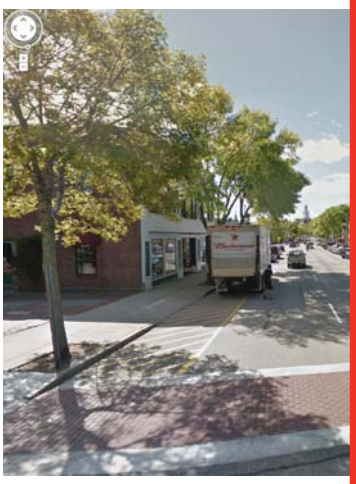
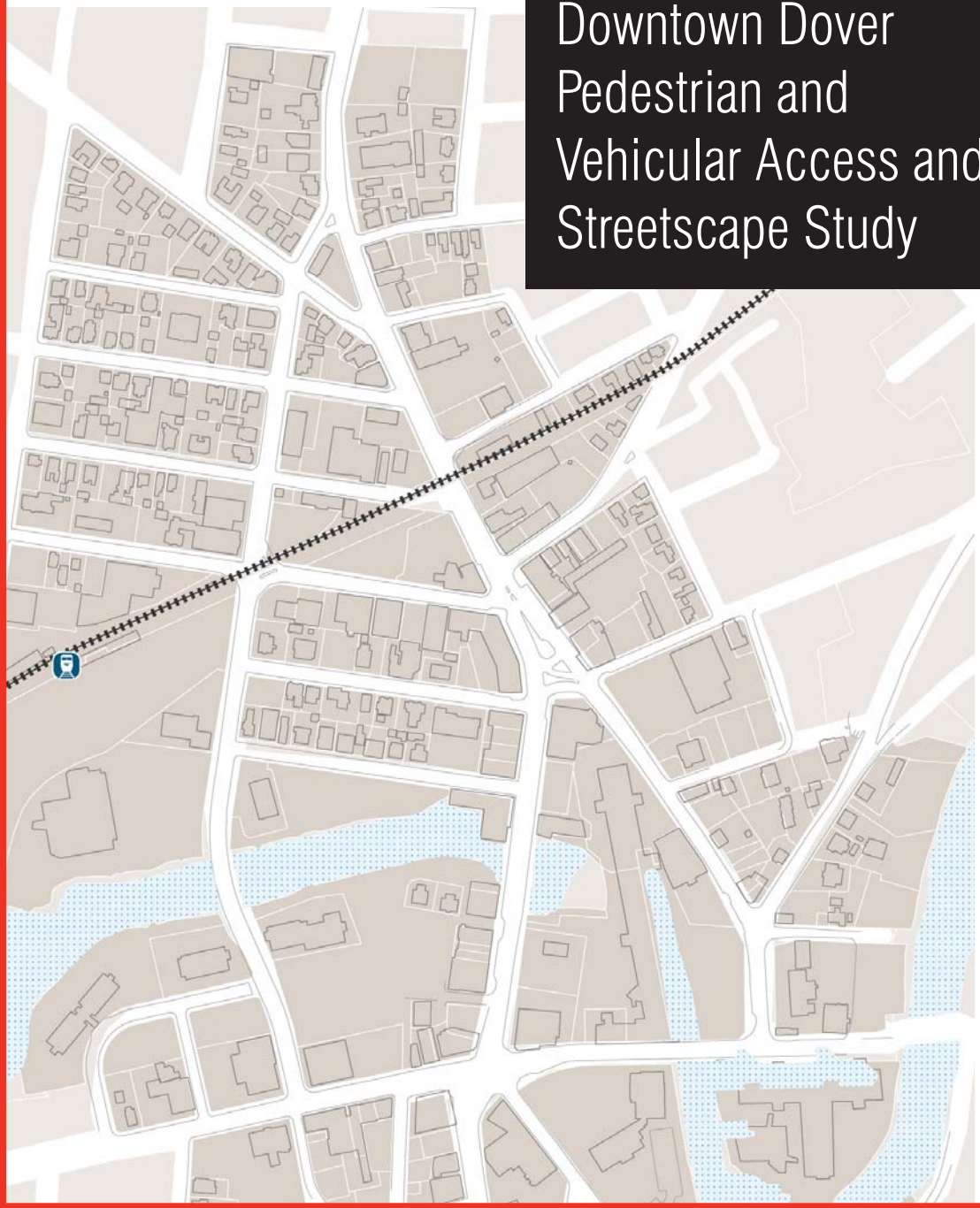
PREFERRED DESIGN - EXECUTIVE SUMMARY

Downtown Dover Pedestrian and Vehicular Access and Streetscape Study





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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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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 the cost estimates and a potential phasing strategy.

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 Overiew

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

The study will have two key products associated with this summary: a **Report**, which will consist of a 10-year plan that includes short-, middle-, and long-term improvements with cost and phasing scenarios, and the 25% design plans, which will be 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 Traffic Advisory Committee
- 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 with the technical studies described above.

Context: Conditions and Trends

Evaluation of existing conditions and trends considered all of the topics that are subject to this study. 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.
- 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. Accessibility in the study area is incomplete

- BICYCLE INFRASTRUCTURE – Limited bicycle infrastructure is present in the downtown district
- PARKING STRATEGY – An overabundance of both on- and off-street parking inventory has led to low levels of utilization throughout the downtown study area.
- 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.
- EXISTING STREETSCAPE CONDITIONS – Inconsistency in the existing streetscape conditions has created a segmented landscape and a general lack of streetscape amenities.

1.2 SUMMARY OF FINDINGS AND RECOMMENDATIONS

Layout and Circulation

The City of Dover should advance a two-way circulation pattern, see **Figure 2**, 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 because it better 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.
- 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

Lower Square

A thorough reorganization of the Central Avenue and Washington Street intersection, **Figure 3** - **Figure 5** 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 and signalization of an efficient, three-way intersection, substantially improving safety and operations, **Figure 6**.
- Creation of a useable civic space, **Figure 7**.
- Connections within the area using short, well-controlled crosswalks
- Retention of diagonal parking
- Reorientation of Central Avenue, **Figure 8**.

Portland Street and Lower Main Street

Portland Street 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, **Figure 9**. This will accommodate all vehicle sizes and turns while regulating entrance and exit speeds to make a safer condition for pedestrians. Additional curb alignment in this area will consist of a reconfiguration of the Main Street and Washington intersection (**Figure 10**) and a narrowing of the existing width of Main Street (**Figure 11**)

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, see **Figure 12**. The reallocation of the right-of-way would allow for a variety of public improvements including:

- Widening of sidewalk, installation of additional of street trees, improvement of existing and installation of additional of crosswalks and lighting and creation of a paved island with seasonal plantings on the bridge, see **Figure 15**
- 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, see **Figure 13** and **Figure 14**.

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 (**Figure 18**)
- TRAFFIC CALMING – Painted or decorative crosswalks 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 (**Figure 19**)
- SIGNAGE AND WAYFINDING – Signage and wayfinding that is appropriate for both vehicles and pedestrians will link the destinations within the town, and indicate transit options, parking areas, and the locations of local businesses (**Figure 20**)
- 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 (**Figure 21**)
- LANDSCAPE – Species of trees and shrubs should complement the existing conditions and provide interest throughout all seasons (**Figure 22**)

- STREET AMENITIES – Benches, trash receptacles, and bike racks should be consistent throughout the downtown and complementary in style (**Figure 23**)
- 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 (**Figure 24**)

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 reconfigurations, 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 Cocheco 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, see **Figure 25**.

Implementation

Costs

This Report suggests that a range of costs be investigated for implementation of the preferred plan recommendations. The preliminary cost estimate has been divided into a variety of minor and major streetscape enhancements and major intersection reconfigurations. The City's preferred level of improvement will affect the cost estimates for implementing the recommendations. However, based upon input from the public and the City Council as to the preferred elements to be implemented, the project cost could range approximately from $6.75 to $9.5 million, as shown in the table below:

Table 1. Estimated Project Costs

		RANGE OF PROJECT COSTS		
Components	**Linear Feet**	**Low Cost Range**	**Median Cost Range**	**High Cost Range**
Minor Streetscape Enhancement	8,200	$3,429,641	$4,295,891	$5,162,141
Major Streetscape Enhancement	4,000	$39,590	$104,615	$170,659
Major Intersection Realignment	Lump Sum	$1,750,736	$1,905,956	$2,063,687
Totals*	12,200	$6,765,098	$8,132,237	$9,503,718

**Totals include an 8% and 15% additional fee for mobilization / general conditions and design / construction contingency respectively*

Phasing

The approach to phasing the streetscape and circulation recommendations is divided into three manageable intervals to promote minimal construction delays. The phases are as follows, see **Figure 26**:

- PHASE ONE – Chestnut Street from Central Avenue to Washington Street.
- PHASE TWO – Upper Square and Mini-Roundabout at Main Street and Portland Avenue.
- PHASE THREE – Lower Square and the street segments of Central Avenue from Upper Square to Washington Street, Washington Street from Central Avenue to Portland Avenue, and Main Street from Upper Square to Washington Street.

A FIGURES

Please see the following pages for cooresponding figures in the executive summary.

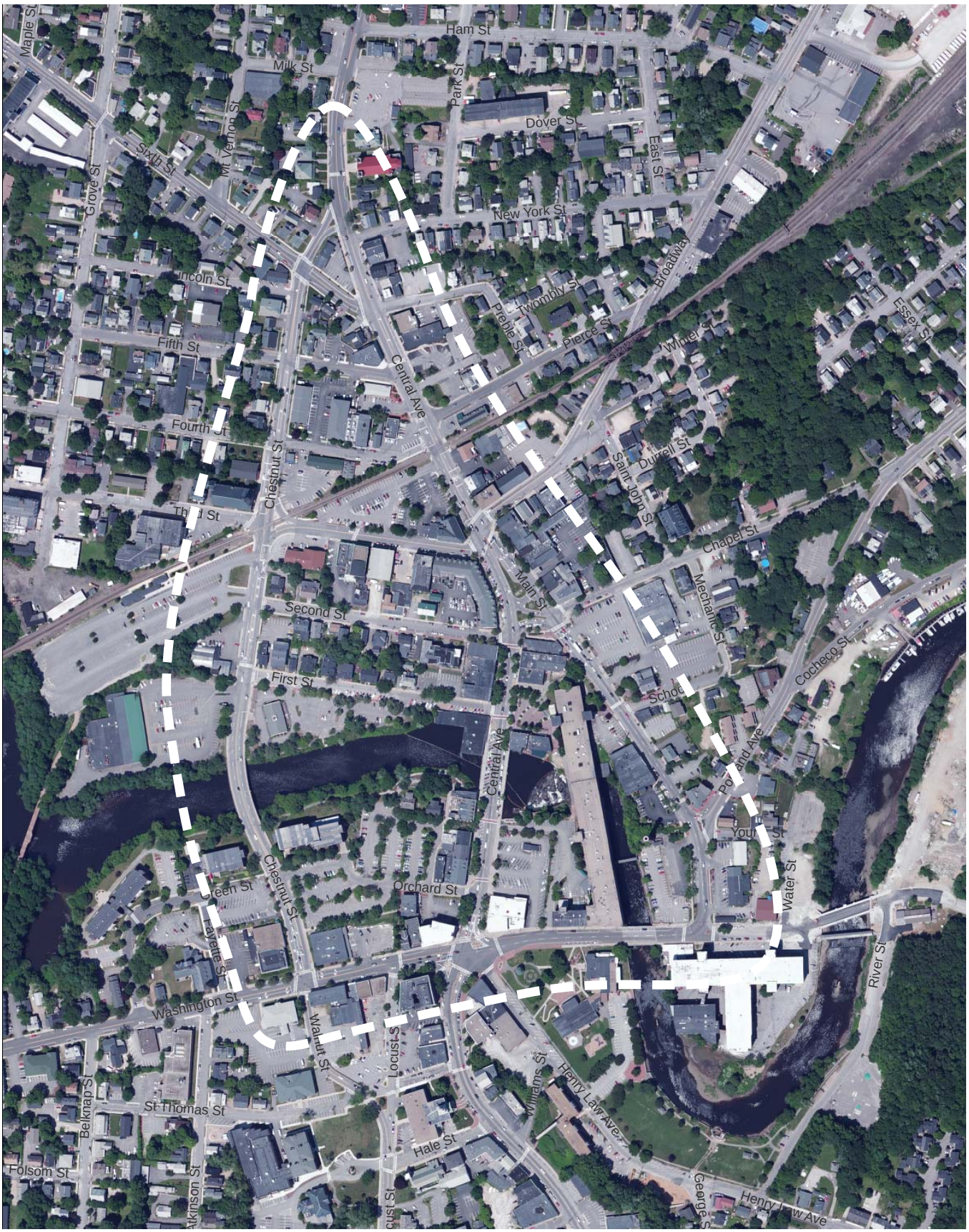

Figure 1: Aerial Photograph with Study Area

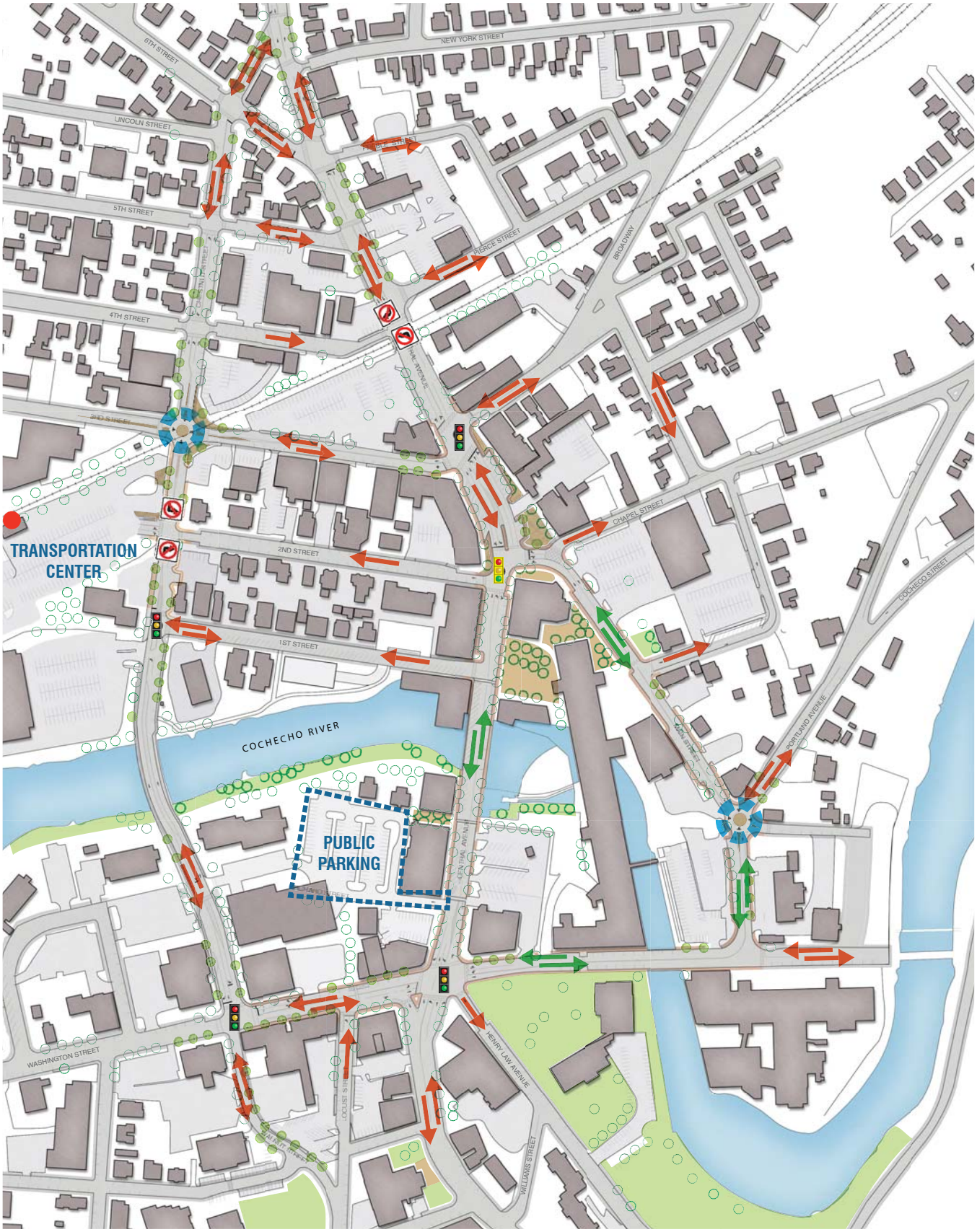

Figure 2: Preferred Circulation Plan

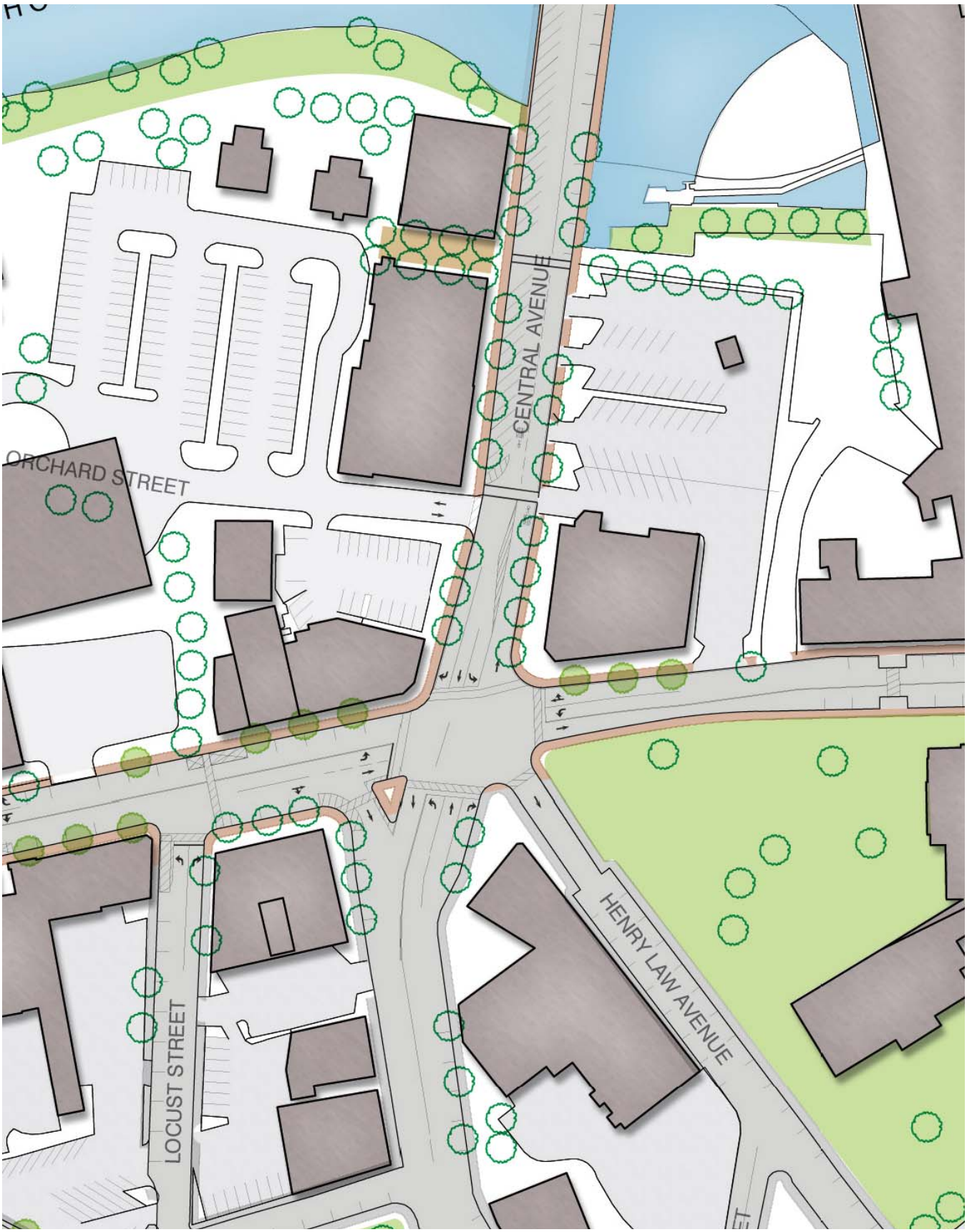

Figure 3: Lower Square Preferred Plan Circulation

Figure 4: Preferred Plan Lower Square Rendered

Figure 5: Washington Street Improvements

Figure 6: Upper Square Preferred Plan Circulation

Figure 7: Preferred Plan Upper Square Rendered

Figure 8: Central Avenue Improvements

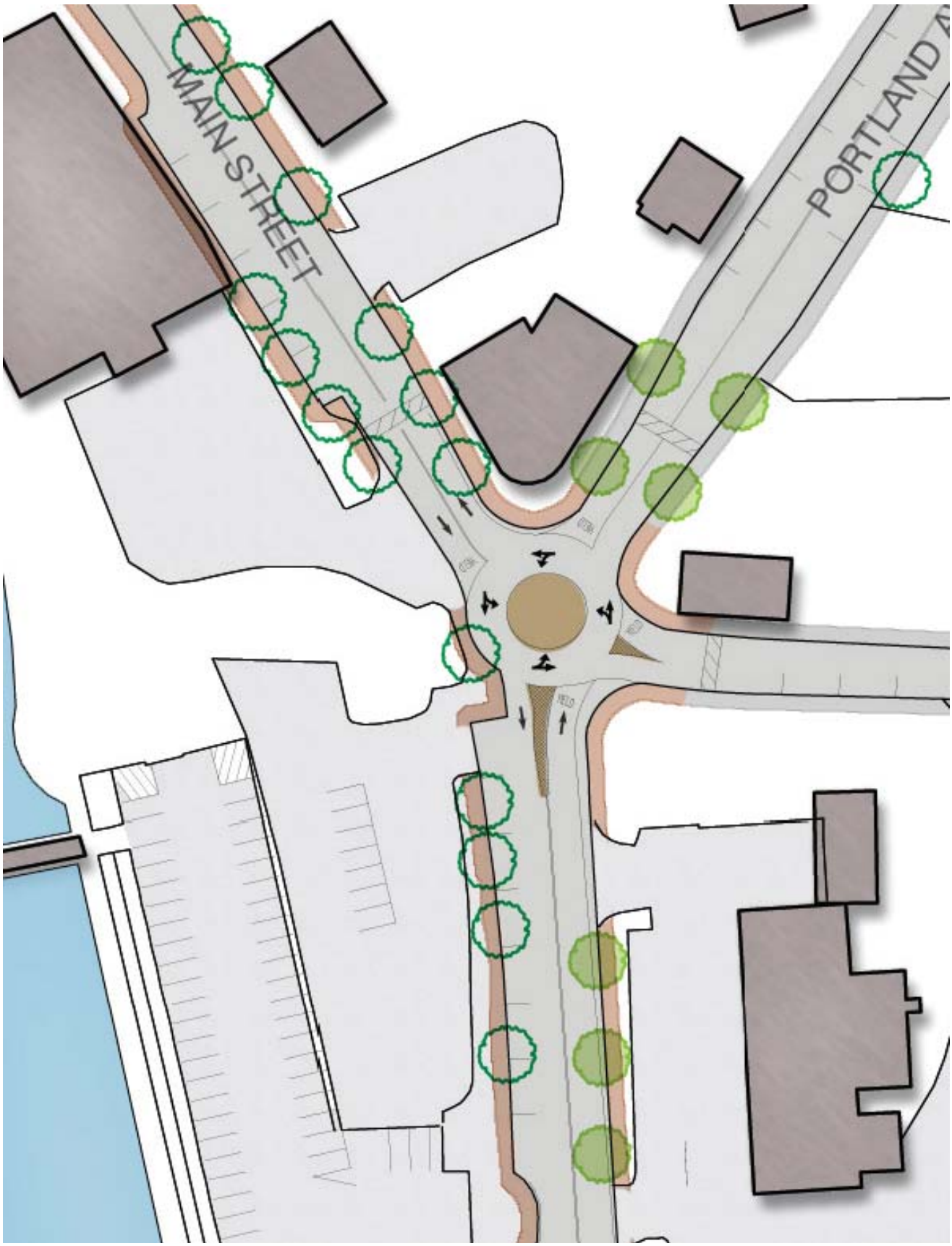

Figure 9: Main Street at Portland Avenue Preferred Circulation Plan

Figure 10: Main Street at Washington Street Preferred Circulation Plan

Figure 11: Main Street Improvements

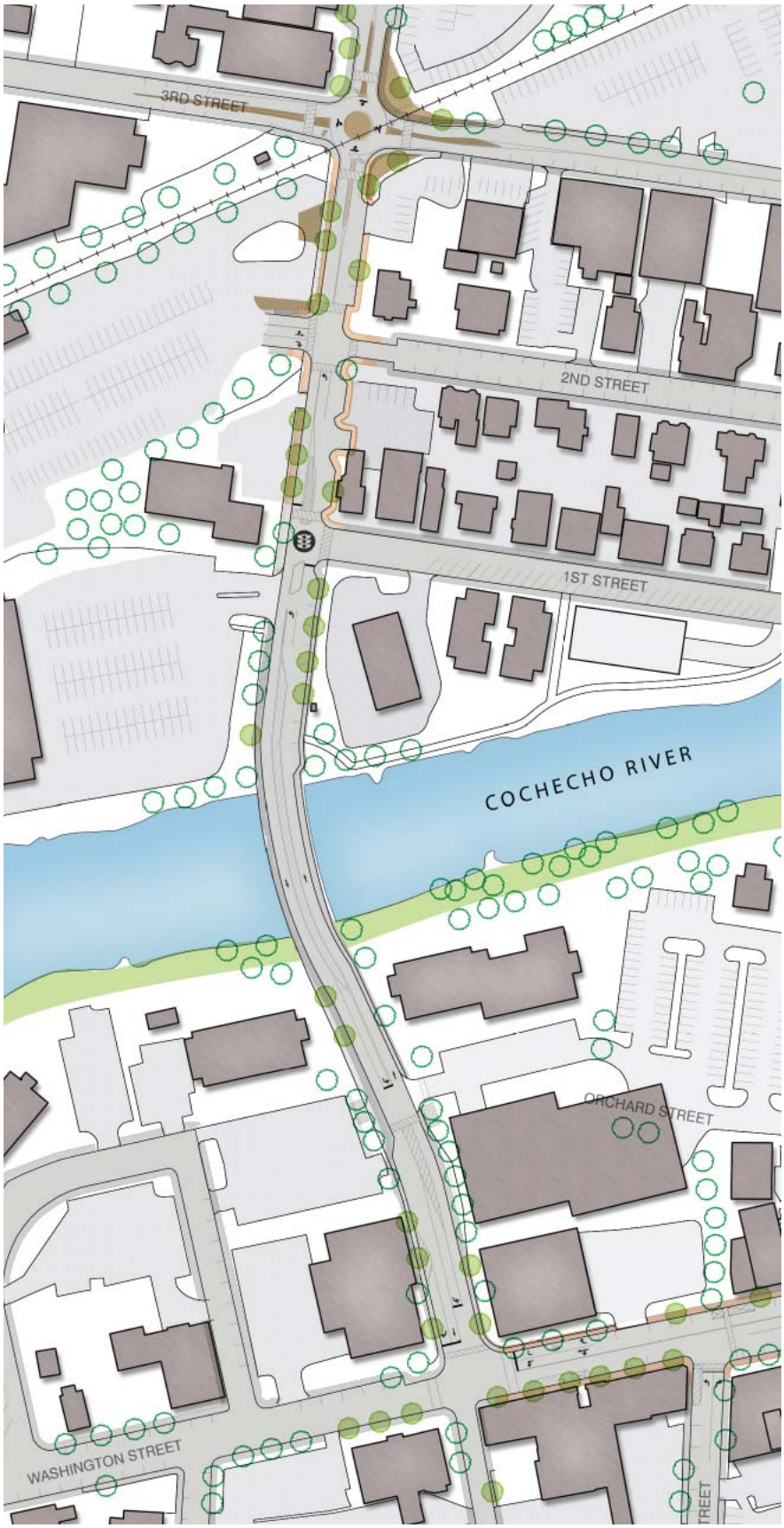

Figure 12: Chestnut Street Preferred Circulation Plan

Figure 13: Chestnut Street at Third Street Preferred Circulation Plan

Figure 14: Chestnut Street at Third Street Preferred Rendering

Figure 15: Chestnut Street Improvements

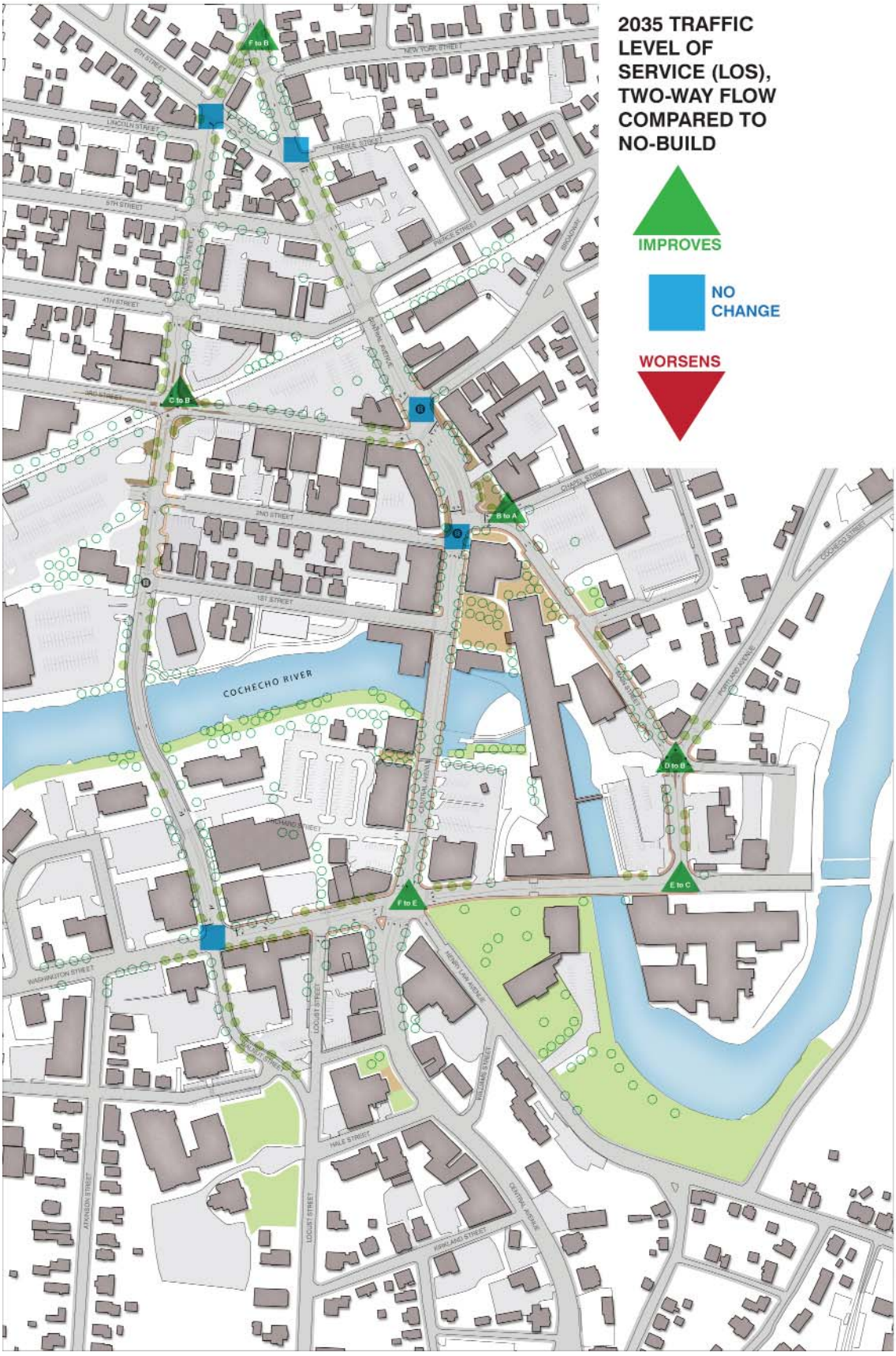

Figure 16: 2035 Overall Level of Service (LOS) Preferred Circulation Plan

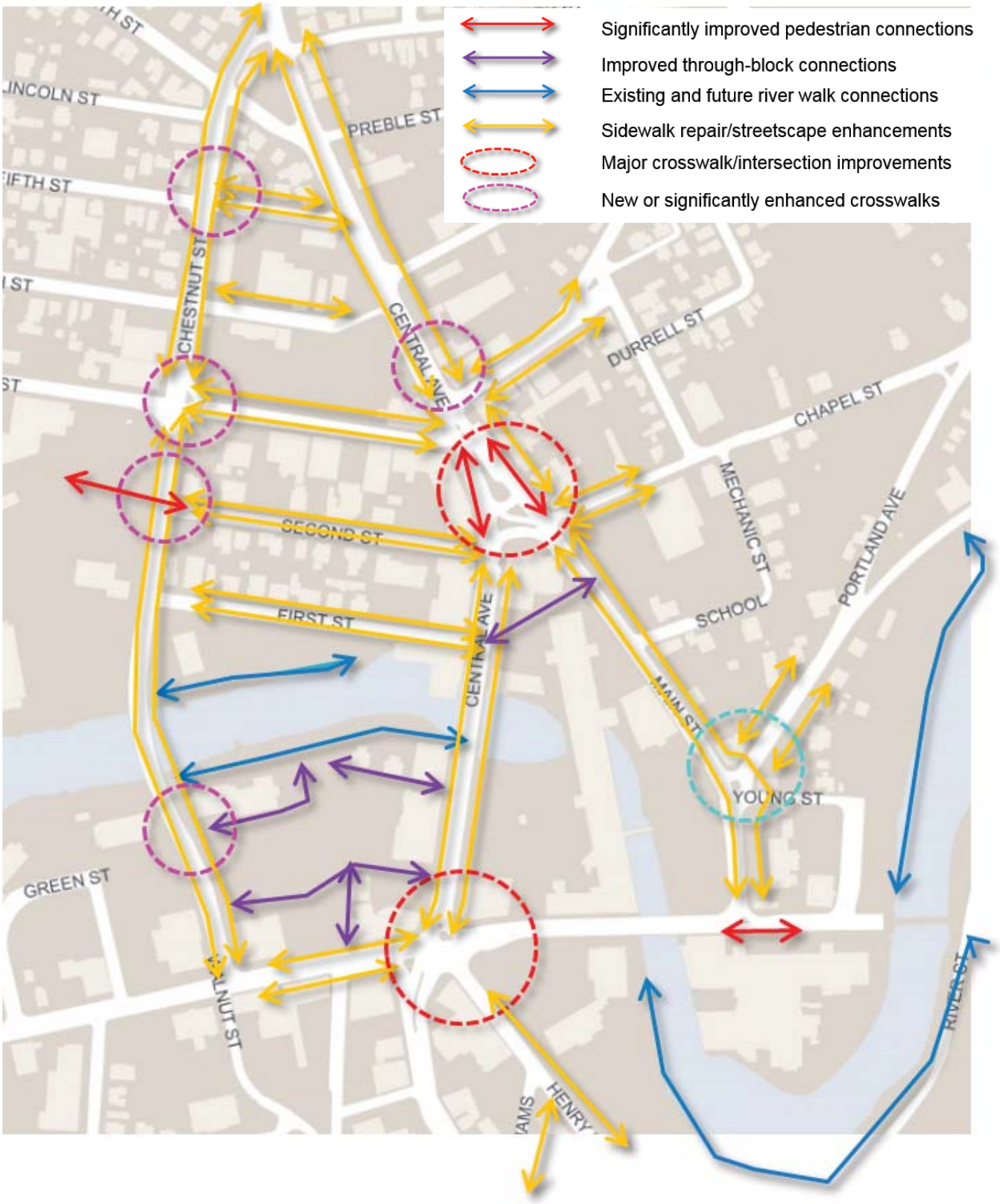

Figure 17: Pedestrian Connectivity Improvements

Figure 18: Paving Materials and Treatments

Figure 19: Traffic Calming

Figure 20: Signage and Wayfinding

Figure 21: Lighting

Figure 22: Landscape

Figure 23: Street Amenities

Figure 24: Public Art

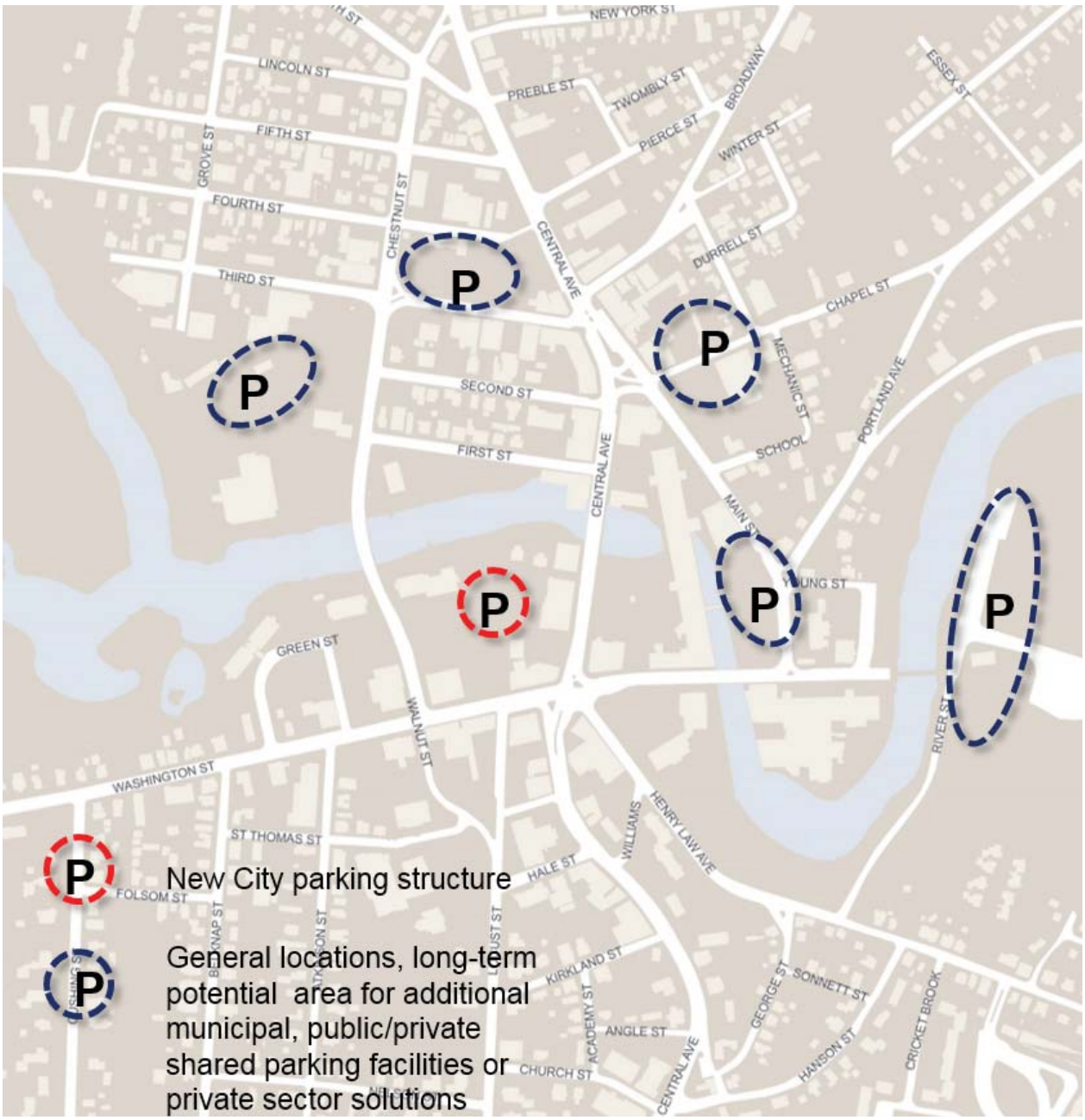

Figure 25: Preferred Plan Parking Strategy

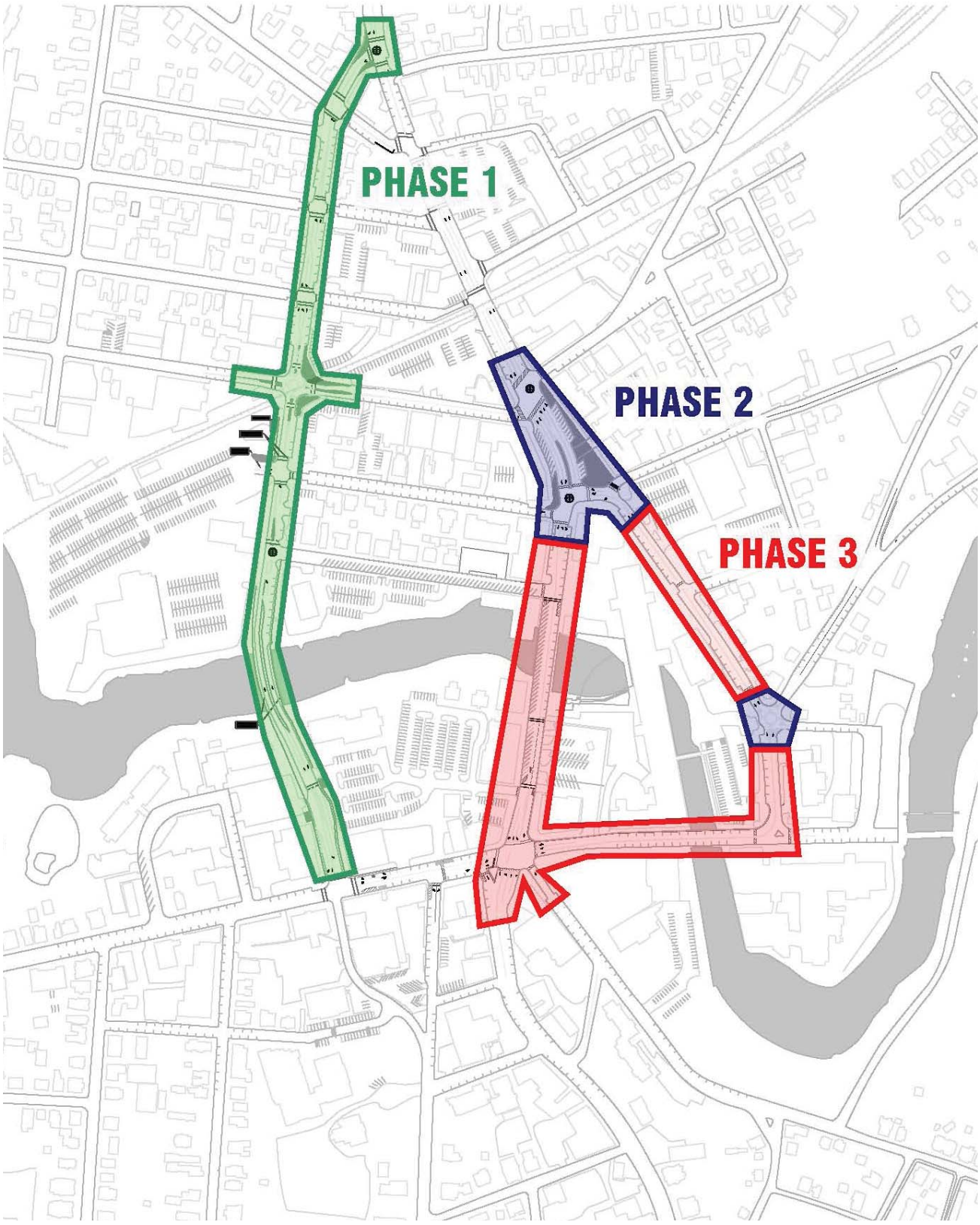

Figure 26: Preferred Plan Phasing Strategy

B TABLES

Please see the following pages for cooresponding tables in the executive summary.

Table 2. Typical Streetscape Improvements and Cost per Linear Foot

COST / LINEAR FOOT	SOFT COSTS % / TOTAL CONSTRUCTION COST	TYPICAL STREETSCAPE IMPROVEMENTS
$10-$50	8%-9%	Concrete walkways, strategic street tree locations, standard painted crosswalks where necessary
$275-$500	10%-11%	Enhanced intersections, decorative paving bands at key locations, period style lighting, curb extensions, banner poles, select amenities (benches, bollards, trash receptacles, bicycle racks, raised granite planters), imprint crosswalks
$1,100-$1,500	12%-14%	Major intersection or roadway realignments, new traffic and pedestrian signals, enhanced roadway paving at intersections (Traffic print), way finding/signage, banners, interpretative elements (paving, benches or signs), special amenities (large raised planters), non-participatory open space areas (adjacent to right of way)

Table 3. Estimated Project Costs

		RANGE OF PROJECT COSTS		
Components	Linear Feet	Low Cost Range	Median Cost Range	High Cost Range
Minor Streetscape Enhancement	8,200	$3,429,641	$4,295,891	$5,162,141
Major Streetscape Enhancement	4,000	$39,590	$104,615	$170,659
Major Intersection Realignment	Lump Sum	$1,750,736	$1,905,956	$2,063,687
Totals*	12,200	$6,765,098	$8,132,237	$9,503,718

**Totals include an 8% and 15% additional fee for mobilization / general conditions and design / construction contingency respectively*

Table 4. Expanded View of Estimated Project Costs

OVERALL COSTS							
		Range of cost / LF			Range of project costs*		
Components	Linear feet	Low cost range	Median cost	High cost range	Low cost range	Median cost	High cost range
Streetscape							
Major Segments	8,200				$3,429,641	$4,295,891	$5,162,141
• Central	3,150	$387	$487	$587	$1,219,680	$1,534,680	$1,849,680
• Main	1,350	$204	$254	$304	$642,915	$800,415	$957,915
• Washington	1,150	$321	$396	$471	$1,012,331	$1,248,581	$1,484,831
• Chestnut	2,550	$176	$226	$276	$554,715	$712,215	$869,715
Connecting Segments	2,800	$10	$26	$43	$27,713	$73,332	$119,791
Lateral Segments	1,200	$10	$26	$42	$11,877	$31,283	$50,868
Roadway							
All Roadway Construction	Lump Sum				$280,112	$305,112	$330,112
Intersections							
Central Intersections	Lump Sum				$1,366,344	$1,466,344	$1,566,344
Chestnut Intersections	Lump Sum				$222,310	$247,310	$272,310
Main Intersections	Lump Sum				$2,925	$3,425	$3,925
Soft Costs	Lump Sum				$159,158	$188,879	$221,109
Subtotals	**12,200**				**$5,500,080**	**$6,611,575**	**$7,726,600**
Roadway Subtotals					$1,871,690	$2,022,190	$2,172,690
Landscape Subtotals					$3,469,231	$4,400,506	$5,332,800
Mobilization and General Conditions	8% of Estimated Construction				$440,006	$528,926	$618,128
Construction Subtotal					**$5,940,086**	**$7,140,501**	**$8,344,728**
Design and Construction Contingency	15% of Estimated Construction Subtotal				$825,012	$991,736	$1,158,990
Totals					**$6,765,098**	**$8,132,237**	**$9,503,718**
Cost / LF					$555	$667	$779

Table 5. Estimated Phase One Project Costs

PHASE 1							
Components	**Linear feet**	**Low cost range**	**Median cost**	**High cost range**	**Low cost range**	**Median cost**	**High cost range**
Streetscape	2,550	$126	$201	$276	$321,555	$512,805	$704,055
Roadway Improvements	Lump Sum				$215,634	$240,634	$265,634
Intersections	Lump Sum				$461,572	$511,572	$561,572
Subtotals	2,550				$998,761	$1,265,011	$1,531,261
Soft Costs	12-14%				$119,851	$164,451	$214,377
Mobilization	8% of Estimated Construction				$79,901	$101,201	$122,501
Design and Construction Contingency	15% of Estimated Construction Subtotal				$149,814	$189,752	$229,689
Phase 1 Total					**$1,348,327**	**$1,720,415**	**$2,097,828**

Table 6. Estimated Phase Two Project Costs

PHASE 2							
Components	**Linear feet**	**Low cost range**	**Median cost**	**High cost range**	**Low cost range**	**Median cost**	**High cost range**
Streetscape	750	$398	$498	$598	$1,014,135	$1,269,135	$1,524,135
Roadway Improvements	Lump Sum				$31,178	$46,178	$61,178
Intersections	Lump Sum				$952,941	$1,052,941	$1,152,941
Subtotals	750				$1,998,254	$2,368,254	$2,738,254
Soft Costs	12-14%				$239,791	$307,873	$383,356
Mobilization	8% of Estimated Construction				$159,860	$189,460	$219,060
Design and Construction Contingency	15% of Estimated Construction Subtotal				$299,738	$355,238	$410,738
Phase 2 Total					**$2,697,643**	**$3,220,826**	**$3,751,408**

Table 7. Estimated Phase Three Project Costs

PHASE 3							
Components	**Linear feet**	**Low cost range**	**Median cost**	**High cost range**	**Low cost range**	**Median cost**	**High cost range**
Streetscape	4,900	$717	$817	$917	$1,828,414	$2,083,414	$2,338,414
Roadway Improvements	Lump Sum				$2,300	$2,800	$3,300
Intersections	Lump Sum				$234,106	$249,106	$264,106
Subtotals	4,900				$2,064,819	$2,335,319	$2,605,819
Soft Costs	12-14%				$247,778	$303,592	$364,815
Mobilization	8% of Estimated Construction				$165,186	$186,826	$208,466
Design and Construction Contingency	15% of Estimated Construction Subtotal				$309,723	$350,298	$390,873
Phase 3 Total					**$2,787,506**	**$3,176,034**	**$3,569,973**

Overall Totals					**$6,765,098**	**$8,132,237**	**$9,503,718**