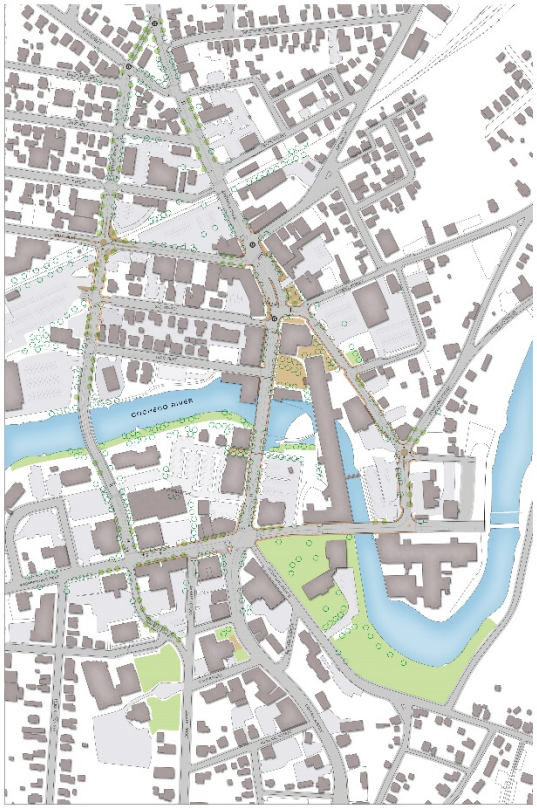
Draft Recommendations and Preferred Plan

City of Dover
Traffic Advisory Committee
September 22, 2014



Purpose of the Study

The City of Dover is undertaking the Downtown Pedestrian and Vehicular Access Streetscape Study 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 support a mixed-use environment that is more convenient, pleasant, and economically vibrant. Goals include:

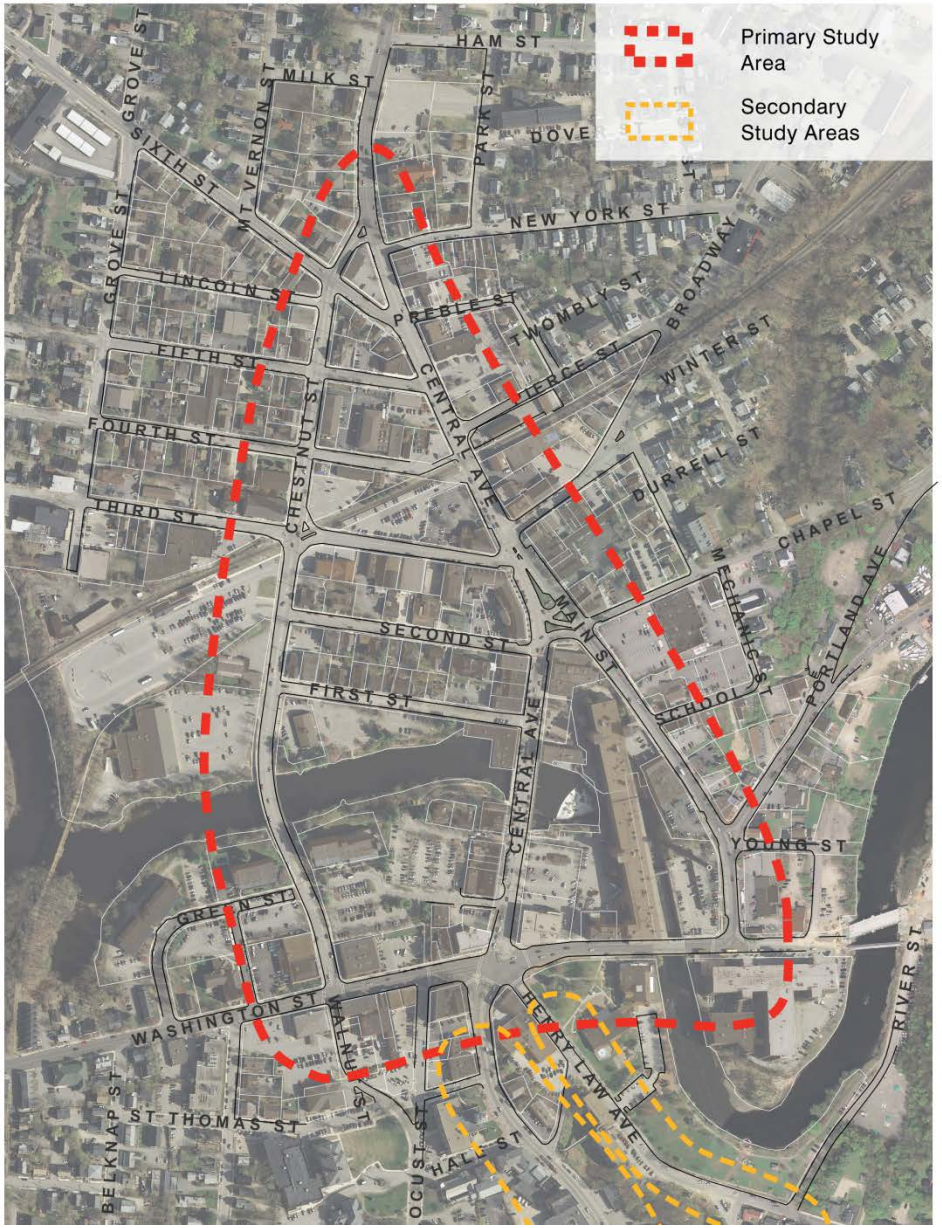
- Create a more attractive **pedestrian-oriented environment**
- Make **vehicle circulation more clear and convenient**
- Simplify **links to parking**
- **Expand bicycle and transit links** to and through the downtown

Process

- City providing management and input on the study
- Dover Planning Department taking the lead
- City's Traffic Advisory Committee and City Council providing feedback on goals and design alternatives
- Stakeholder meetings and conversations reviewed retail economic and parking challenges downtown
- Public workshops:
  - January 21, April 21, 2014
  - Late spring workshop to review refined alternatives

Study Area

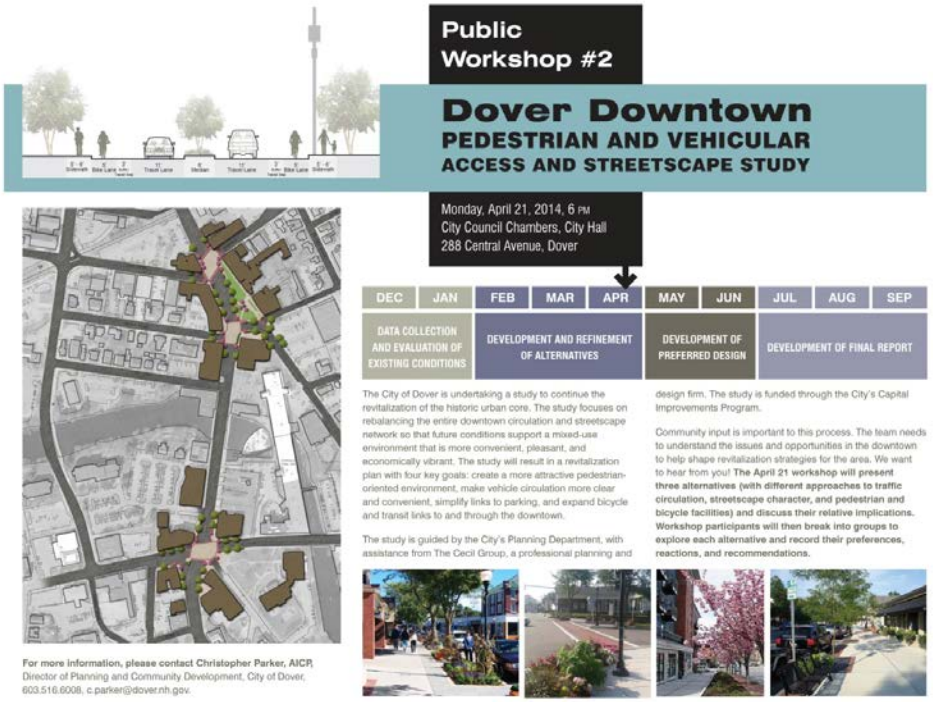
The planning and design focuses the recommendations with the core areas of the downtown, while taking into account the relationship to the streets, roads, paths and sidewalks that lead to and from the downtown.



Consultants

- Consultant team conducting the study for the City
  - The Cecil Group, lead firm, urban design, landscape design
  - Resource Systems Group (RSG) (transportation planning)
  - Gibbs Planning Group (retail economic strategy)

At right is the publicity flier for the public workshop on April 21



Process

Task 1. Data Collection and Review of Existing Conditions

Task 2. Community Workshop #1 – Data and Analysis Presentation

Workshop preparation and participation

Task 3. Development of Alternatives

3.a Preliminary Alternatives

3.b Review of Preliminary Concepts

3.c Alternatives

Task 4. Community Workshop #2 – Alternatives

Workshop preparation and participation

Task 5 Preferred Design

5.a. Layout and circulation concept for all modes

5.b. Streetscape and urban design

5c.Parking strategy

5.d.Cost evaluations

Task 6: Community Workshop #3 Present Preferred Design and Draft Final Report

Workshop preparation and participation

Task 7: Final Report

Community Discussions and Engagement

Two public workshops and a series of stakeholder meetings were held in late spring to discuss alternative approaches to the streetscape, circulation, and other topics.

Community Discussions and Engagement

Presentations were posted on the City website, and a survey was made available to allow people to provide reactions and input to the various ideas advanced in the alternatives.

Community Discussions and Engagement

Hundreds of comments, suggestions and concerns have been taken into account, including the results from about 300 surveys that were submitted.

Representative concerns and aspirations:

- Many **differing views were expressed about the merits of one-way and two-way circulation patterns and the possible impacts of change** from the current system – including additional ideas and variations of all of the alternatives that were presented.

- When given the opportunity to rank their response to three circulation alternatives, most survey participants indicated their own preference for **an enhanced one-way loop (58%**), with a **two-way loop being the second choice (51%** of the respondents), and **a variation on the two-way loop being the third choice (44%)**.

- The respondents **also listed priorities and concerns** in working sessions, and many **added notes to their surveys** which helped the team understand key sensitivities and issues that need to be addressed, under any scenario.

Community Discussions and Engagement

Hundreds of comments, suggestions and concerns have been taken into account, including the results from about 300 surveys that were submitted.

Representative concerns expressed the dilemmas with a downtown street system that accommodates both local traffic and through traffic, and where the pedestrian environment is inconsistent

- **Traffic delays and slow speeds** are a concern for those passing through the downtown, along with a high volume of traffic
- Fast **speeds, pedestrian comfort and safety** are a concern for those who walk
- **People have adapted to the existing circumstances** with strategies to use short-cuts and alternate routes, depending upon the traffic and appreciate having options
- **Supply, location and connections to and from parking and loading** was a frequent concern among businesses and institutions
- **Virtually everybody seemed to agree that positive changes need to be accomplished…**

Review: Analysis, Issues and Opportunities

Placemaking: Creating a More Successful Downtown

- Supporting existing uses
- Expanding complementary uses
- Become an in-town neighborhood
- Adding vitality
- Creating many places for people
- Reinforcing civic places and identity

Review: Analysis, Issues and Opportunities

Balanced, Pedestrian-Oriented Environment

- **All successful downtowns are pedestrian-oriented**
- Pedestrian orientation means excellent pedestrian connections that allow and encourage pedestrians to walk reasonable distances…
  - Between destinations
  - From parking to multiple destinations
  - To and from transit
  - To and from bicycle parking

Review: Analysis, Issues and Opportunities

Downtown and Transportation Networks

- "Through-traffic" is a mixed blessing for downtowns.
- As downtowns become more successful, through-traffic is discouraged in preference to "to-traffic, and to ensure that a pedestrian-oriented character can be maintained.
- Convenience and clarity is essential.
- As a result, successful downtowns benefit from multiple routes and choices, excellent signage, and managed parking.

Review: Analysis, Issues and Opportunities

Parking and Downtowns

- Parking needs to be balanced to support the uses; too much uses up land without benefit, too little harms uses
- Parking locations and the relationship to uses vary considerably by use, patronage and varying need for convenience
- Parking supply and parking management must come hand-in-hand in a successful downtown

Review: Analysis, Issues and Opportunities

Streetscape and Downtowns

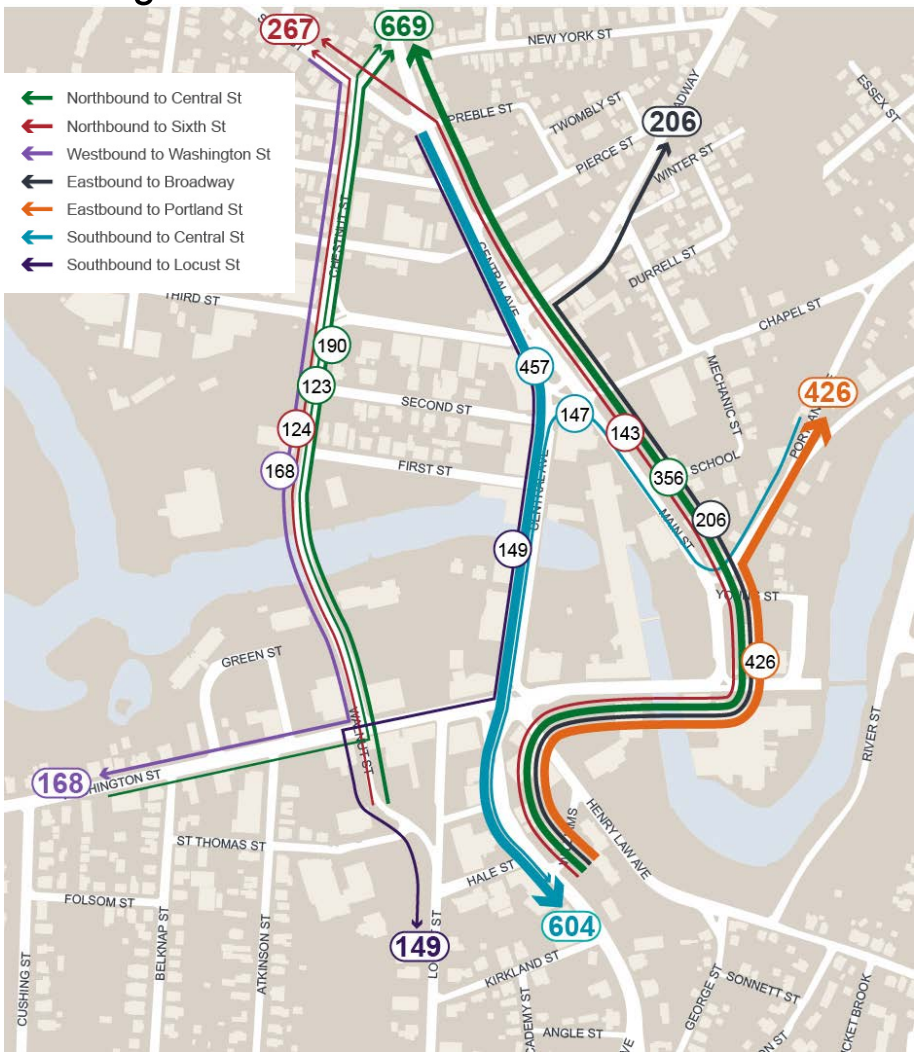
- Excellent streetscapes create excellent pedestrian environments.
- Streetscapes are a direct economic investment.
- Private developments with new “downtowns” and retail districts invest heavily in their streetscapes.
- Studies have documented substantial increases in property values after streetscapes are completed

Review: Analysis, Issues and Opportunities

Peak Hour Travel Conditions: A Review of Evening Traffic Flows

- Multiple routes pass through the downtown loop
- Largest convergence in Lower Square
- Cut-through traffic on Chestnut St. / Locust St/
- Highest Origin-Destination* Pairs:
  - Upper Central Ave to Lower Central Ave (6%)
  - Lower Central Ave to Portland Street (5%)
  - Lower Central Ave to Upper Central Ave (4%)

*An Origin-Destination Pair is a transportation planning concept that quantifies the number of vehicles or people moving from one point to another during a given point in time.

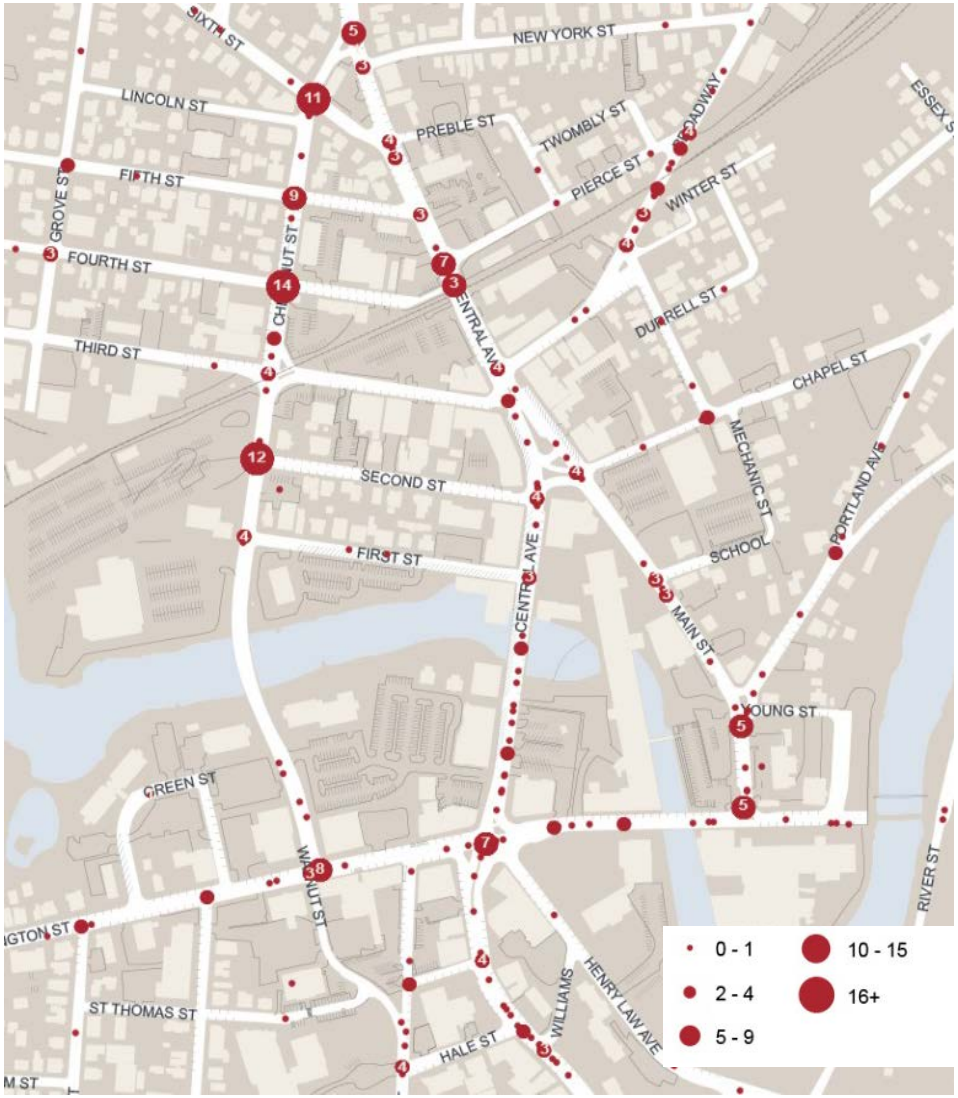


2005 O-D (Rizzo)

Review: Analysis, Issues and Opportunities

Crashes (2003 to 2012)

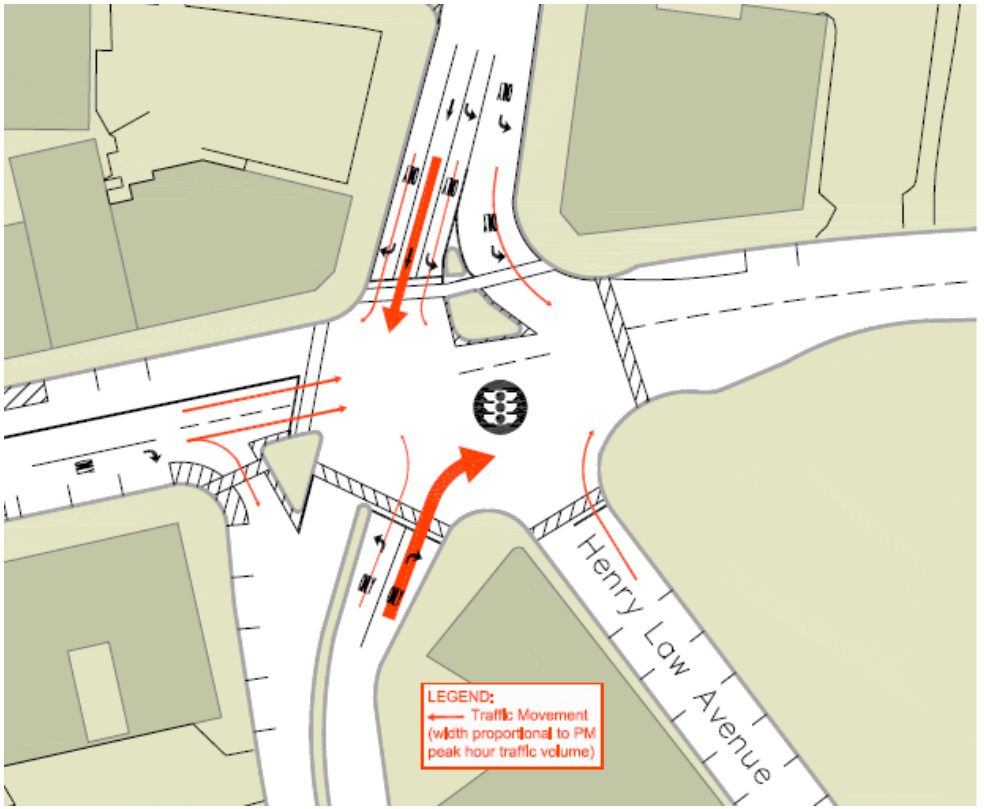
- The diagram shows locations of vehicular crashes. Larger dots indicate areas with more accidents
- Many incidents are along Central Ave. and Main St. in the downtown area
- Intersections with highest crashes:
  - Chestnut & Fourth (14)
  - Chestnut & Second (12)
  - Chestnut & Washington (11)
  - Central & Sixth (11)
  - Lower Square (10)
  - Chestnut & Fifth (9)



Review: Analysis, Issues and Opportunities

Lower Square Conditions

- Convergence of traffic flows at Lower Square results in traffic congestion
- Wide pavement expanses at intersection approaches create long pedestrians crossing times
- Not all vehicular approaches have signalization to allow a walking phase for pedestrians
- Wide pavement expanse divide the quadrants of the intersection, fragmenting the cohesion of Lower Square

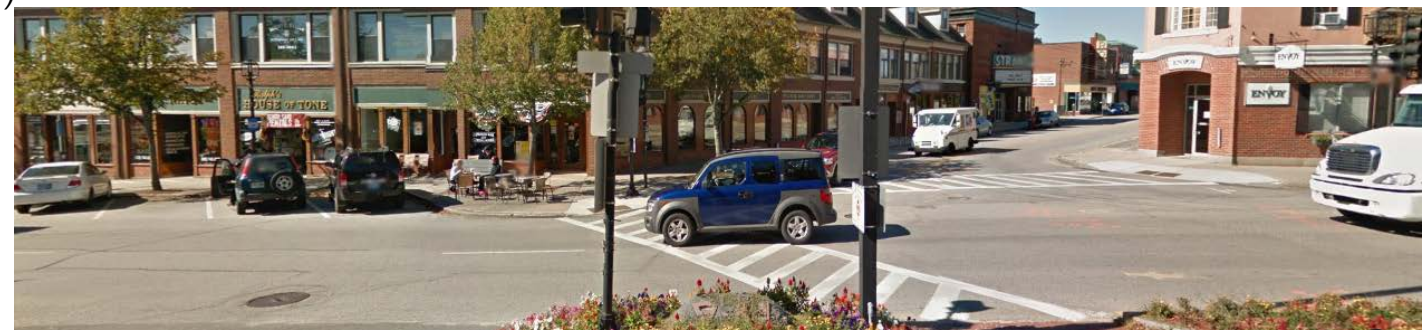


Review: Analysis, Issues and Opportunities

Upper Square Conditions

- Vibrant mixed-use (retail, residential, and offices) setting
- Convergence of several cross streets creates a complex layout
- Complex turning movements from Main Street, Chapel Street, Second Street, and Third Street
- Highest number of crashes downtown

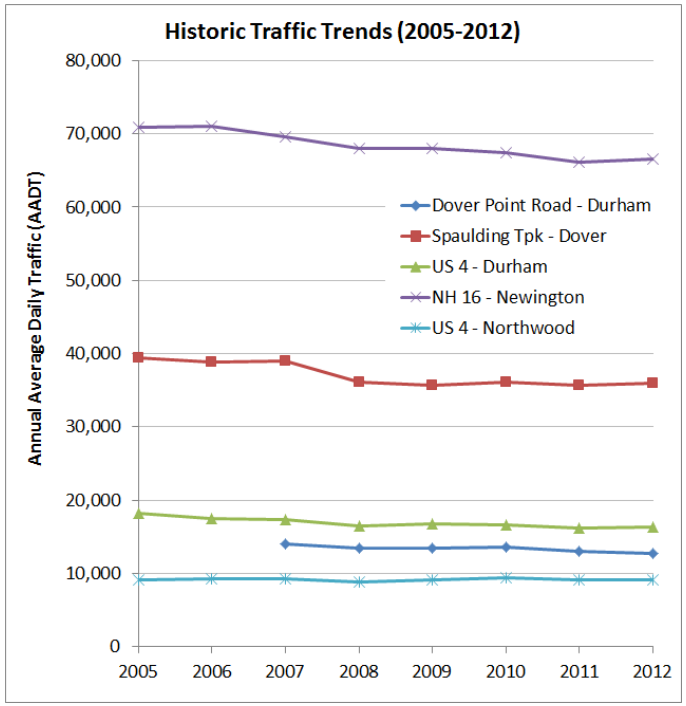
(according to the Downtown / Riverfront Redevelopment Traffic Circulation and Parking Plan study by Rizzo Associates from 2001)

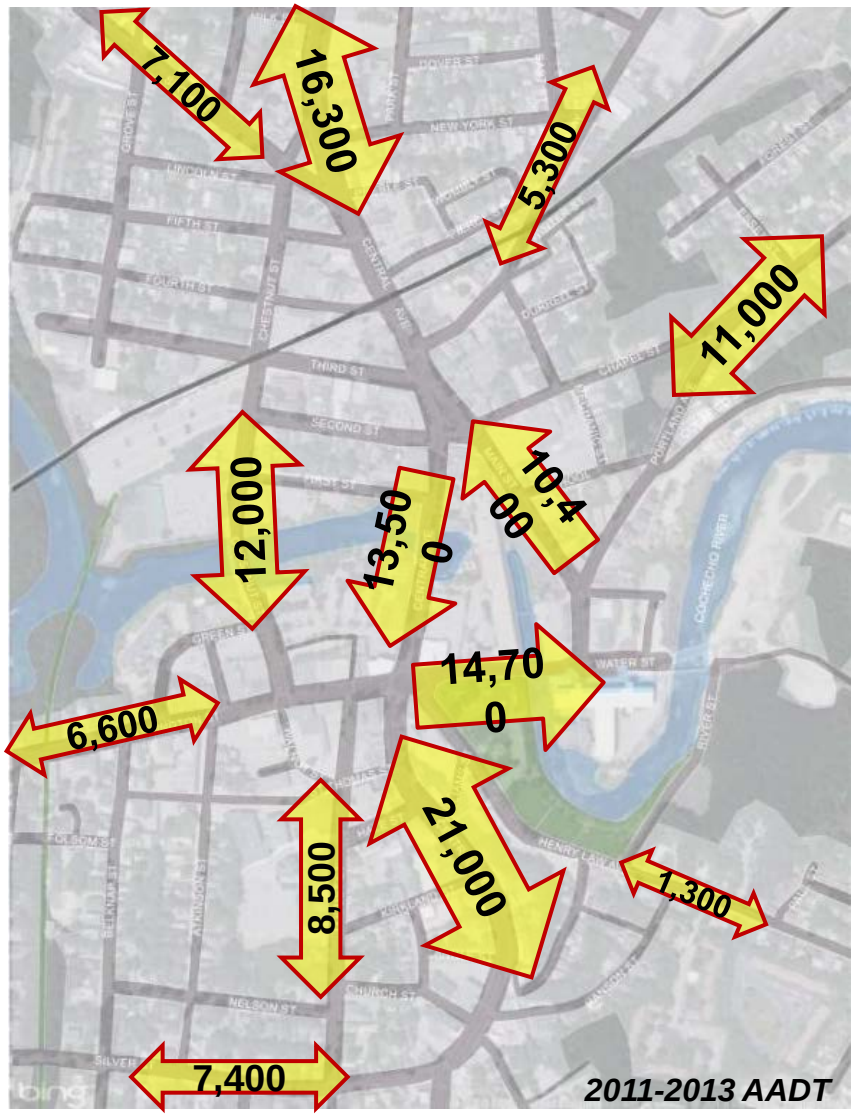


Review: Analysis, Issues and Opportunities

Downtown Traffic Volumes

- Traffic volumes have generally declined since 2005, so
- Rizzo study's volumes remain a conservative assumption for use today

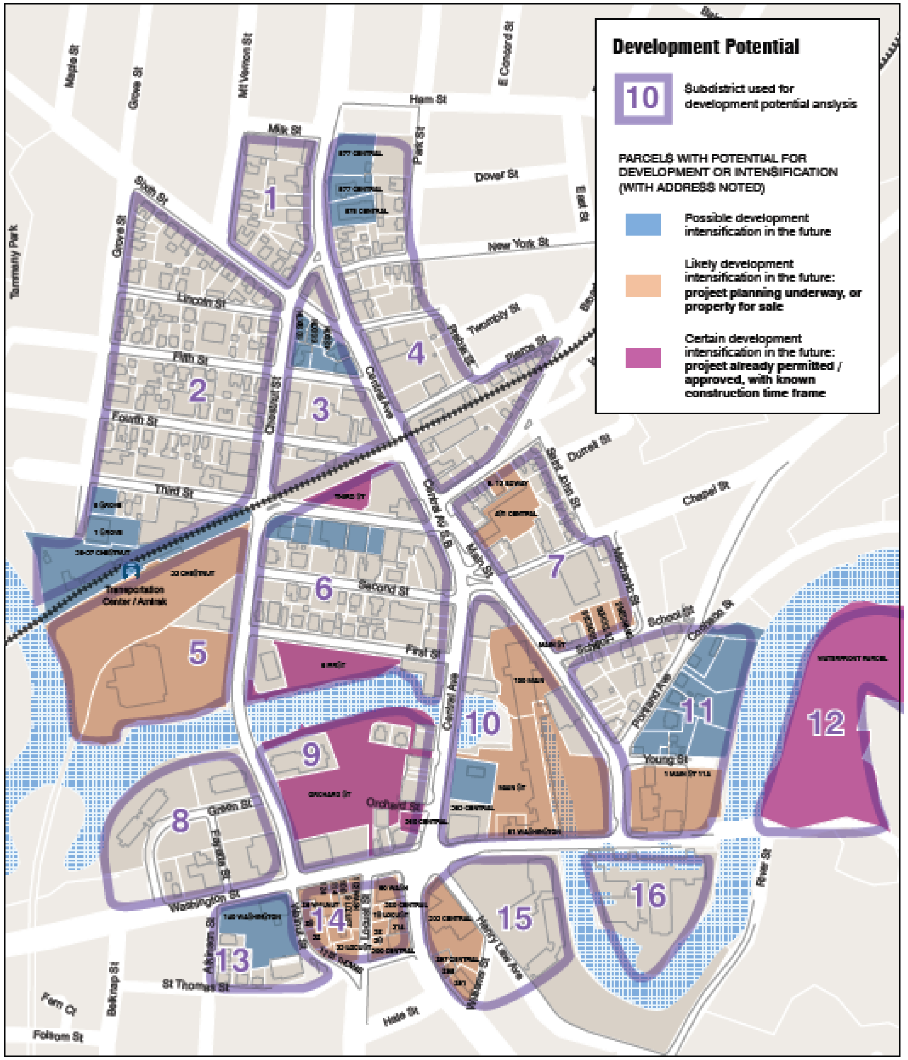




Review: Analysis, Issues and Opportunities

Growth Projections

- Development projections were prepared by The Cecil Group, with input from the City
- Projections considered the likely potential for residential units and commercial and retail space to be added downtown.
- RSG determined the potential growth in downtown traffic, taking these estimates into account

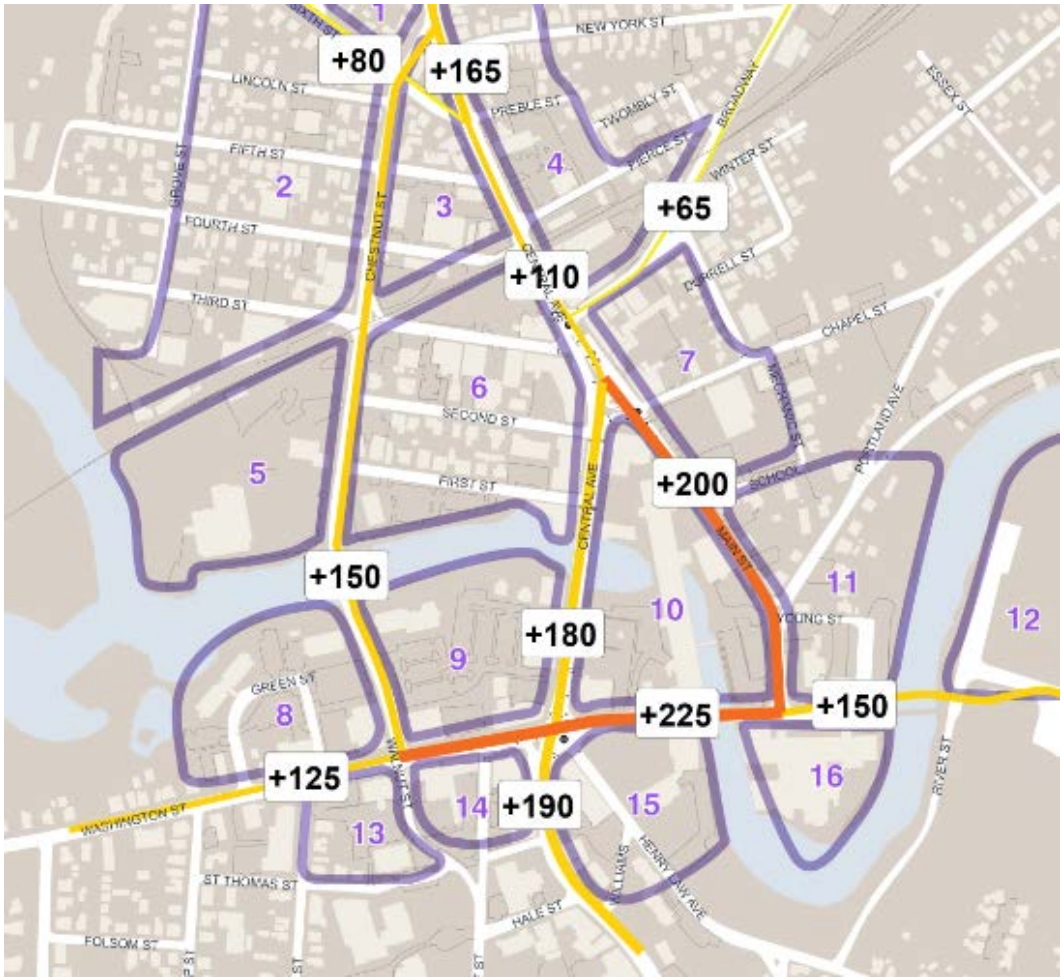


Note: Subdistricts were defined to assess development potential and parking utilization, and reflect areas that are self-contained in terms of walkability to parking. Development type and timing based on conversation with Director of Planning, City of Dover, February 2014.

Review: Analysis, Issues and Opportunities

Projected Increase in Traffic Volumes

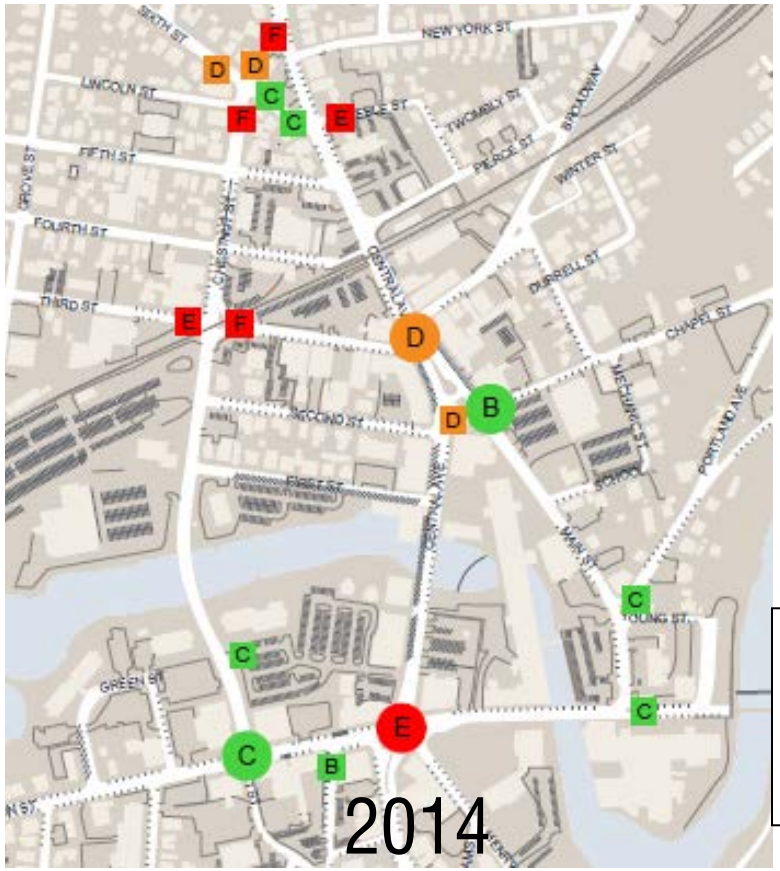
This diagram shows projected increases in the number of vehicles on major downtown streets during a typical afternoon peak hour over the next 20 years. This incorporates projected traffic demand from anticipated development in 16 sub-areas (shows in purple outline) of the downtown.

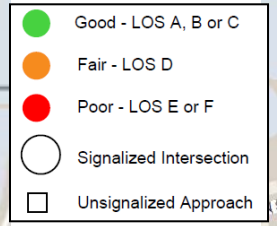


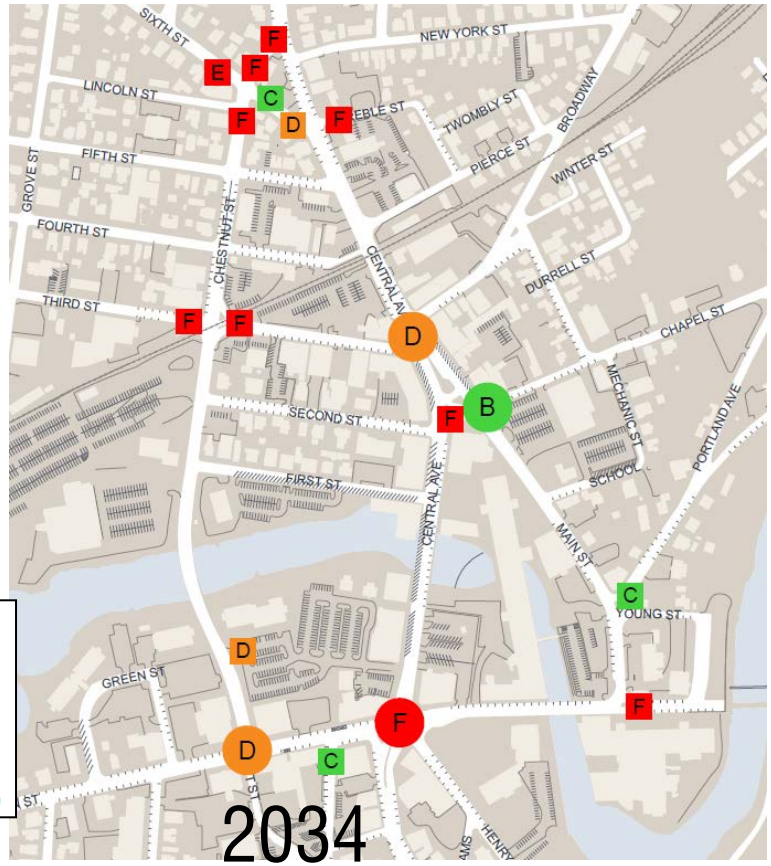
Review: Analysis, Issues and Opportunities

Projected PM Peak Level of Service

These two diagrams depict Level of Service (LOS), a graded measure of vehicular delay at intersections. LOS is based on traffic volumes and turning movements. By 2034, LOS in most major intersections would worsen (for example, from C to D) if the existing street network remains in its current configuration.







Review: Analysis, Issues and Opportunities

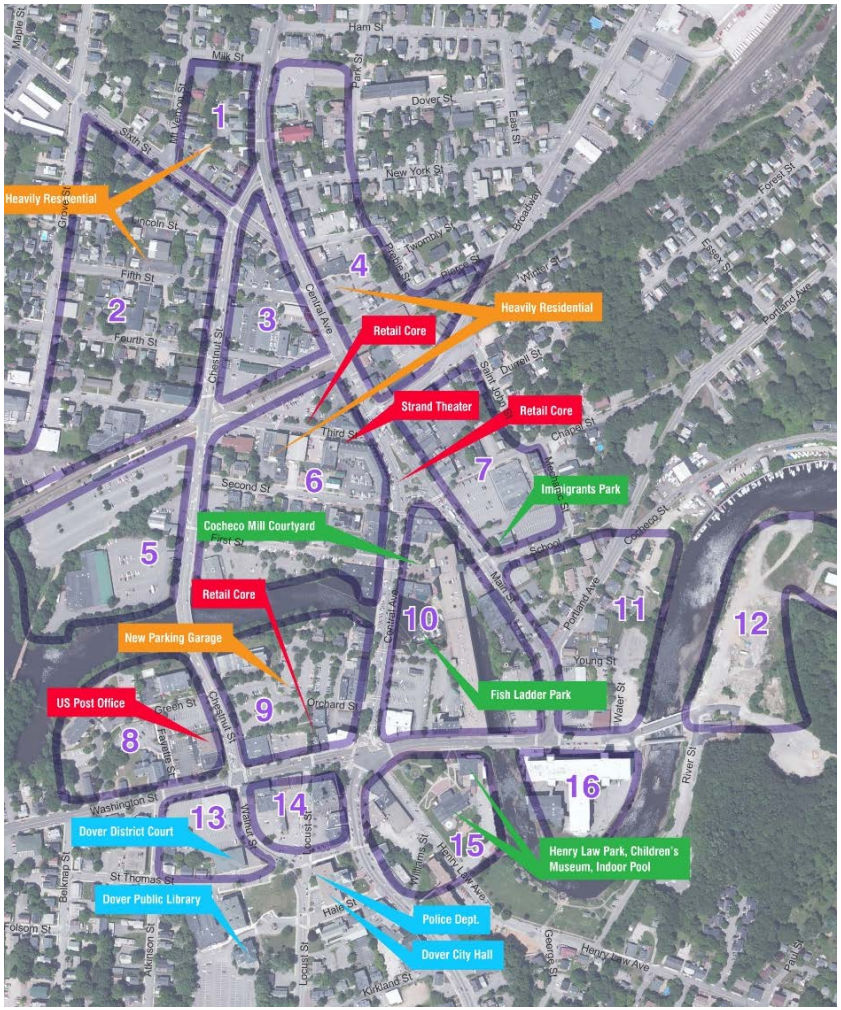
Parking Evaluations

- Previous parking studies have been reviewed and updated.
- With the addition of the new City parking facility (south of the river near new police station), the parking inventory will be able to support the downtown needs.
- An enhanced pedestrian network is a key aspect of an effective downtown parking and shared parking solution, by allowing people to walk between their cars and their destinations.
- Over the long-term, some additional public parking facilities may be needed in strategic locations to help support economic growth and revitalization.

Review: Analysis, Issues and Opportunities

Activity Generators

- The locations of development – in particular the major retail, transportation, civic, and entertainment destinations – affect where people walk in downtown.

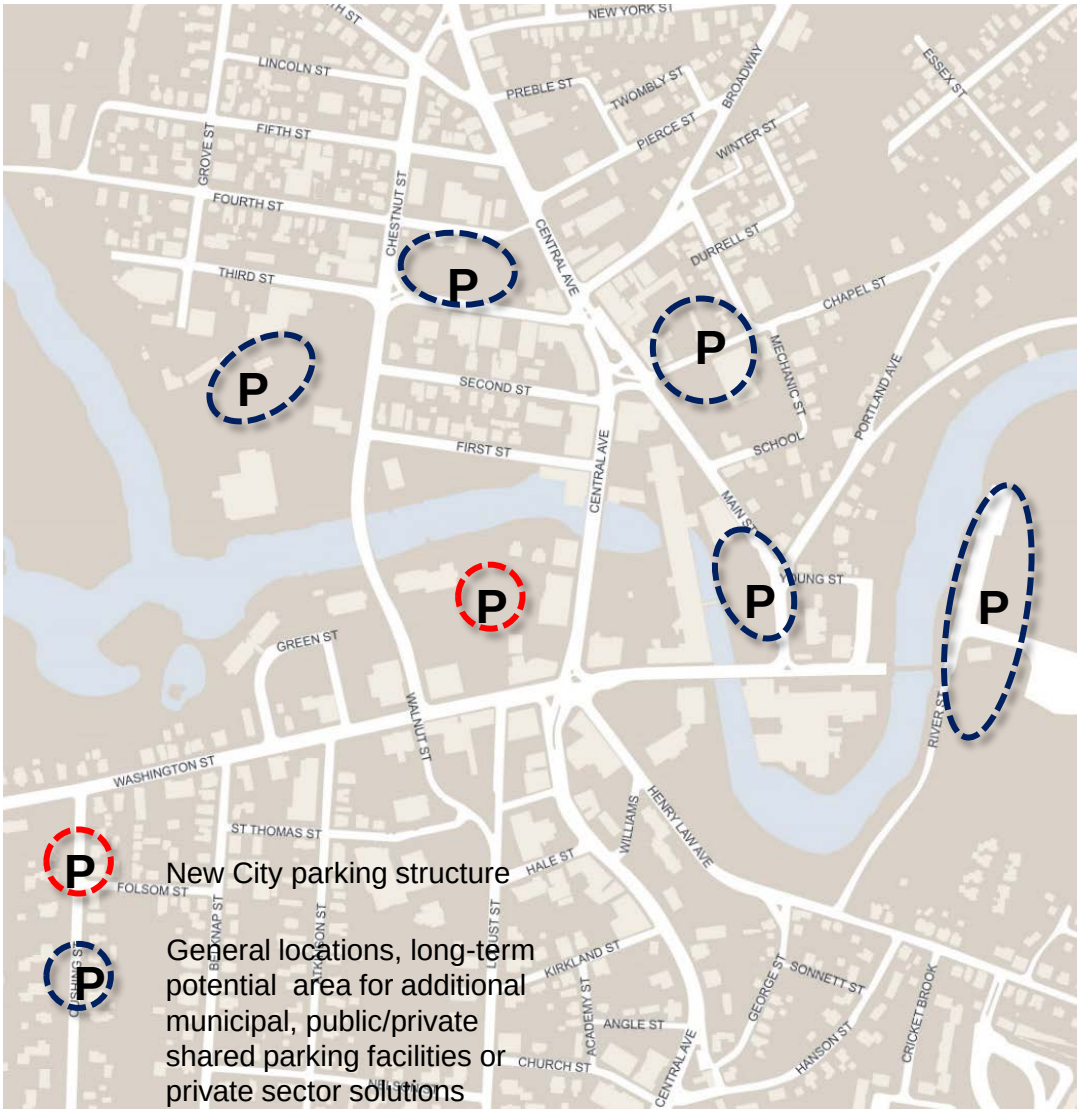


Review: Analysis, Issues and Opportunities

Parking Strategy

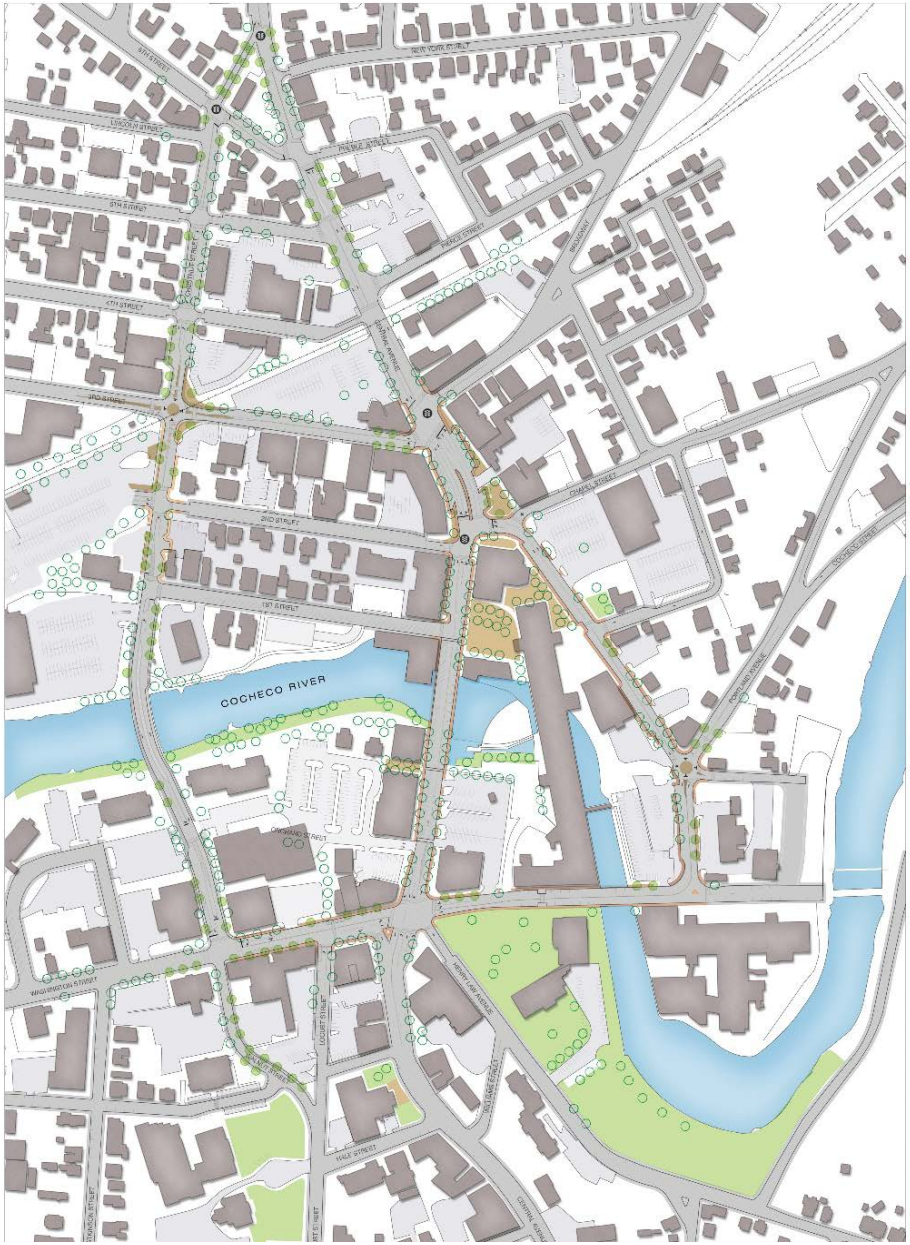
The preferred plan is generally "parking neutral" relative to existing conditions with limited re-organization of spaces, and minor reductions in spaces due to enhanced safety or providing a better pedestrian environment.

The new City parking structure (between the river and Washington Street) will add significantly to the supply of parking. And 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.



Overall Plan Recommendations

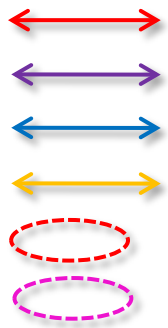
- **Pedestrian network** - complete upgrade of all sidewalks, complete and safe crosswalk network
- **Streetscape** - complete streetscape strategy to provide additional trees, create pedestrian-scale lighting, and provide amenities and enhancements on key streets and locations
- **Circulation pattern** – provide predominantly two-way circulation, except where it impedes intersection operations or streets are too narrow
- **Squares** – Substantially re-organize Upper and Lower Squares



Overall Plan Recommendations

Pedestrian Realm and Connectivity

- Provide special paving treatment in Upper Square, Lower Square, along the “triangle”, and near the transit hub
- Add sidewalks where they are missing, repair or rebuild damaged sidewalks, make all sidewalks ADA compliant
- Provide pedestrian-level wayfinding signage to link different destinations
- Complete the crosswalk network with painted crosswalks at all locations except where it would be unsafe



Significantly improved pedestrian connections

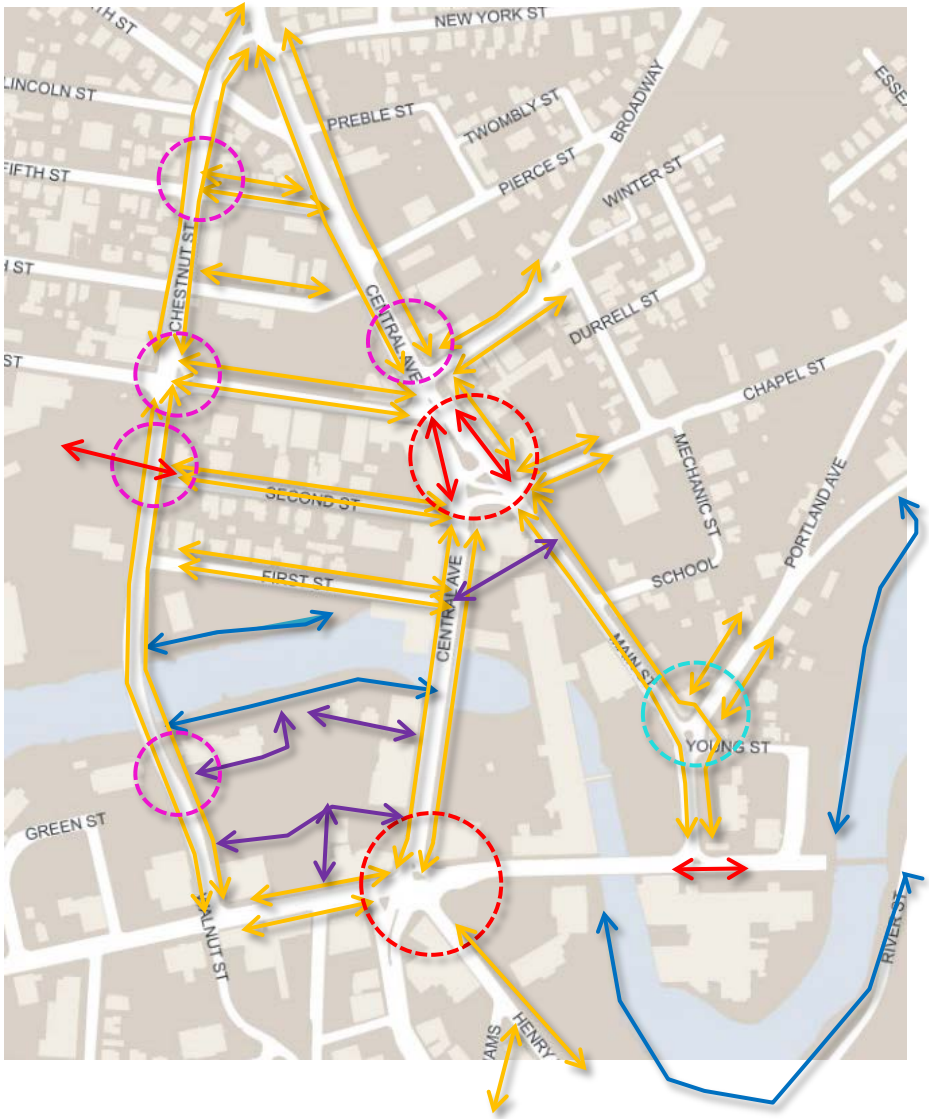
Improved through-block connections

Existing and future river walk connections

Sidewalk repair/streetscape enhancements

Major crosswalk/intersection improvements

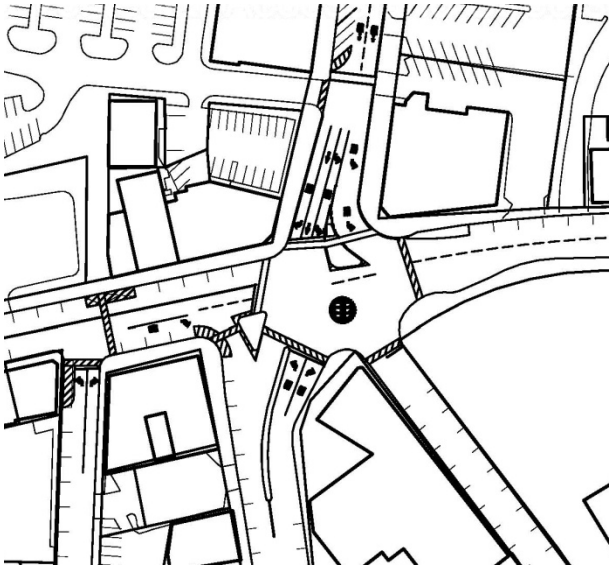
New or significantly enhanced crosswalks

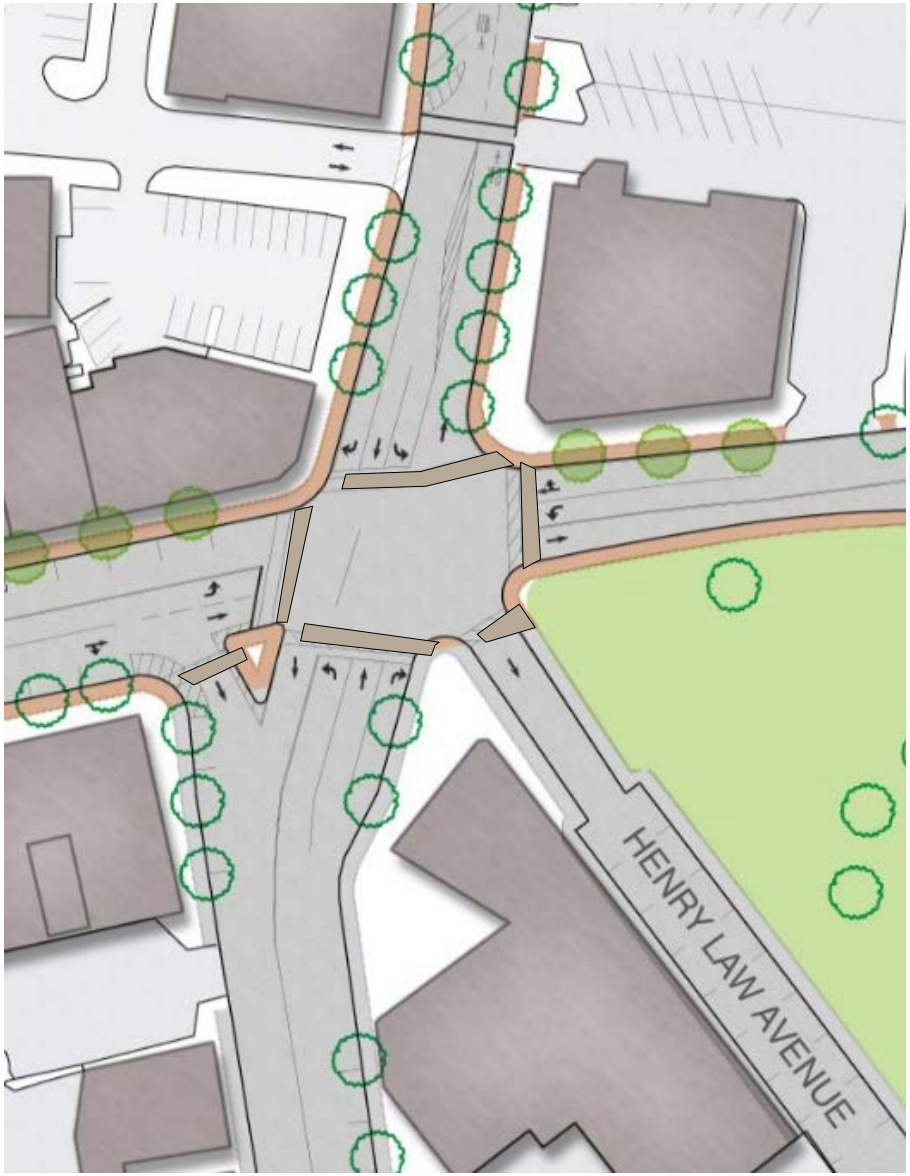


Overall Plan Recommendations

The Squares: Lower Square

- Substantially shorten the walking distances across the intersection
- Add sidewalk areas with plantings, amenities and directional signage
- Improve the pedestrian connections to and from the Children's museum and Henry Law Park





Overall Plan Recommendations

The Squares: A View of Existing Lower Square

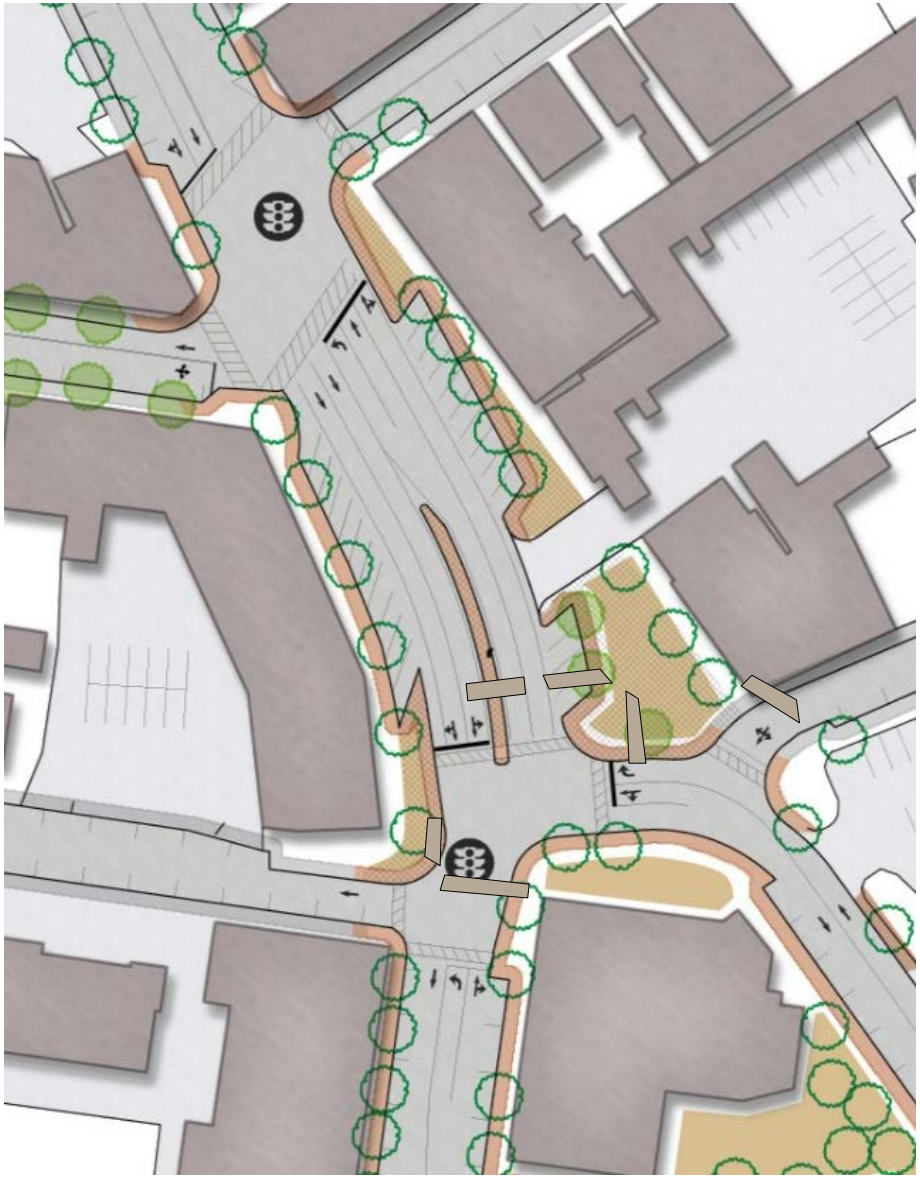
Overall Plan Recommendations

The Squares: A View of Lower Square

Overall Plan Recommendations

The Squares: Upper Square

- Re-organize the intersection so that the open space is next to the sidewalks, create a useable civic space
- Create short, well-controlled crosswalks linking the entire area



Overall Plan Recommendations

The Squares: View of Existing Upper Square

Overall Plan Recommendations

The Squares: View of Upper Square

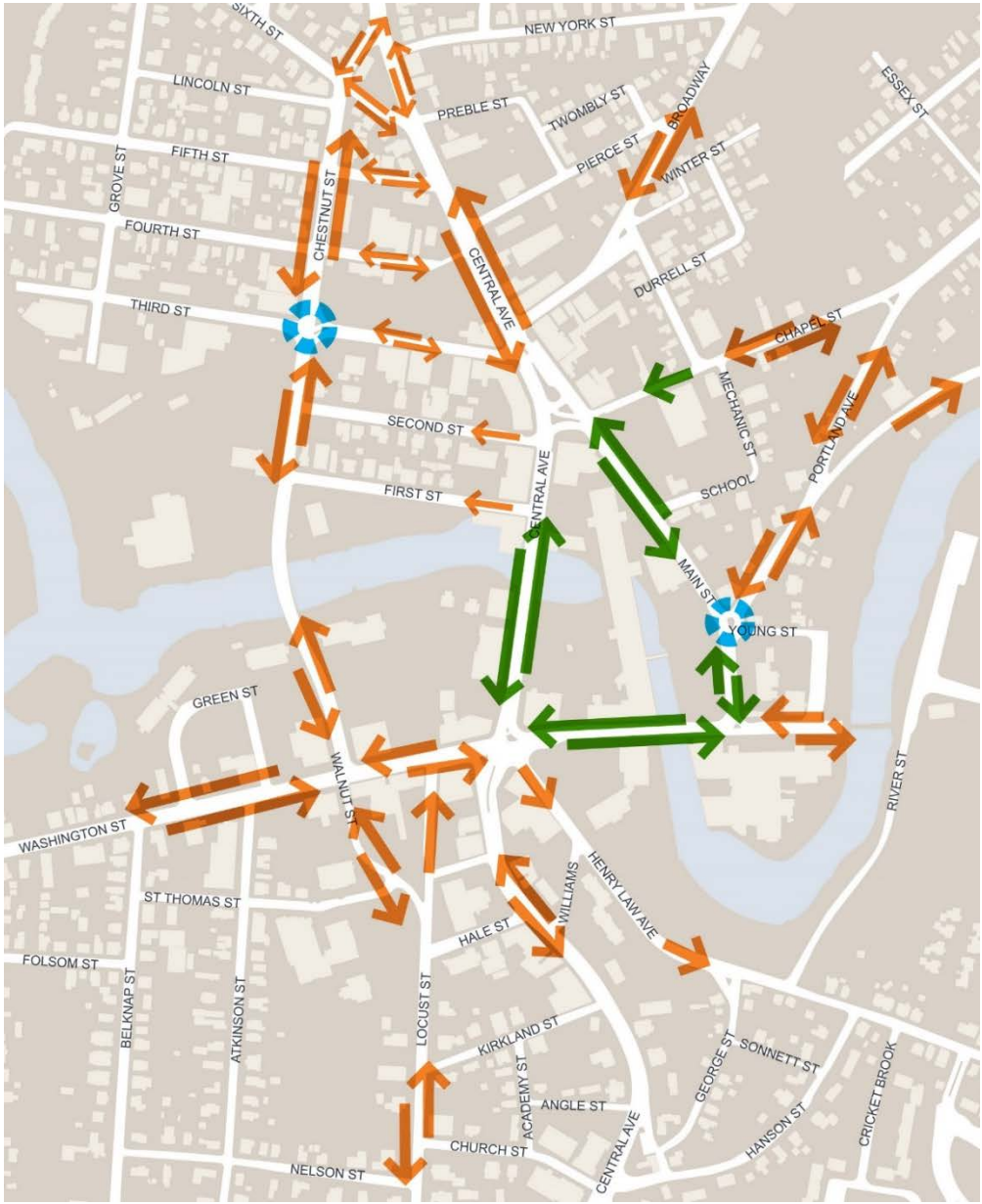
Vehicle Circulation

Existing Circulation Patterns

Vehicle Circulation

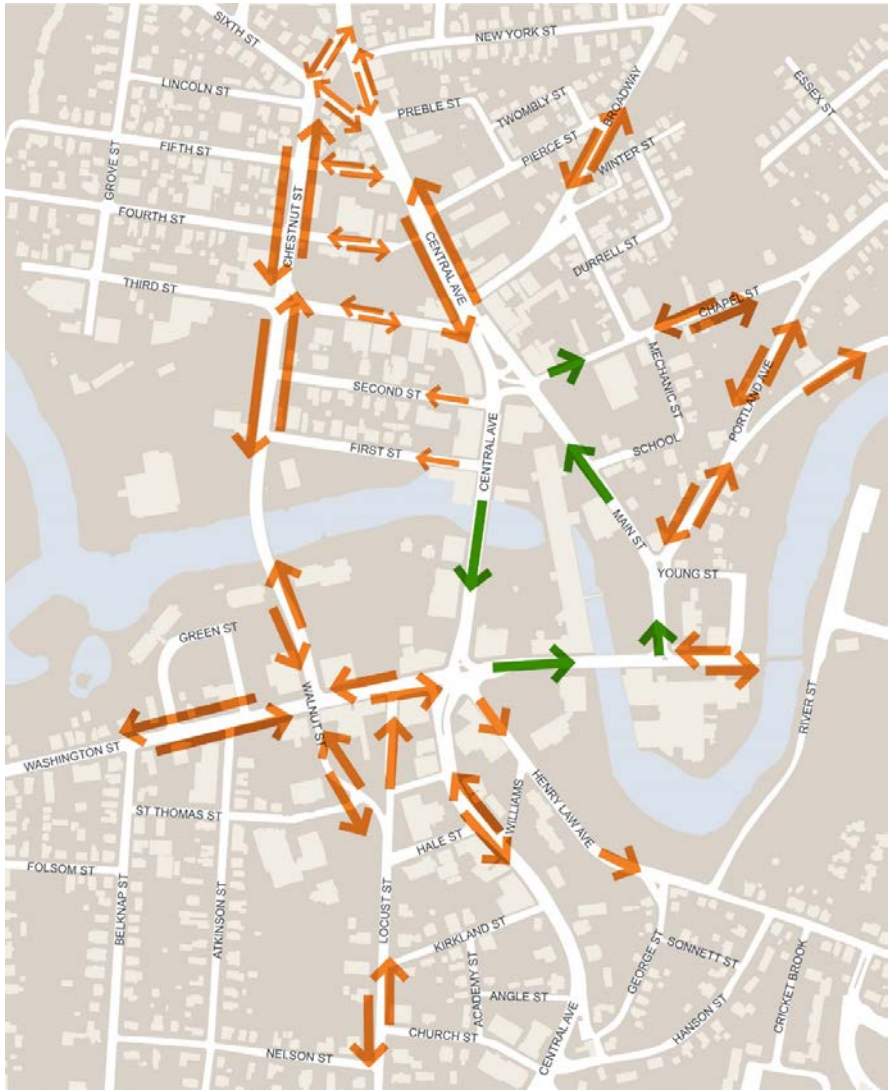
Preferred Circulation Patterns

- Two-way traffic where roadway width and intersection configurations allow
- Two-way traffic along all of Central Avenue, Main Street, and Washington Street
- Continuous two lanes for through-traffic on Chestnut Street, with left hand turn channels
- Two mini-roundabouts, at Portland/Main Streets and 3rd and Chestnut
- New signalization at Chestnut and Central Avenue, and at Upper Square, to facilitate turning movements

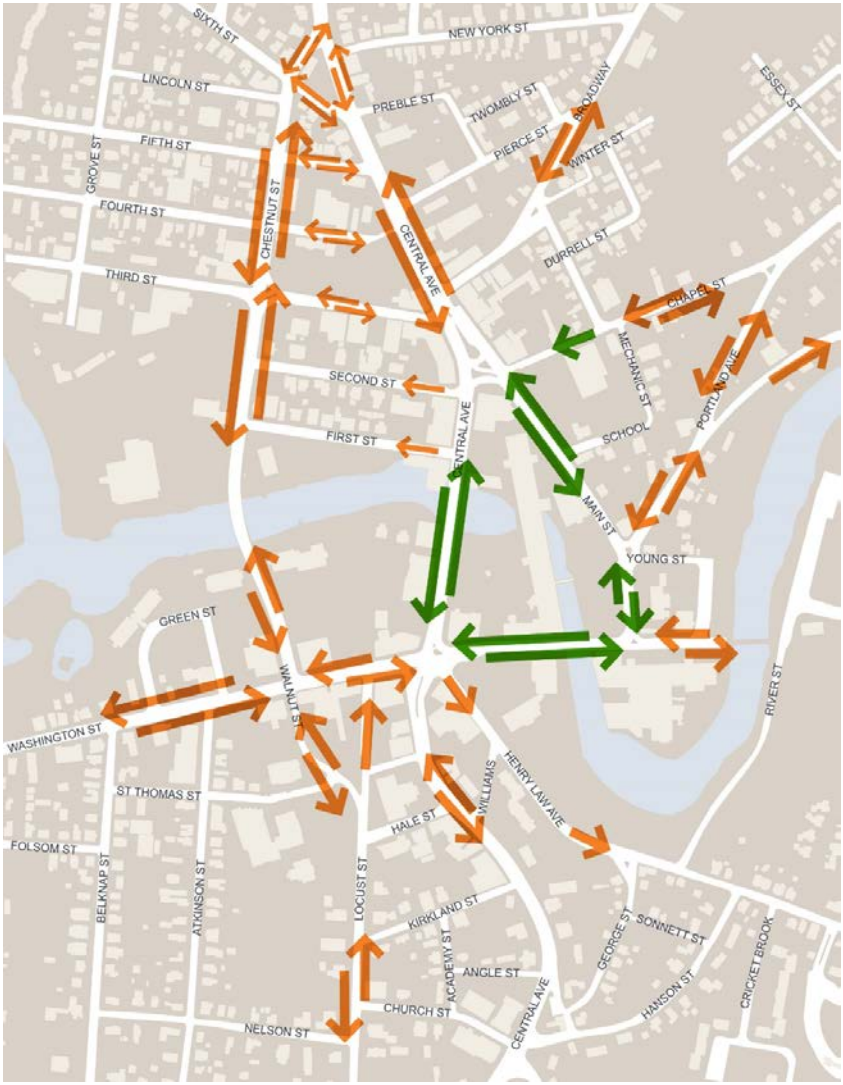


Vehicle Circulation

Existing Traffic Flows

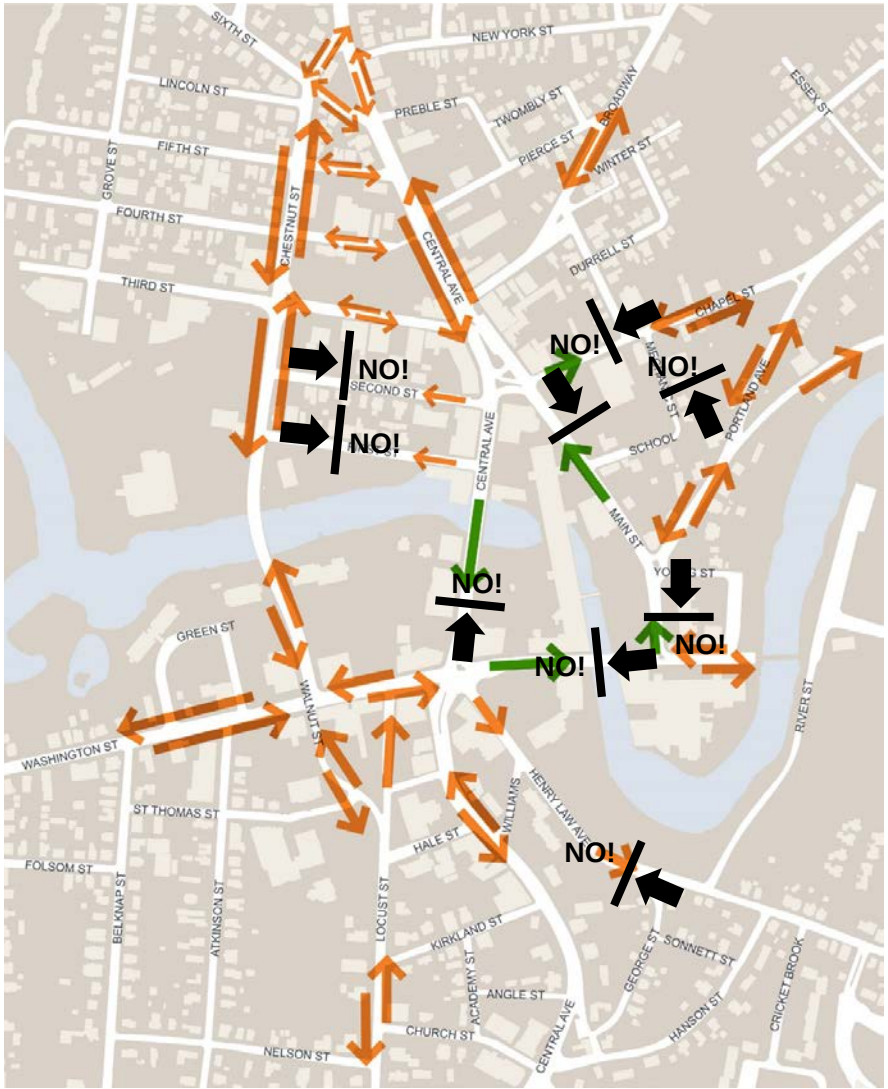


Major Traffic Circulation Changes

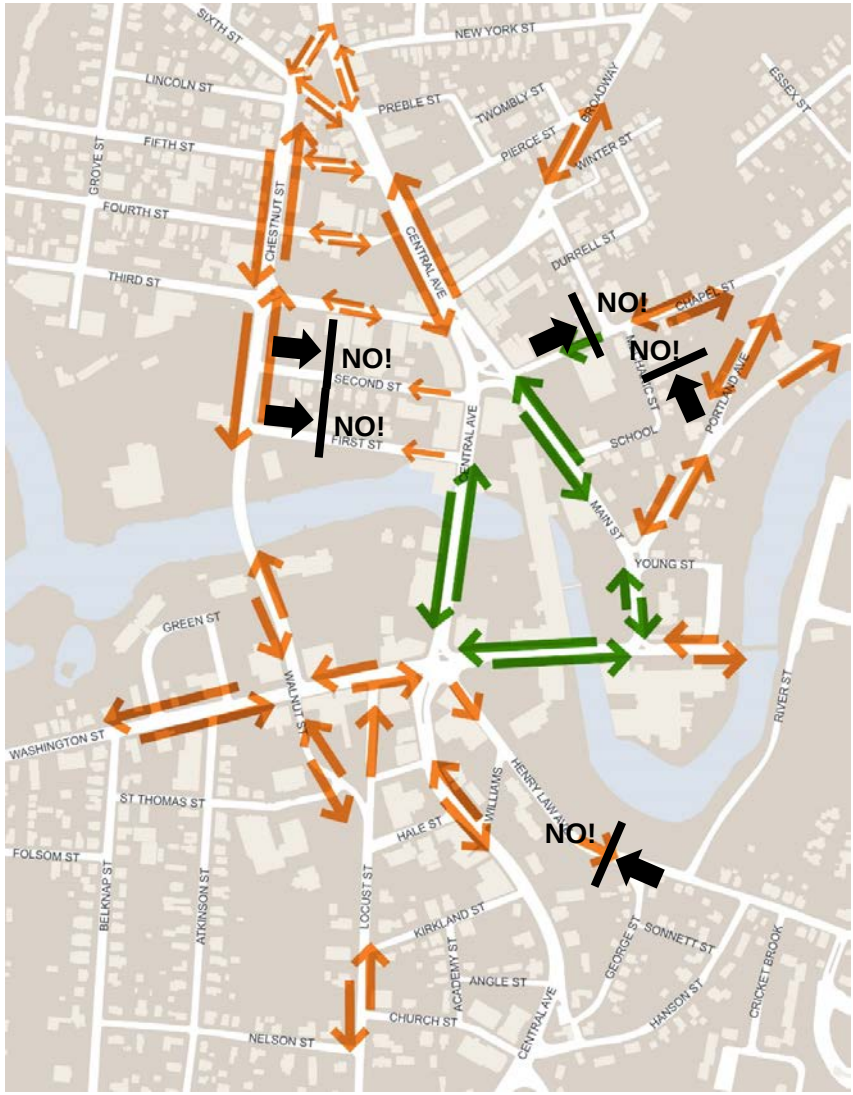


Vehicle Circulation

Existing One-Way Restrictions



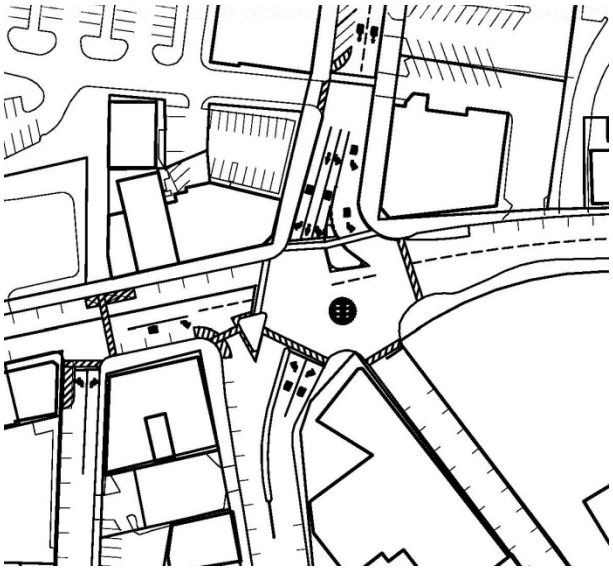
Preferred Plan: One-Way Restrictions

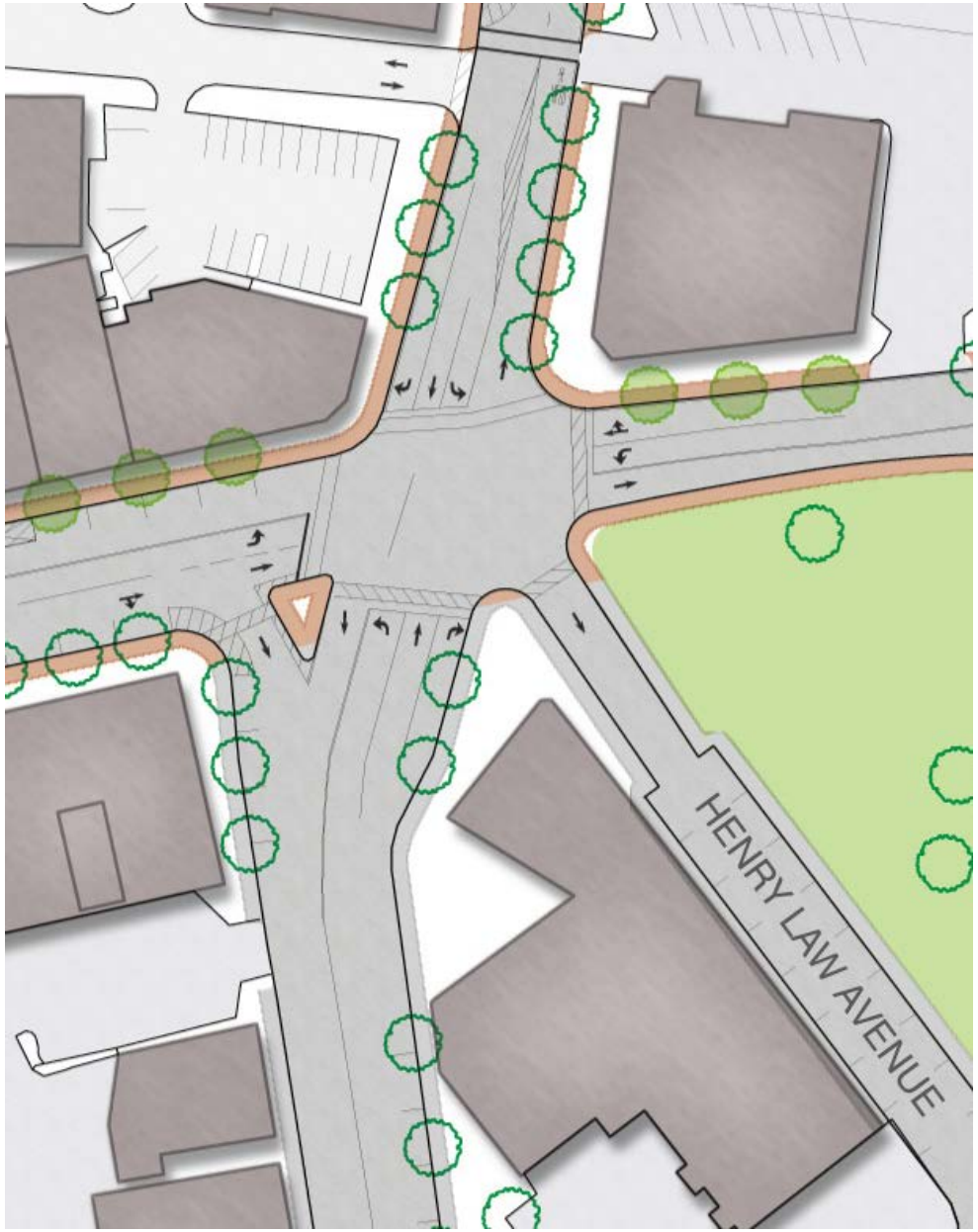


Vehicle Circulation

The Squares: Lower Square

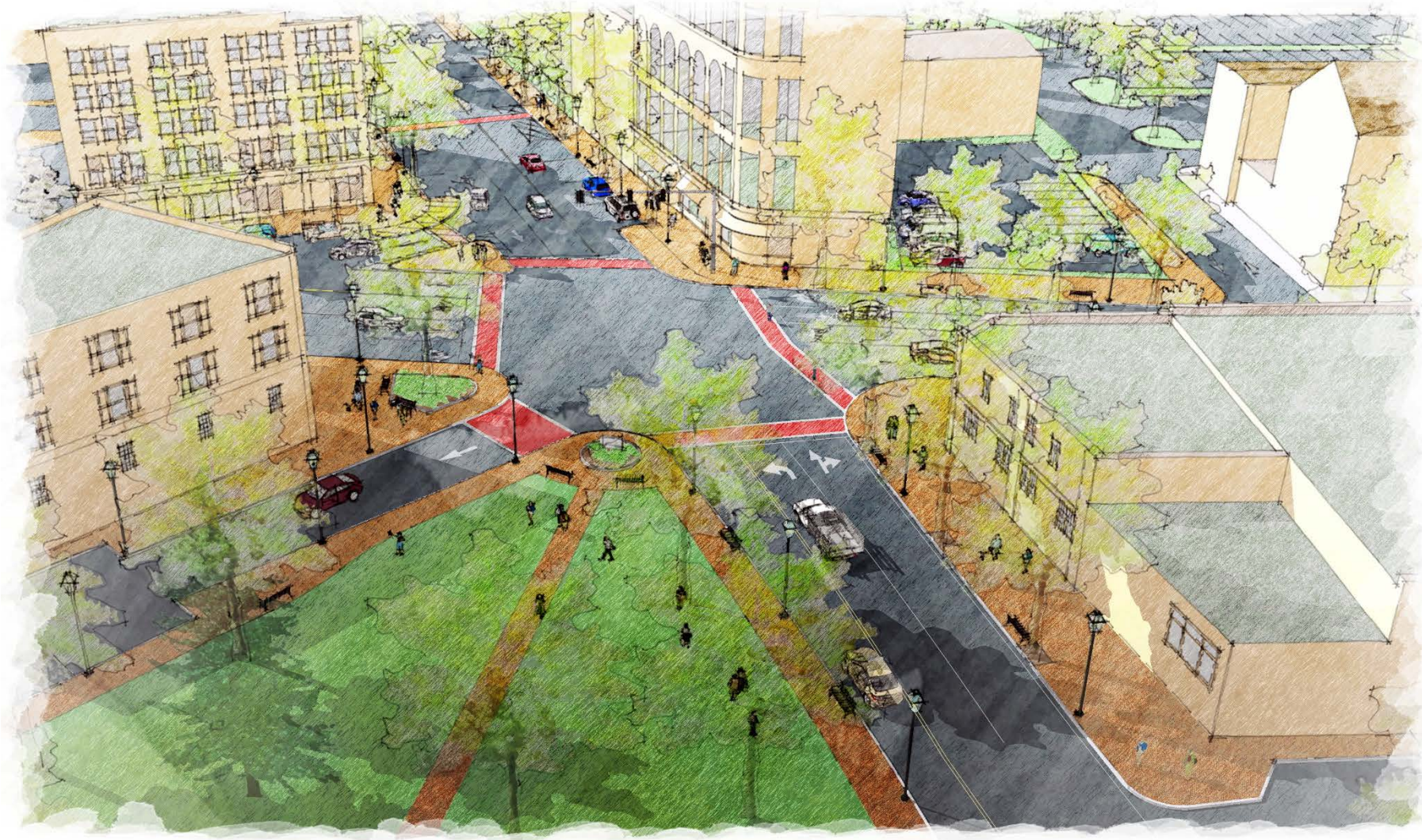
- Increased capacity at intersection for northbound traffic on Central
- Henry Law remains one way southbound





Vehicle Circulation

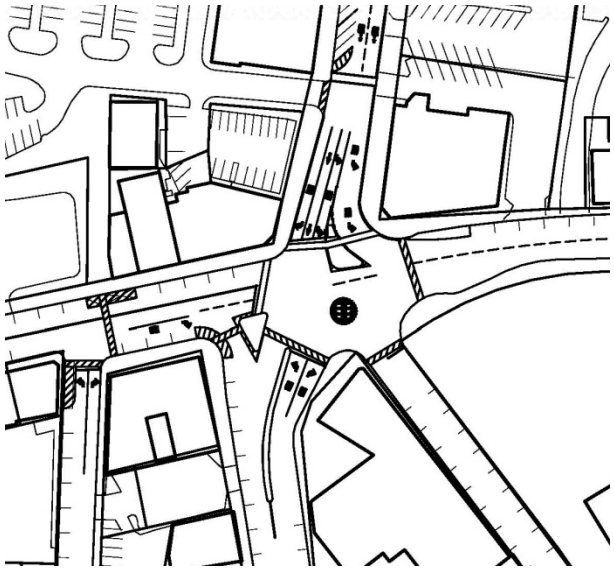
The Squares: View of Lower Square

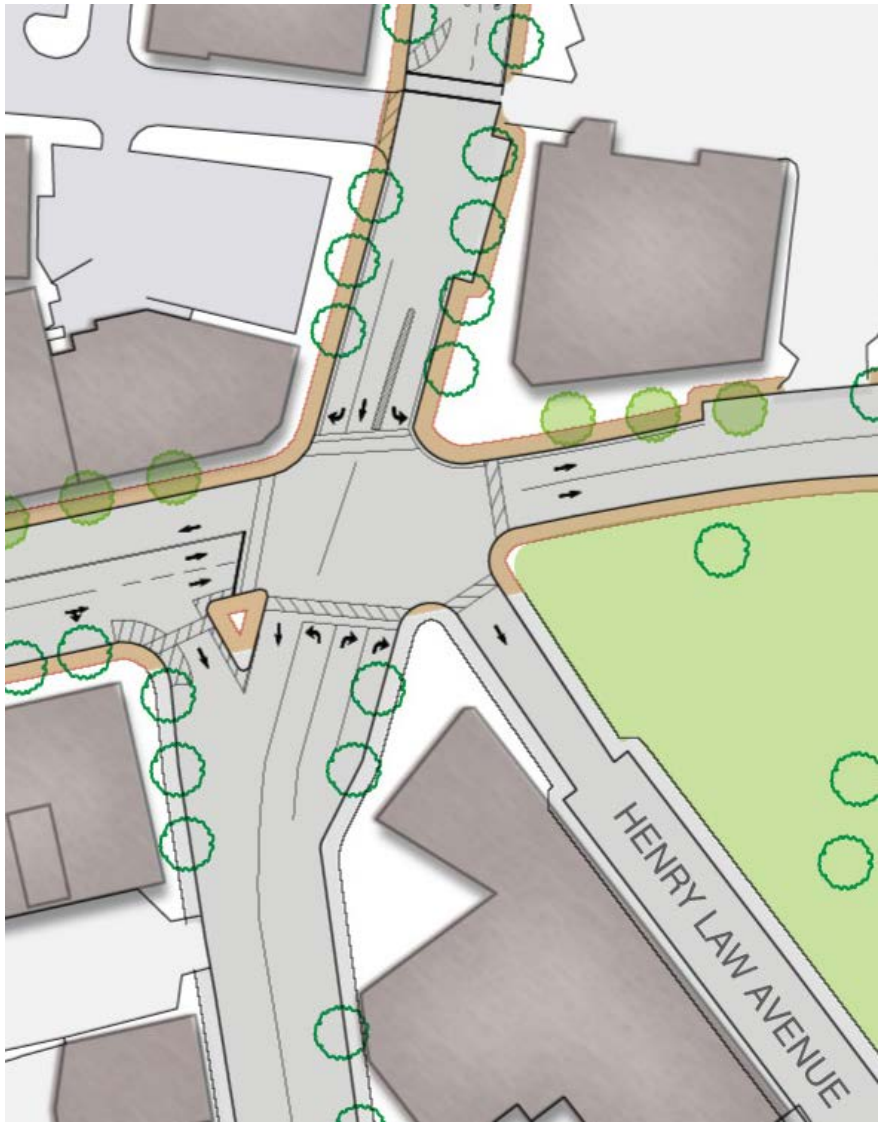


Vehicle Circulation

The Squares: Lower Square and One-Way Circulation

- Similar changes could be made if a one-way system were retained on Washington and Central, but the intersection would not function as efficiently

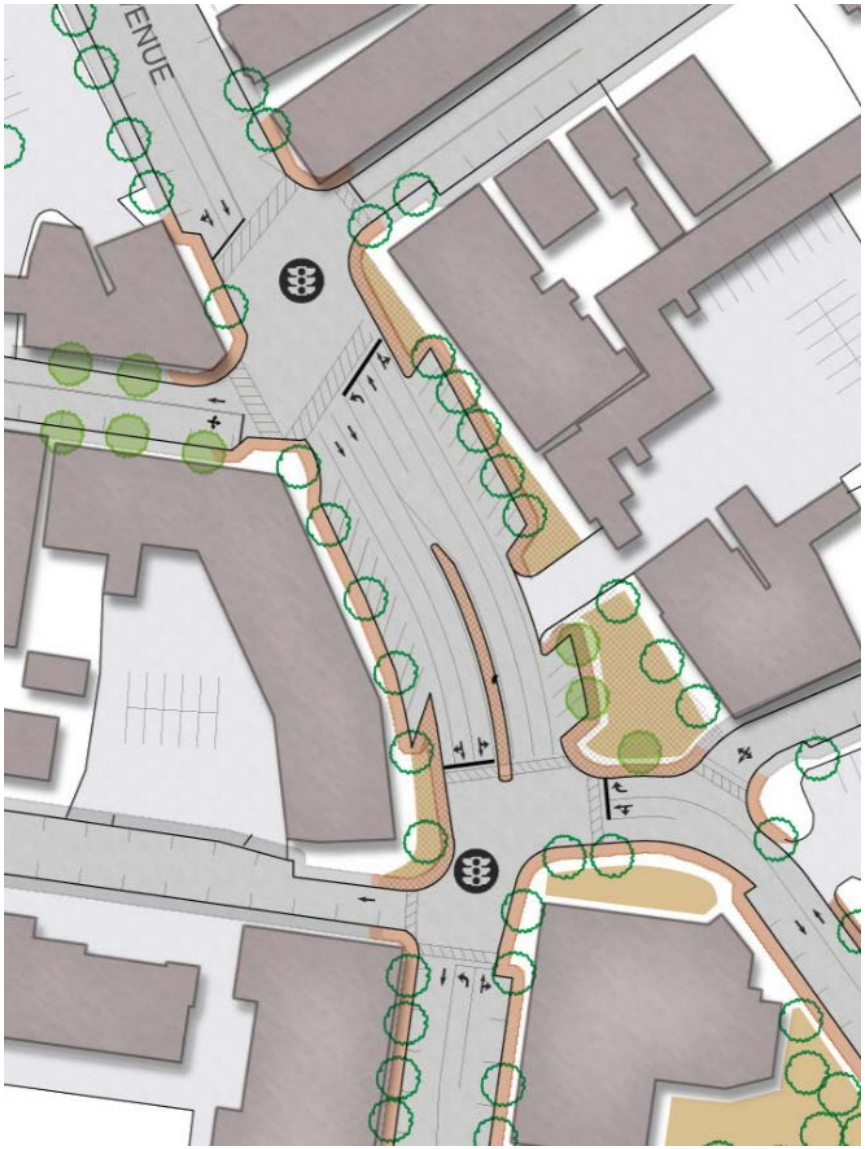




Vehicle Circulation

The Squares: Upper Square

- An efficient, three-way intersection would be created and signalized, substantially improving safety and operations.
- Chapel Street would flow into the Square, rather than away from it



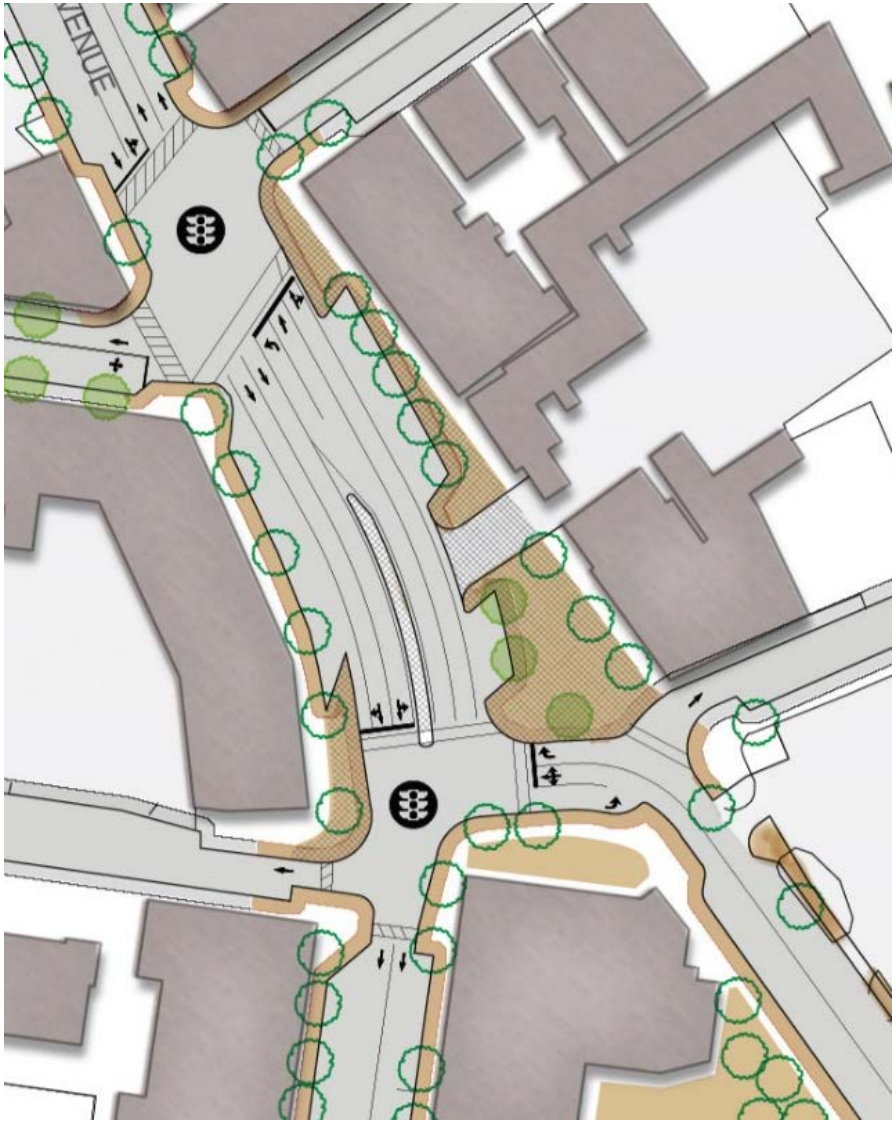
Vehicle Circulation

The Squares: View of Upper Square

Vehicle Circulation

The Squares: Upper Square and One-Way Circulation

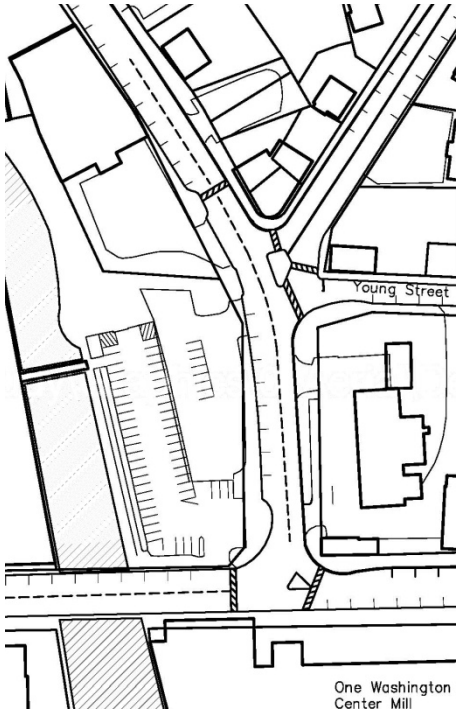
- Similar improvements could be made if Central and Main were one-way.
- However, the left turn into Chapel could cause back-ups if it remains with the same directions as today.

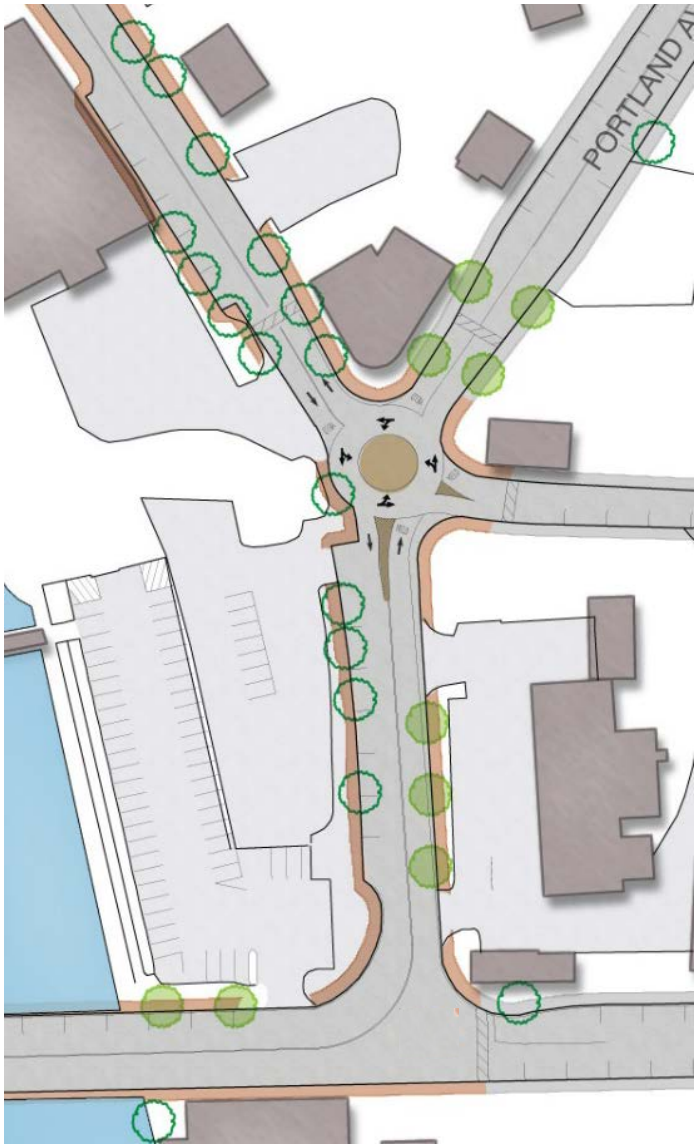


Vehicle Circulation

Segments and Intersections: Portland Street and Lower Main

- Allow all turns at Portland and Main Street with a mini-roundabout
- Allow all turns at Washington and Main

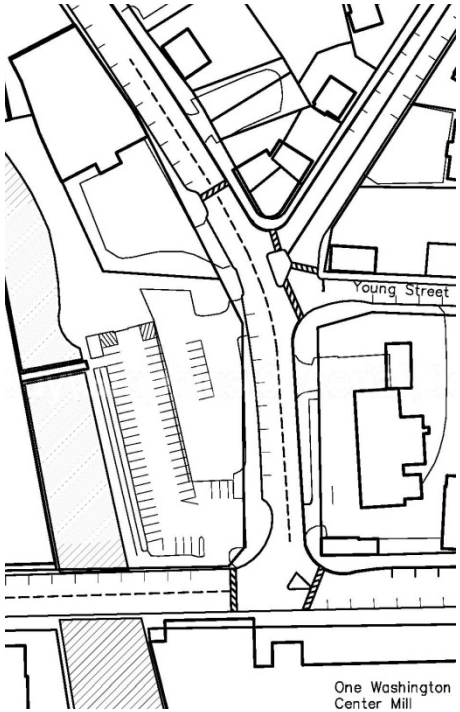


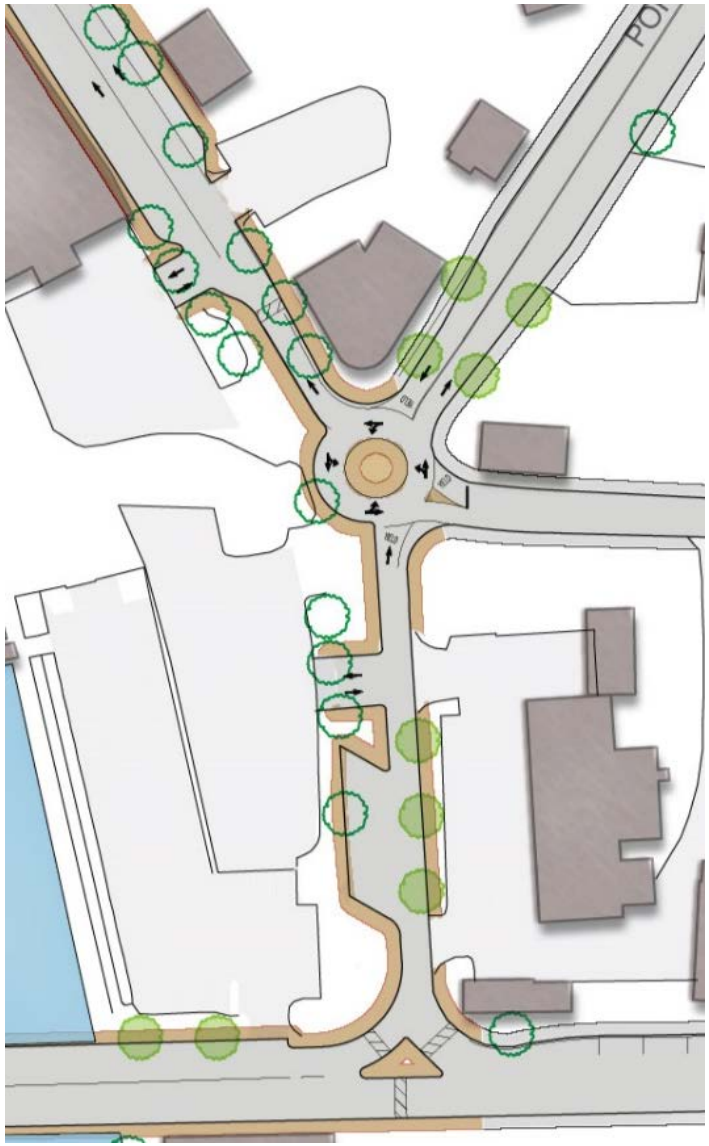


Vehicle Circulation

Segments and Intersections:
Portland Street and Lower Main: One Way

- A one way system on Main Street would require dividing Washington Street traffic into two lanes, with one lane carried northwards into the mini-roundabout

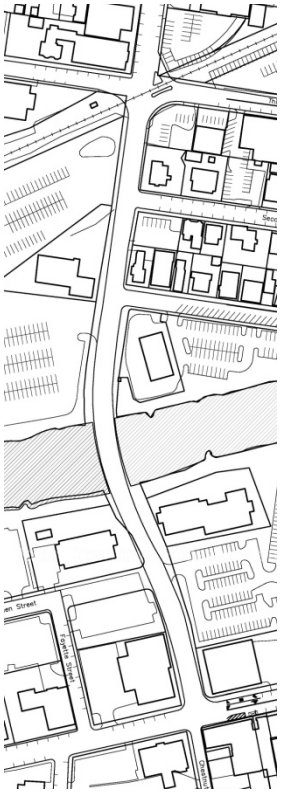




Vehicle Circulation

Segments and Intersections: Lower Chestnut to the Transportation Center

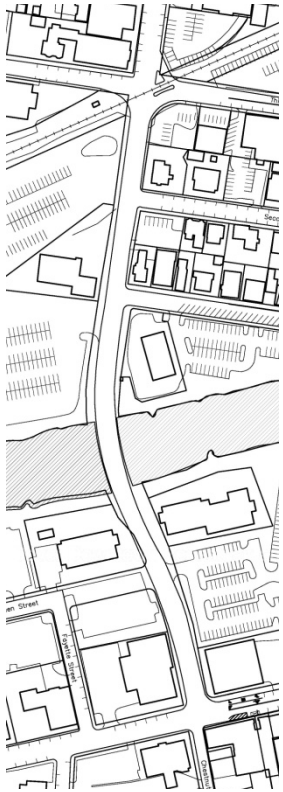
- Turning lanes, crosswalks, bus stops and shelters would be organized around the new entrance to the City parking garage to facilitate safe crossings and avoid traffic congestion.
- A paved island with seasonal planting would be created on the bridge.
- Curb cuts would be reorganized and better pedestrian connections created at the Transportation Center
- A mini-roundabout would join Chestnut and 3rd Street



Vehicle Circulation

Upper Chestnut and Central Avenue

- A signal would be created at Chestnut and Main to enable safer northbound turns
- Sidewalks would be widened, street trees added, and crosswalks and lighting improved and added



Level of Service

2035 Evening Peak Hour Level of Service Summary

Central Ave Corridor

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**	**61**	**0.78**
EB, along Washington St		F	>100	-		E	66	-
WB, along Washington St						F	87	-
NB, along Central St		F	>100	-		C	33	-
SB, along Central St		E	66	-		E	79	-
Central Ave/Preble St								
EB, from Sixth St	STOP	D	25	0.55	STOP	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**		**D**	**46**	**0.78**
EB, along Third St		C	27	-		E	56	-
WB, along Third St		E	59	-		F	88	-
NB, from Main St		D	39	-		B	16	-
SB, along Chestnut St		E	57	-		D	55	-
Central Ave/Second St								
Overall	STOP					**D**	**49**	**0.85**
WB, exiting Main St		F	97	1.09		F	93	-
NB, along Central St						D	50	-
SB, along Central St						D	38	-

Level of Service

2035 Evening Peak Hour Level of Service Summary

Main Street Corridor

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**	**11**	**0.67**
WB, exiting Portland Ave	D	28.0	0.69		A	7	0.34
NB, along Main St					B	14	0.67
SB, along Main St					A	5	0.17
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

Level of Service

2035 Evening Peak Hour Level of Service Summary

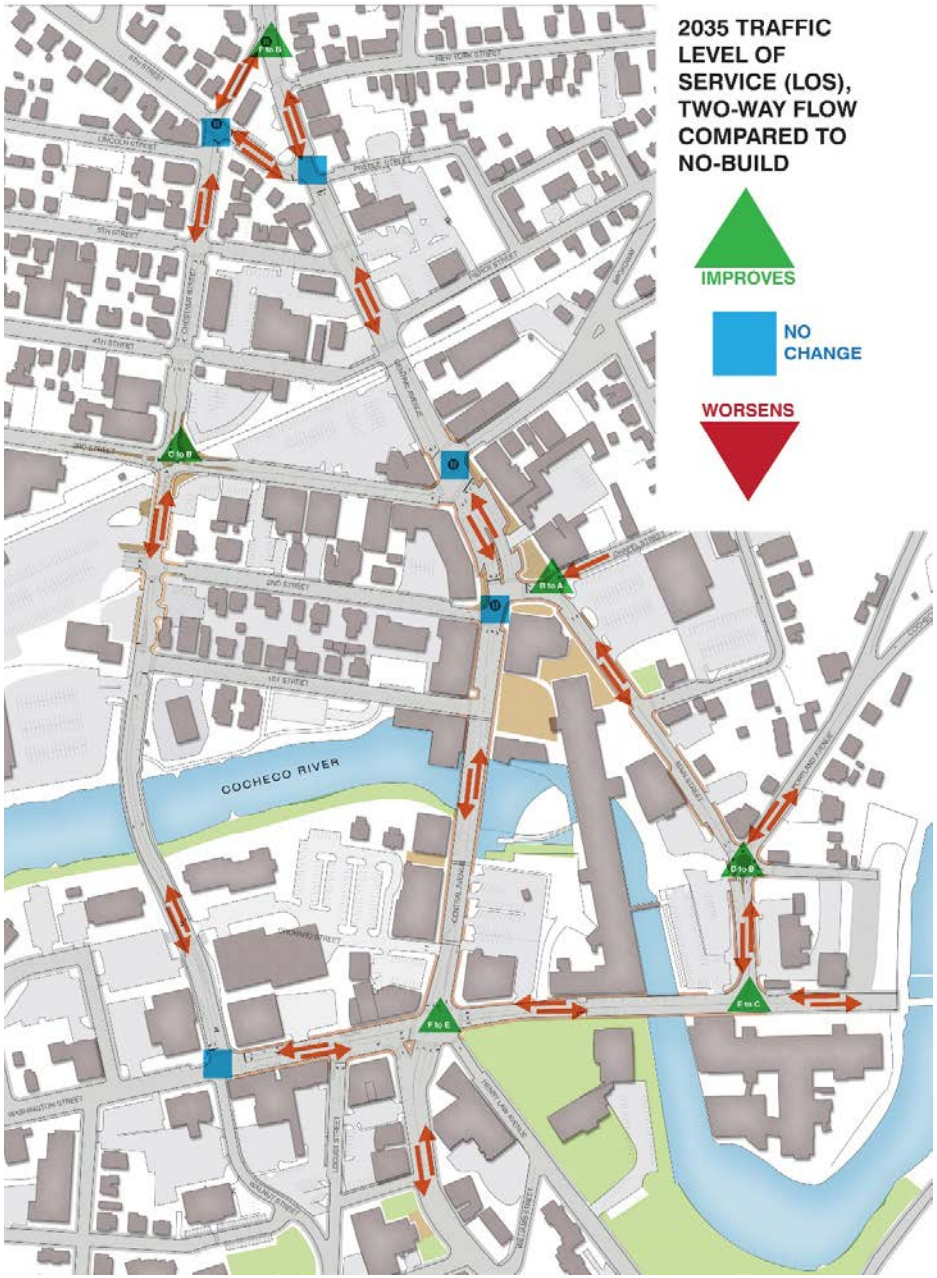
Chestnut Street Corridor

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/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	-

Vehicle Circulation

Future Levels of Services (2035), Preferred Vehicle Circulation Plan Peak Hour

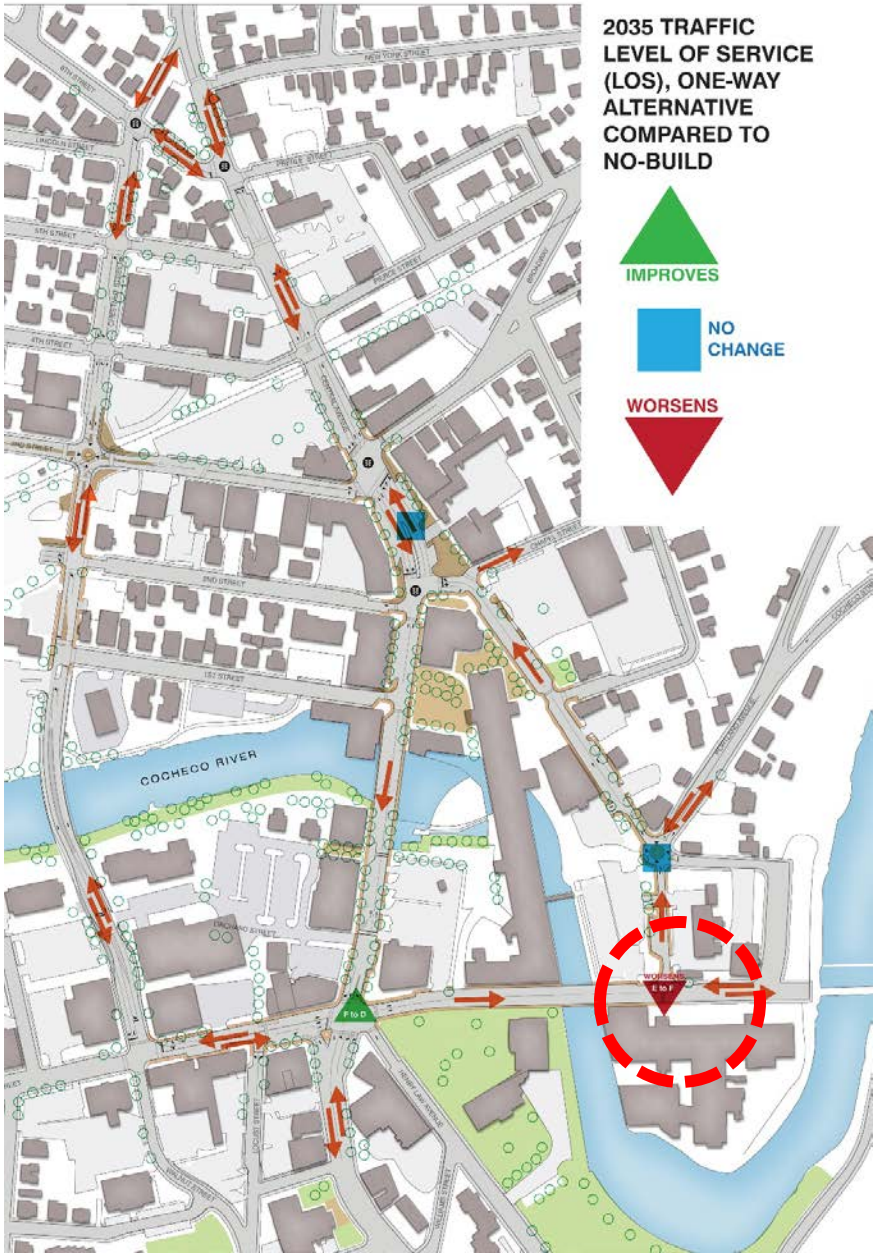
- Relative to the existing network, the preferred circulation plan will have 5 major intersections with reduced delays and improved performance, measured by Levels of Services (LOS) that are used as standards by traffic engineers
- 5 other major intersections will have no change in performance levels
- No intersections will will have worsened Levels of Service



Vehicle Circulation

Future Levels of Services (2035), One-Way Circulation Implications Peak Hour

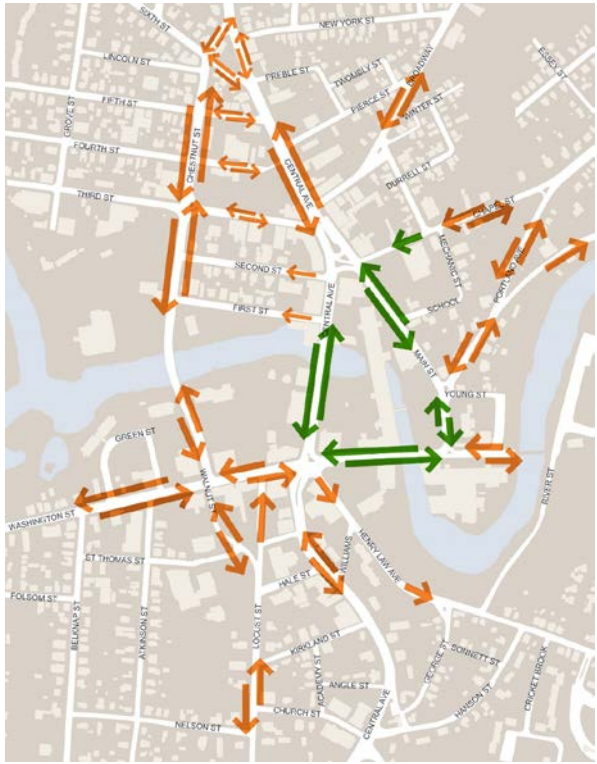
- With a enhancements that retained a one-way loop, fewer improvements in traffic conditions would occur – only one major intersection would have an improved Level of Service (Lower Square)
- The intersection of Washington Street and Main Street would have a worse Level of Service than would occur with the existing configuration



Two-Way Downtown Street Networks

Benefits Relative to One-Way Networks

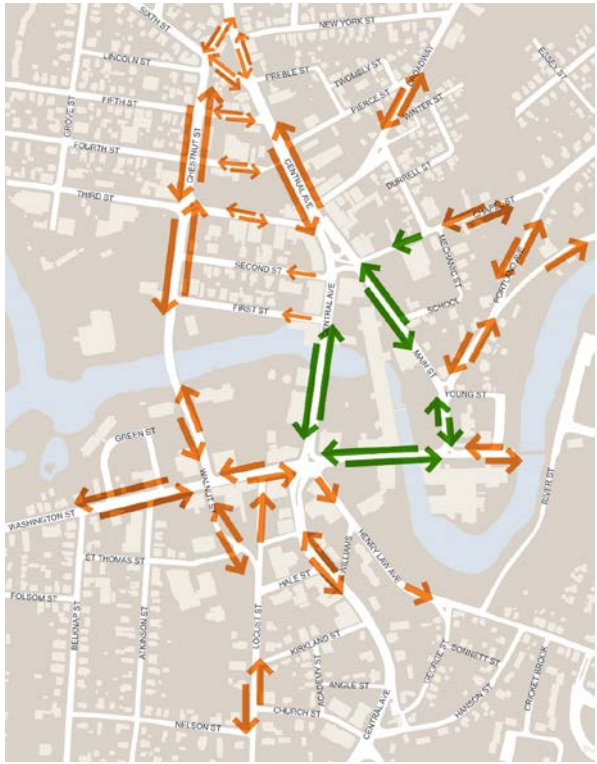
- Economics: Two-way streets provide more convenient and direct access to destinations and the ability to locate parking close by, rather than "looping" through the downtown. The purpose is to achieve higher average sales and the value of both businesses and real estate.
- Safety: Vehicular speeds tend to be lower on two-way streets to accommodate on-coming traffic flows and provided for 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.



Two-Way Downtown Street Networks

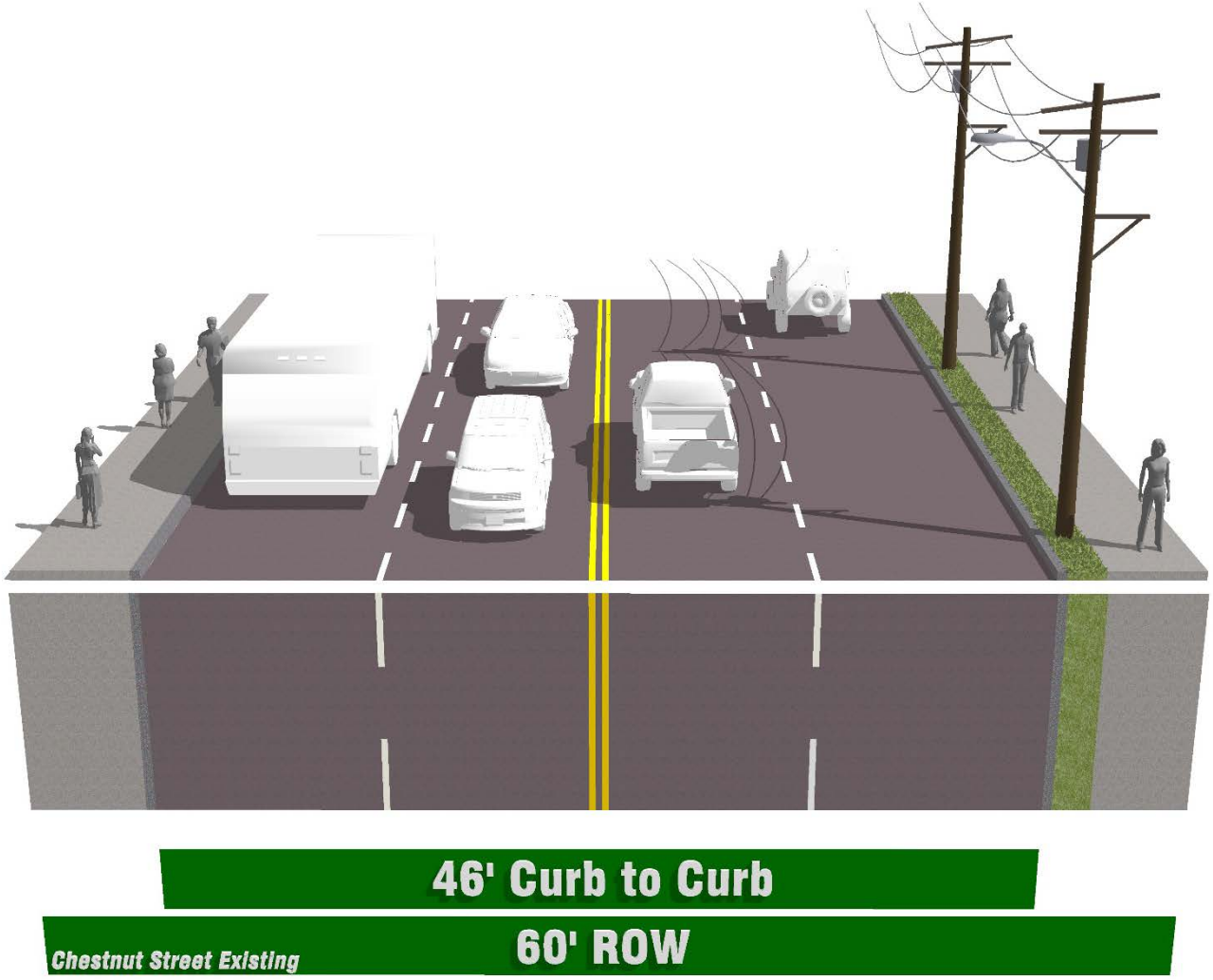
Benefits Relative to One-Way Networks

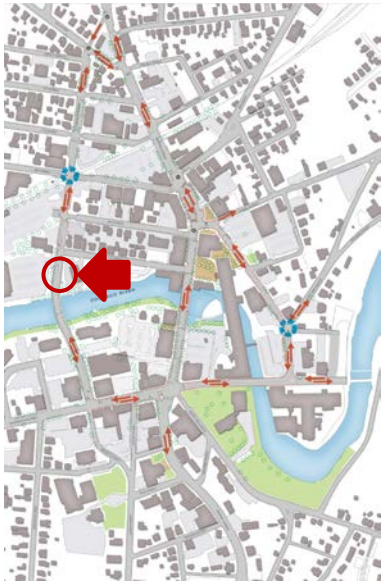
- **Navigation and Wayfinding:** One-way street networks tend to be confusing for visitors, who may need to take long and indirect routes to reach their destinations, and may require extended detours if they do not find their destination or convenient parking at first. One-way circulation also tends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



Streetscape Character

Existing Chestnut Street

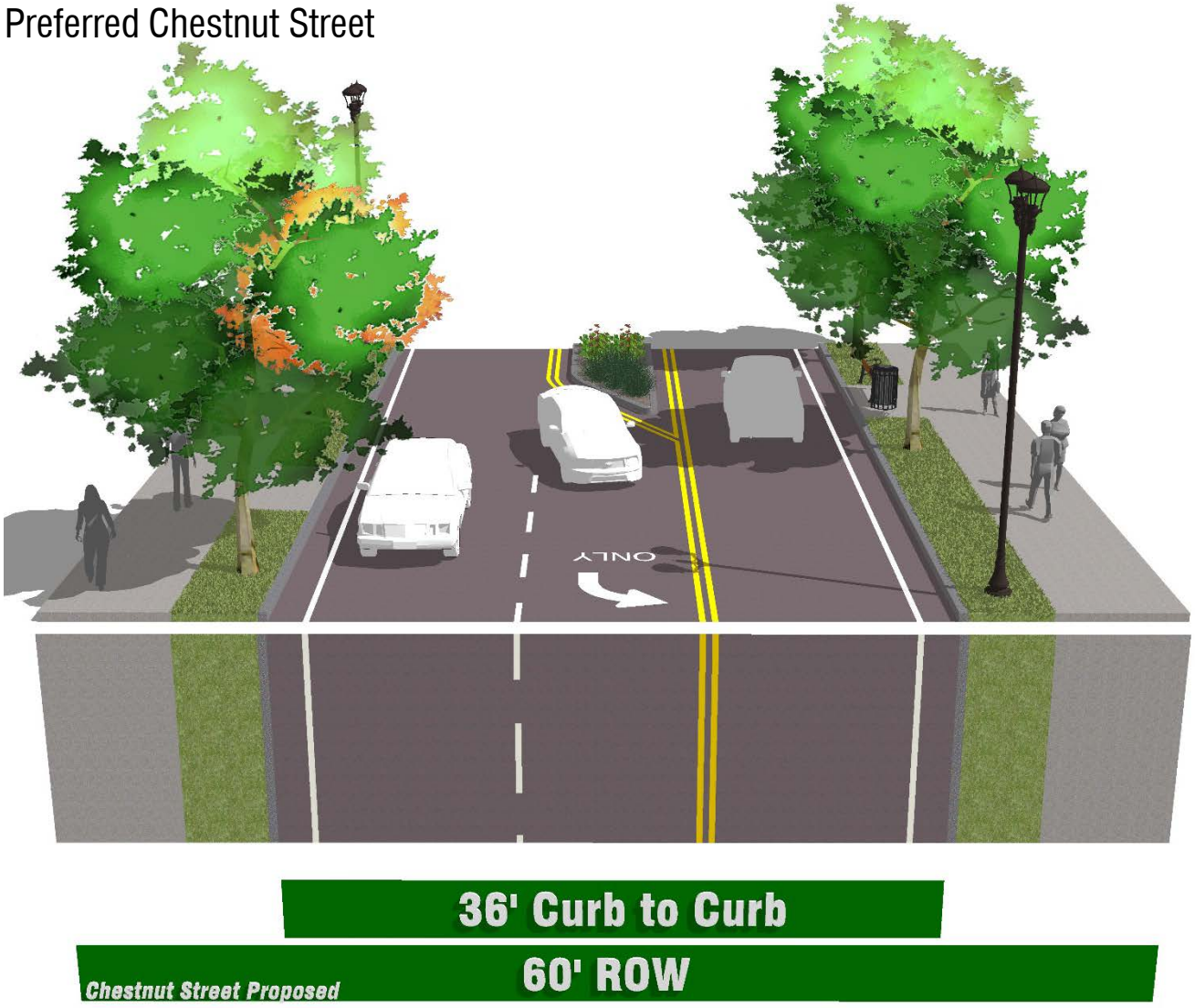


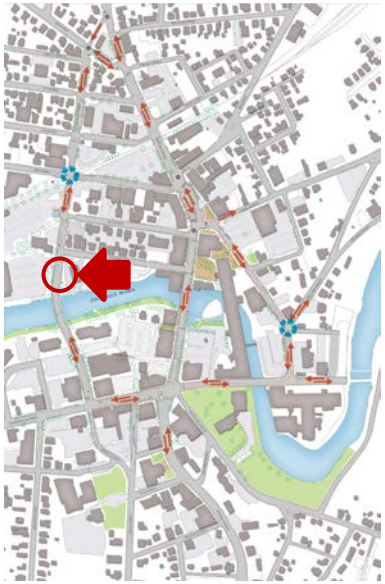


Streetscape Character

Preferred Chestnut Street

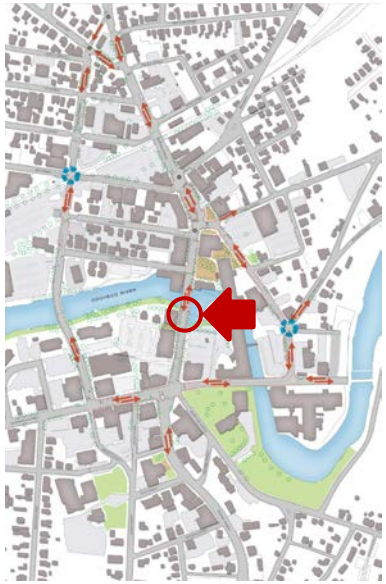
- ~10’ of reallocated ROW





Streetscape Character

Existing Central Avenue

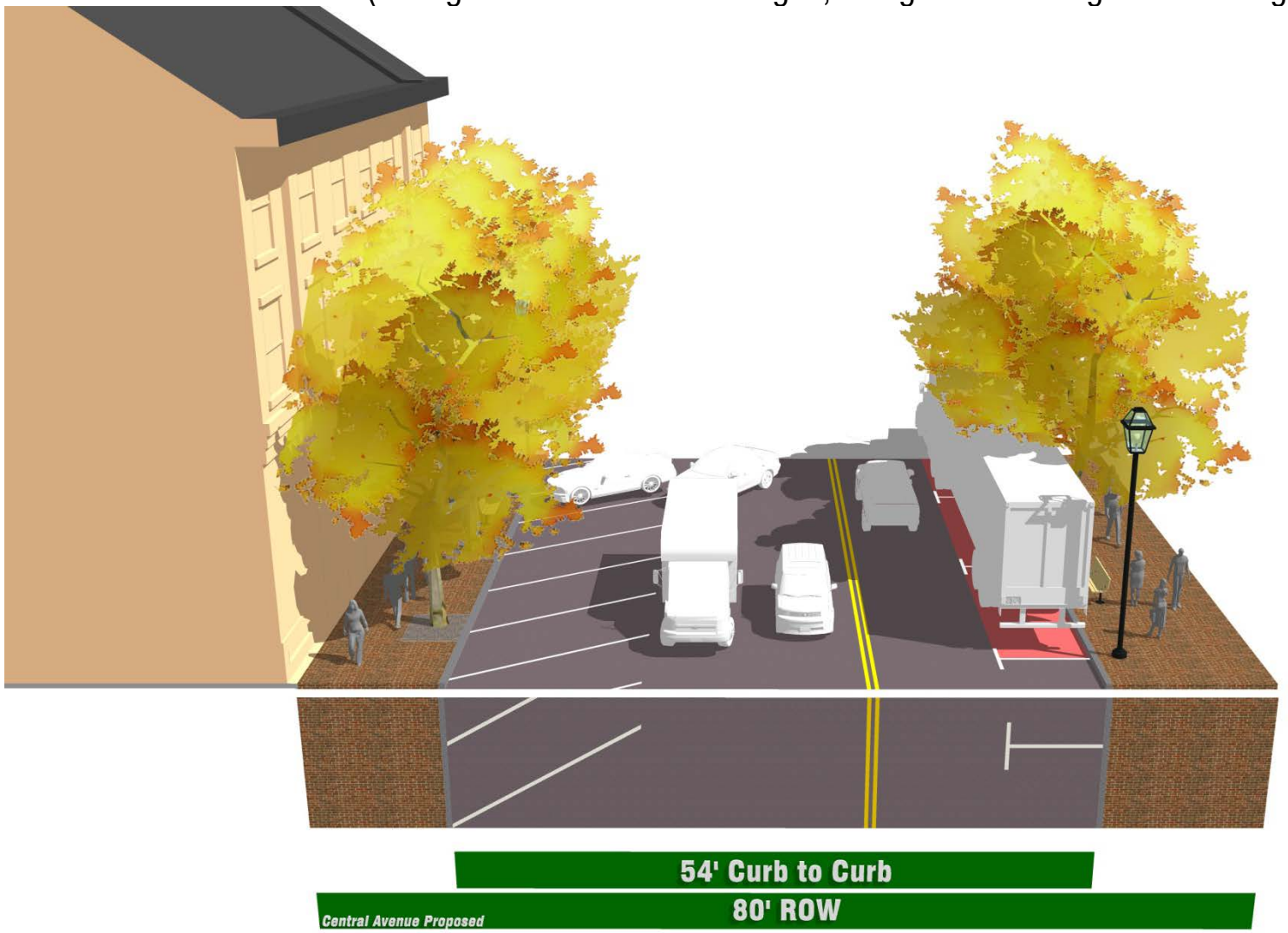


Streetscape Character

Preferred Central Avenue (no significant curb line changes)

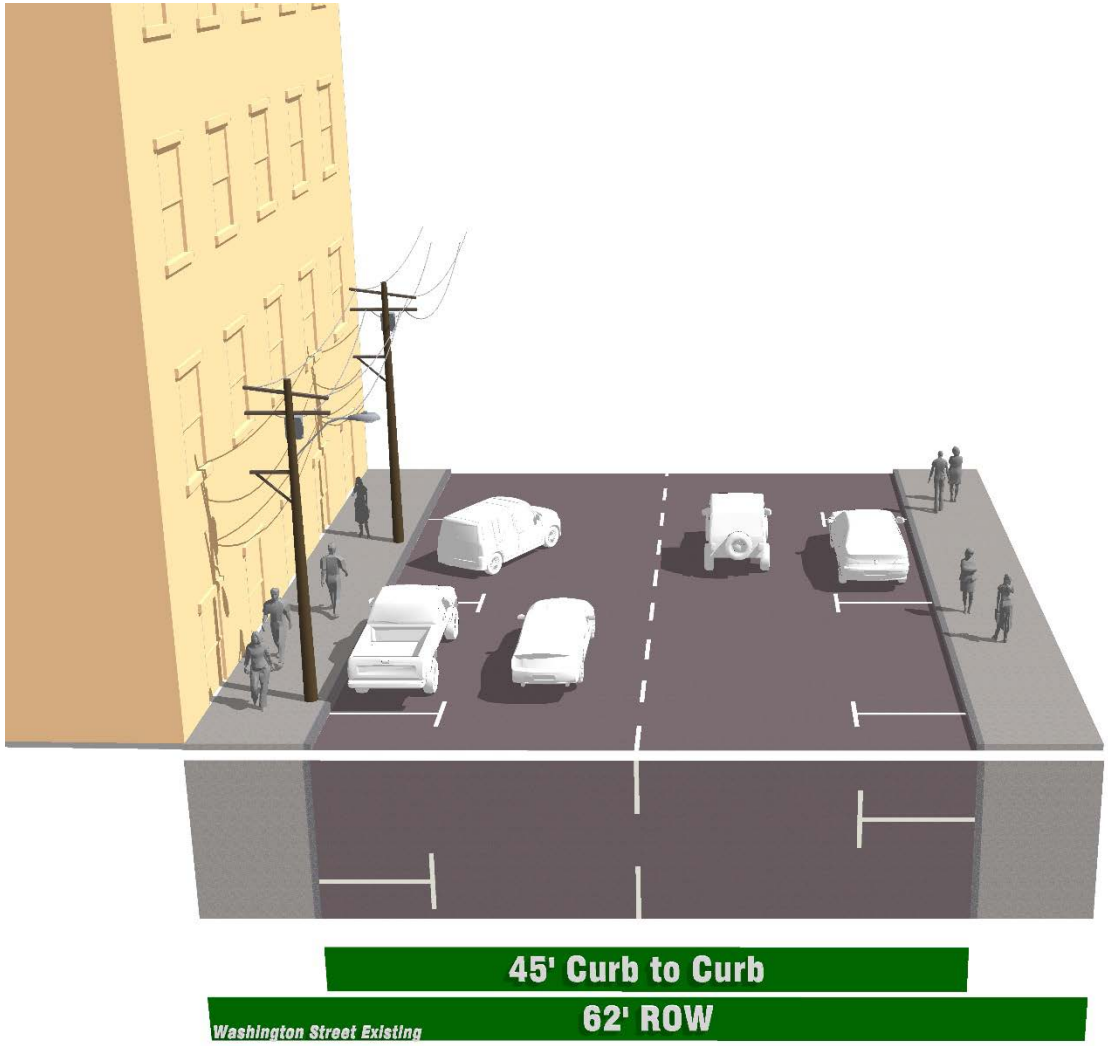
Streetscape Character

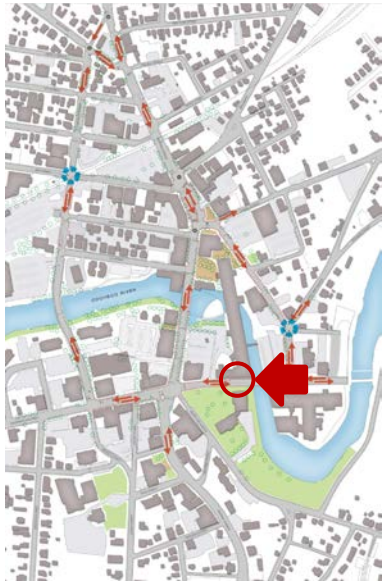
Preferred Central Avenue (no significant curb line changes, designated loading areas during daytime hours)



Streetscape Character

Existing Washington Street

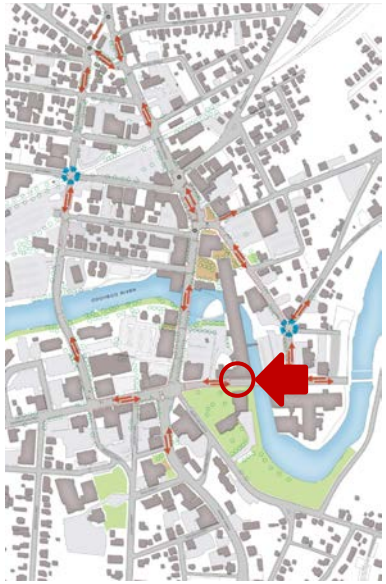




Streetscape Character

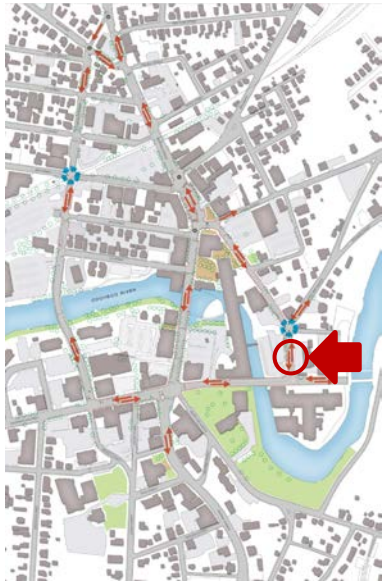
Preferred Washington Street

- ~7’ of reallocated ROW



Streetscape Character

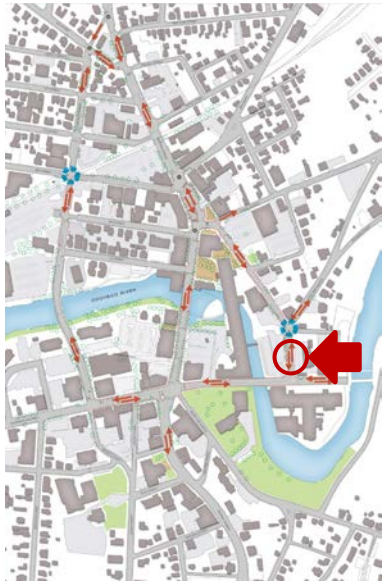
Existing Main Street



Streetscape Character

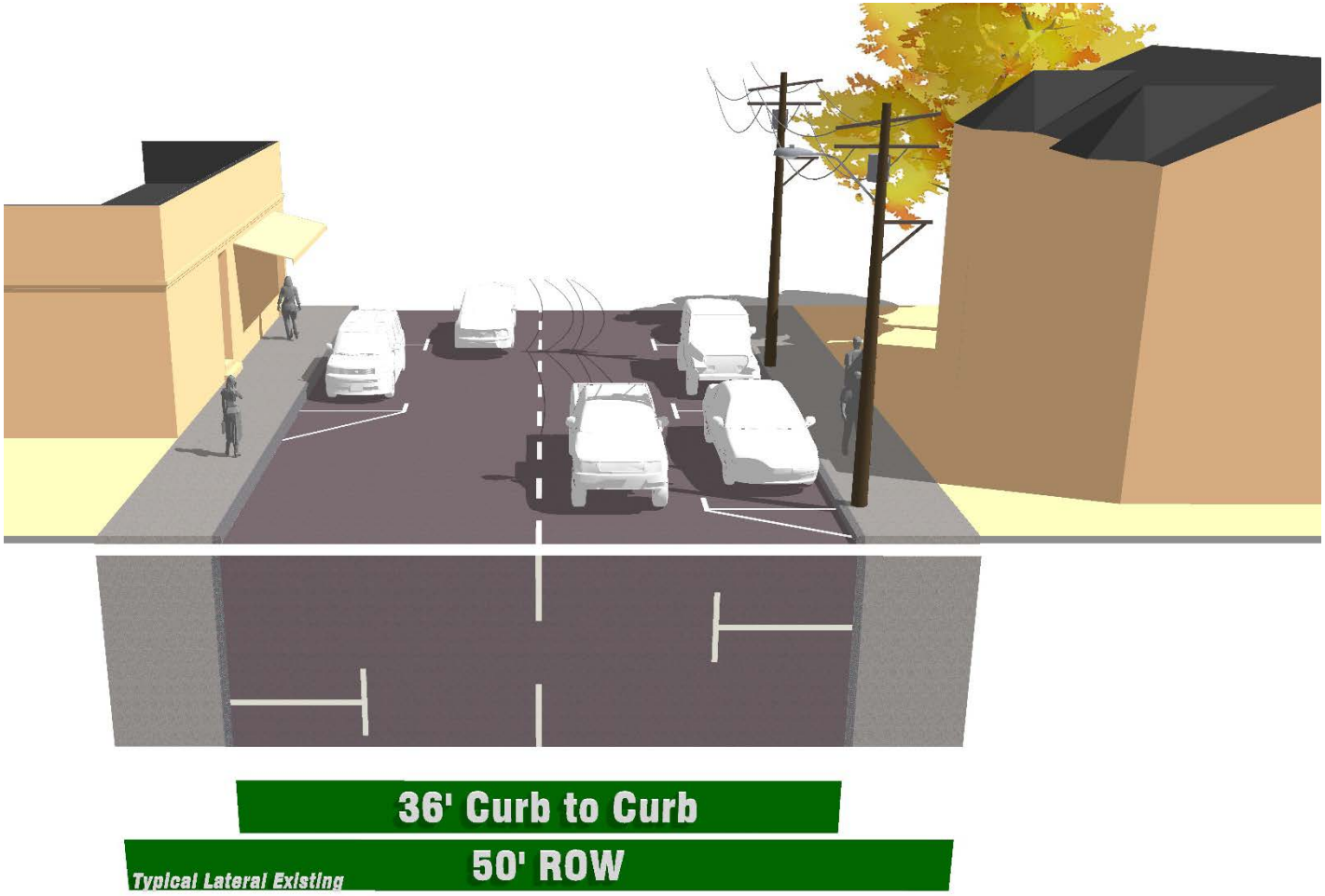
Preferred Main Street

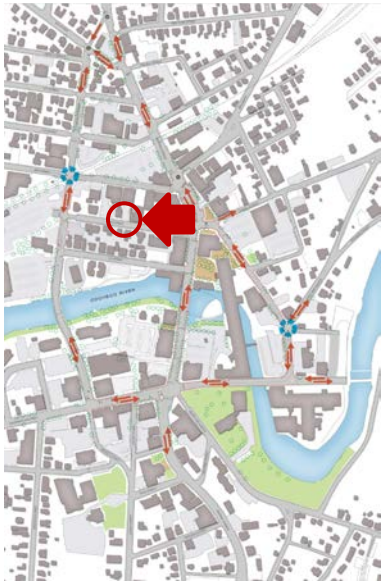
- ~5’ of reallocated ROW



Streetscape Character

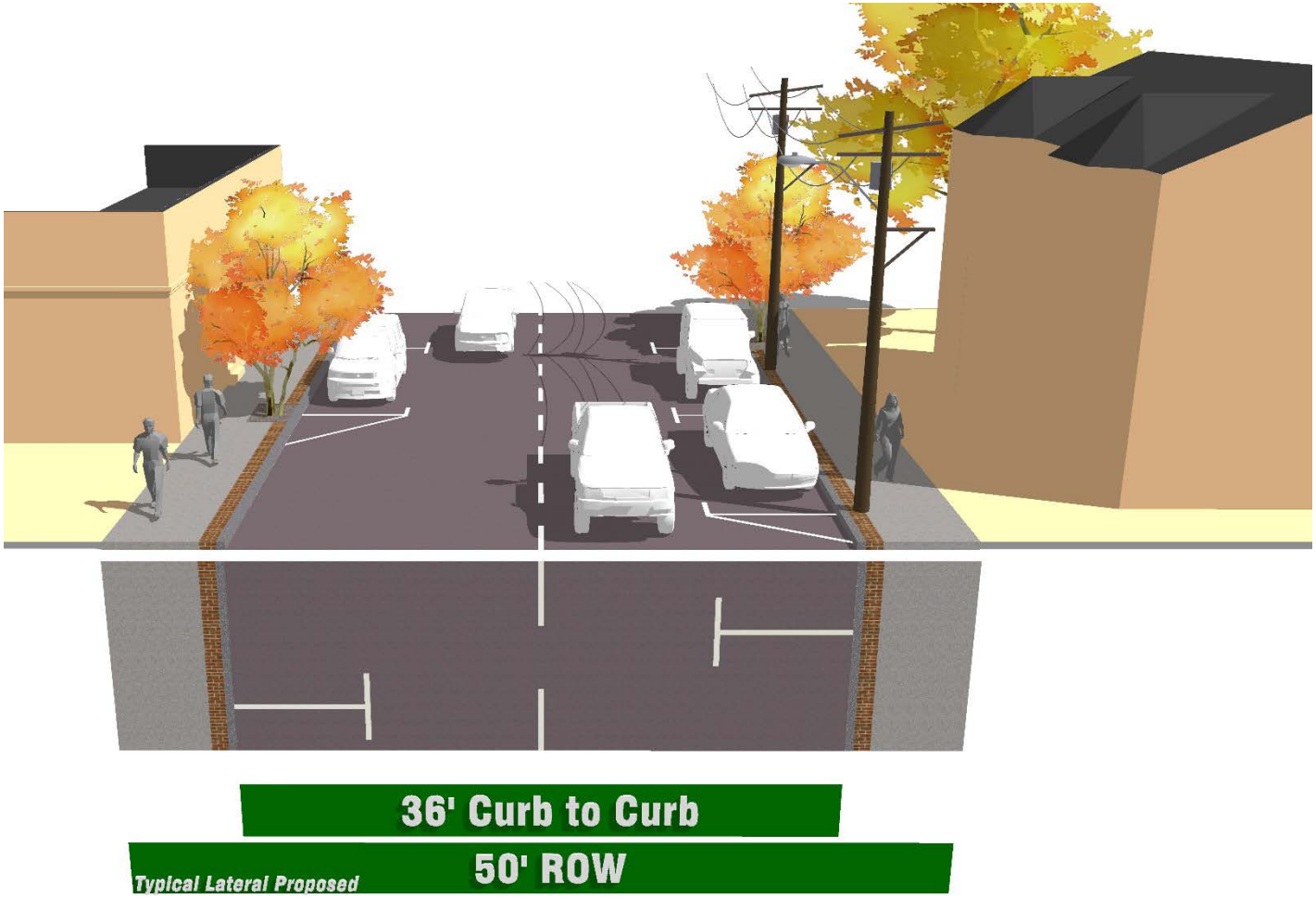
Existing Typical Lateral Street

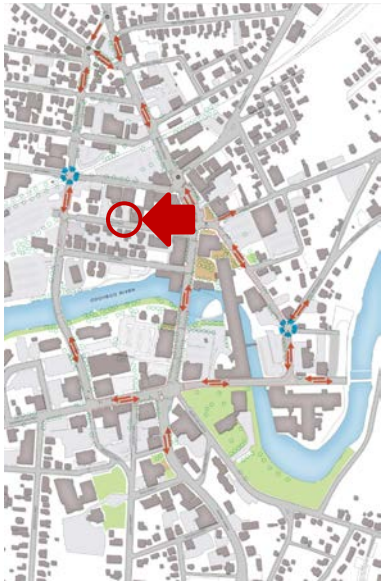




Streetscape Character

Preferred Lateral Street





Streetscape Character : Ornamental Paving Materials

Sidewalks

Crosswalks

Streetscape Character : Landscape

Maple

Elm

Linden

Zelkova

Pear

Serviceberry

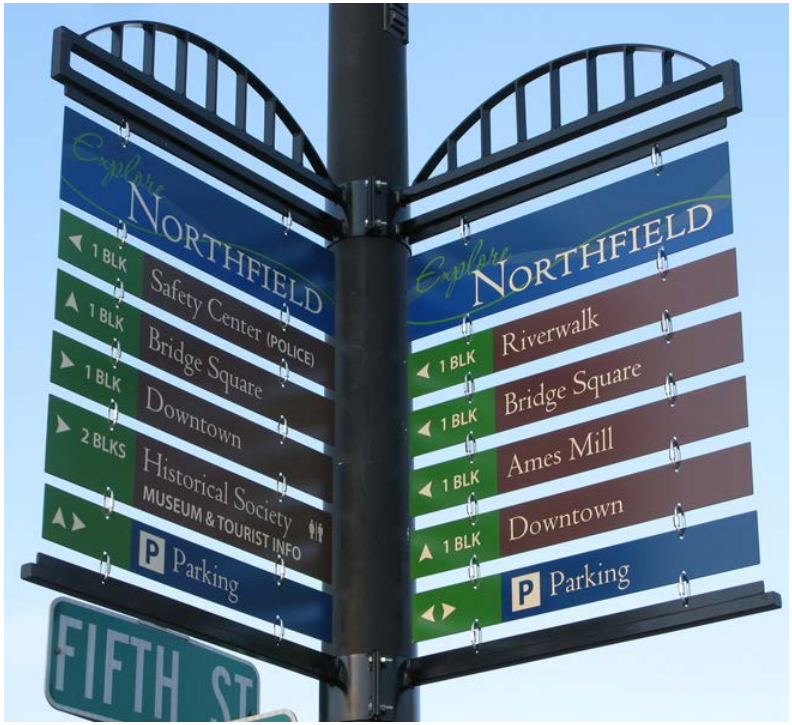
Japanese Lilac Tree

Cherry

Redbud

Streetscape Character : Lighting

Streetscape Character : Signage / Wayfinding



Streetscape Character : Amenities

Bike Racks

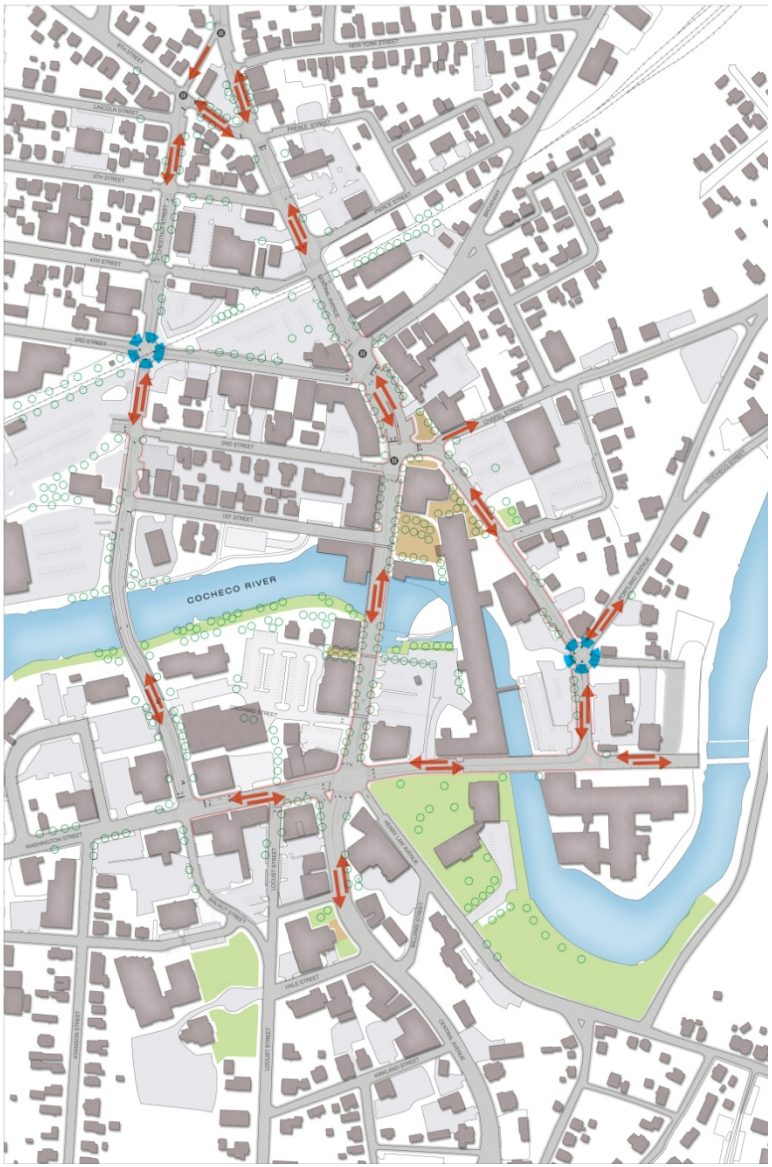
Trash / Recycling

Benches

Streetscape Character : Public Art

Implementation

- Phasing
- Costs and Funding
- Design Process



Phasing

Phase One:
Chestnut Street from Central Avenue to Washington Street

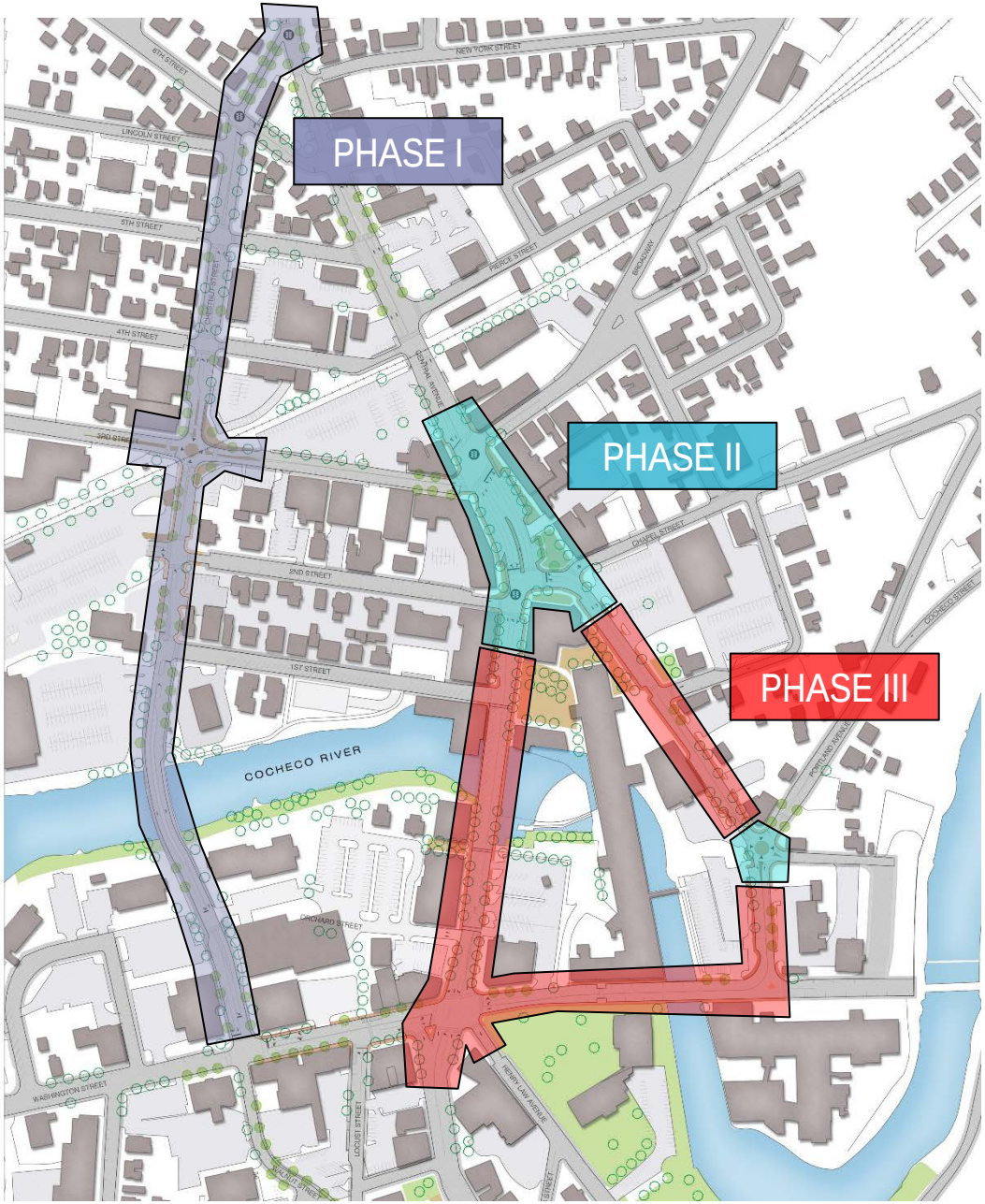
Phase Two:
Upper Square
Roundabout at Main and Portland

Phase Three:
Lower Square

Central Avenue from Upper Square to Washington Street

Washington Street from Central Avenue to Portland Avenue

Main Street from Upper Square to Washington Street



Next Steps

- Public Meeting and Discussion
- Draft Report
- Final Report