehicle circulation more clear and convenient, simplify links to parking, and expand bicycle and transit links to and through the downtown.

The study is guided by the City’s Planning Department, with assistance from The Cecil Group, a professional planning and design firm. The study is funded through the City’s Capital Improvements Program.

Community input is important to this process. The team needs to understand the issues and opportunities in the downtown to help shape revitalization strategies for the area. We want to hear from you! **The April 21 workshop will present three alternatives (with different approaches to traffic circulation, streetscape character, and pedestrian and bicycle facilities) and discuss their relative implications. Workshop participants will then break into groups to explore each alternative and record their preferences, reactions, and recommendations.**

For more information, please contact Christopher Parker, AICP, Director of Planning and Community Development, City of Dover, 603.516.6008, c.parker@dover.nh.gov.

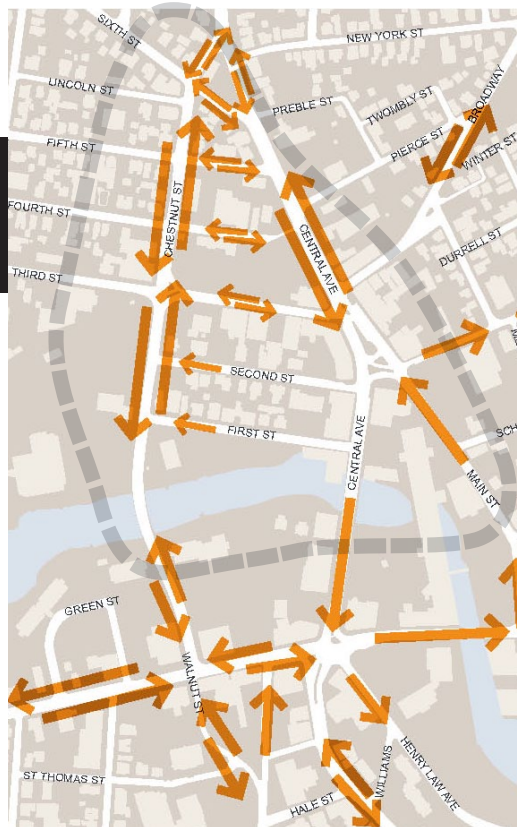
Figure 35: Community Workshop #2A Promotional Flier

Dover Downtown PEDESTRIAN AND VEHICULAR ACCESS AND STREETScape STUDY

**DOVER RESIDENTS, WORKERS, AND VISITORS:
THIS PROJECT WILL AFFECT YOUR DOWNTOWN!**

**Please Join Us for a Public Workshop
Thursday May 15, 2014, from 6 to 8 pm**

The McConnell Center Media Room, 61 Locust Street, Dover



Downtown Study Area and existing traffic flow directions.

PURPOSE OF THE WORKSHOP>

The May 15 public workshop provides a second chance to review and discuss the circulation alternatives being proposed in the City's *Downtown Access and Streetscape Study*. The workshop is an encore presentation of a previous April 21 public workshop; anyone who could not attend the prior workshop is encouraged to attend on May 15.

PROJECT BACKGROUND>

The Study focuses on rebalancing the entire downtown circulation and streetscape network so that future conditions support a mixed-use environment that is more convenient, pleasant, and economically vibrant. The study aims to create a more attractive pedestrian-

oriented environment, make vehicle circulation more clear and convenient, simplify links to parking, and expand bicycle and transit links to and through the downtown.

The May 15 workshop will present three alternatives with different approaches to traffic circulation and pedestrian and bicycle facilities. Workshop participants will then break into groups to further explore each alternative and record their preferences, reactions, and recommendations.

FOR MORE INFORMATION>

Christopher Parker, AICP, Director of Planning and Community Development, City of Dover, (603) 516-6008, c.parker@dover.nh.gov.

Figure 36: Community Workshop #2B Promotional Flier

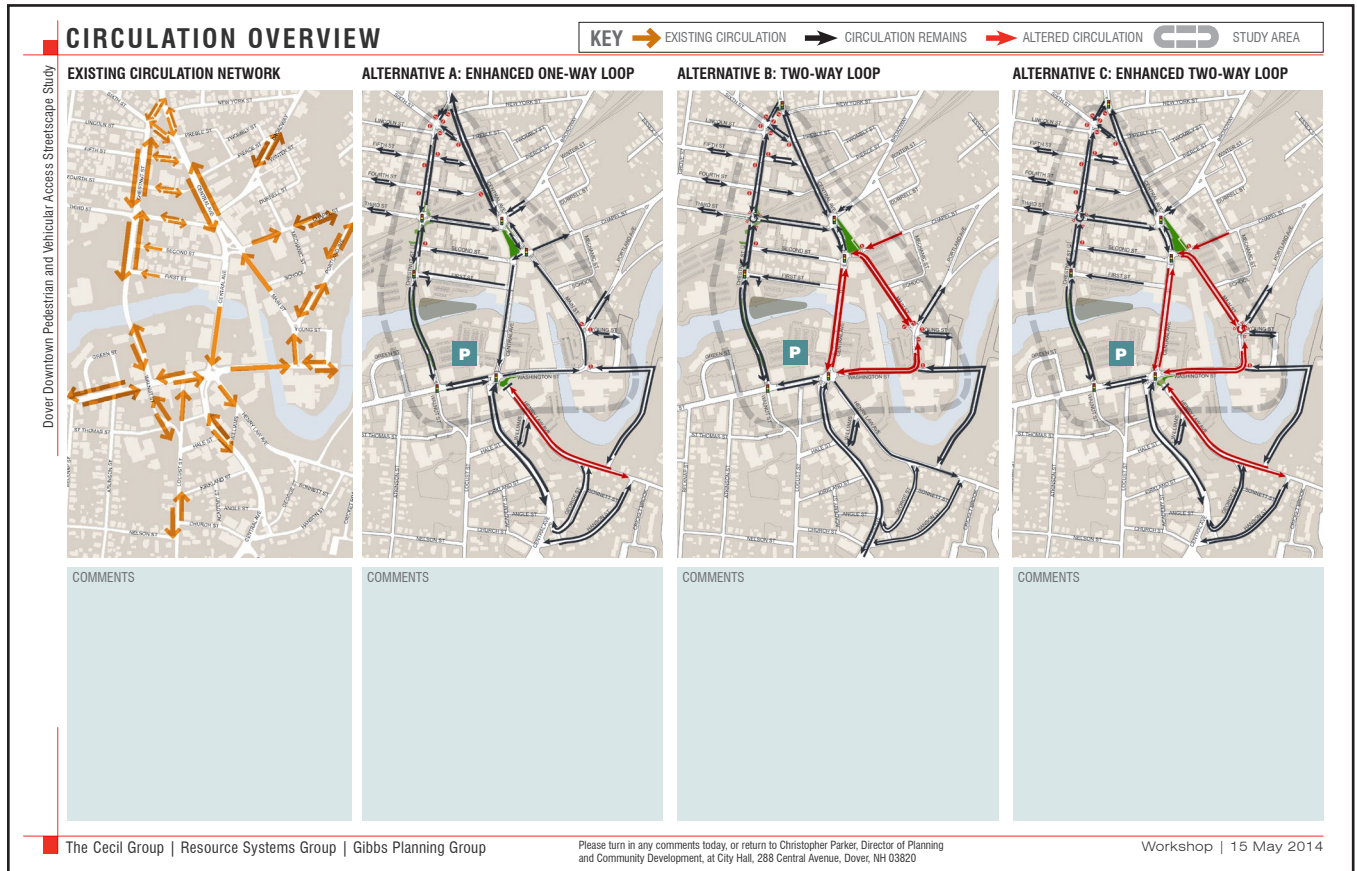


Figure 37: Community Workshop #2A / B Handout

Concerns

General

- Main Street is viewed a secondary street and is “misnamed” as a main thoroughfare

Traffic Movement

- Changing to two way traffic loop could intensify the existing traffic congestion
- Should the existing 30mph speed limit be analyzed for a reduction to increase safety?
- Drivers tend to create an unsafe condition through excessive speeds and erratic movement

Henry Law Closure

- Bad for potential business delivery and Children’s Museum connection
- Left turn from Central Avenue should be limited
- Two-way is good but with only one way into Henry Law but not an exit

Deliveries / Truck Traffic

- * 30+ Trucks / hour is excessive and has the potential to create bottle necks in a two-way system
- * Potential to create loading zones on side streets in certain strategic locations

Chestnut Street

- * No signal at Third and Chestnut
- * There are potential issues in queuing and purging traffic due to the differences in freight train vs. commuter rail waiting periods
- * Would it be quicker with a road diet? Or would the road diet encourage more drivers to use Central Avenue?

Parking

- * Is there a potential for angled parking on both sides of Central Avenue?
- * Parking on both sides of Chapel Street
- * Losses on Central Street angled parking should be strategic to limit the impact on business parking

Pedestrian Movement / Activities

- Parked once how do I get around? – Destination shopping / Transit
- Resolve pedestrian issues where crosswalks are and aren't to better create connections around the downtown
- The Apple Harvest festival could limit the reconfiguration options at Sixth and Chestnut Streets

Opportunities

General Development

- Dover's restaurant / business inventory are mostly destination and don't really depend on one-way or two-way traffic circulation
- Should encourage the potential / future infill to be near Central Avenue / First / Second / Third Streets

Traffic Movement

- Roundabout at third is beneficial by slowing traffic / more visibility / constrains movement
- Potential for using loading zones for snow storage

Parking

- * The proposed parking garage will allow more parking opportunities and free up parking opportunities on Central Avenue

- * The existing parking surplus should be addressed to better facilitate traffic and parking movements (breaking habits of parking right in front of business)

Direction

- * One-way opens up downtown – circulation and experience Main Street. Time associated with “looping around” isn’t really an issue as the loop is less than a half mile in length
- * Exploration of an “Option D” – Blend of two way with Option A (what are the ramifications at Central Avenue)
- * Exploration of one way on Central Avenue and Main Street to two-way
- * Two-way fosters more options and easier to get final destination

Pedestrian / Bicycle Movement

- * Senior housing pedestrian refuge is critical for connection to downtown
- * Provide bicycle connections to existing rail trail
- * Third and Chestnut Street roundabout is beneficial pedestrian crossing

Landscape

- * Large and usable open spaces benefit business by allowing spaces for people and shoppers to congregate
- * Exploring split parks in Upper Square in lieu of promoting one side or the other
- * Good lighting is essential
- * Large and visible signage and wayfinding components are critical for directionality

Survey Results

The Cecil Group created a survey to solicit public opinion on circulation and access options for Downtown Dover. The online survey, created using SurveyMonkey.com, went live on April 26, 2014 and was advertised through the City website and City emails. The survey was closed to responses on May 25, 2014.

Survey Metadata

The following describes the responses to the online survey.

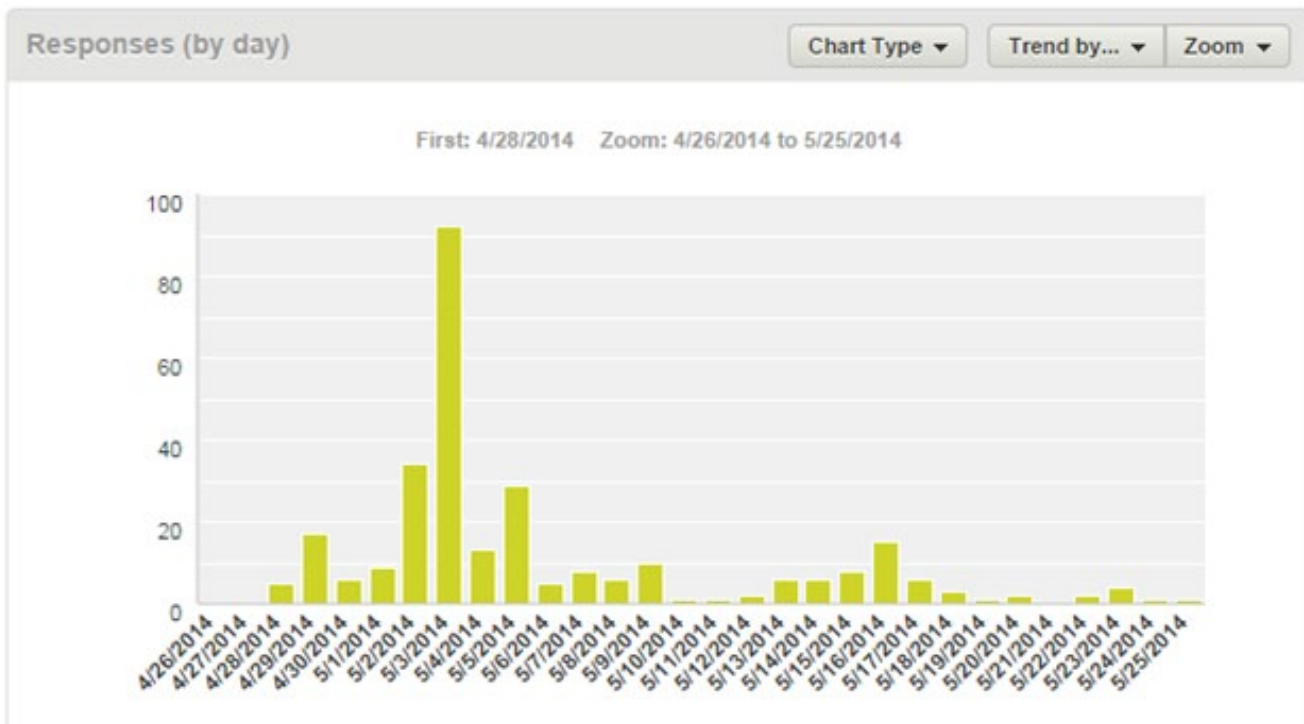
- Approximately 300 responses were received during the month the survey was available online. The Cecil Group verified that all but a few responses came from unique IP addresses, indicating the unlikelihood that individuals were submitting multiple responses.
- The bulk of responses were received between May 2 and 5. By far, the highest day of responses to the online survey was May 3, when 92 responses were received (see bar chart below).

- The 300 responses summarized below also included 6 surveys submitted on paper forms from public meeting.
- Copies of the survey results are attached at the end of this memo.

Observations on Responses

Respondents were most concerned with traffic, rather than other listed concerns such as pedestrian and bicycle comfort, wayfinding, or parking. Maintaining the current circulation system with one-way flow was preferred over two other options that included converting to two-way flow.

A majority of survey respondents live or work in Dover, but do not live or



work downtown. Almost none of the respondents had attended the prior (April 21) public meeting, and only a few planned to attend the next (May 15) meeting.

Individual Question Responses

Question 1

Top priorities for circulation and access issues in downtown Dover indicated a majority are concerned with traffic conditions. However, pedestrian comfort and safety also ranked highly.

Q: Please rank, in order of importance to you, the following issues with the way the circulation and access currently work in downtown Dover. Use rank 1 for your first (top) priority issue, rank 2 for your second priority issue, etc. NOTE: You can drag and drop your answers into order of preference, or you can use the drop-down number menus to order them. Your choices will immediately re-display in your preferred order of preference.

TOP 6 CHOICES	NUMBER OF RESPONDENTS RANKING IT THEIR TOP PRIORITY
#1: Through traffic	18%
#2: Local traffic	17%
#3: Pedestrian comfort and safety	15%
#4: Delays in traffic speeds and flow	15%
#5: High volume of traffic	11%
#6: Safe visibility when driving	8%

Note: Other issues received a much smaller share of votes

Question 2

Respondents believe that downtown streets should be one-way, all else being equal.

Q: If intersection turning movements can be safely designed and parking supply adjusted as appropriate, should major downtown streets have one-way or two-way traffic flow?

- One-way flow: 57%
- Two-way flow: 43%

Question 3

The majority of respondents prefer a downtown circulation pattern that is close to today's configuration, as indicated by responses to the following three choices.

Q. The three images below show the three possible alternatives being considered for traffic circulation in the downtown loop. Please consider each alternative holistically and rank them here in order of preference. Use rank 1 for your 1st (top) choice, rank 2 for your 2nd choice, and rank 3 for your 3rd choice. NOTE: You can drag and drop your answers into order of preference, or you can use the drop-down number menus to order them. Your choices will immediately re-display in your preferred order of preference.

- ALTERNATIVE A – Enhanced One-Way Loop. This alternative would maintain the existing traffic flow direction on every street in downtown Dover except for Henry Law Avenue. It would also create a pedestrian plaza on the west side of Upper Square (at Main Street and Central Ave). Henry Law Avenue would be converted to two-way flow, and closed off to Lower Square. A majority (58.4%) of respondents indicated this as their top choice.
- ALTERNATIVE B – Two Way Loop. This alternative would convert the inner loop of streets (lower Central Avenue, Main Street, and Washington Street) to two-way flow and create a pedestrian plaza on the EAST side of Upper Square. Henry Law Avenue would remain one-way southbound, and would remain connected at Lower Square. This was the most popular second choice, selected by 50.7% of respondents.
- ALTERNATIVE C – Enhanced Two-Way Loop. This is identical to Alternative B, except that, as in Alternative A, it would convert Henry Law Avenue to two-way flow and close it off from Lower Square. This was the most popular third choice, selected by 43.7% of respondents.

Question 4

Approximately 100 respondents took the time to write free-form responses to an open-ended question. Results indicate a broad array of concerns and priorities, with no clear trend. Many responses seem to indicate confusion or misconceptions about the effects of conversion from one-way to two-way traffic flow. Some people didn't see any problem with the status quo system.

The full set of long-form responses is provided in the survey summary after this memo.

Question 5

Responses indicate that most respondents do not live or work in downtown Dover, which perhaps explains the preference to address traffic flow rather than pedestrian conditions.

Q: What is your relationship to downtown Dover? Check all that apply.

- 62.2% live or work in Dover, but not Downtown
- 26.3% live Downtown
- 16.0% work Downtown
- 12.6% are interested outsiders
- 6.5% are landlords for a downtown property
- 5.3% own retail businesses downtown

Question 6

Almost no respondents had attended the prior public meeting, and so had not gained the benefit of the presentations and discussions.

Q: Did you attend the April 21 Public Meeting at City Hall, at which participants learned about and discussed the different traffic flow options?

- No: 94%
- Yes: 6%

Question 7

Similarly, most respondents showed little or no interest in attending upcoming meetings to learn more about the circulation alternatives.

Q: Do you plan on attending the Thursday, May 15 public meeting and open house? This will be a chance for additional discussion and input on the three circulation alternatives. The meeting will be held from 6 to 8 PM at the McConnell Center media room, 61 Locust Street, Dover.

- Maybe: 47%
- No: 37%
- Yes: 16%

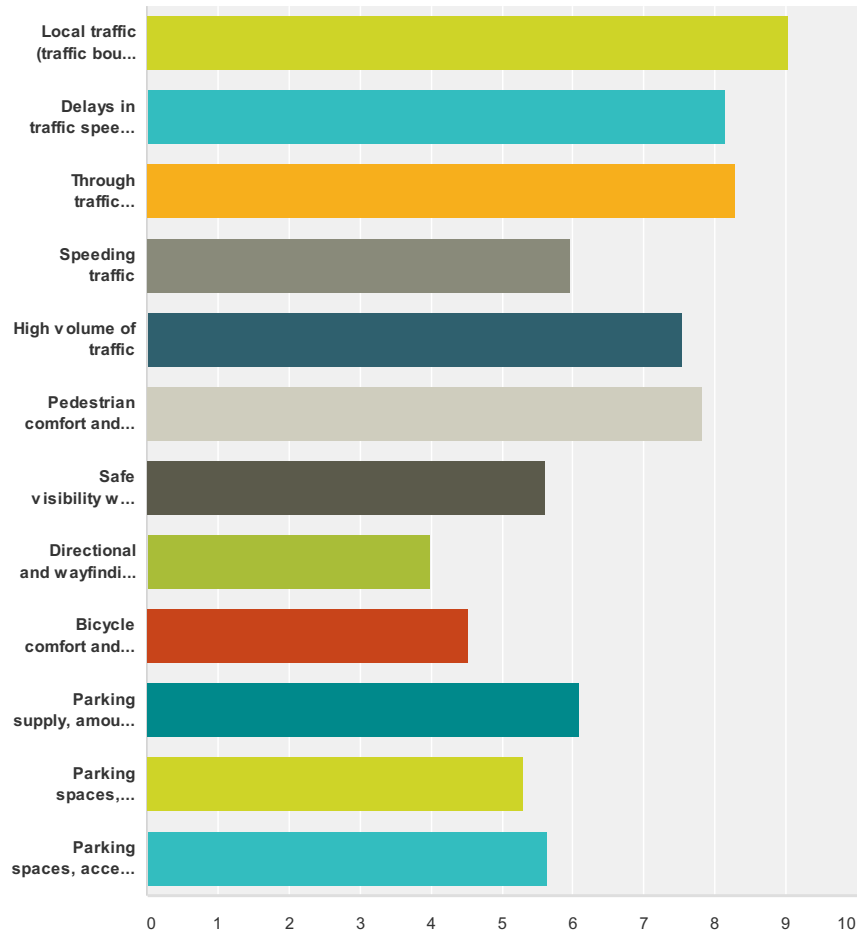
Survey Responses

See following pages for responses provided by the online survey

Dover Downtown Pedestrian and Vehicular Circulation and Access Options

Q1 Please rank, in order of importance to you, the following issues with the way the circulation and access currently work in downtown Dover. Use rank 1 for your first (top) priority issue, rank 2 for your second priority issue, etc. NOTE: You can drag and drop your answers into order of preference, or you can use the drop-down number menus to order them. Your choices will immediately re-display in your preferred order of preference.

Answered: 292 Skipped: 1



	1	2	3	4	5	6	7	8	9	10	11	12	Total	Average Ranking
Local traffic (traffic bound for, or starting from, downtown)	17.12% 50	17.81% 52	14.73% 43	15.07% 44	11.30% 33	8.90% 26	5.14% 15	3.77% 11	2.05% 6	1.71% 5	1.71% 5	0.68% 2	292	9.04
Delays in traffic speeds and flow	15.41% 45	7.88% 23	13.36% 39	15.75% 46	10.62% 31	9.59% 28	7.53% 22	6.16% 18	5.82% 17	3.42% 10	2.40% 7	2.05% 6	292	8.15
Through traffic (traffic passing through downtown, bound for other destinations)	18.15% 53	17.81% 52	11.99% 35	5.82% 17	9.93% 29	7.53% 22	8.56% 25	4.79% 14	4.45% 13	2.05% 6	3.08% 9	5.82% 17	292	8.29
Speeding traffic	4.45% 13	8.56% 25	10.62% 31	7.88% 23	7.19% 21	4.11% 12	9.93% 29	6.51% 19	8.90% 26	11.30% 33	5.14% 15	15.41% 45	292	5.98

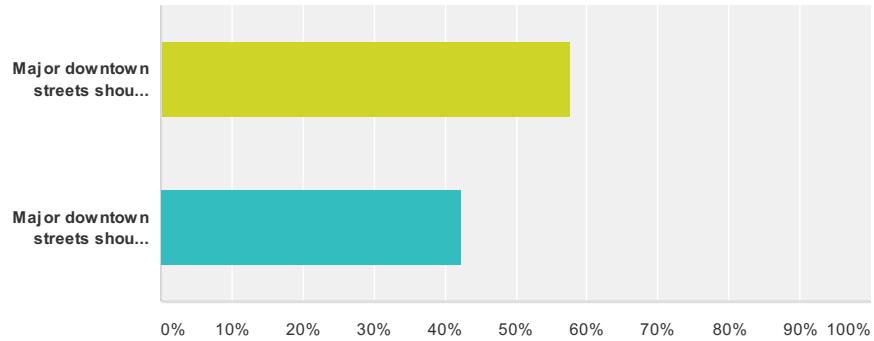
Dover Downtown Pedestrian and Vehicular Circulation and Access Options

Pedestrian comfort and safety	15.75% 46	13.70% 40	9.25% 27	8.90% 26	7.88% 23	6.85% 20	5.82% 17	7.53% 22	17.12% 50	3.08% 9	4.11% 12	0.00% 0	292	7.82
Safe visibility when driving	8.22% 24	8.22% 24	7.19% 21	6.16% 18	7.19% 21	7.19% 21	5.14% 15	6.16% 18	4.45% 13	5.48% 16	7.19% 21	27.40% 80	292	5.62
Directional and wayfinding signage	1.37% 4	3.42% 10	5.14% 15	4.11% 12	5.14% 15	2.40% 7	3.77% 11	8.22% 24	5.14% 15	10.62% 31	31.85% 93	18.84% 55	292	3.99
Bicycle comfort and safety	2.40% 7	4.11% 12	4.79% 14	4.45% 13	4.45% 13	7.53% 22	7.19% 21	4.45% 13	6.16% 18	21.92% 64	14.38% 42	18.15% 53	292	4.53
Parking supply, amount of	3.42% 10	4.11% 12	4.45% 13	7.19% 21	6.51% 19	17.81% 52	12.33% 36	14.38% 42	14.38% 42	5.82% 17	6.85% 20	2.74% 8	292	6.10
Parking spaces, location related to destinations	1.37% 4	3.08% 9	4.45% 13	5.14% 15	7.53% 22	9.25% 27	10.62% 31	16.44% 48	11.30% 33	15.41% 45	12.33% 36	3.08% 9	292	5.31
Parking spaces, access to	1.03% 3	2.05% 6	4.11% 12	7.19% 21	8.22% 24	9.59% 28	18.84% 55	12.67% 37	15.07% 44	12.67% 37	5.82% 17	2.74% 8	292	5.63
High volume of traffic	11.30% 33	9.25% 27	9.93% 29	12.33% 36	14.04% 41	9.25% 27	5.14% 15	8.90% 26	5.14% 15	6.51% 19	5.14% 15	3.08% 9	292	7.53

Dover Downtown Pedestrian and Vehicular Circulation and Access Options

Q2 If intersection turning movements can be safely designed and parking supply adjusted as appropriate, should major downtown streets have one-way or two-way traffic flow?

Answered: 292 Skipped: 1



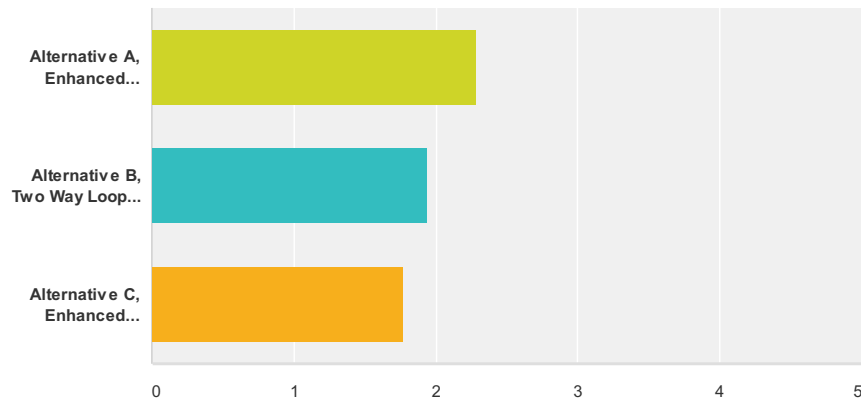
Answer Choices	Responses	Count
Major downtown streets should have one-way traffic.	57.53%	168
Major downtown streets should have two-way traffic.	42.47%	124
Total		292

Dover Downtown Pedestrian and Vehicular Circulation and Access Options

Q3 The three images below show the three possible alternatives being considered for traffic circulation in the downtown loop.

Please consider each alternative holistically and rank them here in order of preference. Use rank 1 for your 1st (top) choice, rank 2 for your 2nd choice, and rank 3 for your 3rd choice. **NOTE: You can drag and drop your answers into order of preference, or you can use the drop-down number menus to order them. Your choices will immediately re-display in your preferred order of preference.**

Answered: 270 Skipped: 23



	1	2	3	Total	Average Ranking
Alternative A, Enhanced One-Way Loop. This alternative would maintain the existing traffic flow direction on every street in downtown Dover except for Henry Law Avenue. It would also create a pedestrian plaza on the west side of Upper Square (at Main Street and Central Ave). Henry Law Avenue would be converted to two-way flow, and closed off to Lower Square.	57.41% 155	14.07% 38	28.52% 77	270	2.29
Alternative B, Two Way Loop. This alternative would convert the inner loop of streets (lower Central Avenue, Main Street, and Washington Street) to two-way flow and create a pedestrian plaza on the EAST side of Upper Square. Henry Law Avenue would remain one-way southbound, and would remain connected at Lower Square.	21.48% 58	50.74% 137	27.78% 75	270	1.94
Alternative C, Enhanced Two-Way Loop. This is identical to Alternative B, except that, as in Alternative A, it would convert Henry Law Avenue to two-way flow and close it off from Lower Square.	21.11% 57	35.19% 95	43.70% 118	270	1.77

Q4 Would you like to add any general comments about these alternatives?

Answered: 97 Skipped: 196

#	Responses	Date
1	It would solve a lot of problems if thru traffic could get from the intersection of Oak street and Rte 4 to the intersection of Rte 16 and Rte 9 and Rte 155 w/o going thru downtown and Silver street. I have to travel thru there regularly with my truck as do many other trucks. I have to say it's one of the worse routes with to much congestion and bad roads that I must travel.	5/24/2014 6:41 AM
2	Portland Ave. and Main Street is a horror. poor visibility, and often long wait to exit Portland Ave.	5/23/2014 2:25 PM
3	Henry Law Ave should Not be closed off to lower square in any choice. Keep lower Washington and Main 1-way. Keep shopping district Central Ave , 1-way as is now.	5/23/2014 12:40 PM
4	No roundabouts	5/23/2014 10:32 AM
5	In any alternative, serious consideration needs to be given to pedestrian and cyclist safety at the Washington/Waters St. and Main/Portland intersections. These are not signalized and motor traffic through them often does not signal and makes fast sweeping turns, conflicting both with pedestrians trying to cross and cyclists operating towards the right edge of the roadway.	5/23/2014 9:58 AM
6	I like the roundabout!	5/17/2014 11:01 AM
7	I don't think the current situation needs a major overhaul.	5/16/2014 12:00 PM
8	better signage and directional indicators need to be part of any plan.	5/16/2014 11:42 AM
9	I don't like any alternative that blocks traffic from Henry Law. The park and museum are two of the biggest attractions that the city had to offer	5/16/2014 11:32 AM
10	really love the pedestrian plaza concepts! Areas that inspire more walking/biking are wonderful for a healthy community!	5/15/2014 10:24 PM
11	Dover sees quite a bit of what I call "pass though traffic". These are vehicles simply passing through Dover in order to get to a destination outside of Dover. In the morning hours 6-9am Dover traffic very calm and it's easy to drive walk or ride a biek through Dover. Sometime after 9am the "pass through traffic" begins. In fact I'd say the majority of the vehicle traffic in Dover is unrelated to Dover, meaning these vehicles are not making business or personal stops anywhere in Dover. They are simply passing through. Unfortunately the way Dover's streets are laid out there is no easy way/ route (read as direct and simple) through our city. This seems to cause driver frustration which can manifest in dozens of ways. The Circulation Alternatives are not clear in their intended purpose and/ or offering insights into their design. For example: What's the purpose of the roundabout in version C? Why is traffic on Henry Law Ave remain one way in Version B but is two way in Version C (especially when the only other difference between these to alternatives is the "roundabout in Version C)? Why not a Version B with Henry Law Ave being two way? Least of all there are no alternatives for Chestnut Street as well as many other streets in the downtown district/ area. (eg First and Second streets remaining one way versus there being an option for two way traffic on these two street)? Limited by what is offered I'd vote for Alternative B but with Henry Law Ave. having two way traffic.	5/15/2014 3:09 PM
12	what about leaving it the way it is ? none of these are better choices, and all would cause more problems than they solve. Not to mention the enormous expense associated with any of these, none of which Dover can afford.	5/15/2014 2:50 PM
13	I do not thing any of the above are better than the existing.	5/15/2014 11:11 AM
14	What are the costs for each?	5/15/2014 10:37 AM
15	None of these designs are practical in terms of improving traffic flow in downtown. All that is accomplished is creating a wider crosswalk across Henry Law Avenue, which benefits relatively few people.	5/14/2014 3:19 PM

Dover Downtown Pedestrian and Vehicular Circulation and Access Options

16	This is not addressing the traffic flow at lower square. More traffic goes into Henry Law than the lights allow. The changes you offer will only increase the other feeder streets like Chestnut, Locust, Court, and Hanson St. I live off the Henry Law Ave connector and do not like the road to be cut off for pedestrian area.	5/14/2014 10:52 AM
17	I have never minded the one-ways...the problem seems to lie in diverting/bypassing traffic away from downtown that is only seeking to drive through, not to, downtown. North to South, South to North, Maine into NH, all flow through town...	5/14/2014 8:25 AM
18	I have two big hopes for this project. One would be making it easier to get through downtown by car, the second would be increasing the "walkability" of downtown. None of these alternatives clearly offer a straight shot through downtown (the intersection of Chestnut and Central would still be a problem, and the intersection of Main and Central may or may not be a problem if both are two way). I worry about how easy it will be to walk back and forth across Central if it becomes two way.	5/14/2014 8:13 AM
19	Shouldn't we just focus on the New Police Station!! Too many changes to our downtown will destroy it.	5/13/2014 5:21 PM
20	Chose Alt.A, why is Henry Law converting back to two-way traffic near the Lower Square? When the new parking garage is built Dover should alleviate the parking on the Avenue, except for handicapped spaces. It is impossible to park in these spaces and reverse out into bumper to bumper traffic. Allowing someone to leave a parking space, boggles traffic even more due to slowly reversing car and taking off, with many on the left cutting in. I find it frustrating, would much rather walk to the stores from beyond the downtown parking spaces. Also, before allowing residences of Dover to give input, would be helpful to know the process of each choice and of course the cost to achieve.	5/13/2014 12:38 PM

Dover Downtown Pedestrian and Vehicular Circulation and Access Options

21	<p>I think I prefer the one-way loop, to provide more visibility to the businesses on Washington and Main. But I can understand the concerns of the impact of one way traffic on pedestrians trying to cross (both lanes do not always stop). But I do wish that Henry Law went back to two-way traffic, having used the Dover Indoor Pool and finding the "back loop" around River St confusing (directional signage is not good). Other thoughts: My primary usage: 1) Travel from South Berwick to Cataract Ave, Dover (St John's UMC) twice weekly, sometimes more. 2) Shopping on Fridays: often from South Berwick to Holy Rosary Credit Union on Central Ave, Dover, thence up Central Ave and onto High Street, Somersworth, to shop at multiple stores along that corridor. Usual path for #1 above: into Dover is via Portland Ave, down to Main St, then up across the upper square to Second St, onto Chestnut, then to Washington, Cushing, Silver, Rutland, to Cataract. Issues: A) Turning left from Main St to cross upper square to Second St: Having both left hand lanes marked for left turn is a real problem: requires that I intentionally look for cars that might be to my right, wanting to turn into the right lane to go across to Second St, before I do, since I stay in the far left lane. So: eliminate the painted turn marking in the next-to-the-leftmost-lane. B) I sometimes will intentionally travel from Portland Ave onto Chapel St, then cut across to Broadway, so I can come out at the lights at Broadway and Central Ave, to avoid the hassle of the lower part of the upper square. It's just "easier" to have the help of the traffic light getting out onto Central Ave. And then, seeking the "easier" route, instead of turning onto Second St to get to Chestnut, I'll will use First St so I can take advantage of the lights getting out onto Chestnut. Traffic lights, altho a pain at times, can be very helpful! C) On my return trip, I come around Washington onto Main St and turn up Portland St. What happened to the state route directional signs at the corner of Washington and Main? I've seen out-of-state cars go straight ahead onto Waters St, since there currently are NO SIGNS saying that routes 4 & 9 & 108 turn left there at Wash. & Main streets! Concerns about path #2 above: D) After stopping at Holy Rosary CU, I use Chestnut Street to get back to Central Ave going north. But I will very often turn right at the 4-way stop, onto 6th St, because getting out onto Central Ave at 6th St is much easier (and safer) than doing it from the end of Chestnut St. I don't have to deal with being stopped on a hill, and traffic visibility is much better. Traffic Lights: E) I like the traffic lights in Dover: they help significantly in ordering the safe flow of traffic thru town. But there are some issues: Lower square (Wash. and Central): I've sat on Washington waiting to go east and watched the lights stay green for southbound traffic on Central LONG after the lights have changed to red for Central Ave northbound traffic. Why is the northbound traffic have to wait for so long when southbound traffic is still moving thru? F) Upper square (Main and Central, at Chapel): I have often seen these lights go to pedestrian crossing signals when there's been NO ONE on any corner, waiting to cross. This seems like a malfunction in the pedestrain push-button system. G) This is more of an side issue: Is there any way that the traffic signal companys can introduce/include a countdown timer in their displays, so pedestrians will know for certain that their button push has been registered and they'll know how soon they will be allowed to cross (and not be so likely to try to cross early)? I understand the possible confusion with the current countdown timer of "you've got x seconds to finish crossing".... but I'm sure some creative minds can come up with a way to distinguish between the two timers! I've experienced the syndrome of "not knowing if this button is working!"</p>	5/13/2014 10:50 AM
22	<p>2 way traffic will not work on Central Ave. 2 way on Main Street could work if incoming from Broadway could be rerouted, but 2 way on Washington would be problematic.</p>	5/13/2014 5:48 AM
23	<p>I would attend the May 15 workshop if I were available</p>	5/13/2014 4:43 AM
24	<p>We need to try something to deal with traffic. Do not listen to those who are afraid of change. Other than building stacked roads (probably too expensive right now). This is the next best thing.</p>	5/12/2014 8:46 PM
25	<p>Please keep the major artery as is, that is a one way loop—the combination of the excessive traffic at certain time of the day (and the need for the two lanes; for safety sake, the familiarity with the road AS IS; the delivery trucks that would block off spaces when delivering to the mills; the ease in emergency vehicles going south on Central ave, etc!! Also, I have worked downtown for 12 years and have LUCKILY seen NO accidents out my window between the 3rd and 2nd street...cars WILL stop and let folks back out, just be patient! Thank you!</p>	5/12/2014 1:53 PM
26	<p>I think the one-way loop needs to be maintained on central and main street to keep it pedestrian-friendly and pedestrian-safe. I think that Henry law could and should be made bi-directional. Something needs to be done with the intersection of main st and Portland ave. Vehicles turning off main onto Portland often don't see pedestrians and are traveling at high speed.</p>	5/11/2014 6:55 PM
27	<p>shorter time for traffic lights thus traffic will more quicker on every street.</p>	5/9/2014 1:46 PM

Dover Downtown Pedestrian and Vehicular Circulation and Access Options

28	Thank you for taking the time to gather opinions, very thankful to have the opportunity to provide honest feedback. I will not be available next week but otherwise would attend meeting in person. My feeling is that any changes should be made with the primary focus on improvement of the backup on Central heading northbound at the Central / Washington intersection. In my opinion at a minimum Henry Law needs to be reworked/closed to allow a right on red from Central to Washington. For this reason, the nearest best solution in my eyes is Alternative C. But as currently laid out I worry that the backup that is currently on Central northbound at Central and Washington will just be moved to the mini rotary. Maybe not as traffic headed for the other side of town now is forced onto Washington to loop around but under the new solution would be able to go right up Central. Thanks again for all of the hard work.	5/9/2014 11:40 AM
29	Like the idea of a roundabout in lower square. Don't think two way traffic looping around the mills will work. Think this was tried for the main drag a one time. Important issue is the bypass flow by the Library and up past the post office to 6th Street. That is critical the central ave flow working.	5/8/2014 2:57 PM
30	Roundabouts are terrible.	5/8/2014 11:26 AM
31	1. I prefer route 4 south traffic avoid the need to circle around the business district thus adding to the congestion. 2. I would like to see no diagonal parking. Parallel parking is more efficient and safer in terms of traffic flow and visibility.	5/7/2014 3:37 PM
32	Options 2 and 3 seem like they would be very dangerous for anyone parked on Central ave. Eg. dropping kids off at Earcraft and then picking up.	5/7/2014 11:06 AM
33	On 1 & 3-...On 1, do not like closing Henry Law; outbound on Chapel St. on 3 Chapel St to be outbound not in bound	5/6/2014 10:38 PM
34	there is definitely a great deal of vehicle traffic at certain times of the day and I am curious to see if a change in traffic light patterns would help. There is now so much more pedestrian traffic in the downtown due to the NHCM that the need for traffic to slow down is also important	5/6/2014 12:17 PM
35	It is so hard /time consuming to get through downtown if you are passing through that a lot of traffic I think ends up on Chestnut, and the Sixth Street / Central Ave exchanges can't really handle that flow well. I'm sure the merchants don't want a "bypass" option via Chestnut but that's what I'd like.	5/5/2014 4:06 PM
36	Leave it the way it is.	5/5/2014 1:37 PM
37	Williams is not a viable access point for the backside of Henry Law Park - access from Central/Washington is unfortunately critical to this public space. Roundabout proposals at 3rd/Chestnut, Main/Portland would be terrifically complex considering the road slope, rail overlap, etc. Any modifications to the east side of the loop needs to consider the implications on inbound/outbound commercial traffic from Portland Ave, since the Oak Street Bridge is not commercial-grade. Alt A would be improved by intersection proposals from the 2006 study.	5/5/2014 12:04 PM
38	move 108 traffic out of main downtown area	5/5/2014 11:31 AM
39	I am not in favor of closing Henry Law Ave from the lower square.	5/5/2014 8:40 AM
40	I might change my ordering in favor of Alternative B if closing Henry Law is a burden for the rest of that street. I think having that new open space offers real advantages for the use and safety of Henry Law Park	5/5/2014 8:30 AM
41	Chestnut and Fourth is an awful intersection to get to downtown. Something should be done. Make all of Fourth a one-way heading towards downtown.	5/5/2014 8:16 AM
42	Pedestrians in crosswalks need to be more visible. Currently they are obscured where crosswalks emerge from between parked cars.	5/5/2014 7:29 AM
43	It's hard to vote on these as there is no indication what kind of traffic signal will be placed at Main St and Portland Ave in alternative B. I don't think that Henry Law should be blocked off from the Lower Square.	5/4/2014 11:26 AM
44	If these are the only alternatives, then "A" is the better of them. Making Central, Main, & Washington two-way make no sense. Traffic can be quite a hassle as it now stands. A better solution is a well identified bypass around downtown. But the question is; what part of the City do you inconvenience?	5/4/2014 8:31 AM

Dover Downtown Pedestrian and Vehicular Circulation and Access Options

45	Closing off Henry Law Ave at the lower square creates a serious wayfinding issue for visitors to the Children's Museum - if adopted, it is critical that this be addressed. Was consideration given to converting all of Washington between lower square and Biddy Mulligan's into pedestrian plaza, with two-way traffic flowing on other two 'legs' of exiting loop (and Henry Law)? This would provide much greater pedestrian access between recreations resources and downtown businesses, minimal parking loss, and substantial alternative space uses.	5/4/2014 7:39 AM
46	That loop would be a nightmare on that hill by the Children's museum/7th Settlement. Especially in the winter.	5/4/2014 12:19 AM
47	Alternative B and C would completely mess up downtown. I've been living here for 26 years and could not imagine the nightmares it would cause.	5/3/2014 10:46 PM
48	This survey is broken. When I try to change the order of preference of the above alternatives, the order doesn't change. I favor keeping the existing one-way loop downtown, but with a bear left on Central Ave. southbound to Henry Law Ave. prohibited (and blocked), and the right turn off Central Ave. northbound to Henry Law Ave. retained.	5/3/2014 5:05 PM
49	We need to see better diagram of what it may be The issues the most common are people hitting walk button and going before walk button, people in wrong lanes.. driving the wrong way.. (does not happen much) the bike lane well there really not any. and traffic is terrible in dover	5/3/2014 1:52 PM
50	The current traffic pattern is state of the art 1970s. Its continuous circular pattern turns downtown traffic into a slow speed version of a Grand Prix raceway. This pattern requires motorists to focus a lot of their attention on their own lane changes or the lane changes of other motorists. In my opinion, this diverts drivers' attention away from what is required to properly observe pedestrians.	5/3/2014 12:46 PM
51	While I would be thrilled to see a conversion to two-way traffic, I'm not at all convinced that closing off access to Henry Law Avenue from Washington Street can work, nor do I see access to Henry Law Avenue via Williams street and George street as viable. I'm a little bit uneasy about a pedestrian plaza becoming a barrier to the adjacent businesses, but it may be workable. I think the roundabout at Third and Chestnut streets can be made to work, though I expect it to be expensive due to the railroad crossing. I also expect the railroad to be very resistant to the change to a roundabout.	5/3/2014 12:22 PM
52	The biggest problem is that this towns roadways were not designed with the thought that there would be a population of 30,000 people using them so ultimately any of these alternatives will most likely not solve the problem and in some cases they may even make it worse the. population will continue to grow so unless there is a complete overhaul of the towns roadways its not going to get better I would suggest more alternatives for sending out of town traffic around downtown instead of through it.	5/3/2014 11:07 AM
53	Have lived here all our lives and don't think making portions of Washington St. and Central Ave. two way is a good idea.	5/3/2014 8:44 AM
54	There are too many crosswalks at random places. Although they are nice for the pedestrians, but are at awkward spots for drivers putting pedestrians at risk. If I have to look left to watch traffic (one way traffic) why is there a cross walk to my right. It is not where my focus is at the moment. Also, I should be able to see the crosswalk completely before I am on it, Many are blocked by parked vehicles not giving enough distance to see it.	5/3/2014 8:13 AM
55	I think there should be an Alternative D. Take Alternative B and modify as follows...keep Main Street from Portland up to Chapel as One Way. Advertise/Route Truck Traffic coming into town on Portland from Rollinsford and points North on to Chapel to Central at Second Street. Keep Central Avenue From Chapel/Second Street down to Lower Square as 1 Way. I believe 2 way traffic all around the loop during high traffic times and during the Christmas Season will be a shit show and far worse than it is now.	5/3/2014 8:08 AM
56	The stop sign from central ave into Henry law (turning left)should work all the time not once in a while as happens now	5/3/2014 8:01 AM
57	Street parking on Central Avenue is adequate however very unsafe and inconvenient. Backing out of the parking spot is very difficult and dangerous and, more importantly, substantially delays the flow of traffic. Also, walkers crossing the street are not easily visible to drivers due to the design of the downtown parking. And, again, traffic is substantially interrupted and delayed due to the high volume of walking traffic.	5/3/2014 7:47 AM
58	I have long considered the one-way was the safer option. The elegance of option "C" has me converted. All options are superior to the current environment.	5/3/2014 7:43 AM

Dover Downtown Pedestrian and Vehicular Circulation and Access Options

59	The main issue for me, as is clearly evident, is that going through downtown Dover at heavy traffic times takes the patience of a saint. The best way to relieve that congestion is what I'm all for.	5/3/2014 7:40 AM
60	Proposal A, while improving some in-town traffic flow and pedestrian access, appear to do nothing to improve through traffic flow on major routes. Proposal B has poor control over traffic to/from route 4 to Rollinsford/South Berwick. The intersection of Portland Ave, Washington, and Main looks like it could lead to flow problems. It does appear to improve flow on Central Ave. Proposal C appears to improve the traffic flow on Central Ave and to/from route 4 with the addition of the roundabout.	5/3/2014 7:31 AM
61	Why close Henry law off at lower square? A lot of traffic coming down Dover point headed to maine could take back road to Henry law and this would eliminate a lot of traffic on central ave.	5/3/2014 7:28 AM
62	I feel two way traffic added to the existing one-way loop would not be a good option.	5/3/2014 7:22 AM
63	keep tractor trailers out of downtown. They are just avoiding the tolls.	5/3/2014 7:11 AM
64	I wanted number (1) next to Alternative B, please and (2) next to Alternative A and (3) next to Alternative C thank you.	5/3/2014 7:07 AM
65	Keep things as they are, and get rid of parking meters	5/3/2014 6:20 AM
66	I think that by having the loop in town one way it is safer to the alternative. There are already too many pedestrian collisions and if it's 2 way I would fear that will increase. Especially on weekend eves when less pedestrians are paying attention.	5/3/2014 5:13 AM
67	I would appreciate a better timing of traffic lights throughout the city. At Weeks Crossing, they are not at all well timed which causes problems almost daily in the afternoon.	5/2/2014 4:58 PM
68	Has anyone considered converting second street's one way direction so that it goes toward Central Avenue instead of away from it? This would provide traffic stopped by the train an alternative option. Two way traffic would seem to be preferable but not if it would add to traffic delays or congestion. I am sure the consultants would predict if that would be a problem but its not clear to me given the information in this survey. I am in favor of options that improve the ability to walk, bike, and drive downtown and would oppose two way traffic if it would impede any of these three modes of transport.	5/2/2014 4:54 PM
69	Why not a roundabout for the inner loop of streets? The backup at the lights is often imbalanced and roundabouts help the traffic flow at a steady pace.	5/2/2014 3:05 PM
70	I feel two way streets increase the danger t pedestrians and biking..	5/2/2014 2:36 PM
71	Make Henry Law 2 way and open to lower square	5/2/2014 12:29 PM
72	1. The current "no turn on solid red" signals at 3rd/Central and Central/Washington are the most dangerous features of downtown now. I have nearly been hit multiple times as a pedestrian and cyclist at these locations. DPD seem to not enforce these effectively. 2. I perceive that 1-way traffic is safest for pedestrians and bicylists, who don't have to cross both directions of traffic. 3. The mini-roundabout adds nothing without also employing other roundabouts and mini-roundabouts at other locations. Central/Washington/Henry Law, Central/Chestnut, Chestnut/Washington would also be good candidates where traffic patterns or light restrictions slow traffic inefficiently right now.	5/2/2014 11:56 AM
73	I don't like the idea of closing off Henry Law Park to Lower Square. Heading down Washington to get to downtown to park along Henry Law Ave for the indoor pool/Children's Museum is a lot easier with tons less traffic than trying to get downtown using Silver Street to Central Ave. which at certain times is an absolute nightmare. I do like the idea of making the intersection at the north end (area of the proposed pedestrian plaza) less confusing	5/2/2014 11:53 AM
74	I walk or bike downtown as often as I drive there, and I see the prevalence of one-way traffic on major streets as ESSENTIAL to maintaining safety and navigability for people who aren't in cars. As a long-time resident with increasingly independent kids (who are not yet drivers, so getting around largely by bike), I greatly value traffic/transportation designs that prioritize safety and accessibility for people traveling to and around downtown because they are using or visiting downtown sites (businesses, library, offices, recreation) - NOT designs that make it faster and easier for people to drive through (let them drive around, on the Spaulding). To me, parking seems like a complete non-issue: even when I drive downtown, I never have any trouble finding places to park very close to my destinations.	5/2/2014 11:38 AM

Dover Downtown Pedestrian and Vehicular Circulation and Access Options

75	I think there is a good reason that most other busy downtowns in the area have two way traffic - I think it would have the flow and volume better. more importantly, a lot of drivers don't seem to expect there to be one-way through the downtown and I've seen many drivers driving the wrong way, especially on the stretch near Smiley's & Taste of India. More than I would expect.	5/2/2014 11:21 AM
76	I don't see any benefit in closing off Henry Law Ave from lower square.	5/2/2014 11:20 AM
77	What about Alternative C but with Chapel St. remaining one-way outbound, Washington and Main St. two-way, but Central Ave remains one way inbound?	5/2/2014 11:17 AM
78	Add more parking along the south side of Washington Street, from the Children's Museum to the east side of the bridge. The presence of parking here will slow down the traffic that is speeding into that loop. Also we need better State route signage to connect the end of NH 4 to a direction to pick up US 4, which is the source of confusion for many motorists who get lost in downtown Dover trying to follow Route 4 on a map.	5/1/2014 2:29 PM
79	I'm a homeowner living off of Henry Law. Closing it off from Lower Square would create a huge headache for anyone living in my area. Coming from the north to the south along Central we'd have to sit in all the traffic through downtown (mostly people driving through Dover to get to their destination) just to get home. Honestly, if the town picked Alternative C I'd be more inclined to drive to Newington to do my shopping using back roads than drive on Central to do my shopping locally in Dover. It'd probably be faster. I really don't see the point in closing off Henry Law from the lower square, the light that allows for left hand turns is on a sensor, so it's not like that left hand turn is what's causing traffic. Also, there is an existing huge park and plaza for pedestrians and people to enjoy. Why close off the main access to our street to create a tiny "pedestrian plaza". Seems like a good way to make traffic flow even worse and piss off a lot of local residents while you're at it.	5/1/2014 12:26 PM
80	Safety of pedestrians crossing to the childrens museum from the north edge of Washington is a major issue. I believe 2 way traffic may further that issue. Parents don't walk up to the sidewalk. I own 7th Settlement and the 2 way would probably help my business, but I'm concerned. I'd like to understand it more.	5/1/2014 10:01 AM
81	Traffic downtown isn't a huge issue. Should focus more on bringing more business and enhancing downtown. Leaving more stores open Sundays. Bringing in more popular shops. Creating more green space in downtown.	5/1/2014 9:58 AM
82	Two way traffic will slow speeds, encourage economic development and cray a more nature and vibrant downtown.	4/30/2014 8:55 PM
83	It is not clear from the maps of B and C... where is the displaced parking for the retail locations going to go? I assume that a 2 way loop would require removing the store front parking spots on Central Avenue? IF you have to remove the parking from the street, then my vote is for Plan A (or no change).	4/30/2014 2:58 PM
84	It is overly complex for the average person to try to analyze these options	4/30/2014 10:42 AM
85	I think having a intersection down by smileys. Would do no good.i believe that your gonna get. Back up no matter what. Take your side walks take the width of those go in about 1 or 2 feet and take the roads and widen them. Wouldn't that work.	4/29/2014 9:45 PM
86	I do not like the upper square configuration in the enhanced one way loop nor do I like closing henry law ave. I do like the possibility of traffic circle at chestnut and third. Can a traffic circle work at lower square, keeping henry law open?	4/29/2014 1:31 PM
87	Is it possible to widen the streets so that two way traffic and parking is possible? Pedestrian friendly please!	4/29/2014 1:00 PM
88	Which one would ease the traffic congestion downtown the most? That's the one I would rank first.	4/29/2014 10:59 AM
89	I would love to see a round-about used rather than a traffic light when possible.	4/29/2014 10:50 AM
90	These alternatives clearly have a biased towards two-way traffic. I suggest maintaining status quo on Central, Main, and Washington. Creating two-way roads through the core of downtown will make crossing the street a nightmare, and will stop traffic in both directions on each event that someone crosses the street. Having lived on Henry Law Ave, though, I think opening that two-way traffic makes sense given that anyone going north or west from HLA has a more immediate route. Although, I worry about the amount of traffic at a 5-way intersection. Yikes. Adding more traffic with more directions to a single intersection? Sounds counter productive.....	4/29/2014 9:32 AM

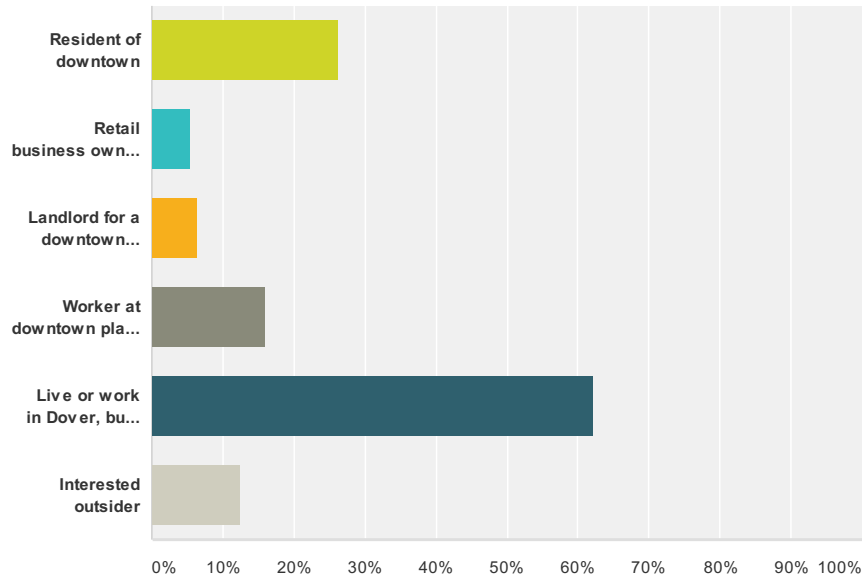
Dover Downtown Pedestrian and Vehicular Circulation and Access Options

91	<p>We at the Children's Museum of New Hampshire feel very strongly that Henry Law Avenue needs to remain one way as the parking spaces along Henry Law Avenue are critical to our visitors and with new enhancements to Henry Law Park Playground slated for 2015, the demand for parking along that street will only increase. It is difficult to rank the three alternatives because two of those include making this a two way street. The Museum hosts 93,000 visitors each year and giving directions to the Museum is already difficult, by closing off access to Henry Law Avenue in any way will adversely affect our operations.</p>	4/29/2014 8:37 AM
92	<p>Main, Central and Washington must become two-way for the long term viability of our downtown businesses.</p>	4/29/2014 8:10 AM
93	<p>Upper Sq.: Central Ave southbound should remain in a fluid alignment similar to existing. Henry Law Ave should remain open. Central Ave should be two way. Intersection of Sixth / Central / Chestnut needs to have a solution proposed. Consider two way on Chapel. Provide overview of benefits associated with establishing all parallel parking, such as expanded pedestrian spaces. Do not decrease capacity on Chestnut - implement Chestnut improvements last to ensure that adequate capacity is retained after traffic has adjusted to new patterns.</p>	4/29/2014 8:06 AM
94	<p>I like Alternative B but tweak it with having the pedestrian plaza on the WEST side of Upper Square. Locate historic fountain/trough in the plaza. Better define pedestrian access from Transportation Center to Downtown.</p>	4/28/2014 11:44 PM
95	<p>Two direction on both Central and Main seems to add congestion to Central as most traffic would not diverge to Main unless they are going to Maine (which they could do on Chapel.) Other congestion point seems to be the corner of Main and Portland with the need to place a light for those headed south on Main to make a left turn on Portland (when they could just have taken Chapel and met up with Portland.)</p>	4/28/2014 9:56 PM
96	<p>can't tell what to choose - not sure what or where the pedestrian plaza would be in either case. would love to know info on studies and pros and cons based on data and safety and priorities for walkable city and bike safety. I did not rank above - left as is.</p>	4/28/2014 9:07 PM
97	<p>Knowing how people don't use their blinkers, I can only imagine what a headache the Portland Ave intersection would be in B and C. Also, the added exhaust fumes at that intersection from autos and trucks starting up after a stop would denigrate our air quality. What about a small rotary there?</p>	4/28/2014 8:38 PM

Dover Downtown Pedestrian and Vehicular Circulation and Access Options

Q5 What is your relationship to downtown Dover? Check all that apply.

Answered: 262 Skipped: 31

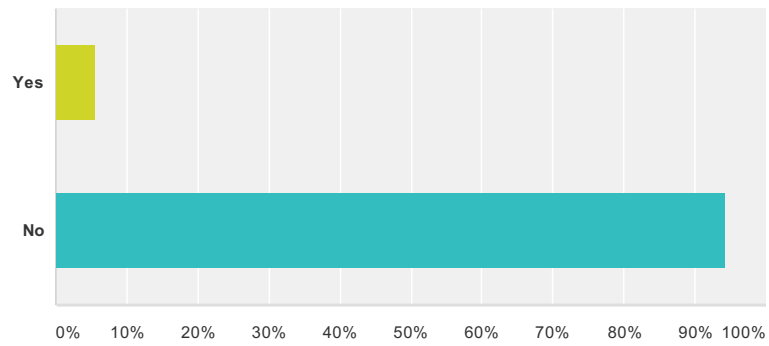


Answer Choices	Responses
Resident of downtown	26.34% 69
Retail business owner in downtown	5.34% 14
Landlord for a downtown property (for retail, residential, or other)	6.49% 17
Worker at downtown place of employment	16.03% 42
Live or work in Dover, but not downtown	62.21% 163
Interested outsider	12.60% 33
Total Respondents: 262	

Dover Downtown Pedestrian and Vehicular Circulation and Access Options

Q6 Did you attend the April 21 Public workshop at City Hall, at which participants learned about and discussed the different traffic flow options?

Answered: 262 Skipped: 31

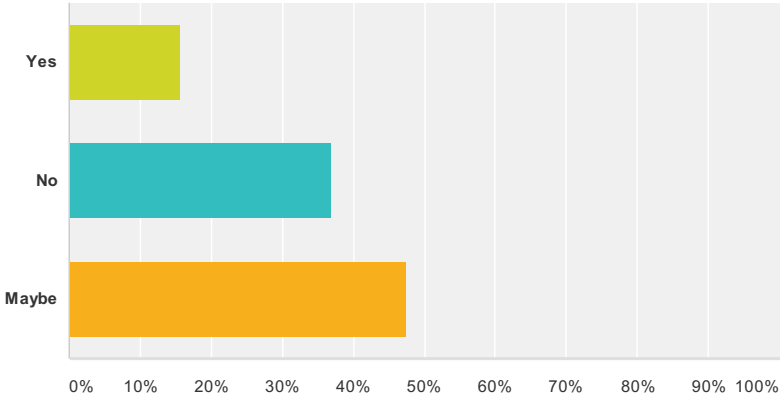


Answer Choices	Responses	
Yes	5.73%	15
No	94.27%	247
Total		262

Dover Downtown Pedestrian and Vehicular Circulation and Access Options

Q7 Do you plan on attending the Thursday, May 15 public workshop and open house? This will be a chance for additional discussion and input on the three circulation alternatives. The meeting will be held from 6 to 8 PM at the McConnell Center media room, 61 Locust Street, Dover.

Answered: 262 Skipped: 31



Answer Choices	Responses
Yes	15.65% 41
No	37.02% 97
Maybe	47.33% 124
Total	262

Community Meeting #3 – Preferred Design

November 20, 2014

This meeting was held to invite discussion about the recommendations and concepts that have been advanced by the consultant team preparing the evaluations, studies and designs for improvements to the downtown pedestrian and streetscape environment, including consideration of circulation and parking patterns. The meeting began with a video presentation that described the purposes of the study and summarized key recommendations that have emerged during the nearly year-long process that has included preceding meetings and discussions.

After the presentation, the participants were invited to join in break-out group discussions that were facilitated by the consultant team members representing both The Cecil Group and RSG.

Meeting Graphics

The following graphics, **Figure 38** through **Figure 41**, were used in the promotion and facilitation of the community workshop.

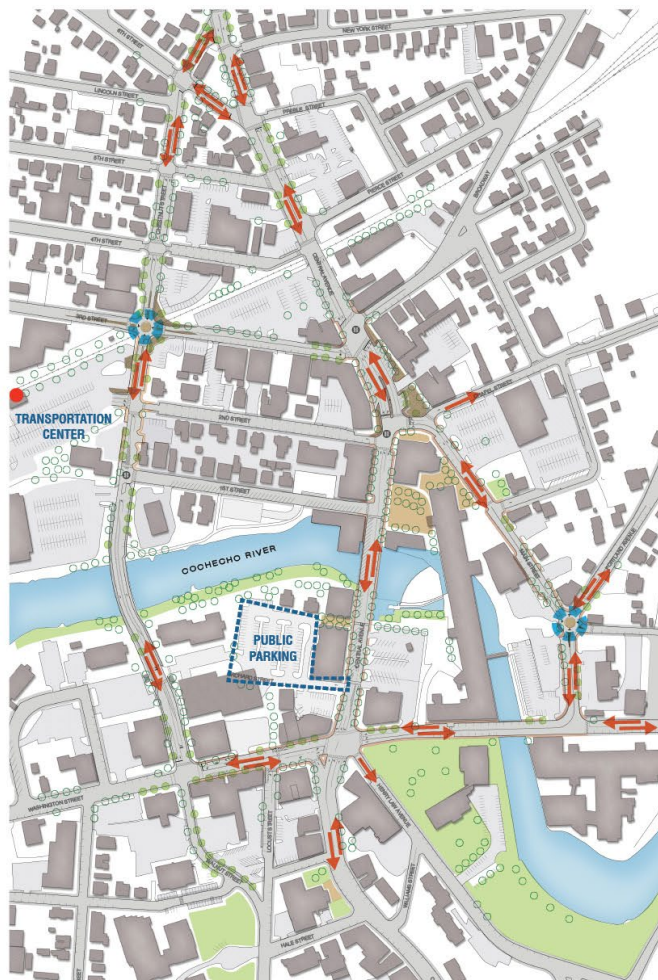


Dover Downtown PEDESTRIAN AND VEHICULAR ACCESS AND STREETScape STUDY

Come Learn about Proposed
Changes to Downtown's
Circulation and Streetscape

Now nearing completion, the **Downtown Access Study** focused on rebalancing the downtown circulation and streetscape network to better support a mixed-use, pedestrian-oriented environment. Improvements within public right-of-ways will make major downtown streets more attractive, safer for walking, and economically vibrant through clearer and more convenient vehicle circulation, simplified links to parking, and expanded bicycle and transit links. Street landscaping and furnishings will be unified, expanded, and upgraded.

Thursday, Nov. 20, 2014, 6 to 8 PM
McConnell Center, Room 306
61 Locust Street, Dover



Central Avenue and Main and Washington Streets are proposed to have two-way traffic flow. Mini-roundabouts will be added at Portland/Main and 3rd/Chestnut to facilitate traffic flow while improving pedestrian crossing conditions.



Upper Square will have a new pedestrian plaza on the east side of Main Street / Central Avenue, making for shorter crossing distances.



Lower Square will have safer pedestrian crosswalks and two-way traffic flow on Washington Street and Central Avenue.



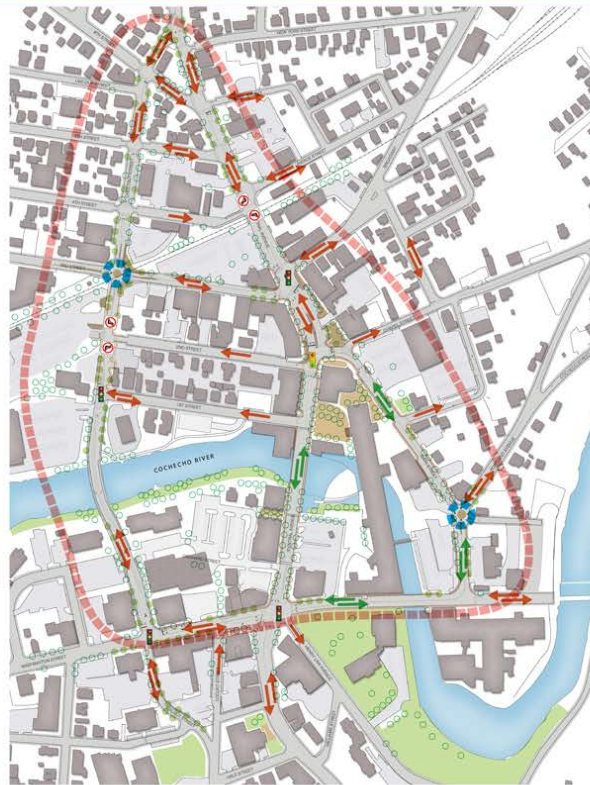
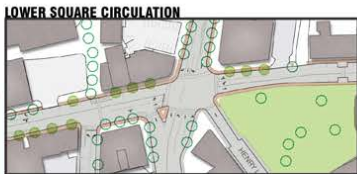
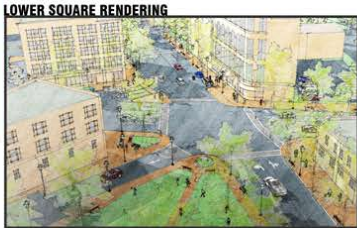
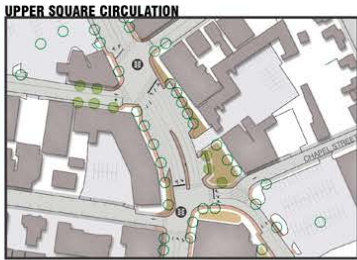
MORE INFORMATION
Christopher Parker, AICP
Director of Planning and
Community Development
City of Dover
(603) 516-6008
c.parker@dover.nh.gov

Downtown Access Plan

Figure 38: Community Workshop #3 Promotional Flier

Recommended Approach

DOVER DOWNTOWN Pedestrian and Vehicular Access and Streetscape Study



CIRCULATION		LANDSCAPE		GENERAL
	RECOMMENDED MINI ROUNDABOUT LOCATION		RECOMMENDED TRAFFIC SIGNAL	
	RECOMMENDED CIRCULATION PATTERN		LANDSCAPE OPPORTUNITY	
	CIRCULATION PATTERN TO REMAIN		EXISTING LANDSCAPE TO REMAIN	STUDY AREA
	PROHIBITED TURNING MOVEMENT			

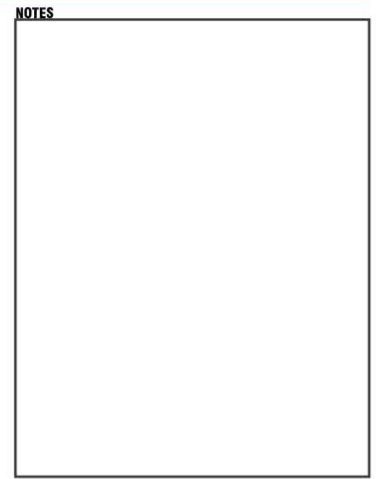


Figure 39: Community Workshop #3 Recommended Approach Breakout Group Board

ONE WAY CIRCULATION CONFIGURATION

DOVER DOWNTOWN Pedestrian and Vehicular Access and Streetscape Study

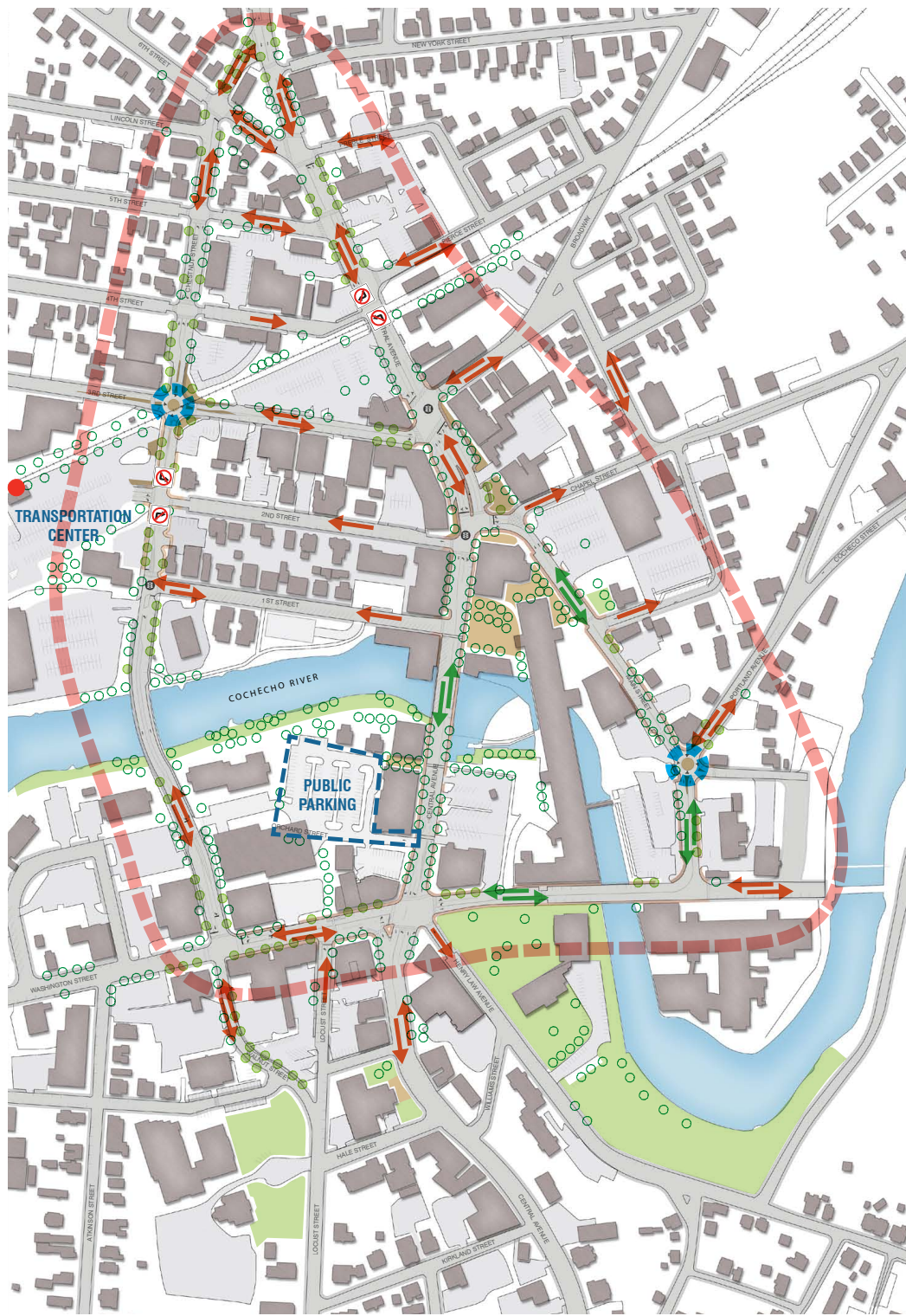


 EXISTING CIRCULATION PATTERN TO REMAIN

Figure 40: Community Workshop #3 One-Way Circulation Handout

Preferred Alternative: Two Way Circulation

DOVER DOWNTOWN Pedestrian and Vehicular Access and Streetscape Study



The Cecil Group

Planning and Design

RSG

November 20, 2014

Figure 41: Community Workshop #3 Two-Way Circulation Handout

Vehicular Circulation and Roadway Layout

- In general, there was broad support for implementing a two-way traffic system for central portions of the downtown along Central Avenue and Main Street. This input was reflected in specific discussions within the groups and comments made at the end of the meeting when the groups reconvened. A number of reservations and questions were raised about the two-way system. Some were answered during the breakout groups as described below and other concerns were noted as topics to be addressed in the final report or subsequent detailed design and engineering.
- A concern was raised over the ability for emergency vehicles to by-pass traffic on Central Avenue under a two-way scenario. It was noted that the traffic signals are equipped with emergency vehicle pre-emption to automatically turn lights green to serve these vehicles as they approach.
- Some of the discussion focused on the benefits of the proposed intersection improvements that would result in a coordinated, computer-controlled traffic light system that can adapt to different times of day and help keep traffic moving properly.
- One participant noted that not all towns are moving to two-way systems, but are retaining one-way networks in their downtowns.
- One participant raised the suggestion to tighten the radius on the southwest corner of Lower Square. It was noted that this could be done but it would likely result in the removal of the small “pork-chop” island in that corner which currently accommodates street lighting and traffic signal poles and also provides a pedestrian refuge area.
- Some attendees were concerned how the specific layout of the roundabout at Third and Chestnut Street would work with the train crossing. The ability to accommodate this configuration appears to be consistent with established engineering practice, and would continue to require traffic control devices to signal train crossing and stop vehicle movements at this location.
- A concern was raised over the turning radius needed for trucks turning from Main Street onto Chapel Street. This comment was noted, and the radii have been subsequently reviewed again by the consultant team as part of the overall circulation pattern to confirm that the concept layout allows for a design that would be consistent with established traffic engineering practices for large truck turns.
- The material and color of the proposed pedestrian crossings were discussed. It was explained that there are several options, but the eventual design and material will need to be “snow plow safe” and enduring.
- A suggestion was made that the street connection be restored that linked the parking area behind the Post Office to Chestnut Street. The concern was raised because of the difficulty for vehicles leaving the parking area and accessing Washington Street near an awkward intersection. A comment by City staff indicated that this connection has been removed and the property transferred to a private entity a number of years ago, and this is no longer an option for the City, but that perhaps other methods could be used to improve that situation.

Pedestrian Circulation / Safety

- There was a common theme of strong interest in improving pedestrian safety through streetscape improvements, and in better pedestrian circulation including the location, placement, and safety of crosswalks.
- Concern was raised in general about the number of mid-block crossings and in particular about safety at the crosswalk on Central Avenue just south of Second Street.
- Several comments focused on the opportunity to better connect the sidewalk network to the growing network of riverfront paths and walkways.
- Attendees discussed the safety of one-way vs. two-way traffic on pedestrian crossing safety. It was noted that studies indicated that pedestrians are safer crossing two-way traffic (one lane in each direction) compared with crossing two lanes of one-way traffic. It was also noted that part of the intent of two-way streets is often to slow traffic by removing long stretches of one-way traffic that tend to be more rapid.
- It was also noted that the proposed improvements include tightening up intersections which reduce the amount of time pedestrians are in the roadway and also reduces the pedestrian crossing times to improve traffic safety.
- Concerns were discussed about the long length of the pedestrian crossing at Main Street and Washington Street. The potential need for a traffic light in this location was discussed and the comment noted.
- Concern was expressed about sidewalks that would have brick as the walking surface. The specific concern was that brick walkways seem to become uneven over time creating hazardous conditions and accessibility issues. It was noted that many older brick sidewalks were constructed in a different manner than modern techniques and that there are several construction methods that can prevent this impact.

Existing Business Impact

- Concern was raised over the potential for the visibility of storefront signs on the east side of Upper Square to be blocked by the proposed new trees. It was noted that the City will limb up the trees to an adequate height to ensure visibility from the street.
- Several participants underlined the importance of better signage to provide wayfinding and directions to destinations in the downtown.

Bicycle Circulation

- There were concerns about how bicycle circulation would be accommodated throughout the plan. It was noted that the proposed improvements would slow overall traffic speeds, which would make sharing lanes with vehicles much safer. It was also noted that there would be future opportunities to include bike lanes on specific sections of roadways.
- One participant and bicyclist noted their support for a circulation solution that does not provide for on-street bike lanes in the downtown because they could be potentially unsafe and more hazardous than off-street solutions or shared lanes.

Street Trees and Landscape

- There was interest in the locations and types of street trees that would be used. It was noted that the intent would be to remove street trees that were in poor condition and place new street trees where there were opportunities. The result would be street trees of varying age and species that are appropriated to their immediate context.



D ONE-WAY CIRCULATION ALTERNATIVE

Please see the following pages for one-way alternative to preferred plan highlighted in this study

The community meetings provided additional insights and helped to articulate the desired vehicular and pedestrian circulation patterns for the study area. The consultant team explored an alternative concepts for streetscape improvements in the study area based on the active input from a community meeting and discussions with property owners and the Transportation Advisory Commission. While the final steps in the process translated into a preferred design there was a one-way alternative that was investigated for potential recommendations. The subsequent recommendations and figures highlight the suggested changes with vehicular circulation changes in red arrows and creation of public space in green, see .



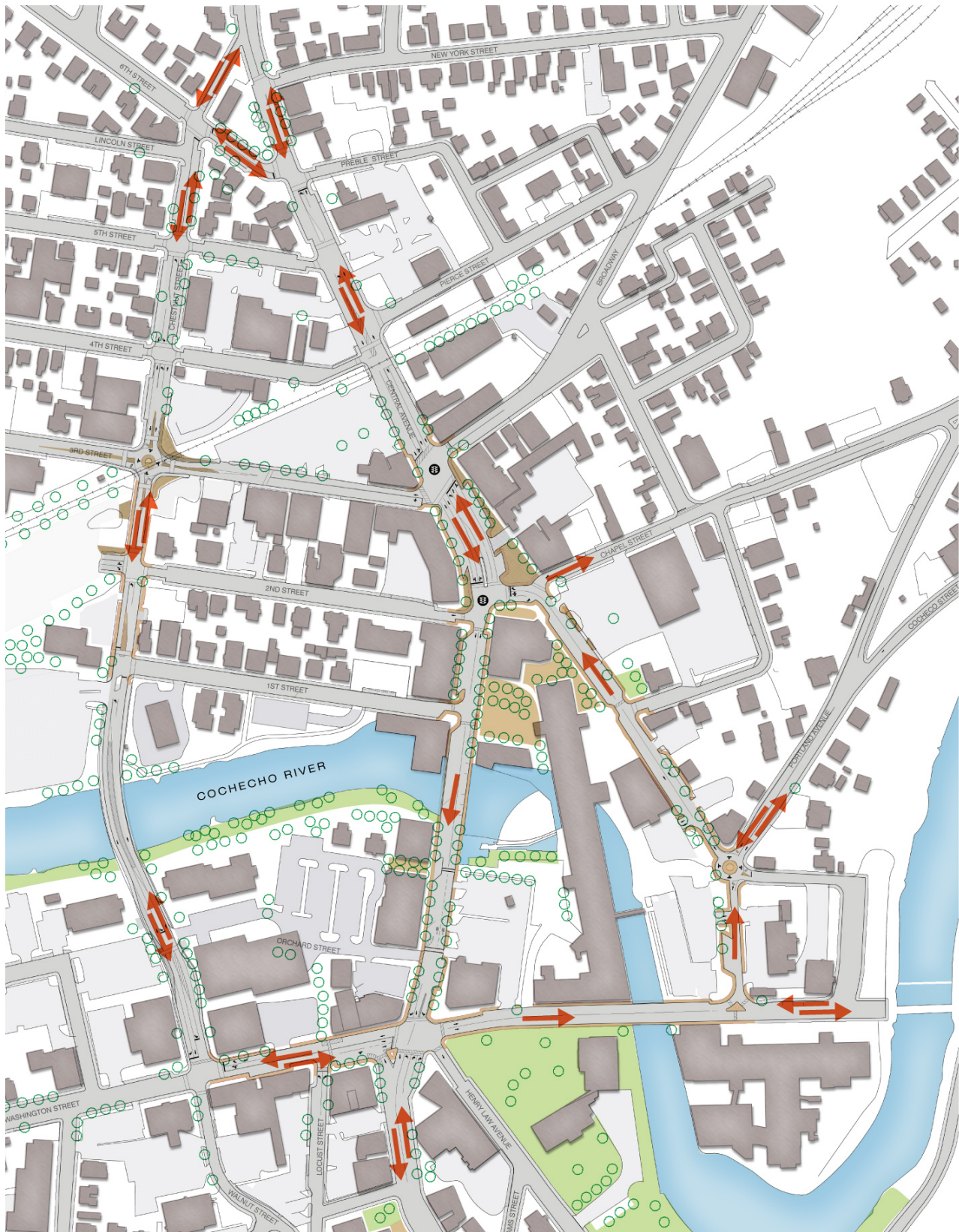


Figure 42: One-Way Circulation Alternative

Lower Square

The recommended layout of this intersection remains generally unaltered except for the changes involved with traffic pattern improvements on Central Avenue and Washington Street. Henry Law Avenue remains a one-way southbound access with curb radii adjustments. This alternative recommends an additional northbound right hand turn lane to alleviate traffic congestion issues on Central Avenue during the peak hour.

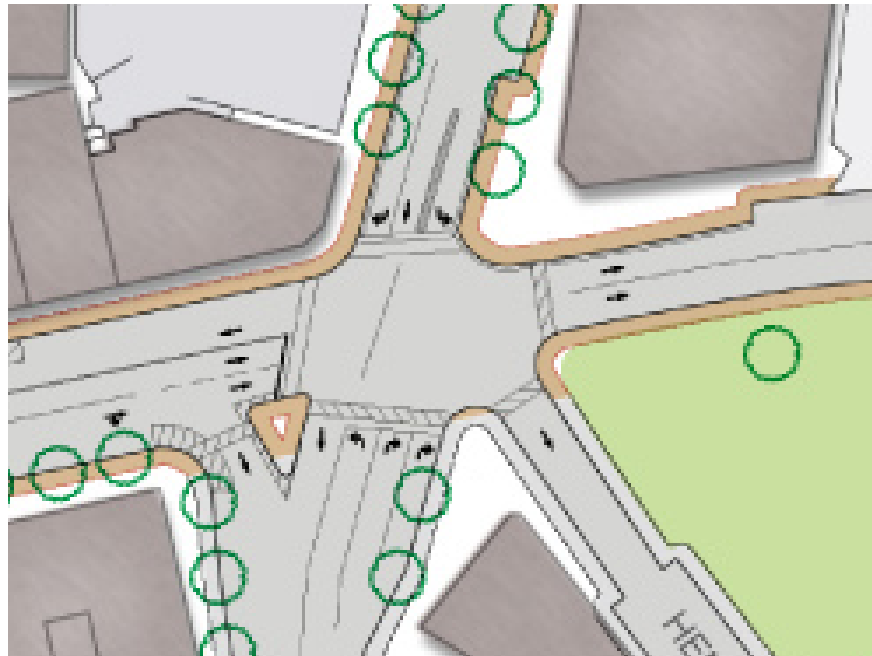


Figure 43: Lower Square Circulation Pattern

Upper Square

The upper square condition is fractured, unnavigable for vehicles and pedestrians, and creates a series of unusable open spaces. Alternative A suggests that the City should concentrate the open spaces to the west side of the street and realign Central Avenue. This configuration would facilitate a perpendicular intersection while providing a substantial gateway open space on the northern entry into the downtown. With the realignment, Central Avenue would receive a “road diet” from Fifth to Third Street. This treatment would consist of the reduction of two travel lanes in both the north and southbound directions into one each way with an auxiliary turn lane to provide a safer and slower condition for vehicular travel.

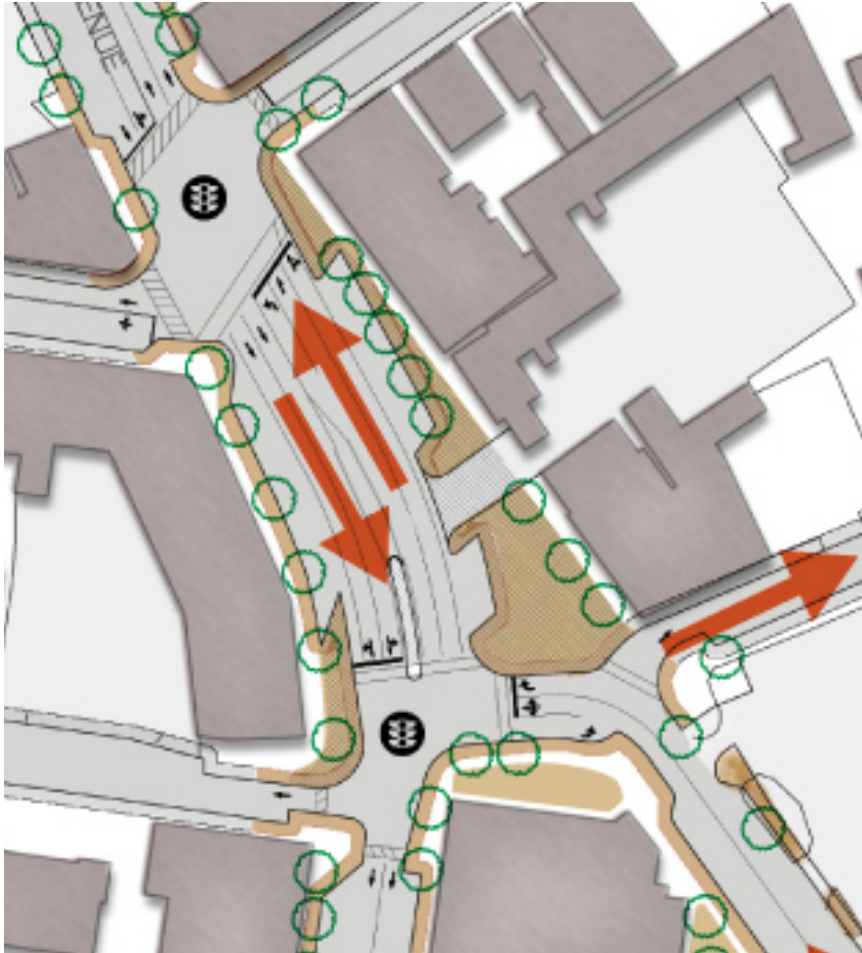


Figure 44: Upper Square Circulation Pattern

Main Street

Regulating the speeds and access at Main Street is critical to providing two safe intersections for pedestrians and vehicles entering and exiting downtown. This alternative recommends that the existing roadway be realigned to favor Portland Avenue as the primary circulation pattern into the downtown, and using a four-way stop condition to regulate speeds.

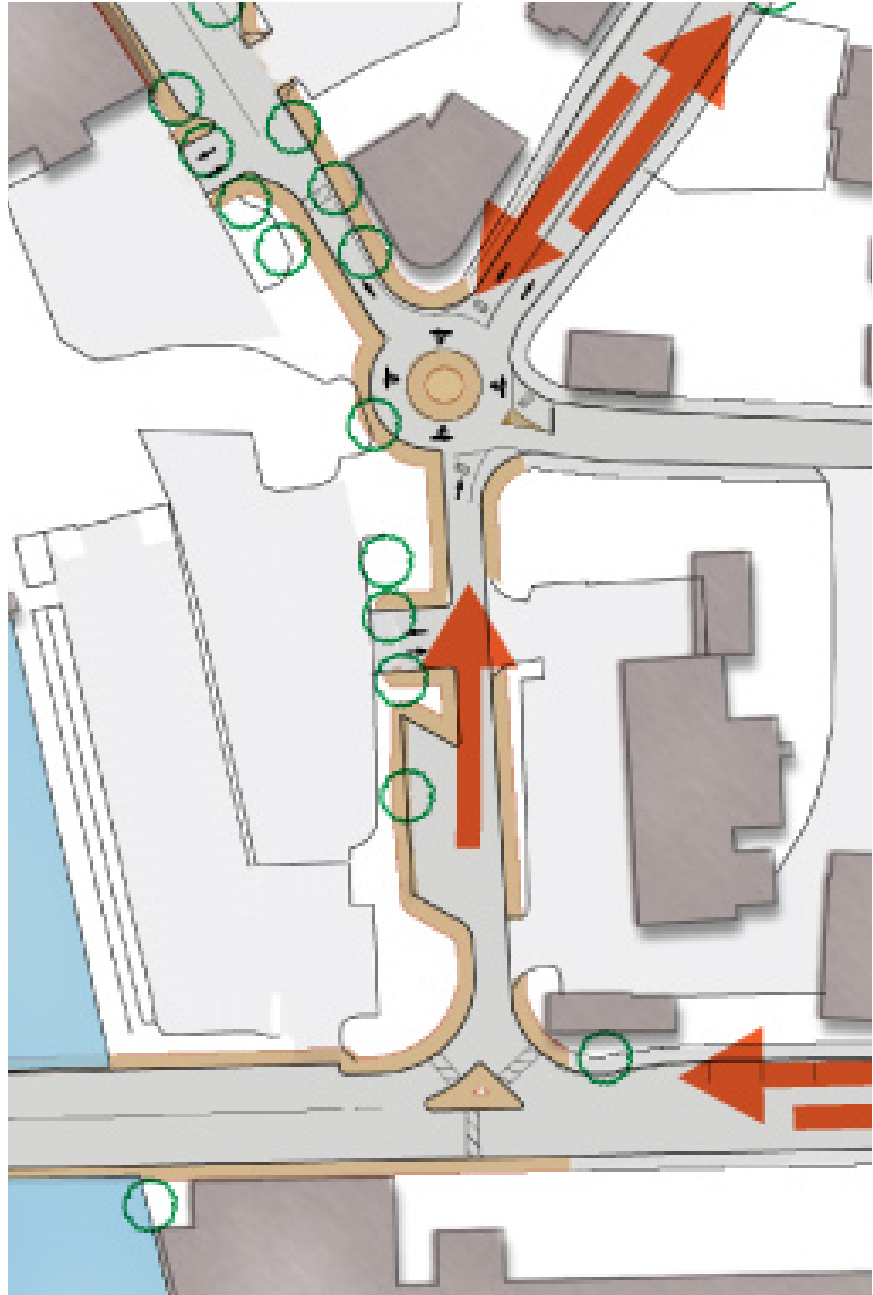


Figure 45: Lower Main Street and Portland Avenue Circulation Pattern

Level of Service

Levels of Service (LOS) is a methodology used as a standard of measurement by traffic engineers to indicate the levels of congestion at intersections. By evaluating the LOS within an overall network, existing problems can be identified and future conditions can be projected.

With a enhancements that retained a one-way loop, fewer improvements in traffic conditions would occur – only one major intersection would have an

improved Level of Service (Lower Square). Additionally, the intersection of Washington Street and Main Street would have a worse Level of Service than would occur with the existing configuration.

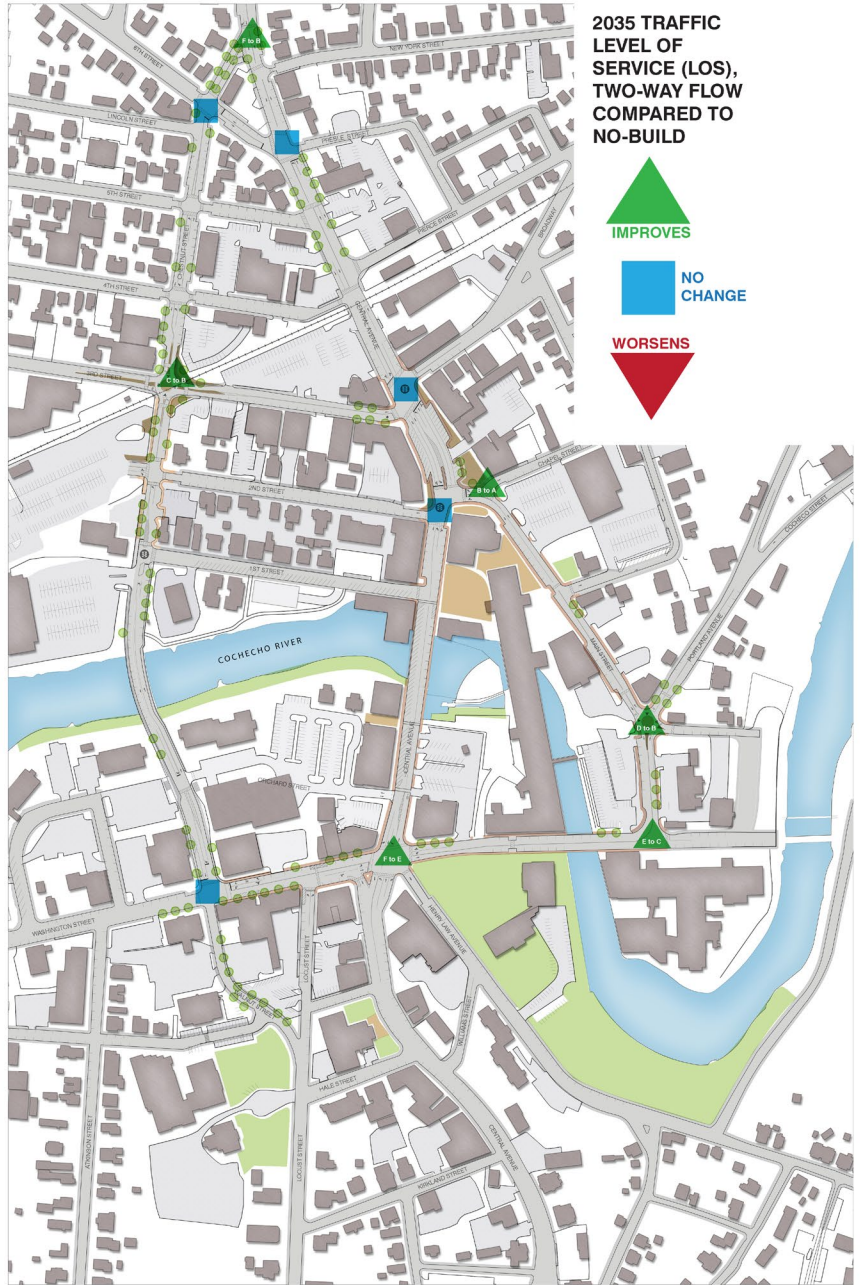


Figure 46: 2035 One-way Circulation Level of Service



E. COST ESTIMATE DETAILS

Roadway Costs

Table 7. Detailed Costs for Intersection Improvements and Road Segments

Item	Description	Unit	Price	Intersection Improvements			
				Central /Chestnut		Central/Sixth	
				Quantity	Total	Quantity	Total
201.1	Clearing and Grubbing	LS	VAR	0	\$ -	0	\$ -
203.1	Common Excavation	CY	\$ 10.00	1,000	\$ 10,000	500	\$ 5,000
304.2	Compacted Gravel	CY	\$ 25.00	100	\$ 2,500	20	\$ 500
304.3	Crushed Gravel	CY	\$ 35.00	60	\$ 2,100	10	\$ 350
403.11	Hot Bituminous Pavement	TON	\$ 100.00	40	\$ 4,000	5	\$ 500
417.00	Cold Planing Bituminous Surfaces	SY	\$ 5.00	0	\$ -	0	\$ -
603.82218	18" Polyethylene Pipe	LF	\$ 45.00	200	\$ 9,000	50	\$ 2,250
604.12	New Catch Basin	EA	\$ 2,500.00	4	\$ 10,000	2	\$ 5,000
604.4	Reconstruct/Adjust Existing Catch Basin	EA	\$ 750.00	2	\$ 1,500	0	\$ -
609.X	Granite Curb	LF	\$ 35.00	150	\$ 5,250	150	\$ 5,250
609.5	Remove & Reset Granite Curb	LF	\$ 25.00	150	\$ 3,750	150	\$ 3,750
616.1	Traffic Signals	LS	VAR	0	\$ -	0	\$ -
Subtotal				\$ 48,100		\$ 22,600	

Item	Description	Unit	Price	Intersection Improvements			
				Central/Broadway/Main		Central / Washington	
				Quantity	Total	Quantity	Total
201.1	Clearing and Grubbing	LS	VAR	5,000	\$ 5,000	1,000	\$ 1,000
203.1	Common Excavation	CY	\$ 10.00	10,000	\$ 100,000	2,500	\$ 25,000
304.2	Compacted Gravel	CY	\$ 25.00	2,500	\$ 62,500	250	\$ 6,250
304.3	Crushed Gravel	CY	\$ 35.00	1,600	\$ 56,000	175	\$ 6,125
403.11	Hot Bituminous Pavement	TON	\$ 100.00	1,750	\$ 175,000	250	\$ 25,000
417.00	Cold Planing Bituminous Surfaces	SY	\$ 5.00	1,700	\$ 8,500	1,000	\$ 5,000
603.82218	18" Polyethylene Pipe	LF	\$ 45.00	1,000	\$ 45,000	300	\$ 13,500
604.12	New Catch Basin	EA	\$ 2,500.00	15	\$ 37,500	5	\$ 12,500
604.4	Reconstruct/Adjust Existing Catch Basin	EA	\$ 750.00	5	\$ 3,750	2	\$ 1,500
609.X	Granite Curb	LF	\$ 35.00	1,500	\$ 52,500	500	\$ 17,500
609.5	Remove & Reset Granite Curb	LF	\$ 25.00	500	\$ 12,500	250	\$ 6,250
616.1	Traffic Signals	LS	VAR	400,000	\$ 400,000	150,000	\$ 150,000
Subtotal				\$ 958,300		\$ 269,700	

Item	Description	Unit	Price	Intersection Improvements					
				Chestnut/Sixth		Chestnut/Third		Main/Portland	
				Quantity	Total	Quantity	Total	Quantity	Total
201.1	Clearing and Grubbing	LS	VAR	0	\$ -	2,500	\$ 2,500	2,500	\$ -
203.1	Common Excavation	CY	\$ 10.00	200	\$ 2,000	5,000	\$ 50,000	2,500	\$ 25,000
304.2	Compacted Gravel	CY	\$ 25.00	20	\$ 500	1,200	\$ 30,000	1,000	\$ 25,000
304.3	Crushed Gravel	CY	\$ 35.00	20	\$ 700	1,000	\$ 35,000	800	\$ 28,000
403.11	Hot Bituminous Pavement	TON	\$ 100.00	10	\$ 1,000	800	\$ 80,000	700	\$ 70,000
417.00	Cold Planing Bituminous Surfaces	SY	\$ 5.00	0	\$ -	0	\$ -	0	\$ -
603.82218	18" Polyethylene Pipe	LF	\$ 45.00	30	\$ 1,350	500	\$ 22,500	400	\$ 18,000
604.12	New Catch Basin	EA	\$ 2,500.00	1	\$ 2,500	4	\$ 10,000	3	\$ 7,500
604.4	Reconstruct/Adjust Existing Catch Basin	EA	\$ 750.00	1	\$ 750	2	\$ 1,500	2	\$ 1,500
609.X	Granite Curb	LF	\$ 35.00	100	\$ 3,500	500	\$ 17,500	450	\$ 15,750
609.5	Remove & Reset Granite Curb	LF	\$ 25.00	50	\$ 1,250	500	\$ 12,500	450	\$ 11,250
616.1	Traffic Signals	LS	VAR	0	\$ -	0	\$ -	0	\$ -
Subtotal				\$ 13,600		\$ 261,500		\$ 202,000	

				Road Segment Improvements*			
				Central Street		Main Street	
Item	Description	Unit	Price	Quantity	Total	Quantity	Total
201.1	Clearing and Grubbing	LS	VAR	0	\$ -	0	\$ -
203.1	Common Excavation	CY	\$ 10.00	0	\$ -	0	\$ -
304.2	Compacted Gravel	CY	\$ 25.00	0	\$ -	0	\$ -
304.3	Crushed Gravel	CY	\$ 35.00	0	\$ -	0	\$ -
403.11	Hot Bituminous Pavement	TON	\$ 100.00	450	\$ 45,000	425	\$ 42,500
417.00	Cold Planing Bituminous Surfaces	SY	\$ 5.00	3,700	\$ 18,500	3,500	\$ 17,500
603.82218	18" Polyethylene Pipe	LF	\$ 45.00	0	\$ -	0	\$ -
604.12	New Catch Basin	EA	\$ 2,500.00	0	\$ -	0	\$ -
604.4	Reconstruct/Adjust Existing Catch Basin	EA	\$ 750.00	10	\$ 7,500	8	\$ 6,000
609.X	Granite Curb	LF	\$ 35.00	100	\$ 3,500	75	\$ 2,625
609.5	Remove & Reset Granite Curb	LF	\$ 25.00	100	\$ 2,500	75	\$ 1,875
616.1	Traffic Signals	LS	VAR	0	\$ -	0	\$ -
Subtotal				\$ 77,000		\$ 70,500	
				<i>*(Exclusive of Intersections)</i>			
LF Cost				\$ 24.44		\$ 52.22	
				Assumption: Mill & overlay between Upper Square & Lower Square. Minor drainage and curb adjustments		Assumption: Mill & overlay between Upper Square & Water Street. Minor drainage and curb adjustments	

				Road Segment Improvements*			
				Washington Street		Chestnut Street	
Item	Description	Unit	Price	Quantity	Total	Quantity	Total
201.1	Clearing and Grubbing	LS	VAR	0	\$ -	2,500	\$ 2,500
203.1	Common Excavation	CY	\$ 10.00	100	\$ 1,000	2,000	\$ 20,000
304.2	Compacted Gravel	CY	\$ 25.00	75	\$ 1,875	1,750	\$ 43,750
304.3	Crushed Gravel	CY	\$ 35.00	50	\$ 1,750	1,500	\$ 52,500
403.11	Hot Bituminous Pavement	TON	\$ 100.00	425	\$ 42,500	1,000	\$ 100,000
417.00	Cold Planing Bituminous Surfaces	SY	\$ 5.00	3,500	\$ 17,500	7,500	\$ 37,500
603.82218	18" Polyethylene Pipe	LF	\$ 45.00	0	\$ -	300	\$ 13,500
604.12	New Catch Basin	EA	\$ 2,500.00	2	\$ 5,000	5	\$ 12,500
604.4	Reconstruct/Adjust Existing Catch Basin	EA	\$ 750.00	6	\$ 4,500	5	\$ 3,750
609.X	Granite Curb	LF	\$ 35.00	150	\$ 5,250	1,000	\$ 35,000
609.5	Remove & Reset Granite Curb	LF	\$ 25.00	50	\$ 1,250	500	\$ 12,500
616.1	Traffic Signals	LS	VAR		\$ -	50,000	\$ 50,000
Subtotal				\$ 80,700		\$ 383,500	
				<i>*(Exclusive of Intersections)</i>			
LF Cost				\$ 70.17		\$ 150.39	
				Assumption: Mill & overlay between Lower Square & Water Street. Minor drainage and curb adjustments. New mid-block curbed bump-outs.		Assumption: Mill & overlay between 3rd St and Washington Street. Minor drainage and curb adjustments. Signal modifications at 1st St. Transportation Center entrance improvements. Curbing enhancements adjacent to new parking garage/police station.	

Streetscape Costs

Table 8. Detailed Costs for Streetscape Improvements

Central Ave					
Item	Comments	Qty	Unit	Cost	Total
Lighting					\$680,000
Roadway Lighting	1 Light per 160 LF (both sides)	40	EA	\$11,000	\$440,000
Ornamental Lighting		25	EA	\$9,000	\$225,000
Bollards		10	EA	\$1,500	\$15,000
Landscape					\$162,250
Shade Trees		35	EA	\$750	\$26,250
Ornamental Trees		15	EA	\$500	\$7,500
Shrubs		600	EA	\$85	\$51,000
Groundcover / Perennials		1550	EA	\$50	\$77,500
Paving					\$733,350
Type A - all brick		1200	SY	\$180	\$216,000
Type B - brick banding	Assume 2' wide	1000	SY	\$180	\$180,000
Type C - concrete	Assume average 8' wide	2275	SY	\$50	\$113,750
Type D - repaired		2275	SY	\$40	\$91,000
Basic Crosswalk		0	SF	\$10	\$0
Enhanced Crosswalk		6630	SF	\$20	\$132,600
Amenities					\$136,250
Wayfinding / Signage	Assume 2 signs per intersection	20	EA	\$1,000	\$20,000
Bench		30	EA	\$1,500	\$45,000
Trash / Recycling	3 per block average	30	EA	\$2,000	\$60,000
Public Art		0	EA	\$0	\$0
Bike Racks		15	EA	\$750	\$11,250
				Linear Feet	3150
				Construction Total	\$1,711,850
				Linear Foot Cost	543

Chestnut Street					
Item	Comments	Qty	Unit	Cost	Total
Lighting					\$424,000
Roadway Lighting		32	EA	\$11,000	\$352,000
Ornamental Lighting		6	EA	\$9,000	\$54,000
Bollards		12	EA	\$1,500	\$18,000
Landscape					\$113,000
Shade Trees		20	EA	\$750	\$15,000
Ornamental Trees		10	EA	\$500	\$5,000
Shrubs		800	EA	\$85	\$68,000
Groundcover / Perennials		500	EA	\$50	\$25,000
Paving					\$352,750
Type A - all brick		0	SY	\$180	\$0
Type B - brick banding		550	SY	\$180	\$99,000
Type C - concrete		1975	SY	\$50	\$98,750
Type D - repaired		1975	SY	\$40	\$79,000
Basic Crosswalk		0	SF	\$10	\$0
Enhanced Crosswalk		3800	SF	\$20	\$76,000
Amenities					\$96,000
Wayfinding / Signage		18	EA	\$1,000	\$18,000
Bench		14	EA	\$1,500	\$21,000
Trash / Recycling		24	EA	\$2,000	\$48,000
Public Art		0	EA	\$0	\$0
Bike Racks		12	EA	\$750	\$9,000
				Linear Feet	2550
				Total	\$985,750
				Linear Foot Cost	387

Main Street					
Item	Comments	Qty	Unit	Cost	Total
Lighting					\$283,000
Roadway Lighting	1 Light per 160 LF (both sides)	17	EA	\$11,000	\$187,000
Ornamental Lighting		10	EA	\$9,000	\$90,000
Bollards		4	EA	\$1,500	\$6,000
Landscape					\$67,000
Shade Trees		12	EA	\$750	\$9,000
Ornamental Trees		5	EA	\$500	\$2,500
Shrubs		300	EA	\$85	\$25,500
Groundcover / Perennials		600	EA	\$50	\$30,000
Paving					\$196,000
Type A - all brick		0	SY	\$180	\$0
Type B - brick banding		450	SY	\$180	\$81,000
Type C - concrete		900	SY	\$50	\$45,000
Type D - repaired		900	SY	\$40	\$36,000
Basic Crosswalk		0	SF	\$10	\$0
Enhanced Crosswalk		1700	SF	\$20	\$34,000
Amenities					\$40,750
Wayfinding / Signage	Assume 2 signs per intersection	8	EA	\$1,000	\$8,000
Bench		6	EA	\$1,500	\$9,000
Trash / Recycling		10	EA	\$2,000	\$20,000
Public Art		0	EA	\$0	\$0
Bike Racks		5	EA	\$750	\$3,750
				Linear Feet	1350
				Construction Total	\$586,750
				Linear Foot Cost	435

Washington Street					
Item	Comments	Qty	Unit	Cost	Total
Lighting					\$268,000
Roadway Lighting		14	EA	\$11,000	\$154,000
Ornamental Lighting		12	EA	\$9,000	\$108,000
Bollards		4	EA	\$1,500	\$6,000
Landscape					\$58,000
Shade Trees		14	EA	\$750	\$10,500
Ornamental Trees		7	EA	\$500	\$3,500
Shrubs		400	EA	\$85	\$34,000
Groundcover / Perennials		200	EA	\$50	\$10,000
Paving					\$287,000
Type A - all brick		400	SY	\$180	\$72,000
Type B - brick banding		400	SY	\$180	\$72,000
Type C - concrete		1500	SY	\$50	\$75,000
Type D - repaired		800	SY	\$40	\$32,000
Basic Crosswalk		0	SF	\$10	\$0
Enhanced Crosswalk		1800	SF	\$20	\$36,000
Amenities					\$45,750
Wayfinding / Signage		8	EA	\$1,000	\$8,000
Bench		12	EA	\$1,500	\$18,000
Trash / Recycling		8	EA	\$2,000	\$16,000
Public Art		0	EA	\$0	\$0
Bike Racks		5	EA	\$750	\$3,750
				Linear Feet	1150
				Construction Total	\$658,750
				Linear Foot Cost	573

Central Ave Ext. to Silver Street					
Item	Comments	Qty	Unit	Cost	Total
Lighting					\$359,000
Roadway Lighting	1 Light per 160 LF (both sides)	22	EA	\$11,000	\$242,000
Ornamental Lighting		12	EA	\$9,000	\$108,000
Bollards		6	EA	\$1,500	\$9,000
Landscape					\$67,000
Shade Trees		30	EA	\$750	\$22,500
Ornamental Trees		5	EA	\$500	\$2,500
Shrubs		200	EA	\$85	\$17,000
Groundcover / Perennials		500	EA	\$50	\$25,000
Paving					\$221,000
Type A - all brick		0	SY	\$180	\$0
Type B - brick banding	Assume 2' wide	350	SY	\$180	\$63,000
Type C - concrete	Assume average 8' wide	1400	SY	\$50	\$70,000
Type D - repaired		1400	SY	\$40	\$56,000
Basic Crosswalk		3200	SF	\$10	\$32,000
Enhanced Crosswalk		0	SF	\$20	\$0
Amenities					\$52,750
Wayfinding / Signage	Assume 2 signs per intersection	10	EA	\$1,000	\$10,000
Bench		10	EA	\$1,500	\$15,000
Trash / Recycling	3 per block average	12	EA	\$2,000	\$24,000
Public Art		0	EA	\$0	\$0
Bike Racks		5	EA	\$750	\$3,750
				Linear Feet	1800
				Construction Total	\$699,750
				Linear Foot Cost	389

Laterals					
Item	Comments	Qty	Unit	Cost	Total
Lighting					\$0
Roadway Lighting		0	EA	\$11,000	\$0
Ornamental Lighting		0	EA	\$9,000	\$0
Bollards		0	EA	\$1,500	\$0
Landscape					\$10,000
Shade Trees		8	EA	\$750	\$6,000
Ornamental Trees		8	EA	\$500	\$4,000
Shrubs		0	EA	\$85	\$0
Groundcover / Perennials		0	EA	\$50	\$0
Paving					\$227,700
Type A - all brick		0	SY	\$180	\$0
Type B - brick banding		250	SY	\$180	\$45,000
Type C - concrete		1830	SY	\$50	\$91,500
Type D - repaired		1830	SY	\$40	\$73,200
Basic Crosswalk		0	SF	\$10	\$0
Enhanced Crosswalk		900	SF	\$20	\$18,000
Amenities					\$45,250
Wayfinding / Signage		10	EA	\$1,000	\$10,000
Bench		5	EA	\$1,500	\$7,500
Trash / Recycling		12	EA	\$2,000	\$24,000
Public Art		0	EA	\$0	\$0
Bike Racks		5	EA	\$750	\$3,750
				Linear Feet	2700
				Construction Total	\$282,950
				Linear Foot Cost	105