



Final Study Report

## Franklin Street Feasibility Study - Phase II

Submitted to City of Portland  
by IBI Group with Gorrill-Palmer Consulting Engineers, Inc. |  
S.W. Cole Engineering, Inc. | Titcomb Associates | Morris Communications  
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Sam Cohen – Munjoy Hill Neighborhood Association

Jon Graback – Franklin Towers

Bill Hall – Island Representative

Steve Hewins - Portland Downtown District

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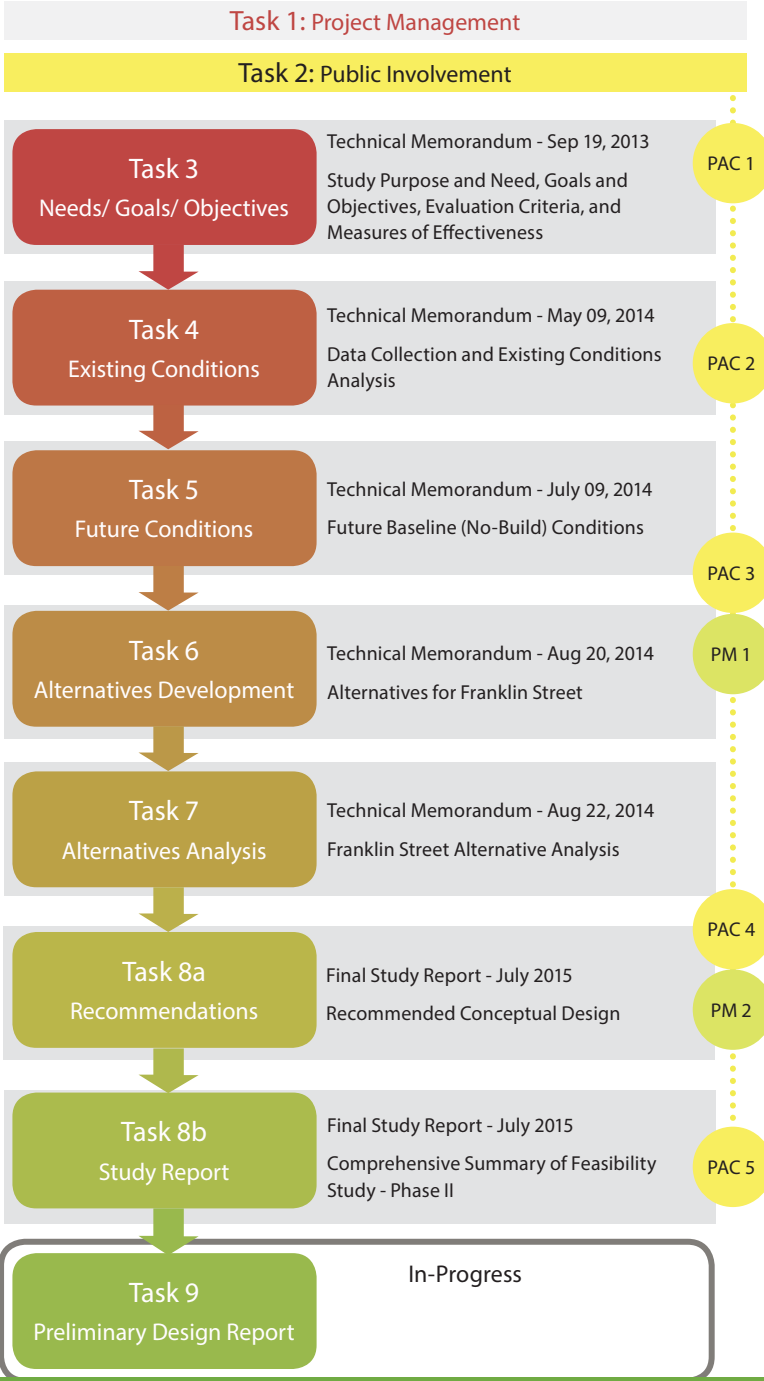
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# Executive Summary

### PROJECT OVERVIEW

The Franklin Street Feasibility Study Phase II, under an agreement between the City of Portland, MaineDOT, and Portland Area Comprehensive Transportation System (PACTS), is a project to “update and evaluate alternatives, developed in a Phase I study, through a more comprehensive technical and engineering analysis that includes land use, social, economic, neighborhood and street connectivity, environmental, safety, and transportation data of both current and future conditions for the entire corridor from the waterfront at Commercial Street to Back Cove.



### GOALS AND OBJECTIVES



Goals and Objectives Icons

This task defined a statement of purpose and need, goals, and objectives plus established the guiding principles and updated the vision statement developed for the Reclaiming Franklin Street study (Phase 1), based on review of other plans and reports for the City and region, and PAC input. The Measures of Effectiveness (MOEs), developed to supplement the traffic analysis of the Alternatives were derived from that updated vision statement. While the Vision Statement established the overarching goals for evaluating the alternatives and the final recommendations, the objective “to not worsen the capacity and LOS compared to the future capacity and LOS of the current configuration of the corridor” is the ultimate basis on which the Study recommendations can be approved for Preliminary Design.

### EXISTING CONDITIONS

An existing conditions analysis was performed, through data review, field visits and stakeholder input, to develop a detailed story of the study area. Five common themes emerged from this analysis, which were used to guide the refinement of alternatives:

Nodal Development (gateway treatment): was identified as a strategy to help activate the corridor’s fragmentation and lack of cohesive development, streetscape or traffic patterns. This strategy was considered more effective than consistent redevelopments or treatments along the entire corridor. This was a key consideration for intersections (such as Cumberland/Franklin) and for entry points (such as the I-295 overpass and Casco Bay Ferry Terminal).

Reconnections: Franklin Street is a dividing force between neighborhoods and adjacent land uses, causing key east-west desire lines to be inadequately met.

Grading: The grade of Franklin Street presents a challenge for non-motorized transportation uses, reconnection of streets and stormwater management and needs to be taken under careful consideration in the alternatives.

Possible Realignment: The realignment of Franklin Street, whether it is north or south, and the reduction or elimination of the median could offer a number of opportunities, including additional mixed use development as well as the restoration of Lincoln Park. The realignment of Franklin Street may present stormwater management challenges/opportunities.

Scale and Balance: The scale of existing development as well as of the roadway is inconsistent and often inappropriate. To be a more pedestrian, bicycle and transit-oriented street – essentially a more Complete Street – recommendations should include strategies for softening of development that is out of scale (such as the Franklin Towers), redesigning the street itself, better utilizing underutilized space with in-fill and other strategies.

### FUTURE CONDITIONS

The Study Team projected future (year 2035) traffic volumes, motorized vehicle level of service (LOS), and multimodal LOS (MMLOS) for a baseline) ‘no-project’ condition, which as noted in Goals and Objectives is to be the minimum criteria for assessing the Alternatives and the ultimate Recommendation of the Study. To produce this information, the project team worked with Kevin Hooper and Associates to update the PACTS regional travel demand model to the design year for the Franklin Street Feasibility Study Phase II (2035). The updated volumes from the regional travel demand model were used as inputs to update a traffic simulation model developed by Gorriill-Palmer Consulting Engineers as well as to a MMLOS tool used by IBI Group.

Franklin Street – Overall Corridor					
	Mode	AM Peak - 2035		PM Peak - 2035	
		Score	LOS	Score	LOS
Northbound	Auto	0.34	E	0.34	E
	Transit	6.48	F	6.48	F
	Bicycle	3.62	D	3.62	D
	Pedestrian	3.18	C	3.18	C
Southbound	Auto	0.43	D	0.32	E
	Transit	6.45	F	6.46	F
	Bicycle	3.69	D	3.66	D
	Pedestrian	3.02	C	3.05	C

Year 2035 Peak Overall Facility Score

This evaluation was intended to assess the ability of the three alternatives and the no-build baseline to meet the study’s goals and objectives. The ability to meet the broader goals and objectives was assessed in this evaluation through the use of qualitative and quantitative measures of effectiveness (MOEs) assigned to each objective. These MOEs were vetted with MaineDOT, the City of Portland, PACTS, and the PAC in advance and have been modified and honed as the study has progressed to be the best measures based on available data.

The Urban Street approaches rank better than the no-build or Urban Parkway. Because of this, recommendations leaned more toward greater reconnection, enhanced bicycle and pedestrian facilities, and preference for development opportunity with enhanced if not greatly expanded green spaces. Although Urban Street Option 2 ranks highest overall, the final recommendations take into account the best features from the various alternatives.



The evaluation did not resolve all questions and issues. Unresolved elements of the plan were topics for the PAC and Public meetings on September 23 and October 1, 2014 and the feedback from those meetings has been incorporated into the final recommendations.

Traffic

None of the traffic models for the alternatives were operating at an acceptable level, primarily due to challenges at Marginal Way, where the north-most end of Franklin Street was a bottleneck that was negatively affecting the operation of the remainder of the corridor. It was decided to focus on that specific area to arrive at an alternative that would address the overcapacity issue before proceeding to the remainder of the corridor. The Study Team explored several alternatives, including the following strategies: 1. General retiming / rephrasing of the existing signals; 2. Raised central median on Franklin at Marginal Way; 3. Roundabout at Franklin / Marginal; 4. Roundabout at Franklin / Somerset / Fox with a raised center median on Franklin at the Marginal Way intersection; and 5. Separation of the NB and SB I-295 on/off ramps from Franklin Street and have them intersect Marginal Way at points north of Franklin for the NB on-ramp and south of Franklin for the NB off-ramp. The only workable solution was an approach that restricts out-movements from Marginal Way. This approach was vetted by the public in a September 4, 2014 meeting in the East Bayside neighborhood.

RECOMMENDATIONS

The proposed recommendation is a hybrid of the best elements of the Urban Streets approach, incorporating desires expressed in the PAC and Public Meetings of 9/23/14 and 10/1/14, respectively, regarding unresolved elements from the Alternatives Analysis.

The process of refining the final recommendation has been carefully vetted through meetings, bi-weekly teleconferences, and individual coordination in an effort to discuss choices and trade-offs. These refinements focused on: enhancing the Marginal Way intersection for pedestrians and cyclists; optimizing reconnections (at Oxford and Federal, in place of Newbury); reducing the scale of vehicular turning movements; ensuring that the minimum clear space of 10'-12' for pedestrians is maintained, with the incorporation of City standards for street trees; and that the design for the Commercial Street roundabout sufficiently accommodates all modes of transportation while supporting the vision for the project.

The recommendation satisfies the cooperative agreement for capacity and LOS not to be worse than future conditions in a no build scenario. It makes marked improvements for the non-auto modes, and even when looked at narrowly in terms of the auto mode alone, can be seen to offer an overall improvement in LOS as well as the capacity needed to meet the projected demand.

An Implementation Plan has been developed to provide recommendations for streetscape and landscape that support the overall vision for the Franklin Street study area, while responding to the unique needs and opportunities of distinct sections. The Implementation Plan includes plan enlargements and before/after visualizations of four key locations (Marginal Way, Oxford Street, Lincoln Park expansion, and reconnection of Federal Street, and Commercial Street), which were selected for their unique conditions and significant opportunities for enhancing the character and vitality of the corridor and the larger neighborhood context.

The Implementation Plan is supported by a preliminary cost estimate and a multi-phased schedule which breaks out the permitting, design and construction activities and timeframes necessary for completing the full corridor improvements from Marginal Way to Commercial Street within a five year framework.

Accessibility and Safety

There is a key tradeoff between accessibility objectives and those related to safety and traffic flow because of the way that they are measured in this tool. None of the modeled reconnections across Franklin Street (Lancaster, Oxford, Newbury, and Federal) would meet the requirements for signal warrants. Any reconnections of side streets for accessibility purposes, whether full vehicular or pedestrian/bicycle only, would initially be unsignalized and therefore would be expected to introduce additional conflicts and disruption to traffic flow. Traffic diversion is another concern. This is a notable tradeoff that warrants further discussion; however, as long as the LOS does not worsen in the alternatives compared to the future baseline (no-build), it is recognized that the goals and PAC feedback tend to favor providing reconnections where feasible.

Transit

The decision to provide a transit shuttle on Franklin Street or a parallel street, while recommended to achieve certain goals, will likely be a policy decision as well as a decision based on cost, and requires further discussion with the City and METRO. The predicted benefit in terms of immediate ridership is small. It should also be further discussed whether it is preferred to operate a shuttle on Franklin Street or a parallel route based on potential conflict with other vehicles and bicycles.

Bicycle and Pedestrian Facilities

The Portland Bicycle and Pedestrian Advisory Committee provided detailed recommendations on both pedestrian and bicycle facilities, including the preference for buffered on-street bicycle lanes that merge into traffic lanes at intersections over off-street paths. These recommendations are taken into account in the Preliminary Recommendations narratives and lead us to recommending on-street bicycle facilities and relatively consistent 10' to 12' sidewalks, which may not be the same conclusion reached by looking at the MOEs alone.

New Development Calculations

Many of these measures, including the estimates of new developable land and costs, are based on conceptual plans at a very rough level of detail. The numerical inputs provide us with an ability to compare the alternatives to the no-build scenario, but should not be taken as final absolute numbers.

Alignment

During the Evaluations Task 7, the roadway alignment remained to be finalized, independent of traffic considerations and lane configurations. There was quite a bit of consensus on this in the PAC's Google Groups discussion, but a final recommendation on the Lincoln Park expansion was needed before finalizing the alignment. In the evaluation tool, some objectives lead to an assessment that development is preferred over the expansion of the park and vice versa.

These became topics for the PAC and Public meetings scheduled on September 23 and October 1, 2014, and the feedback from those meetings has been incorporated into the final recommendations. Maximum expansion of Lincoln Park was endorsed by both the PAC and in the Public Meeting.

PRELIMINARY DESIGN

The approved Recommended Plan resulting from this Feasibility Study is the basis for the next step in the Maine Department of Transportation's program for highway projects: preliminary design, which includes development of a horizontal and vertical alignment (HVAC) and completion of a Preliminary Design Review (PDR). This step will develop design details and will resolve some issues that have been identified as warranting attention at the preliminary design level as identified in this document.



Recommendations for Franklin Street





1. Overview



# 1.1. Introduction

This report presents the results of the Franklin Street Feasibility Study Phase II and its recommendations for an integrated transportation and land use vision of Franklin Street and a quarter mile radius around it. The study is based on cooperation among the City of Portland, Maine Department of Transportation (MaineDOT), and Portland Area Comprehensive Transportation System (PACTS). The study was also guided by a Public Advisory Committee (PAC). For more information on this study see: <http://www.portlandmaine.gov/660/Franklin-Street-Committee-Phase-2>

This study builds on the work of Phase I, which was a visioning process for the study area resulting in three initial alternative concepts for Franklin Street. The final report for the Phase I study can be found at <http://portlandmaine.gov/DocumentCenter/Home/View/1995>. Many committee members from that phase of the work joined the PAC working on Phase II. The Phase II work was founded on detailed technical analysis including assessment of existing conditions, modeling of future conditions, and a detailed evaluation of refined alternatives for the study area, resulting in phased recommendations for transportation, land use, landscape architecture, and streetscape in the study area. Although the most detailed analysis has been focused on the transportation elements, all four areas were taken into account to develop a comprehensive set of recommendations.

This final report summarizes the various aspects of the study, details the recommendations, and addresses planning for implementation. These recommendations will inform the development of a Preliminary Design Report (PDR) for a section of Franklin Street between the Marginal Way intersection and 825 feet southeast of the Fox/Somerset Street intersection (approximately Oxford Street), which is the planned final stage of the contract under which this report was completed.

The team for the overall contract is made up of a consultant team including IBI Group, the lead consultant; Gorrill-Palmer Consulting Engineers, Inc.; Morris Communications; S.W. Cole Engineering, Inc.; and Titcomb Associates. IBI Group managed the study process resulting in this report, and provided transportation, land use, and streetscape expertise building on the concepts of Smart Cities, Transit Oriented Development, Complete Streets, and Context Sensitive Solutions. These concepts are described in greater detail in the Task 3 memorandum titled Study Purpose and Need, Goals and Objectives, Evaluation Criteria, and Measures of Effectiveness. Gorrill-Palmer provided engineering services for the transportation analysis as well as planning assistance. Morris Communications carried out the public process. S.W. Cole and Titcomb Associates are anticipated to provide geotechnical engineering and surveying services for the PDR, respectively.



Exhibit 1.1 Study Area for Franklin Street Feasibility Study Phase II





## 1.2. History

Franklin Street is a vital transportation link running northwest to southeast across the Portland Peninsula, classified as a “minor arterial” under the National Highway System. Currently, the street’s primary purpose is as a vehicular thoroughfare, designed to efficiently funnel high volumes of traffic from Interstate 295 to Portland’s downtown and waterfront. It used to look quite different, however, than it does today.

Until the 1960s, Franklin Street was a two-lane residential/mixed use street, well-integrated into Portland’s neighborhood fabric. There were cross streets at regular intervals, including Oxford and Lancaster Streets, which, at the time, served as important east-west connections through the City. In fact, Oxford Street was the primary east-west route through Portland before the construction of Route 1 around Back Cove and later, Interstate 295.

In the 1940’s and 50’s, Portland City officials were focused on developing

strategies on what to do about slums and how to increase the flow of traffic into the city more effectively from the suburbs. This included the demolition of historic neighborhoods abutting Franklin. In 1967, the Victor Gruen Associates plan called Patterns for Progress identified Franklin Street as the preferred primary route to move traffic from Interstate 295 to downtown. It became the four-lane divided highway known today.

The differences between traffic volumes at the I-295 end of Franklin Street versus the Commercial Street end indicate that the present design exceeds what is necessary beyond the immediate I-295 environment. Although the need for the present configuration is not uniform throughout its length, Franklin Street has become a barrier between neighborhoods and nearby amenities. Many studies and plans have been completed since its reconstruction, redefining yet again the vision for Franklin Street, its surrounding neighborhoods, and the City of Portland

as a whole. The newer visions of Franklin Street have it returning to a multimodal, mixed use, walkable, urban environment. These studies are summarized in the Task 4 memorandum titled Data Collection and Existing Conditions Analysis.

At the time of the study, there were also ongoing and future studies that are relevant to the effort. These included the following and are discussed further in the Task 4 memo Chapter 4 as well as in Section 2.2 of this report:

- Sustain Southern Maine India Street pilot project (<http://sustainsouthernmaine.org/pilot-communities/portlandindiast/>)
- The Friends of Lincoln Park initiative to restore Lincoln Park (<http://lovelincolnpark.org/>)
- Development plans (see TASK 4 memo)
- Marginal Way project



Exhibit 1.2 Illustrative Sketch of Section through Franklin Street (1966) before the Urban Revitalization Project



Exhibit 1.3 Section through present day Franklin Arterial



Exhibit 1.4 Aerial View of Franklin Corridor Before and After Arterial Project (Source: Portland Press Herald 2009)



# 1.3. Vision and Goals and Objectives

## VISION

Franklin Street will be a critical transportation facility for all modes of travel, linking Interstate 295 & Back Cove to the waterfront & island ferries and serving as an attractive gateway to the city. Franklin Street will be a vibrant, active and walkable urban corridor, connecting neighborhoods and destinations. It will enhance the urban fabric of the city through mixed-use development of appropriate, diverse, and functional residential, commercial and recreational space in the midst of attractive streetscapes.

All modes of travel, including motor vehicles, public transit, bicycle and pedestrian, shall be able to coexist in a design that is safe and environmentally sound for an urban setting, through state-of-the-art design utilizing optimum architecture, street widths, curbs, sidewalks and street level crosswalks, and other appropriate amenities such as vegetation, trees and art.

This study's vision was developed in collaboration with the PAC based on the Phase I study. In addition, the consultant, client, and PAC team developed specific objectives related to the goals, which were later used to create specific measures of effectiveness that are the basis for the evaluation.





# GOALS

1

ACCESSIBILITY

To improve the local and regional accessibility of people and the movement of goods.

- Access to city and regional destinations
- Local street network connectivity
- Multi modal transportation
- Current and future transit operations
- Pedestrian and bicycle facilities
- Capacity and LOS

2

URBANISM AND LAND USE

To enhance the urban fabric of the city through respectful, compact, and sustainable development.

- Provide urban gateway
- Enhance built heritage
- Promote mixed use development
- Pedestrian scale
- Wayfinding and navigation
- Appropriate urban design
- Integrated streetscape and land use
- Balance between different uses

3

ENVIRONMENT AND ENERGY

To conserve and efficiently use nonrenewable energy resources, protect the environment, and improve the urban quality of life.

- Reduce impact of through traffic
- Reduce SOV trips
- Improve transportation efficiency
- Enhance green space
- Roadway handling storm surge and sea level rise
- Activate Lincoln Park

4

HEALTH AND SAFETY

To provide a healthy and safe urban environment in which to live and work.

- Promote physical activity
- Enhance safety for all modes
- Reduce vehicle speed

5

COMMUNITY & ECONOMIC DEVELOPMENT

To foster community improvement and enhance social prosperity of the local economy in an equitable way.

- Enhance liveability and vitality
- Improve transit to Casco Bay Terminal
- Enhance neighborhood character
- Access to employment, community and activity centers
- Community sensitive infrastructure

# OBJECTIVES



# 1.4. Scope, Limitations and Assumptions

## 1.4.1. Scope

This report represents the conclusion of several tasks designed to articulate the vision established in Phase I of the study, as presented in the previous section, as a preferred alternative plan. Principal among these tasks were:

- Articulation of the project Purpose and Need and establishment of goals, objectives, and measures of effectiveness (also known as evaluation criteria) for the project. The results of this task were set out in the Task 3 Technical Memorandum in September 2013.
- Documentation of existing conditions in the corridor. These conditions were documented in the Task 4 Technical Memorandum in May 2014.
- Projection of future (design year 2035) conditions in the corridor. The results of this task were issued in the Task 5 Technical Memorandum in July 2014.
- Development of three alternative plans for the corridor using the Phase I results and input from stakeholders. These alternatives were identified in the Task 6 Technical Memorandum issued in August 2014.
- Evaluation of the three alternative plans according to the objectives established in Task 3. The results of this task were set out in the Task 7 Technical Memorandum in September 2013.
- Identification and refinement of a preferred plan for the corridor. This effort constitutes Task 8 of the scope of work, and is documented in this draft report.

In parallel with the conduct of these principal tasks, the consultants carried on project management activities as Task 1, and an ongoing public information and involvement plan as Task 2. The contract also includes a Task 9 for a preliminary design effort that may follow the adoption of a preferred alternative plan.

## 1.4.2. Limitations

A cooperative agreement among the City of Portland, MaineDOT, and PACTS specifies that “the capacity and level of service (LOS) shall not be worse with a preferred alternative design than the future capacity and LOS of the current configuration”. When the agreement was originally reached, it likely was intended to only refer to highway capacity and LOS as defined in the Highway Capacity Manual (HCM), the original source of the LOS concept, and the only practical source for evaluating both capacity and LOS at the time. In keeping with project vision, this project has been advanced with objectives related to all modes, including public transportation and non-motorized travel (bicycles and pedestrians), and has been informed by ‘Complete Streets’ principles. Therefore the treatment of LOS has been widened to include a Multimodal Level of Service (MMLOS). Notwithstanding, the possible original viewpoint was kept in view so as to preclude

making auto travel conditions worse in 2035 than they would be without the project.

The existing vertical profile and highway right-of-way for Franklin Street also established limitations on possible features of both the alternatives and the recommended plan. Grade separations from cross streets were effectively precluded, for example, because of the street blocks being relatively short. Acquisition of additional right-of-way, while not strictly infeasible, would be difficult to support for a plan following the vision established for Franklin Street,

## 1.4.3. Assumptions

The principal assumptions underlying this work were those informing the projection of design year 2035 conditions. These were based on PACTS’ regional travel demand model, which in turn assumes stability in societal factors such as labor participation rate, motorization, and personal propensity to travel. The total estimate of personal travel depended on the projected 2035 levels of population and different types of employment in each of the model’s geographic zones. These levels were based on projections of these quantities, called the ‘Urban and Rural Form’, developed by the Maine Department of Transportation and the Maine Turnpike Authority, with some review and adjustment by the City of Portland. The model highway and transit networks were modified from their present form to include specific committed projects. The amount of forecast travel and how it is divided between auto and transit were driven by the land use and network changes. More information on the modelling assumptions may be found in section 4.2.1 of this report.



## 1.5. Project Approach

The study process, illustrated below, consisted of nine tasks. The original scope included ten tasks but the Recommendations and Study Report tasks were combined in order to allocate additional resources to technical analysis and public process. Each of the Tasks 3 through 7 have an approved technical memorandum summarizing in detail the work associated with the task and the outcomes. Underlying the technical analysis were also project management and public process tasks.

The guiding principles for the public process in this study were:

- Shared stakeholder vision – A design process that is based on common aspirations rather than on individual positions and preconceptions, with the intention of clearly defining goals and objectives founded on the core principles of the project.
- Comprehensive understanding of context – A design process that seeks to understand the environmental, social, aesthetic, historic, and natural resource context before arriving at solutions that reflect engineering considerations.
- Communication and collaboration – A design process that fosters an open, honest and respectful interdisciplinary exchange of ideas in a collaborative, consensus-based setting.
- Flexibility and creativity – A design process that is adaptable, ingenious and inventive, utilizing the full range of design choices in order to meet the expectations of all.

At the core of this public process was an engaged group of knowledgeable citizens who represented a diversity of stakeholder groups and were well-positioned to help move the study forward. These citizens made up the Public Advisory Committee (PAC), the members of which are listed on page iii. The PAC for this Phase II study included many members from the Phase I committee, taking advantage of the existing wealth of knowledge and community investment in the study area. The PAC was tasked with clearly understanding the choices and tradeoffs inherent in each decision point of the study and communicating those to their constituents.

The study team also used significant resources to reach the public-at-large to ensure that they were aware of and understood the project discussions and decisions taking place. The following strategies helped keep information flowing freely and encouraged feedback and commentary from Portland-area residents and stakeholders. Webpages and social media: <http://www.portlandmaine.gov/660/Franklin-Street-Committee-Phase-2>, [www.franklinstreet.mindmixer.com](http://www.franklinstreet.mindmixer.com), <https://www.facebook.com/franklinstphase2>

- Press releases
- Simple flyers and posters in public locations within study area
- Encouraging attendance and managing expectations at PAC Meetings: coordinate on meeting times, notice for each meeting, provision of materials in advance, inclusion of PAC co-chair on biweekly project coordination calls
- Provision of meeting reports

- Additional stakeholder meetings including: Pedestrian and Bicycle Advisory Committee meeting to gather initial input (August 12, 2013), East Bayside Neighborhood meeting to discuss Marginal Way September 4, 2014. These efforts led to a transparent study process. Significant challenges arose during the study process that were only successfully navigated by relying on the foundation of ongoing, extensive communication between the technical team, the PAC and members of the public.

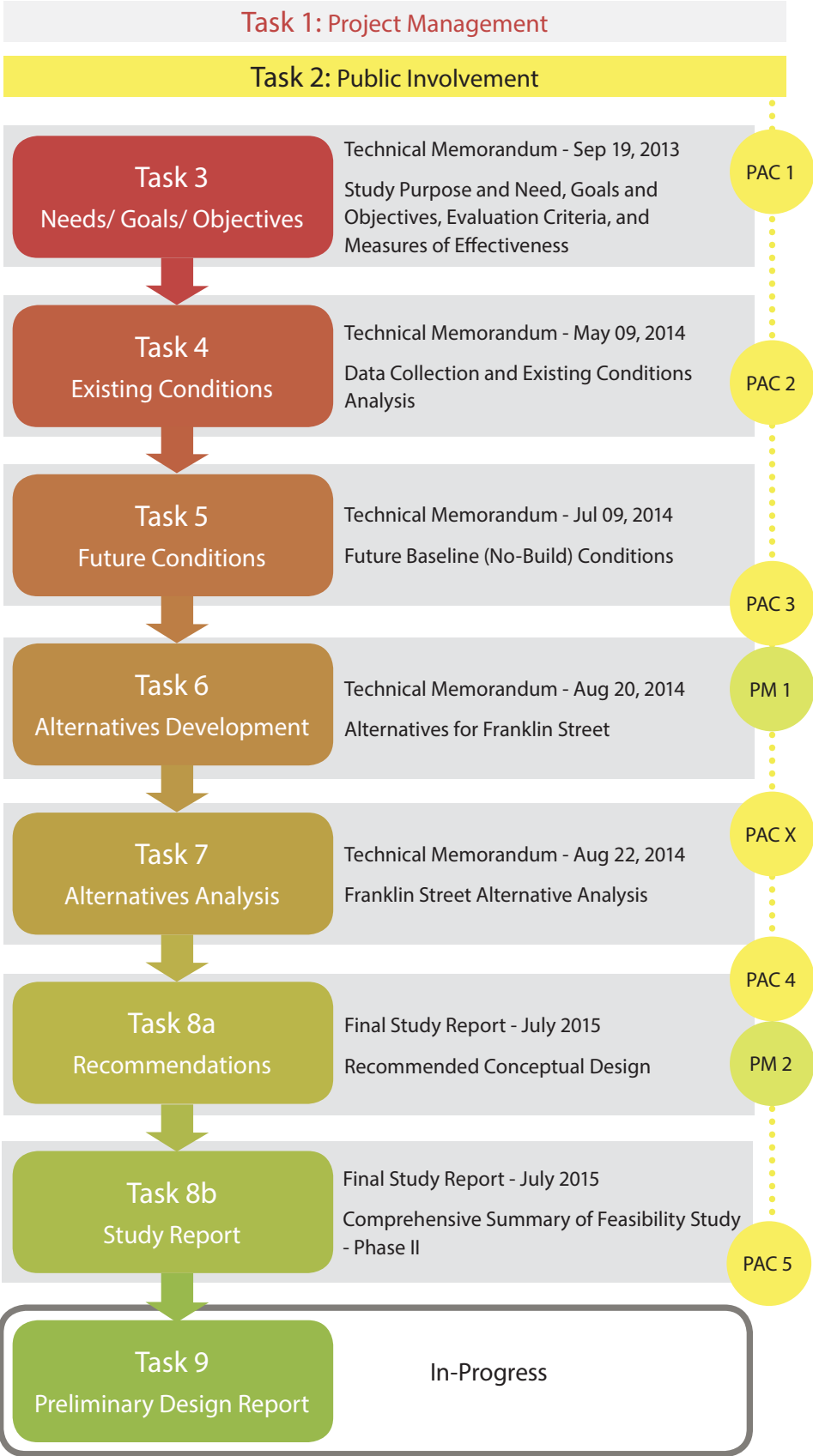
The scope for the study included five PAC meetings and two public meetings. In addition to those shown in the diagram on this page, an extra PAC meeting was held to discuss the alternatives further as well as one of the most challenging locations in the study area: the Marginal Way and Franklin Street intersection, including the interaction with the I-295 entrance and exit ramps. This meeting was held on April 3, 2014.

Public meetings were designed to be as interactive as possible, with minimal presentation and greater focus on stations where various concepts, alternatives, or issues could be explored and discussed. Through the participation of City, PACTS, and MaineDOT staff, as well as the participation of PAC members, the consultant team was able to gather extensive feedback from these many centers of conversation.

The final PAC meeting was held on April 1, 2015. In a show of hands, the PAC voted unanimously in favor of the Study recommendations, with one abstention due to the lack of a pedestrian crossing at Lancaster Street. While supporting the overall Study recommendations, the PAC identified the following issues as unresolved:

- Absence of a pedestrian crossing at Lancaster Street
- Absence of a pedestrian crossing on the north side of Federal Street
- Size of intersections – MDOT agreed to study each intersection to identify locations where turning radii could be decreased to reduce the crossing time for pedestrians and cyclists. It was understood that the Preliminary Design activity might re-visit this issues, but that ultimately it would need to be resolved with MDOT following their study. Crosswalk alignment should be smoothed out in order to improve the crossing experience.
- Roundabout at Commercial and Franklin Streets– the PAC expressed a concern that the concept design might not accommodate pedestrian volumes adequately
- Pearl Street alignment – needs to reflect negotiations between City and an abutter
- Oxford Street bicycle facility – the PAC expressed preference for a sharrow condition, consistent with other cross streets, rather than the separated cycle track shown in the concept plan
- Bike boxes – were not incorporated at all intersections

It was understood that these issues would be considered and resolved in the course of the Preliminary Design.









# 2



## 2. Existing Conditions Summary



## 2.1. Socio Demographic Context

The highest population and housing densities are observed in the central part of the study area on the eastern side of Franklin Street between Fox and Middle Streets as seen in Exhibit 2.1. The population density in this area ranges from 5,000 to 35,000 persons per square mile compared to Portland's average population density of about 3,000 persons per square mile. The housing density in this areas ranges from 1,000 to 13,000 housing units per square mile. North of Somerset Street and south of Middle Street the population density reduces with several blocks being entirely unpopulated.

The majority of the blocks in and around the study area have a high level of poverty with up to 70% of the population living below the poverty level in several areas; this

is significantly higher than the city average of 14%. A large number of households living to the east of Franklin Street and between Somerset and Congress Streets to the west of Franklin Street have incomes less than \$10,000; this is significantly lower than the city-wide median household income of \$36,000.

The study area population's primary mode of transportation to their place of work is by driving alone; the next preferred mode of travel is by walking. The population between Congress and Commercial Streets are the highest users of public transportation, with almost 50% either using public transportation or walking and 5% using bicycles to access their places of employment. This area also has the lowest private vehicle trips, with only 30% driving to work alone. The population to

the northwest of the study area is not well served by public transportation and this is reflected by the negligible public transport mode share; the walking conditions are not ideal either, which is also reflected in the low mode share for walking. From the means of transportation to work statistics it can be inferred that there is a latent demand for public transportation and good walking conditions in the vicinity of Franklin Street.

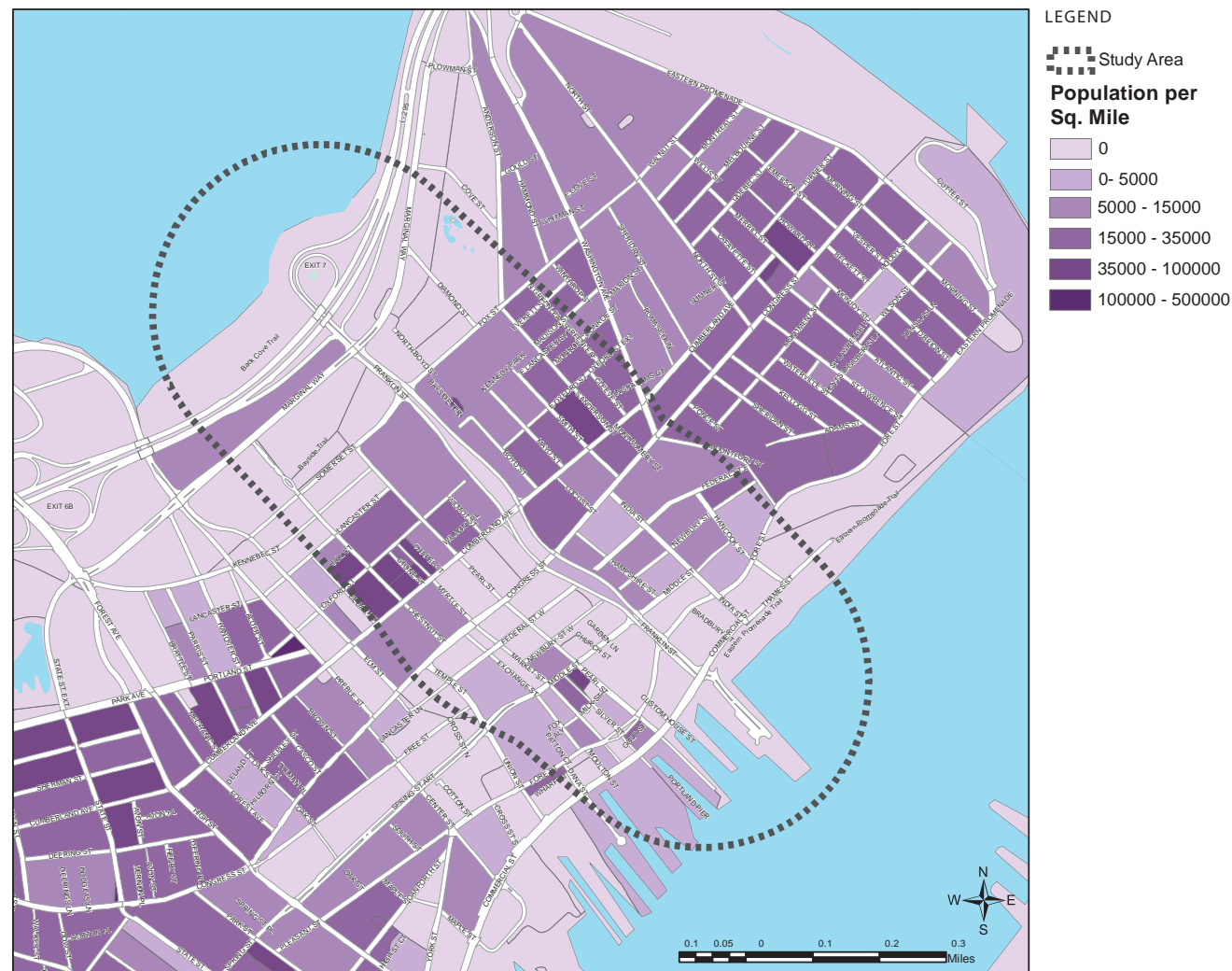


Exhibit 2.1 Population Density

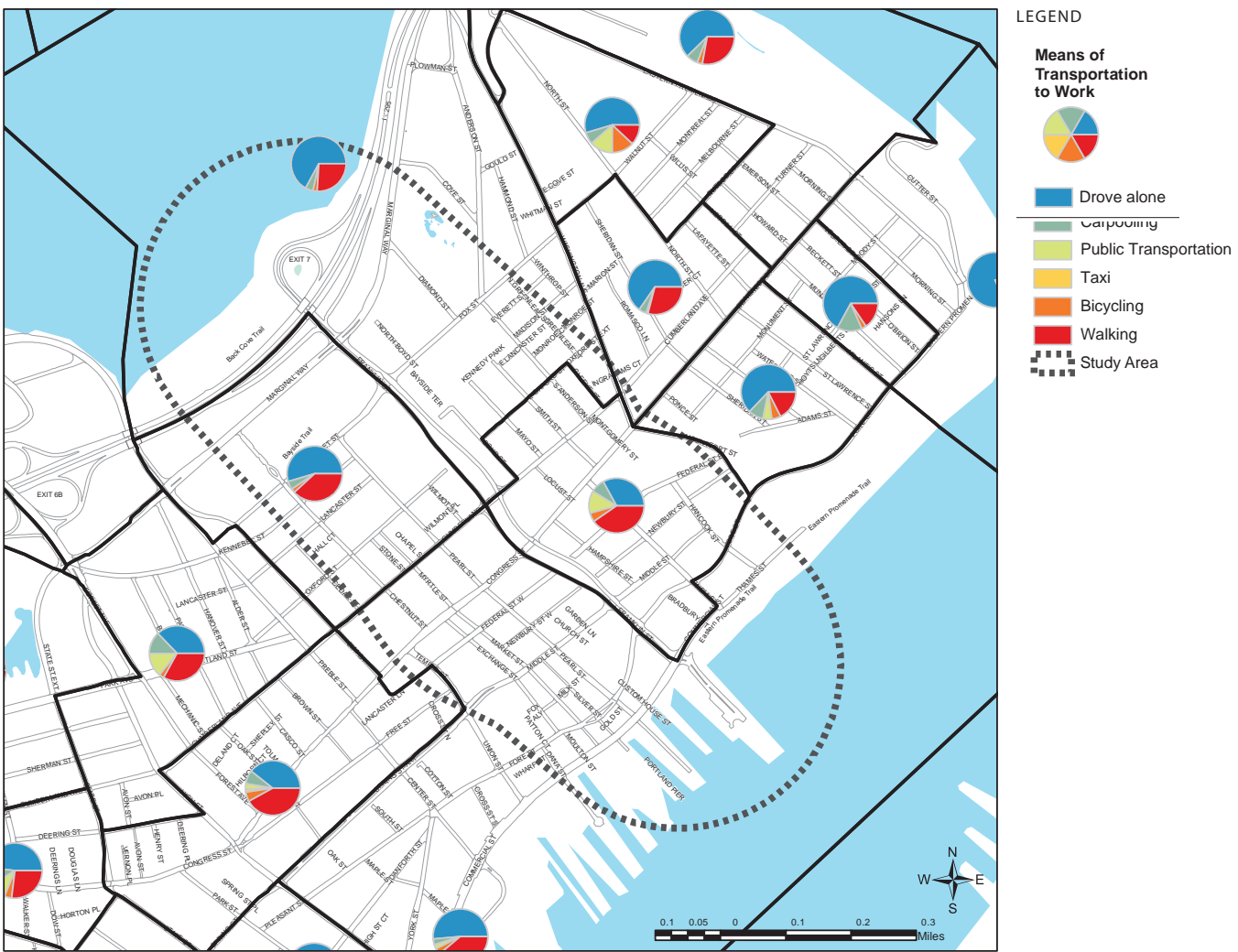


Exhibit 2.2 Means of Transportation to Work





## 2.2. Development Context – Land Use, Zoning, and Upcoming Development

Portland currently has a Euclidean zoning code structure, under which land uses of the same type are grouped together. As seen in Exhibit 2.3, non-residential uses are the dominant land uses along the Franklin Street Corridor. The B7 urban commercial Business Zone is found to the west of Franklin Street between I-295 in the north and Oxford Street in the south and Forest Avenue in the East. This zone is home to several retail shops and a few warehouses. The R-6 residential zone is found to the east of Franklin Street. The typical building typologies are mid-density apartments with the exception of Franklin Towers, which is a high density, 16-story high rise low-income apartment building. The

division created by the current zoning is enhanced because Franklin Street creates an “edge condition” between two general areas; the residential areas on the east side of the corridor (East Bayside and India Street neighborhoods) and the businesses and warehouses districts on the west side (Bayside and downtown).

The study area has a considerable amount of underutilized areas such as parking lots, community gardens, the median and large warehouses. Residential and commercial structures are oriented such that the rear or sides of the buildings face Franklin Street with the front opening on abutting or adjacent streets.

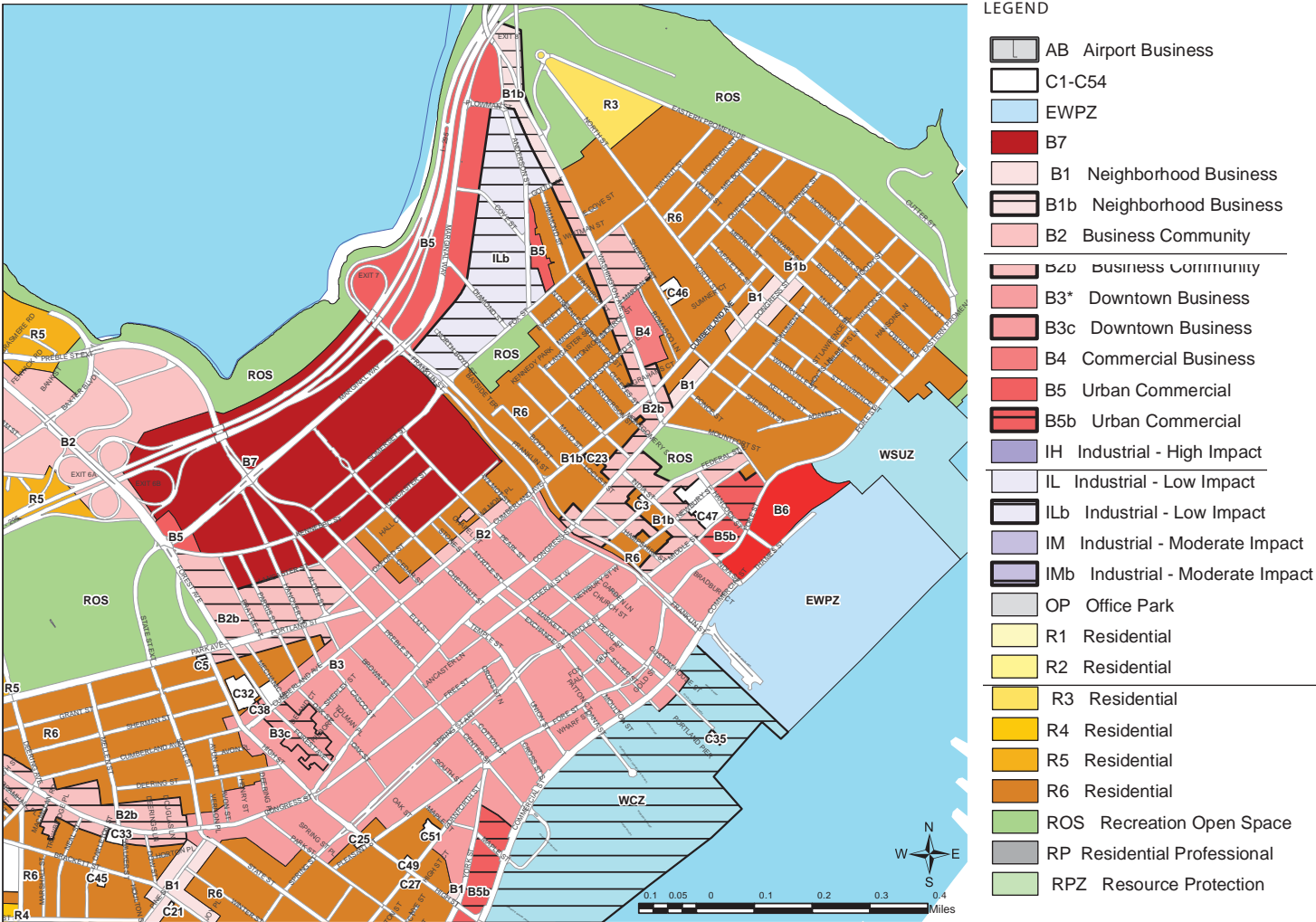


Exhibit 2.3 Zoning Map

There are several ongoing studies or projects that are relevant for the work on Franklin Street and have been studied and presented in detail in the Task 4 Memorandum. Two projects of note are as follows:

### India Street Revitalization (Sustain Southern Maine) -

This regional long-term sustainability project aims to understand how much residential and commercial growth this neighborhood could absorb in the coming decades to make it a more vibrant urban area. Information can be found at <http://sustainsouthernmaine.org/pilot-communities/portlandindia/>.

### Lincoln Park -

This initiative promotes the revitalization and restoration of Lincoln Park to its historic glory. Information can be found at <http://lovelincolnpark.org/>.

There are numerous other development and infrastructure projects in the study area that have either received or are in the process of pursuing funding. These are shown in Exhibit 2.4. Brief details on upcoming developments can be found in the Task 4 Memorandum.

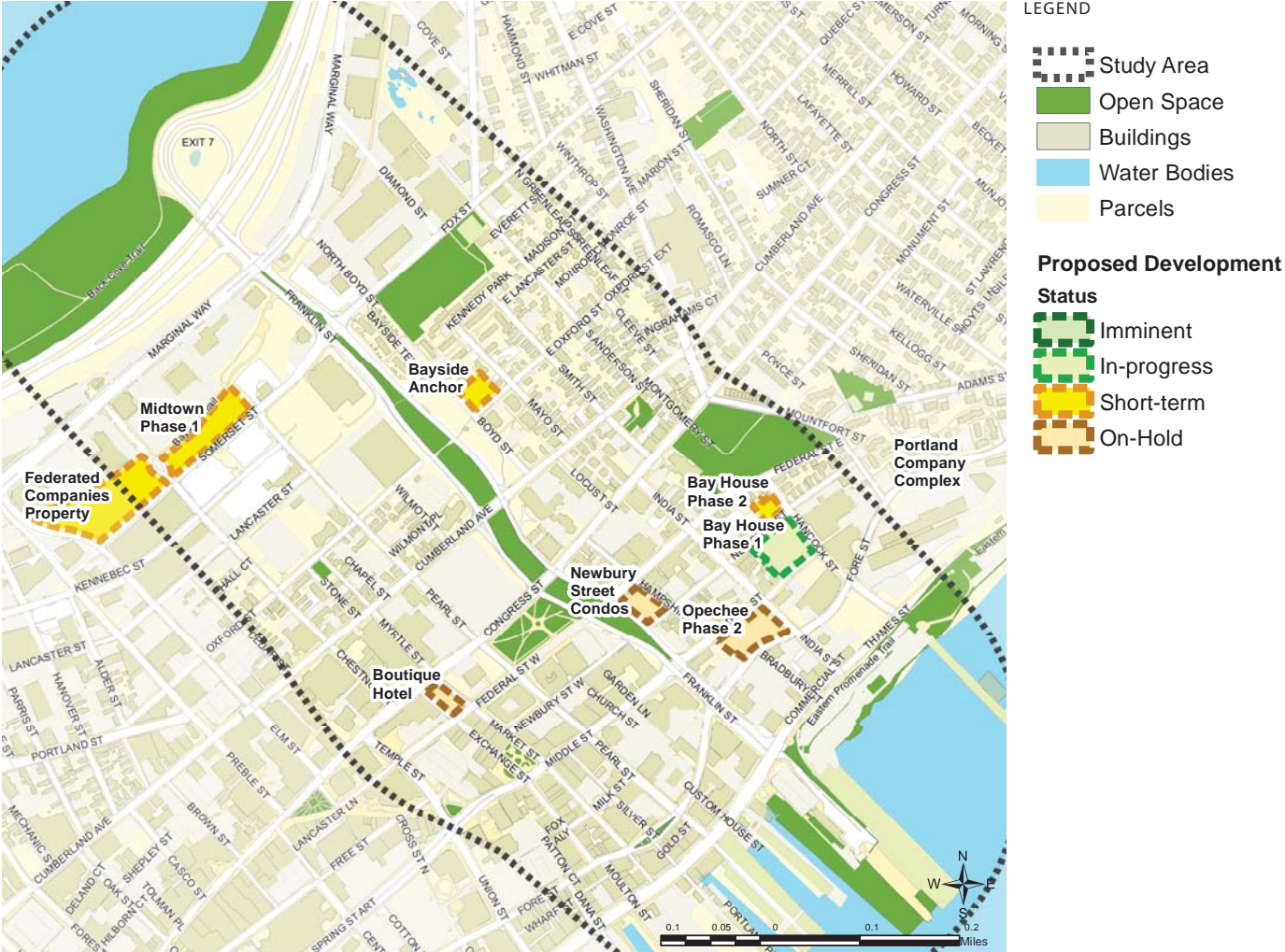


Exhibit 2.4 Upcoming Developments in the Study Area



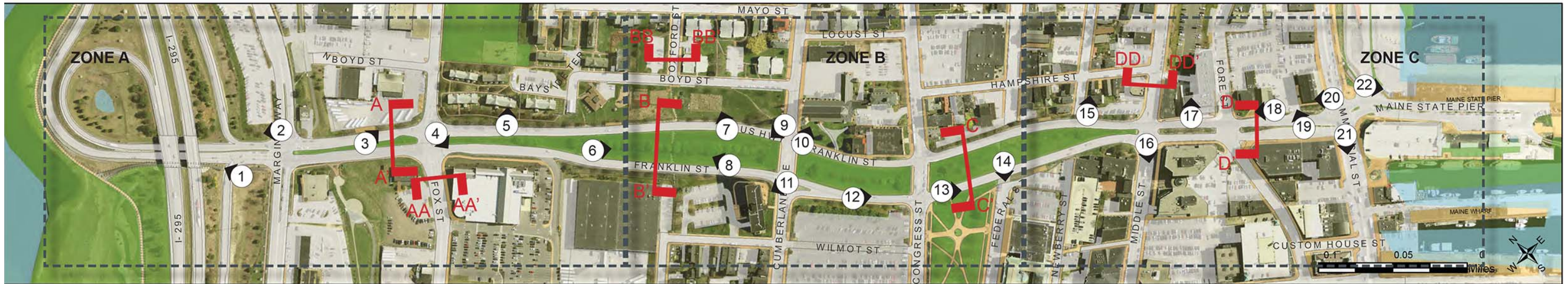


Exhibit 2.5 Franklin Street Corridor





## 2.3. Streetscape Analysis

Overall, the layout and physical structure of the Franklin Street corridor is designed for the effective movement of motor vehicles, resulting in the neighborhood having diminished views and limited access.

For the purpose of the streetscape analysis, the Franklin Street Corridor is divided into 3 sections; Zone A, Zone B and Zone C. The plan of Franklin Street in Exhibit 2.5 indicates the different section locations along Franklin street (illustrated by the red lines labelled A-A', B-B', C-C', D-D') and cross streets (labeled as AA-AA', BB-BB' and DD-DD'). These sections are shown in Exhibits 2.6 to 2.13.

The following is a brief description about the streetscape characteristics of each zone.

**Zone A:** Zone A covers the northern section of the corridor between I-295 and Lancaster Street. The primary entrance to the Franklin Street corridor is from under the I-295 Overpass. The environment under the overpass is dim and noisy due to motor traffic.

Currently, Zone A is not visually unified. It lacks both spatial balance between the two sides of the roadway and a consistent visual rhythm along the corridor. The entrance to Franklin Street lacks a unified streetscape with the commercial establishments of Planet Dog, Verizon and Whole Foods on one side of the road as seen in the cross-section A-A' in Exhibit 2.6 and Charter Bus Depot on the other. Section AA-AA' in Exhibit 2.7, demonstrates embellished visual quality of the side street abutting Whole Foods. The Portland Housing Authority's Bayside Terrace development across Franklin Street is a well-kept, and community-supported residential neighborhood and is defined by a chain link fence and no public sidewalk. Another distinguishing characteristic of the two sides of the street is the setback of street trees from the edge of roadway.

**Zone B:** The northern end of Zone B is south of Whole Foods as the roadway rises in elevation towards Cumberland Avenue. The central median is widest in this zone, and is planted with a mature row of large crabapple trees, which obstruct sightlines towards significant landmarks like the Cathedral of the Immaculate Conception. A major horizontal curve and the vertical grade also divert attention away from the Cathedral and towards the overwhelming mass of the 16-story Franklin Towers. Exhibit 2.8 shows section B-B' cut through a typical stretch of streetscape in Zone B.

There is no sidewalk at the roadway edge on the eastern side, only a chain link fence that separates the roadway from the open space along Boyd Street. The open field on Boyd lies below Franklin Street and is used in part by the Boyd Street Urban Farm's community gardens. Oxford Street, one of the streets which was severed when Franklin Street was built, is shown in the cross-section BB-BB' in Exhibit 2.9. The pedestrian desire to cross at this point remains strong, as indicated by the broken chain link fence and the worn path showing the continued use of the Oxford right-of-way as a cut-through.

Along with Congress Street, the Cumberland Avenue intersection serves as a primary gateway into the downtown Portland area. It is the pinnacle of Franklin Street and

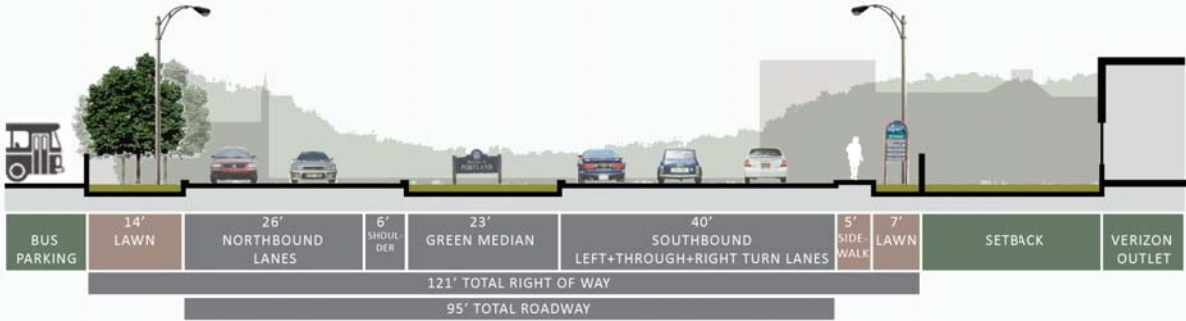


Exhibit 2.6 Section A-A'

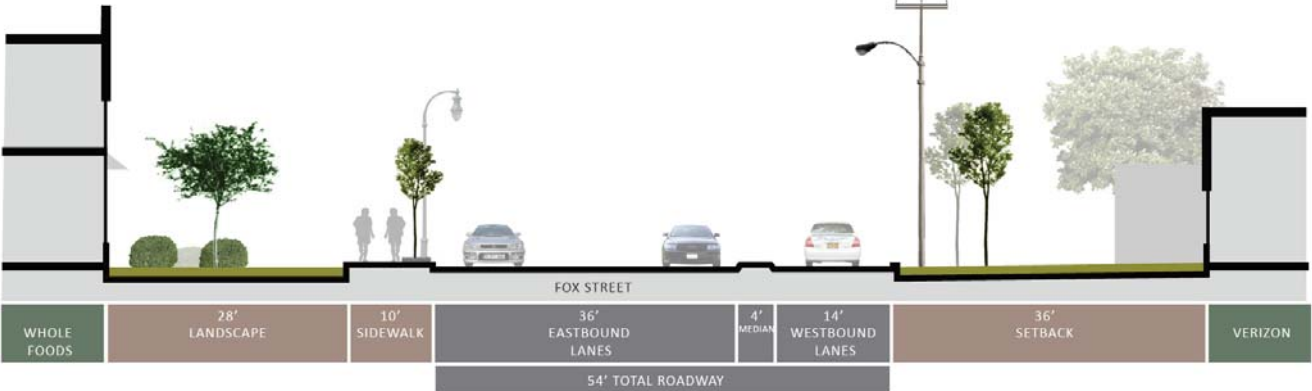


Exhibit 2.7 Section AA-AA'

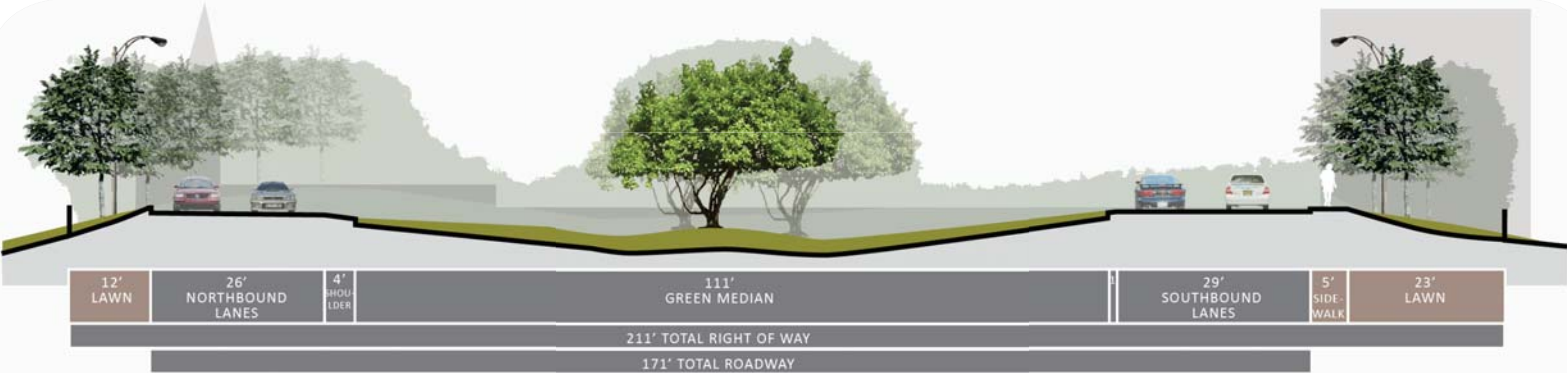


Exhibit 2.8 Section B-B'

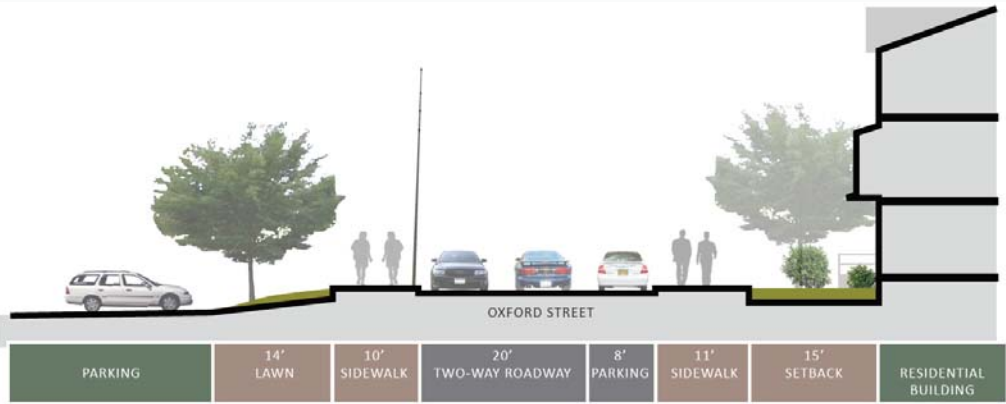


Exhibit 2.9 Section BB-BB'

provides a great urban design opportunity. The presence of both the Cathedral and Franklin Towers on opposite corners emphasizes the significance of this intersection in the fabric of Portland. The view from southbound Franklin Street to the Cathedral is impressive. The seating and picnic area at the foot of Franklin Towers is too close to the street and provides limited refuge to residents.

The Congress Street intersection does not have the architectural presence of the Cumberland Avenue intersection; however, it is flanked on the south corner by Lincoln Park. A former jewel of Portland in the late 1800s and early 1900s, Lincoln Park’s appeal has declined from the reconstruction of Franklin Street in the 1960s. Of critical note, Lincoln Park was once at the same elevation as Franklin Street. The reconstruction of Franklin Street lowered the roadway relative to Lincoln Park and eliminated the sidewalk. As with Oxford Street, Federal Street was cut in half and ceased to serve as a cross street when Franklin Street became the dominant arterial connector. The once gracious gateway into the park at Federal Street is now a parking lot. Exhibit 2.10 and Exhibit 2.11 are street sections (Section C-C’) cut at the same location, and illustrate how a section of the park was taken over for the construction of Franklin Arterial. More information and images can be found in the Task 4 Existing Conditions Analysis Memorandum.

**Zone C:** This zone extends from Federal Street to the Maine State Pier. Between Federal and Middle Streets, the median is planted with trees. There is no sidewalk on Franklin Street between Congress Street and Middle Street. This length of the street is one of visual disharmony: remnant building lots, views into side yards, overgrown vegetation, absent sidewalks, blocked streets and parking lots. Beyond Middle Street down to Commercial Street, the mix of historic brick buildings and new infill brick construction on the west side of Franklin Street follows a common setback from the curb line.

The Fore Street intersection has well designed streets on the west and outside Hampton Inn on the east with wide sidewalks, pedestrian lighting and street trees. Exhibit 2.12 shows section D-D’ cut through Franklin Street between Middle and Fore Streets.

The design unity exhibited on the north side of Franklin Street is absent, however, at Commercial Street, where the façade of the Ferry Terminal parking garage is also a brick structure. Exhibit 2.13 shows section DD-DD’ through Middle Street to which the visual disharmony continues. The terminus of Franklin Street seems to visually leak away to the east, without a façade wall equal in scale to the Ferry Terminal garage.

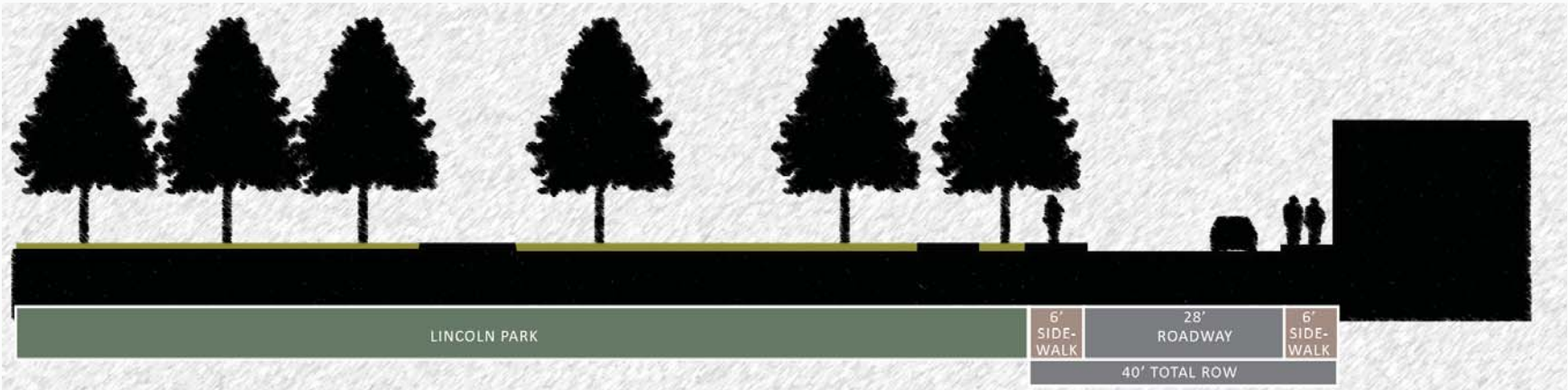


Exhibit 2.10 Illustrative Sketch of Section C-C’ cutting Lincoln Park as it was before 1966



Exhibit 2.11 Section C-C’ in 2014



Exhibit 2.12 Section D-D’



Exhibit 2.13 Section DD-DD’





## 2.4. Roadway Characteristics

### Roadway and Intersection Geometries

Franklin Street has a general cross section consisting of a divided roadway with two through lanes for the northbound and southbound directions, with northbound (NB) toward I-295 and southbound (SB) toward Commercial Street. A typical cross-section is shown in Exhibit 2.14. Further details of the inventory can be found in the Task 4 memorandum, Chapter 5.5.

Franklin Street has eight (8) intersections between and including Commercial Street and Marginal Way. Seven (7) are signalized; one (Lancaster Street) is unsignalized. The lanes for Franklin Street and the Maine State Pier are misaligned.

### Sight Distances

For the two potential intersections of Newbury and Federal Streets with Franklin, sight distance for the eastbound approach to Federal Street is limited looking beyond Congress Street, due to the sudden drop-off in vertical grade. For Oxford Street, sight distance could also be problematic due to the vertical grade of approximately 7% of Franklin. For the potential additional right turn onto Franklin Street from Lancaster Street, sight distance appears to be adequate.

### Bike and Pedestrian Accommodations

The Bayside Trail crosses Franklin Street via the crosswalk at the Marginal Way intersection. There are no other bike trail connections along the corridor. Pedestrian crossings associated with the Bayside Trail and a few other locations appear to be ADA compliant; the crossings at all the other intersections do not appear to be ADA compliant.

Sidewalks are present on all cross streets. Sidewalks are either bituminous, concrete or brick depending on their location.

Generally the older sidewalks are in poor condition; the concrete pavements are stained, asphalt pavements have settled, and weeds can be seen growing at the back of the curb. Old brick sidewalks have settled at the back of curb and no longer drain adequately. The newer brick sidewalk at the Whole Foods facility is in good condition. In many locations there are no sidewalks. Often paths have been worn in the turf along the side of the roadway.

### Grading / Horizontal Alignment

The vertical grade between Lancaster and Cumberland Avenue approaches 7% for nearly 800 feet. Between Congress and Fore Streets, grades approach 5% for 1,100 feet. The remaining sections of Franklin Street have grades of less than 2%.

City streets to the northeast (Boyd and Hampshire) and to the southwest (Pearl and Wilnot) have not been altered to the extent that Franklin Street has. The landform under Franklin Street from Congress to Middle was substantially excavated to achieve the present roadway gradients.

The horizontal curves range from approximately 400 feet in length at the Middle Street SB approach to 780 feet for the SB section between Cumberland Avenue and Congress Street.

### Striping

Existing pavement striping, including cross walk striping, appears to be worn, but is typically re-painted every spring. Arrow pavement markings are not currently visible at many intersections.

### Stormwater Management

Stormwater runoff from the roadway surfaces of Franklin Street is dealt with in two general ways:

- In the higher elevations of Franklin Street by directing roadway runoff to the large median at the center of the roadway, and
- In the lower elevations by directing runoff to catch basins and piping.

From the area of Bayside Terraces up over the hill southward to Middle Street, there does not appear to be a stormwater piping system to accommodate runoff from Franklin Street. The outside gutter lines of Franklin Street from Bayside Terrace to Middle Street have weeds growing in several areas of the gutter, and at other areas roadway debris and leaf litter have accumulated. From Middle Street southward to Commercial and from Fox Street northward, where the median strips narrow, surface runoff is captured by catch basins and piped away.

### Existing Vegetation

Vegetation along Franklin Street is dominated by turf and trees. Street trees grow along the edges of the roadway and in the median. Four genera appear to make up the great majority of tree species: Quercus (Oak), Pinus (Pine), Gleditsia (Honeylocust) and Malus (Crabapple).

From Congress Street through to Marginal Way, the dominant trees within the median are a mature variety of crabapple that is growing on a slightly raised berm in the center median. From Congress Street to Middle Street, the dominant deciduous shade tree in the median is Pin Oak. Along the length of Franklin Street, the dominant street tree is Honeylocust. Beyond the right-of-way there are many instances of tree and shrub planting on adjacent properties that are part of the visual tableau of Franklin Street.

### Street Lighting

Franklin Street is lighted with cobra head light fixtures, many of which have been de-lamped between intersections, apparently in an effort to save energy. Thus lighting is inadequate, except at the illuminated intersections, and the style of fixture

### Signage and Wayfinding

Directional and Route signs along Franklin Street do not appear to be compliant with the 2009 edition of the Manual on Uniform Traffic Control Devices (MUTCD). Route signs are located for the northbound traffic approaching Congress Street and Marginal Way intersections.

At intersections along Franklin Street, the street name signage for cross streets has blades scaled for a typical city street, where the building-to-building distances are tight and there is a consistency to building facades. Considering the breadth and scale of Franklin Street, the size and scale of the street signage blades are too small, disappearing within the visual context of Franklin Street.

Wayfinding signs are located for the southbound traffic approaching the Fox Street / Somerset Street, Congress Street, Middle Street and Commercial Street intersections. These wayfinding signs are understated. Colors are muted shades of green, blue and mauve. They blend with the landscape and, without being spot lighted at night, become nondescript, invisible and inadequate.

Likewise, at the other end of Franklin Street there is no recognition of the corridor or the entry into the Old Port and the Waterfront, which are major commercial destinations, other than the small and unobtrusive Wayfinding Sign.

The Portland Peninsula Vehicular Wayfinding Plan (2013) is expected to address most of these concerns.

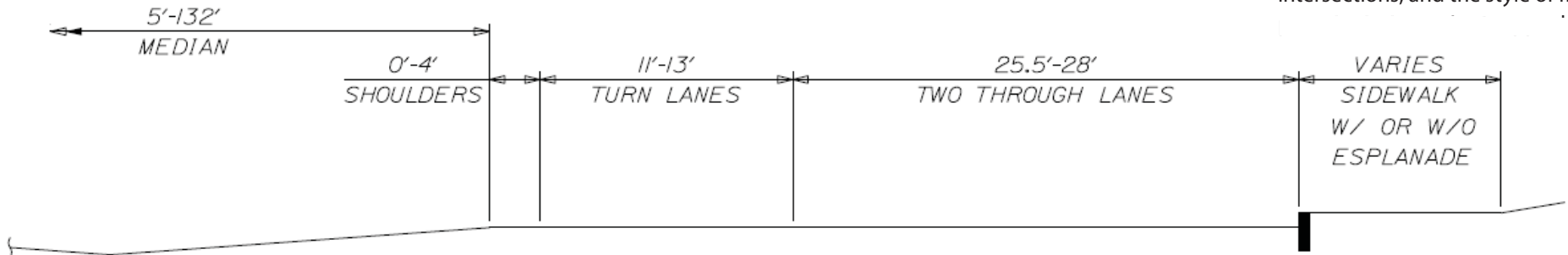


Exhibit 2.14 Typical Section - Northbound and Southbound



## 2.5. Traffic and Transportation Analysis

### 2.5.1. Traffic Characteristics

This section summarizes traffic characteristics, including traffic volumes, travel times and corridor speeds, and crash data.

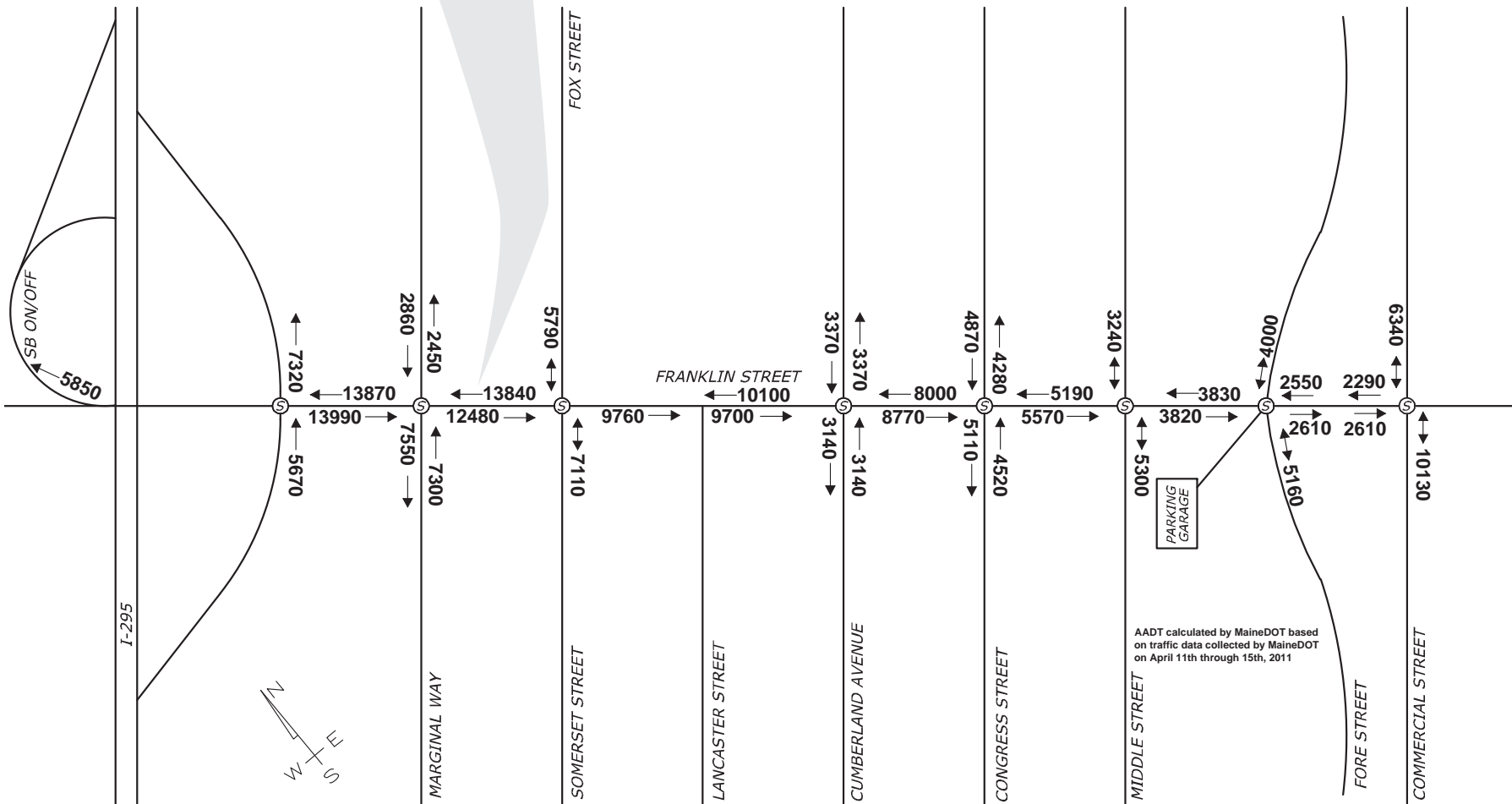
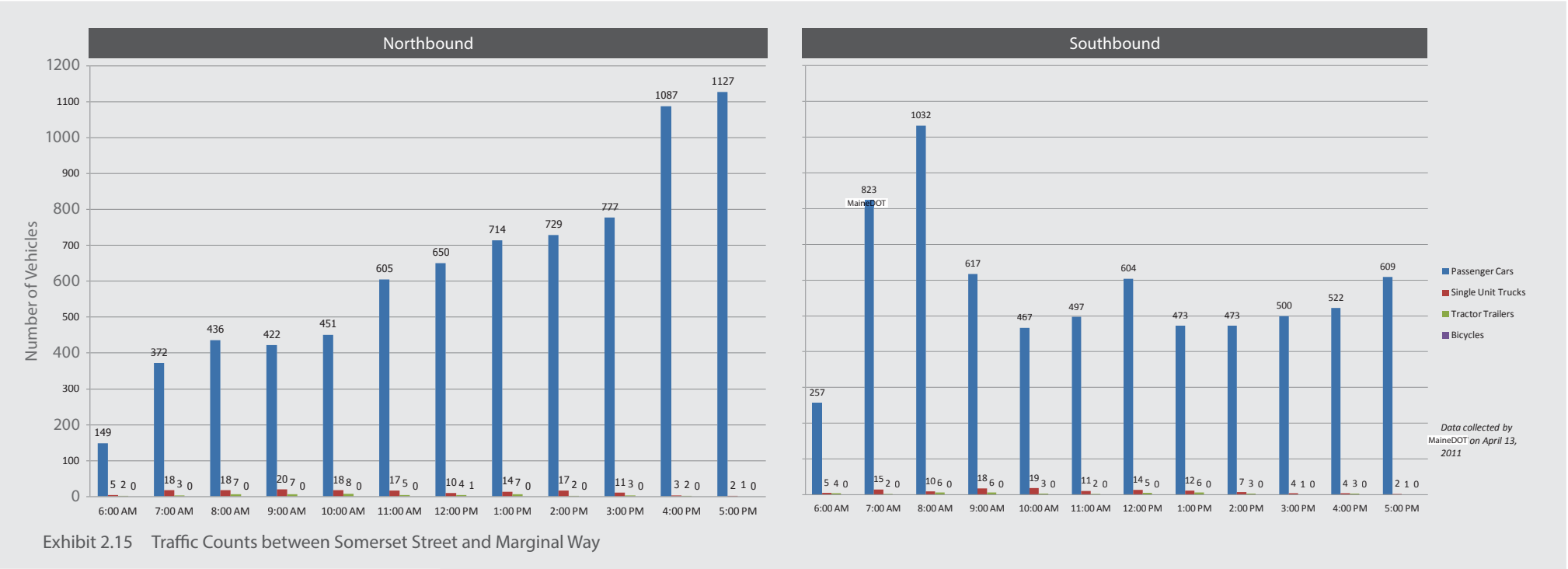
#### 2.5.1.1. Traffic Volumes

The Annual Average Daily Traffic (AADT) is the average daily volume of motor vehicle traffic on a roadway over the course of a year. This number is estimated from the measure of daily traffic over a short period, adjusted using a factor in order to account for seasonal and day of week changes. The following table lists the AADT at selected locations along Franklin Street. Table 2.1 shows the AADT for the entire corridor. The raw and adjusted counts that the AADT is based on can be found in the Task 4 Memorandum.

Over the course of the day, automobile counts peak in the AM between the hours of 7:30-8:30am and in the PM between 4:30 and 5:30pm. Small and large truck traffic peaks between the hours of 9:00 and 10:00am. The volume of traffic moving in either direction decreases exponentially going south towards Commercial Street from I-295.

Table 2.1 AADT at Select locations

Street Segment	Southbound (I-295 to Commercial)	Northbound (Commercial to I-295)
Between I-295 and Marginal Way	13,990	13,870
Between Cumberland Avenue and Congress Street	8,000	8,770
Between Middle Street and Fore Street	3,830	3,820







2.5.1.2. Average Travel Times and Corridor Speeds

The section between Marginal Way and Somerset Street carries a higher volume of trucks relative to other portions of the corridor. However, the overall volume of trucks, even in these peak locations is significantly lower than that of automobiles.

The observed average travel speeds for all segments of the corridor were:

NB: 21mph (AM) / 13mph (PM) | SB: 13mph (AM) / 10mph (PM).

These are well below the posted speed limit of 35mph because of the traffic signals at almost every intersection.

Travel speeds and corresponding travel times along the corridor do vary between peak and nonpeak travel times. The average travel time doesn’t vary significantly between peak and nonpeak travel times when travelling north to south. The difference in travel time becomes more significant when travelling south to north, with the majority of northbound peak hour delay occurring between Fox Street and I-295. (Exhibit 2.17).

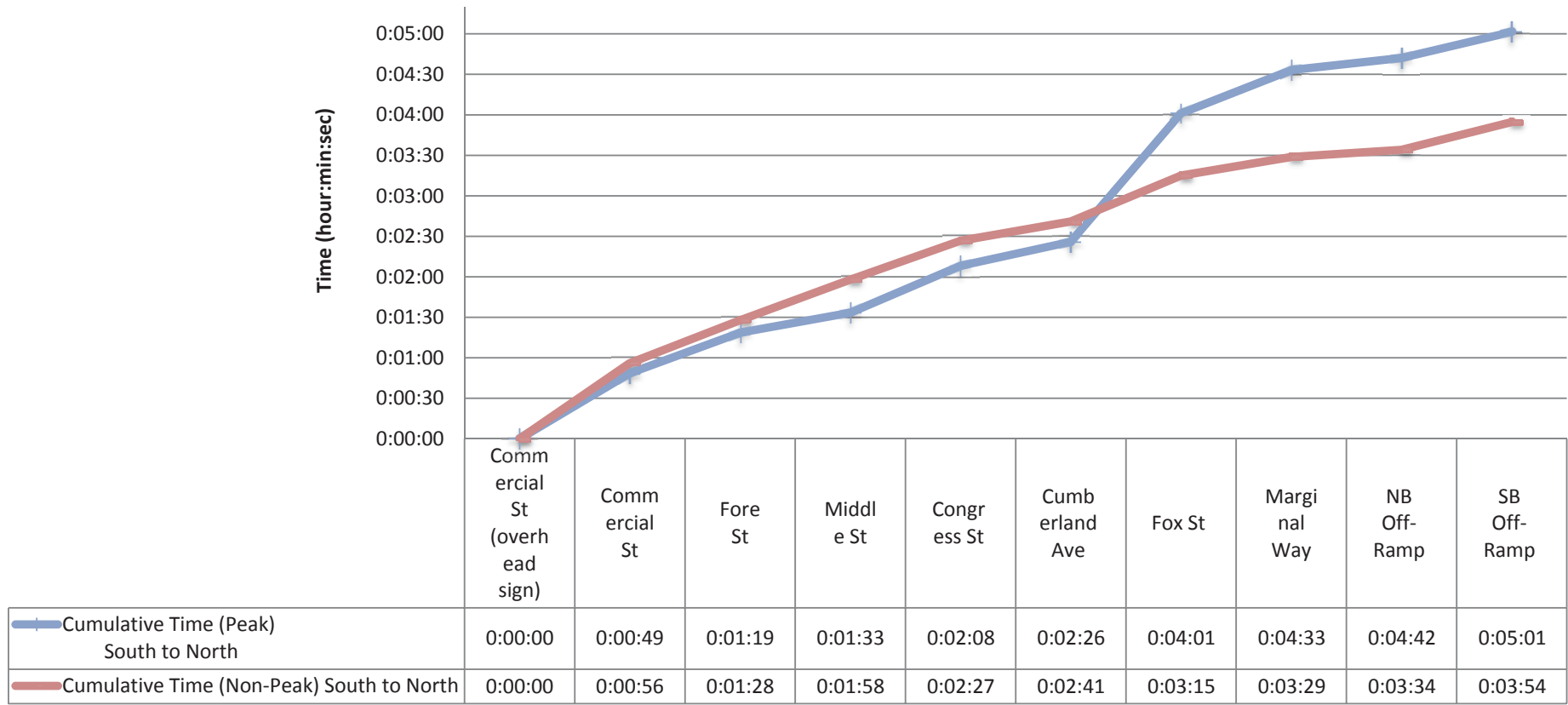


Exhibit 2.17 Average Travel Time along Franklin Street (South to North) - Peak versus Non-Peak Hour

2.5.1.3. Crash Data Analysis

The project team obtained the crash data from MaineDOT for the period of 2010-2012.

There were a total of 165 collisions during the three year period along the Franklin Street corridor from and including Marginal Way to Commercial Street. The majority of these collisions, 155, occurred at intersections, with the remaining 10 in roadway segments between intersections. A breakdown of the location of these collisions is summarized in Tables 2.2 and 2.3 at right:

Table 2.2 Crash History at Intersections

Intersection with Franklin	No of Crashes	Crash Rate	CRF*	Percent Injury	HCL**?
Commercial-signal	3	0.24	0.21	0.00	No
Fore-signal	7	0.59	0.50	57.1	No
Middle-signal	15	1.01	0.90	26.7	No
Congress-NE signal	8	0.49	0.45	37.5	No
Congress-SW-signal	17	0.76	0.80	35.3	No
Cumberland-NE-signal	4	0.24	0.22	25.0	No
Cumberland-SW-signal	14	0.83	0.71	35.7	No
Fox- signal	26	0.83	0.86	38.5	No
Marginal Way-signal	47	1.17	1.26	24.0	Yes
Northbound on-ramp-unsig-nalized	1	0.07	0.22	0.00	No
Northbound off-ramp-signal-ized	13	0.91	0.81	46.2	No
Total	155				

CRF\* = Crash Rate Factor; HCL\*\* = High Crash Location

Table 2.3 Roadway Segments

Road Segment Between:	No of Crashes	Crash Rate	CRF	Percent Injury	HCL?
Fox and Marginal Way	1	66.72	0.16	100.00	No
Marginal Way to Ramps	2	467.25	1.65	0.00	No
Fox and Cumberland heading southeast	4	158.66	0.42	0.00	No
Cumberland and Congress heading southeast	1	116.98	0.23	0.00	No
Commercial and Fore	2	884.58	1.30	50.00	No
Total	10				

CRF\* = Crash Rate Factor; HCL\*\* = High Crash Location

The statewide average crash rates are 0.12 and 0.62 for un-signalized and signalized intersections respectively and 178.48 for roadway segments. Six (6) intersections and two (2) segments exceed these averages. The intersection of Marginal Way and Franklin street is rated as a high crash location (HCL).



2.5.2. Operational Analysis and Level of Service

Two approaches have been used throughout the study to identify Level of Service (LOS). The more traditional methodology is a highway LOS, focusing on the experience of motorized vehicle users. The concept of LOS has also recently been extended to both public transit and non-motorized transportation. This multimodal LOS (MMLOS) incorporates the operational quality of these modes as well as highway traffic.

2.5.2.1. Highway Level of Service (LOS)

The project team completed a Synchro / Simtraffic computer model of the eight signalized intersections along Franklin Street for the existing 2013 AM and PM peak hour conditions. The reports from the Synchro / Simtraffic analysis are included in Appendix E of the Task 4 Existing Conditions Memo.

Based on the modeling of the 2013 existing conditions (AM and PM peak hours), the level of service (LOS) for the intersections varies from B-C toward the Commercial Street end and decreases moving along the corridor to failing (LOS E and F) at the Marginal Way end. (Exhibit 2.18). This decrease in LOS is proportional to the trend in traffic volumes, since the Marginal Way end has approximately three to four times the volume of traffic of the Commercial Street end.

Based on the modeling, the intersections from approximately Cumberland Avenue to Commercial Street are operating at acceptable levels of service (LOS B-D) with no clear operational issues. The three intersections with Franklin Street and Somerset / Fox Streets, Marginal Way, and the I-295 ramps are all over capacity during both the AM and PM peak hours, leading to queue lengths that interfere with proper functioning of the surrounding intersections

2.5.2.2. Multimodal LOS

The methodology for this analysis follows the guidelines presented in NCHRP Report 616 Multimodal Level of Service Analysis for Urban Streets, and utilizes the CompleteStreets software released by Dowling Associates, Inc. The methodology, framework and explanation of results is presented in the Task 4 Existing Conditions Memo.

Table 2.4 summarizes the Multimodal LOS results for the AM and PM peak period for each segment in the northbound and southbound directions. The detailed analysis report is included in Appendix F of the Task 4 Existing Conditions Memo.

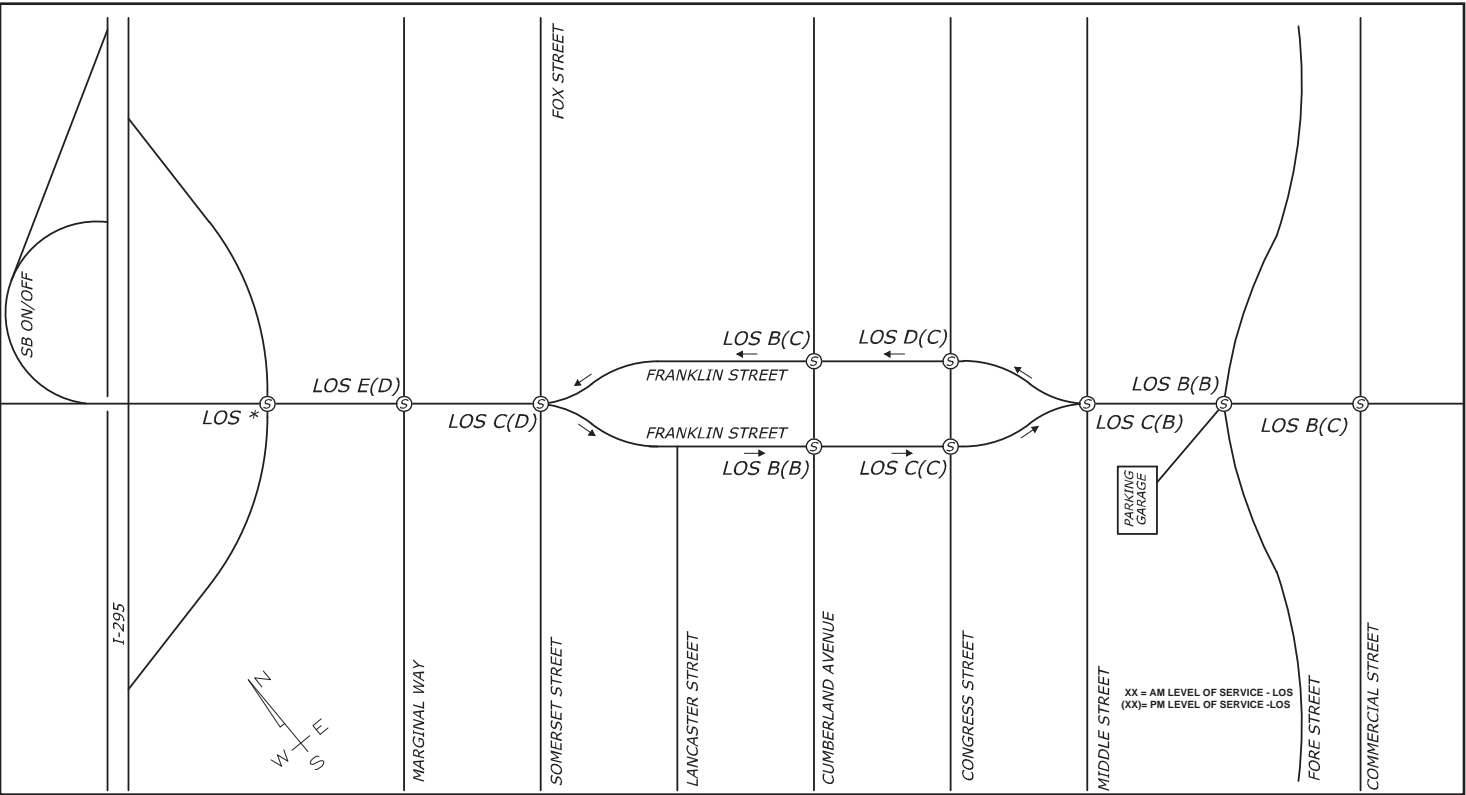


Exhibit 2.18 Intersection Level of Service for Existing Conditions

Table 2.4 AM and PM Peak Overall Facility Score

Franklin Street – Overall Corridor					
	Mode	AM Peak		PM Peak	
		Score	LOS	Score	LOS
Northbound	Auto	0.52	C	0.47	D
	Transit	6.40	F	6.41	F
	Bicycle	3.25	C	3.02	C
	Pedestrian	2.69	B	2.76	C
Southbound	Auto	0.42	D	0.44	D
	Transit	6.45	F	6.45	F
	Bicycle	3.65	D	3.65	D
	Pedestrian	2.97	C	3.02	C

Conclusions of MMLOS Analysis

The results of the Multimodal LOS for Franklin Street are generally consistent in both the northbound and southbound direction and during both peak periods.

Auto LOS is a function of the average travel speed over the length of the street and the average number of stops per mile. The overall corridor Auto LOS is “D” during the PM peak period in the northbound direction and both AM and PM peak periods and in the southbound direction. The overall corridor Auto LOS during the AM peak period in the northbound direction is LOS “C.”

There are currently no transit stops along Franklin Street, resulting in a Transit LOS of “F.” The transit level of service is based on a combination of the access experience, the waiting experience, and the rider experience, as well as the pedestrian LOS score.

The overall corridor Bicycle LOS for Franklin Street is LOS “C” for both peak periods in the northbound direction and LOS “D” for both peak periods in the southbound direction. Bicycle LOS is based on a combination of user experience at intersections, the presence of striped bicycle lanes, and the number of signalized intersections per mile that the bicyclists must cross. The resulting LOS is due to the lack of striped bicycle lanes along Franklin Street. However, due to limited driveways and intersections along the corridor, combined with the volume and speed of auto traffic in the direction of travel, bicyclists can still travel along the corridor.

The overall corridor Pedestrian LOS for Franklin Street is LOS “C” for all scenarios, except during the AM peak period in the northbound direction where the LOS is “B.” Pedestrian LOS is a combination of pedestrian density and widths of bicycle lanes, parking lanes, buffers, and sidewalks. The most significant factor affecting Pedestrian LOS is usually the volume of auto traffic and traffic speed.





### 2.5.3. Bike and Pedestrian Analysis

#### Pedestrian Facilities

Exhibit 2.19 includes information on paved and unpaved sidewalks in the study area. There is limited consistency in the sidewalks along the corridor, both in terms of materials and in their very existence. According to City of Portland data, sidewalks are present on most other roads in the study area, except along much of Somerset, Kennebec, Diamond, Anderson, and Cove Streets as well as on the north side of Fox and Fore between Franklin and India Street.

Pedestrian crossing conditions at intersections are inconsistent along the corridor. Pedestrian crossings associated with the Bayside Trail and a few other locations appear to be ADA compliant, with appropriate cross slopes and widths for curb ramps and truncated domes. Some pedestrian crossings have actuation buttons with pedestrian countdown information and ramps that would qualify under ADA guidelines, but many do not. Many of the existing crosswalk markings have faded and are not clear, but are typically re-striped every spring.

#### Pedestrian Trips

As illustrated in Table 2.5, pedestrian volumes at the intersections along Franklin Street steadily increase going southward towards Commercial Street from I-295. This is the opposite of the pattern for motorized vehicular traffic. In all cases, the majority of pedestrians at each intersection are navigating the cross street rather than Franklin Street itself. The peak hour for pedestrian volumes (the hour within a 12 hour period where the greatest numbers of pedestrians were counted) varies from intersection to intersection. However there is a trend towards an earlier peak hour (generally between 12:00pm and 2:00pm) moving from north to south along the corridor. At the mid-block crossings between Somerset Street and Cumberland Avenue, where pedestrian counts were not available, the volumes were estimated from field surveys at high demand crossings for people navigating across Franklin Street from East Bayside towards Bayside and Downtown.

Table 2.5 Pedestrian Volumes at Intersections along Franklin Street

Junction	Total Daily Crossing Volume (4-ways)	Daily Crossing Volume- (Across)	Daily Crossing Volume (Along)	Pedestrian Peak hour	Peak hour crossing volume (4-ways)
I-295	n/a	n/a	n/a	n/a	n/a
Marginal Way	143	124	19	5:00-6:00pm	24
Somerset/Fox Streets	161	131	30	3:00-4:00pm	25
Cumberland Avenue	387	326	61	1:00-2:00pm	65
Congress Street	735	685	50	11:00-12:00pm	101
Middle Street	910	805	105	1:00-2:00pm	132
Fore Street	1140	707	433	12:00-1:00pm	185
Commercial Street	1345	1152	193	12:00-1:00pm	243

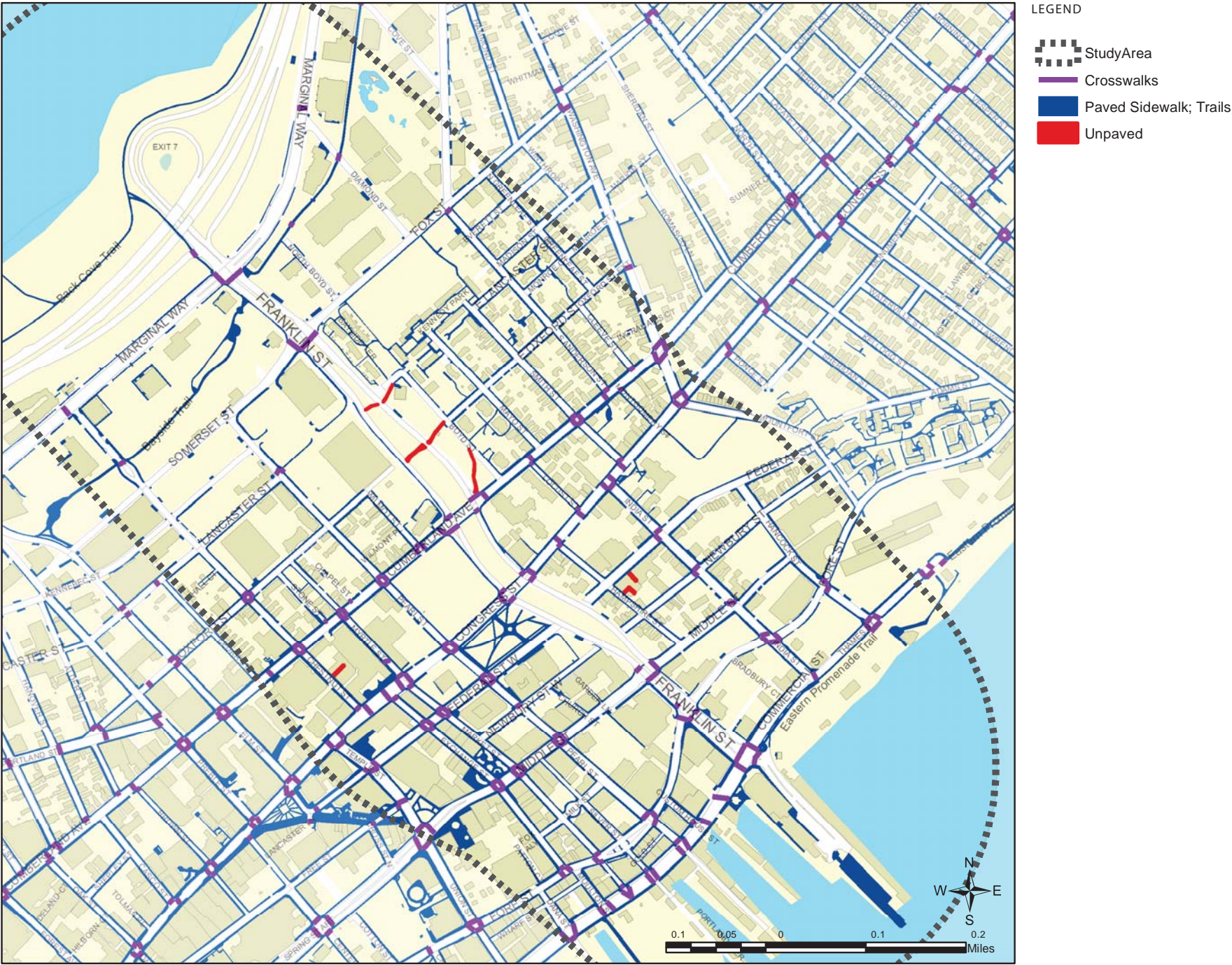


Exhibit 2.19 Pedestrian Infrastructure (adapted from City of Portland GIS files)



Bicycle Facilities

Exhibit 2.20 shows both existing and planned bicycle facilities according to the City’s data, as well as a ranking of pavement conditions. There are no bicycle facilities along the length of Franklin Street, nor on most streets in the study area except Marginal Way. The pavement quality was generally rated F on Franklin Street, and was rated a C on other key streets such as all of India Street and Washington Ave, part of Marginal Way and Cumberland Ave, as well as most of Congress and Commercial Streets. The rating of conditions on Franklin Street does not reflect the most recent repaving projects carried out by the City, which will likely elevate the pavement rating to A or B.

The Bayside Trail crosses Franklin Street at the Marginal Way intersection. There are no other direct bike trail intersections on Franklin Street, though it is possible to access the Back Cove Trail under the I-295 overpass, as well as the Eastern Promenade Trail across Commercial Street.

Bicycle Trips

Although there is a sizeable bicycle presence on the Portland Peninsula as a whole, MaineDOT counts reveal that bicycle traffic is minimal along the Franklin Street corridor.

Parallel bicycle routes were often identified by the Committee to be preferred over using Franklin Street. One example of an alternative parallel route was Pearl Street, because of its lesser gradient and more comfortable cycling conditions. This street connects to most of the same streets that cross Franklin Street, from Somerset to Commercial Streets. One opportunity to enhance bicycle circulation in the study area might be to complete the missing link of this connection, from Somerset Street to Marginal Way, crossing the Bayside Trail.

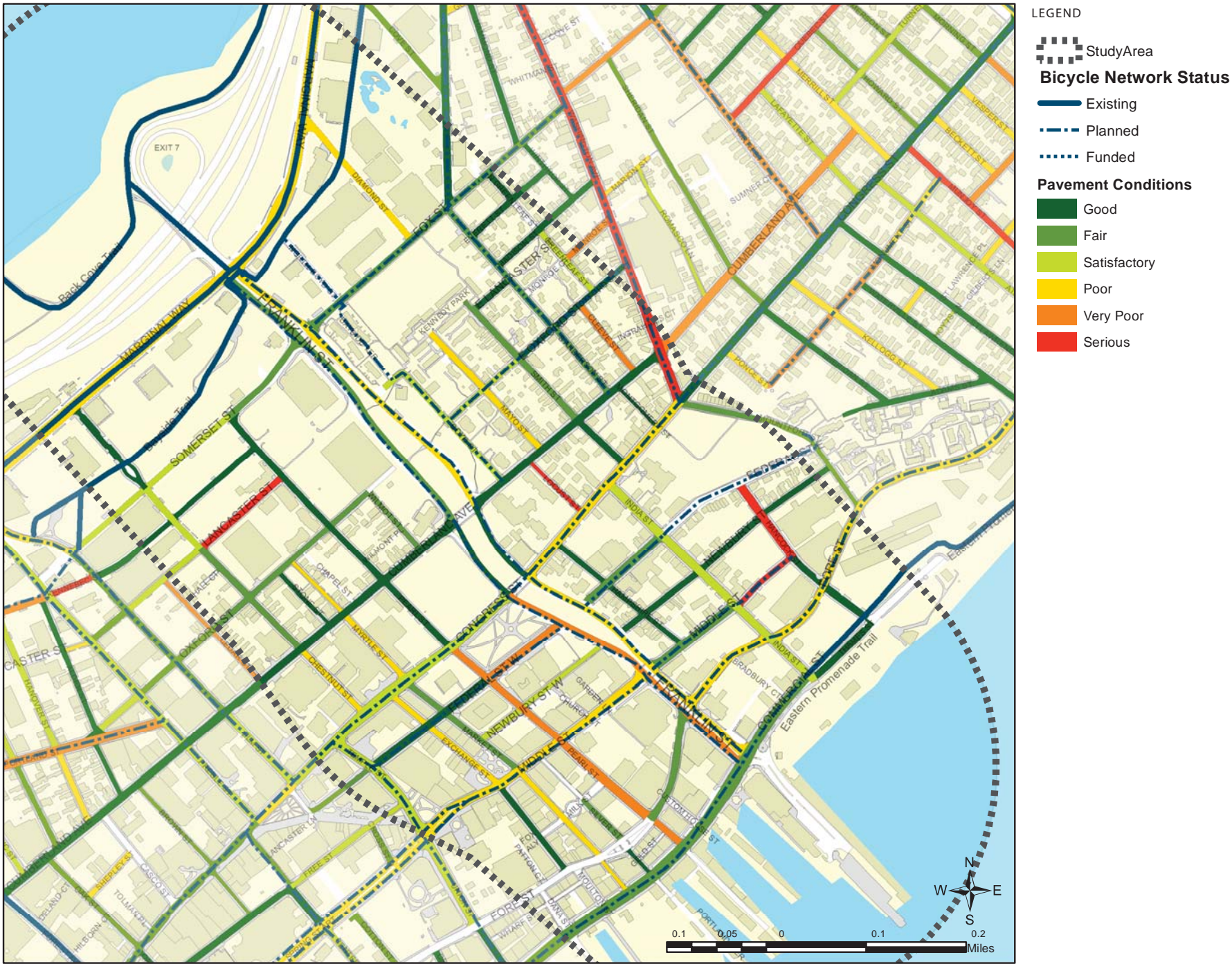


Exhibit 2.20 Bicycle Infrastructure and Network (Source: City of Portland GIS files and 2011 PCI ratings)





Generators/Attractors and Desire Lines

Major generators and attractors of bicycle trips, identified based on feedback received from Portland Bicycle and Pedestrian Committee, are displayed in Exhibit 2.21. It is observed from the diagram that there is a division between the residential neighborhoods, which are trip generators, and their associated destinations. Portland Bicycle and Pedestrian Committee members described it as being an imbalance, where there is a greater attraction for trips on the southwest side of the corridor. The Committee members stated that there was less reason to travel to the northwest portion of the study area unless a pedestrian or cyclist is a resident of the East Bayside or India Street neighborhoods.

In addition to Oxford, Lancaster, Federal, and Newbury Streets, other connections identified as lacking include the following:

- East-west connections along Pearl from Somerset to Marginal
- Connections between Bayside Trail to all destinations along the trail
- Easier wayfinding for the recently improved connection between Back Cove and Franklin Street

Of the streets that were discussed for possible reconnections, Newbury was identified as a less critical connection, because the street is shorter. Oxford, Lancaster, and Federal were identified as higher priorities. Pearl Street and Middle Street were both identified as good alternatives to biking on or along Franklin Street.

Portland High School, as well as the King Middle School (not in the study area), are key attractors of note. These destinations are a large part of the reason that the Oxford and Lancaster desire lines are so strong.

The park-and-ride off of Marginal Way east of Franklin Street was not recognized as a major attractor for walking or cycling trips. There are additional key attractors not in the study area, but worth mentioning in this analysis. Some of these include the Trader Joe's and Hannaford shopping plazas to the west, as well as the commercial districts on Congress and Commercial Streets to the south and west.



Exhibit 2.21 Major Generators / Attractors (based on feedback received from Portland Bicycle and Pedestrian Committee)



Challenges and Opportunities

Exhibit 2.22 shows challenges to walking and cycling in the study area as identified by the Bicycle and Pedestrian Committee. Although Franklin Street provides a high level of mobility for vehicles, the current design has long pedestrian crossings, long distances between pedestrian crossing opportunities, poor pedestrian sight lines, and an overall lack of cycling facilities. Pedestrian desire lines are clearly visible as worn paths across the median that separates the two sides of Franklin Street. Although Franklin Street could provide users with a direct route to bicycle and pedestrian amenities such as the Back Cove and Bayside Trails, and even the East Coast Greenway, the character of the roadway is generally felt to be appropriate only for experienced, confident cyclists and pedestrians.

Data provided by the City of Portland indicate that there is inadequate pedestrian and infrastructure along Franklin Street to support the current travel behavior.

Intersections were identified as key challenge areas for both cyclists and pedestrians. For example, turning motor vehicle traffic can be a particular challenge for both cyclists and pedestrians; although there are warnings along the corridor for drivers to look for pedestrians and cyclists, the geometry and other conditions are not conducive to such care. The turning radii at each corner of the intersection of Franklin Street at Middle Street were identified as a particular challenge. Crossings at both Congress and Cumberland are confusing for all users, resulting in less safe conditions for pedestrians and cyclists trying to navigate among equally confused drivers (The pedestrian crossings at Congress and Cumberland have recently been extensively upgraded to meet ADA standards, and thus are much improved).

Cyclists face the additional challenge of limited to no bicycle parking opportunities along the corridor. The only parking rack for cyclists that was observed along Franklin Street was a comb type. This type of bicycle rack has been generally recognized as not best practice because the close spacing of the parking reduces its usability and efficiency. Other than that, while the Whole Foods property offers significant bicycle parking, there is generally a dearth of parking along the corridor.

Zoning can be used to ensure that new developments meet minimum bicycle parking requirements, in accordance with good practice.

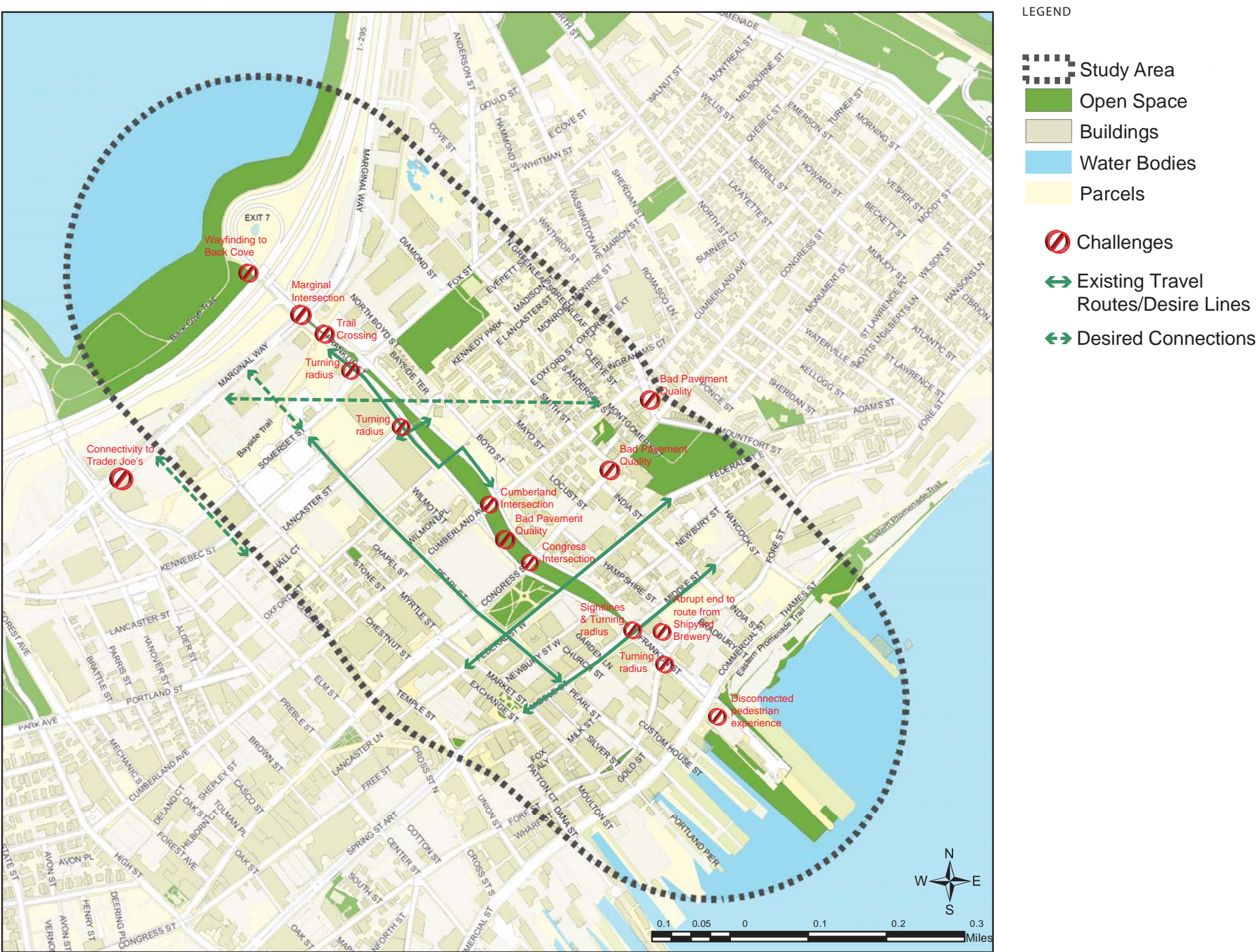


Exhibit 2.22 Challenges and Desire Lines (based on feedback received from Portland Bicycle and Pedestrian Committee)





2.5.4. Transit Service Analysis

In and of itself, Franklin Street has not played a significant role in the Portland Peninsula’s transit network. Historically, Portland’s streetcar system was focused on principal double-tracked routes on Congress Street and along Park Street and Portland Street, with single tracks on three streets roughly parallel to Franklin: Elm and Cross Streets (formerly connected), Market Street, and Pearl Street. Single tracks were also present on three streets roughly perpendicular to Franklin: Oxford Street, Middle Street, and Commercial Street. Forest Avenue also had extensive sections of double streetcar track.

The Franklin street area is presently served by METRO routes 1, 6, 7, and 8, as shown in Exhibit 2.23. The present bus routes 1 through 7, operated on the Peninsula by Portland METRO, retain the general pattern of the principal streetcar lines. These routes connect central Portland with outlying parts of the city and points beyond, and connect at the system’s PULSE transit center on Elm Street, between Congress Street and Cumberland Avenue. The present Route 8 has evolved as a circulator or community bus route, and is confined entirely to the Peninsula. These routes as well as South Portland Routes are described in more detail in the Task 4 memorandum.

2.5.5. Parking Assessment

There is minimal on-street parking along Franklin Street. At the southerly end of the corridor, between Fore and Commercial Streets, there are four metered parallel spaces (2-hour limit) on the northbound side. The remainder of the corridor has no on-street parking.

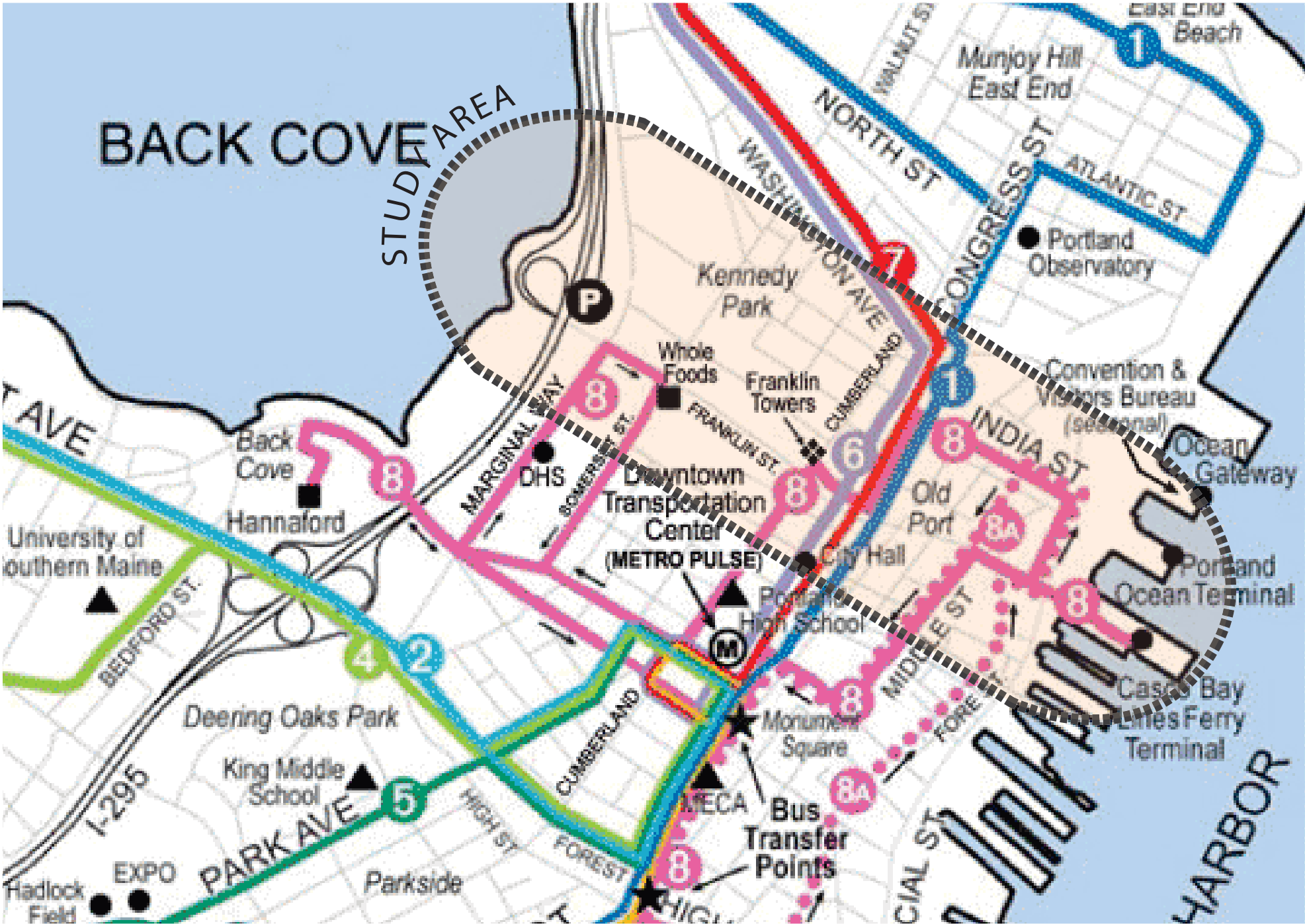


Exhibit 2.23 Metro Routes in Study Area









### 3. Alternatives Development and Evaluation



# 3.1. Alternatives Introduction

## 3.1.1.Objectives:

The purpose of this task was to refine the alternatives developed in Phase I of the Franklin Street study. The key objectives were as follows:

- To align the Phase I alternatives to the refined vision of Franklin Street and develop new alternatives if needed,
- To identify gaps in the Phase I alternatives based on technical feasibility,
- To add details to the Phase I alternatives based on site conditions and technical requirements,
- To ensure that the alternatives provide choices addressing important stakeholder priorities, and
- To enable fair evaluation of the various design elements of the alternatives to select the best approach for Franklin Street.

The refined Phase II alternatives were as follows and are defined in Section 5:

- Urban Street Option 1
- Urban Street Option 2
- Urban Parkway

## 3.1.2. Alternative Development Methodology:

The development and refinement of the Phase I alternatives were driven by a number of inputs:

- Review of the Phase I alternatives. Details can be found in Alternatives for Franklin Street – Task 6 memorandum Appendix A.
- Review of other key plans and studies within the study area as enlisted in the Existing Conditions Memo.
- Exploration of specific design elements of interest based on existing conditions. Design elements considered can be found in Alternatives for Franklin Street – Task 6 memorandum Chapter 2.2.
- Interactions with the Public Advisory Committee (PAC).
- Interactive sessions with members of the public during a public meeting on January 29, 2014.
- Public feedback through the Mindmixer web tool. Summary of feedback can be found in Alternatives for Franklin Street – Task 6 Memorandum Appendix B.

## 3.1.3. Alternatives

The alternatives were refined with the intention of capturing the range of options for elements that needed to be analyzed. These options were grouped together into alternatives, building on how they were grouped in Phase I, primarily for the purpose of being able to carry out an evaluation. It is very important to note that it is not required that the final alternative include exactly one set of elements as described below. Instead, the project team and PAC discussed the results of the analysis to determine the preferred combination of elements, which could be different from any of the three alternatives described below. With that caveat, the three alternatives that were created for the purposes of evaluation are presented and defined in detail below:

### Alternative 1 – Urban Street Option 1

Envisioned as the most pedestrian oriented of the three alternatives, Urban Street Option 1 provides 22-footwide sidewalks and on-street buffered bike lanes/cycle tracks. It incorporates maximum street reconnections for all modes. This alternative maximizes the development opportunities created by narrowing and realigning the right of way (ROW), allowing for large parcel sizes that can attract active mixed-use development. This alternative was intended to retain the current size of Lincoln Park, and to use the land across the street for active mixed use development.

### Alternative 2 – Urban Street Option 2

The Urban Street Option 2 alternative balances transportation priorities with local neighborhood needs and development opportunities. It proposes the narrowest ROW width, which is achieved by providing a bi-directional off-street cycle track along the western sidewalk instead of on-street facilities. Sidewalks are limited to an adequate 10 feet that is usually wider than existing conditions. Only some streets are proposed to be reconnected for all modes. The rest are proposed as only pedestrian and bike connections. This alternative allows for smaller scale development opportunities due to smaller parcel sizes made available by the proposed ROW alignment. There remains high potential, however, for new development to better integrate the surrounding urban fabric. Lincoln Park is proposed to be partially expanded, while the land across the street is used for small-scaled development with an active edge.

### Alternative 3 – Urban Parkway

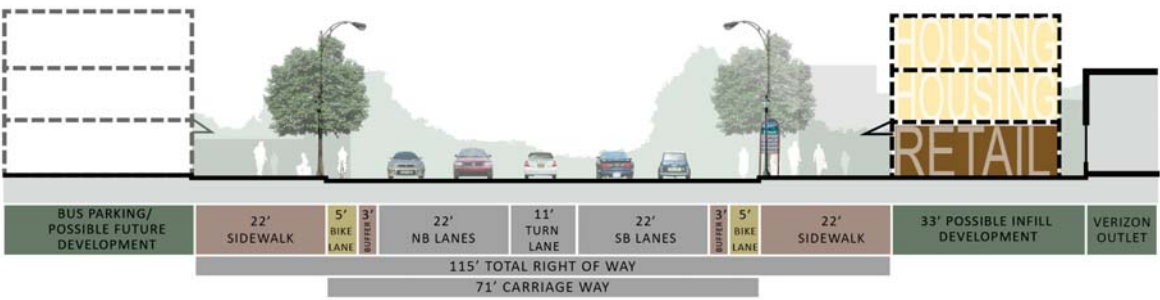
Prioritizing both transportation and open space needs, the Urban Parkway alternative focuses on maintaining higher mobility for automobile and transit users, while providing improvement for pedestrian and bicycle facilities. It is intended to retain the central median and to use it as a median bi-directional bike path in the near-term, reserving it for potential future fixed guideway transit. Street reconnections are principally provided for pedestrians and bicyclists only. In terms of development, the emphasis is more on open spaces. Lincoln Park is proposed to be expanded as much as possible within geometric constraints. A form-based code is proposed to enhance the quality of the street edge and improve the interaction between the street and surrounding neighborhoods.



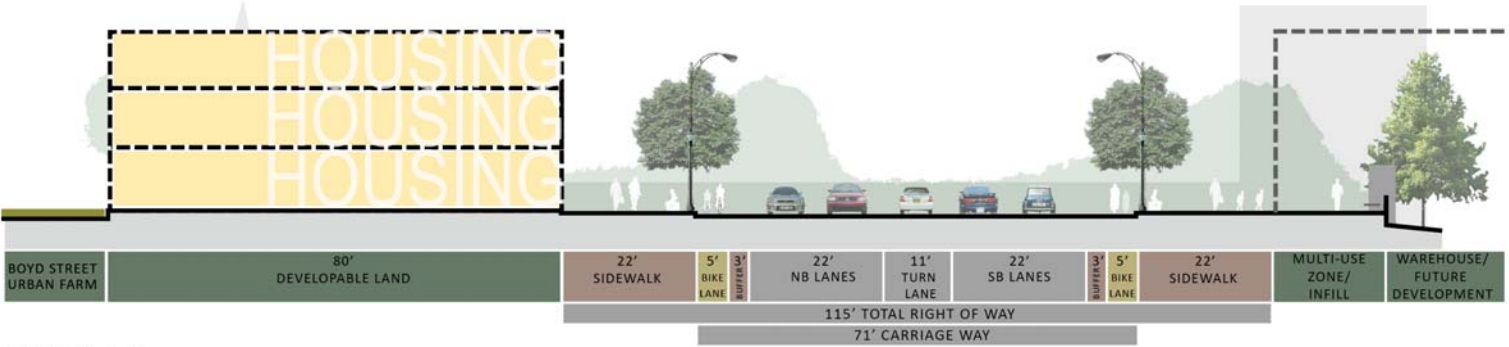


ALTERNATIVE 1 - URBAN STREET OPTION 1

Exhibit 3.1 Alternative 1- Urban Street Option 1- Plan and Sections



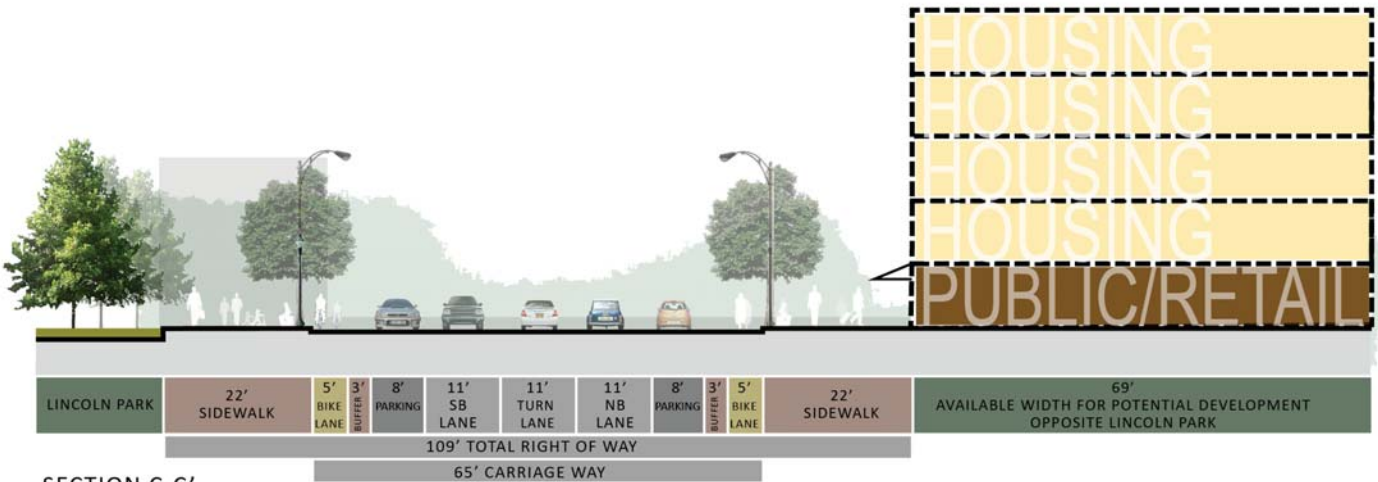
SECTION A-A'  
Through Franklin Street Near Somerset St. Looking South



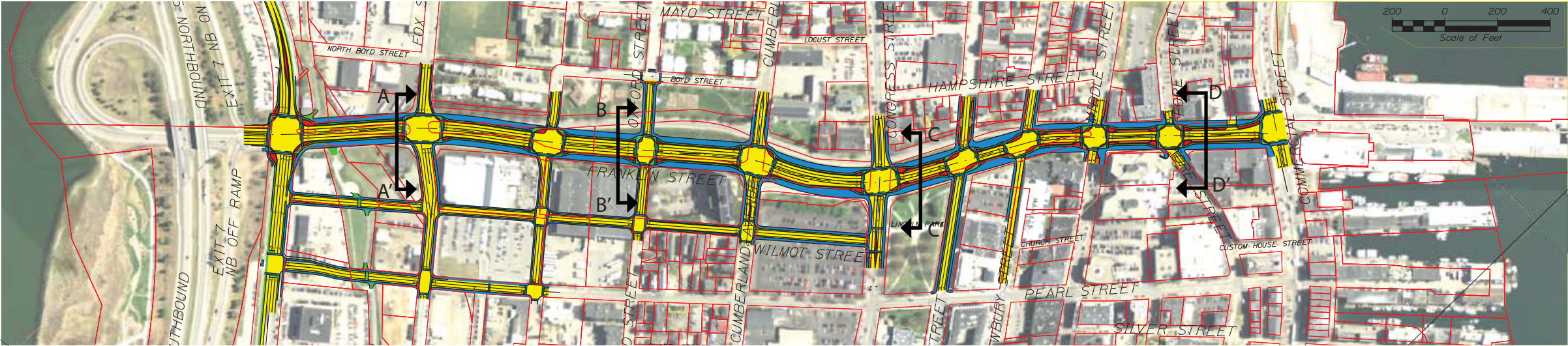
SECTION B-B'  
Through Franklin Street Near Oxford St. Looking South



SECTION D-D'  
Through Franklin Street Near Fore St. Looking North



SECTION C-C'  
Through Franklin Street Near Lincoln Park Looking North

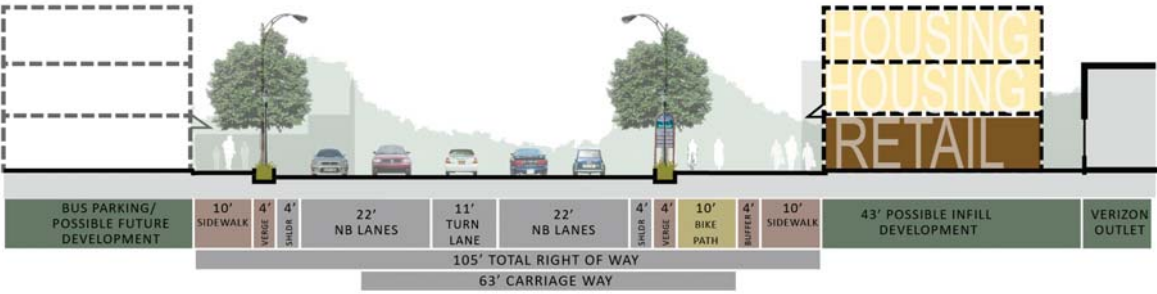


- LEGEND
- Vehicle
  - Bike
  - Pedestrian
  - Right Of Way Lines
  - Traffic Flow Arrows
  - Parking
  - Buffers & Islands
  - Signalized Intersection

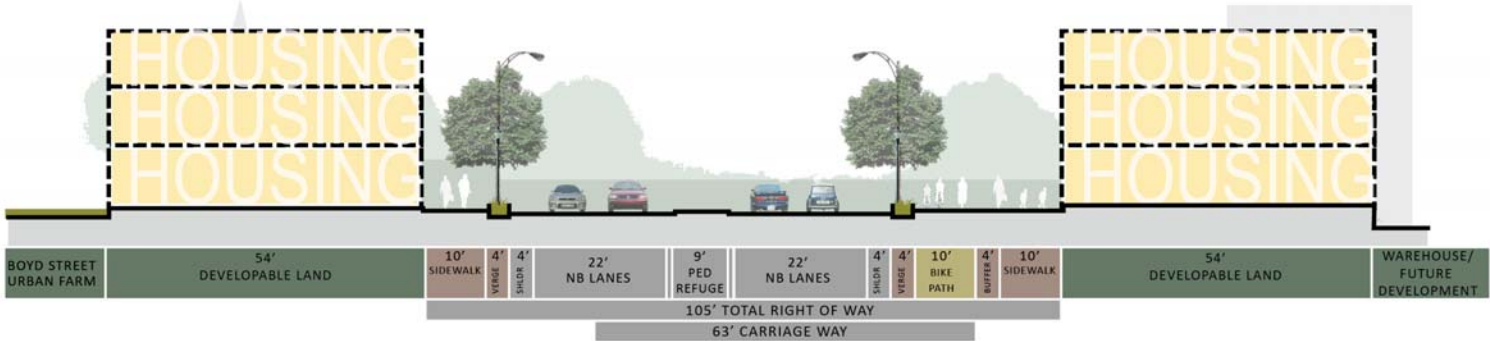


ALTERNATIVE 2 - URBAN STREET OPTION 2

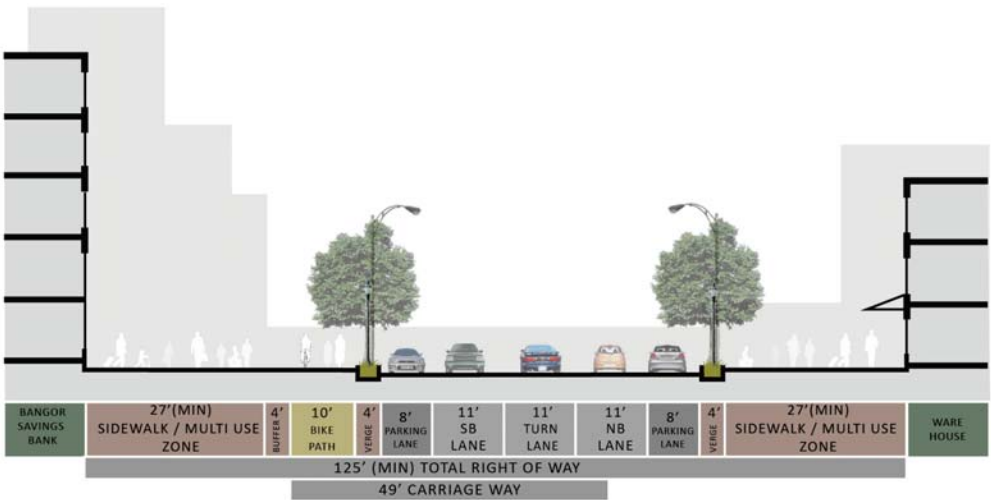
Exhibit 3.2 Alternative 2- Urban Street Option 2- Plan and Sections



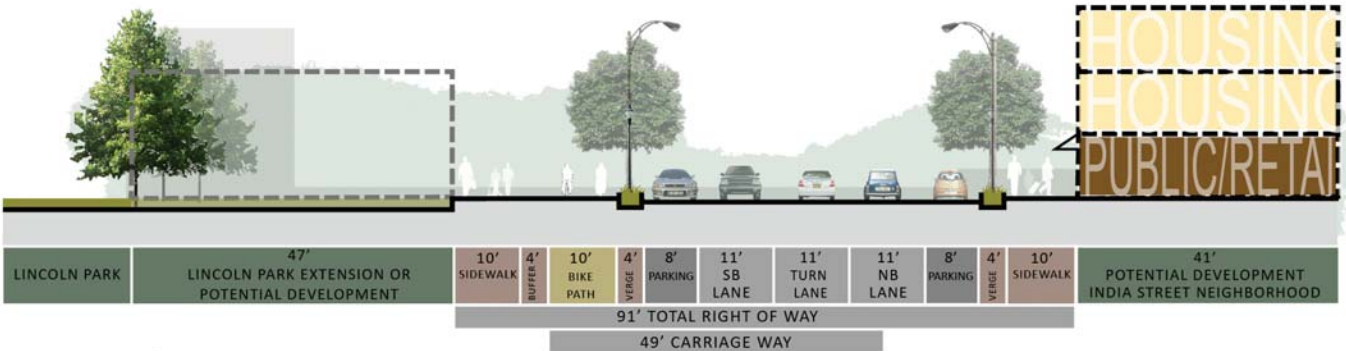
SECTION A-A'  
Through Franklin Street Near Somerset St. Looking South



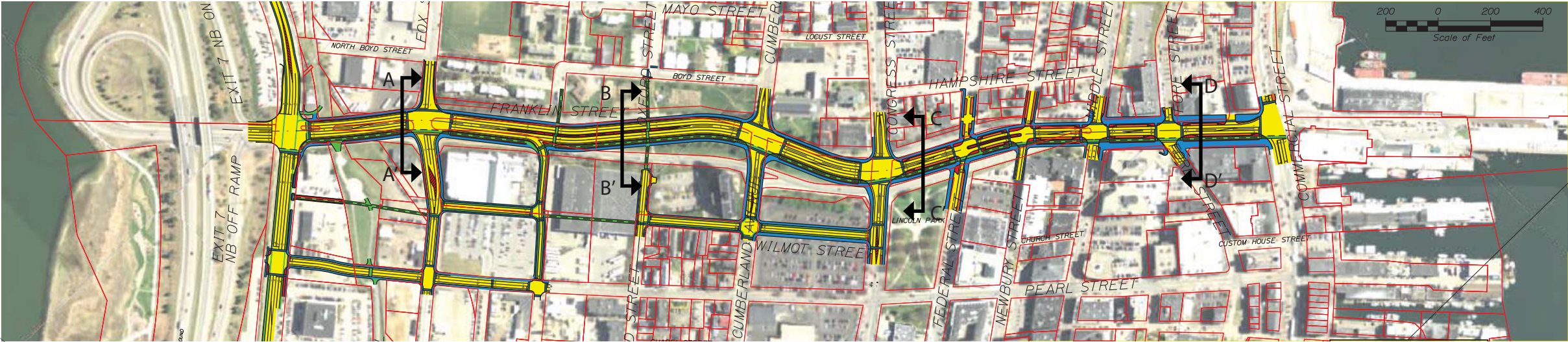
SECTION B-B'  
Through Franklin Street Near Oxford St. Looking South



SECTION D-D'  
Through Franklin Street Near Fore St. Looking North



SECTION C-C'  
Through Franklin Street Near Lincoln Park Looking North



- LEGEND
- Vehicle
  - Bike
  - Pedestrian
  - Right Of Way Lines
  - Traffic Flow Arrows
  - Parking
  - Buffers & Islands
  - Signalized Intersection



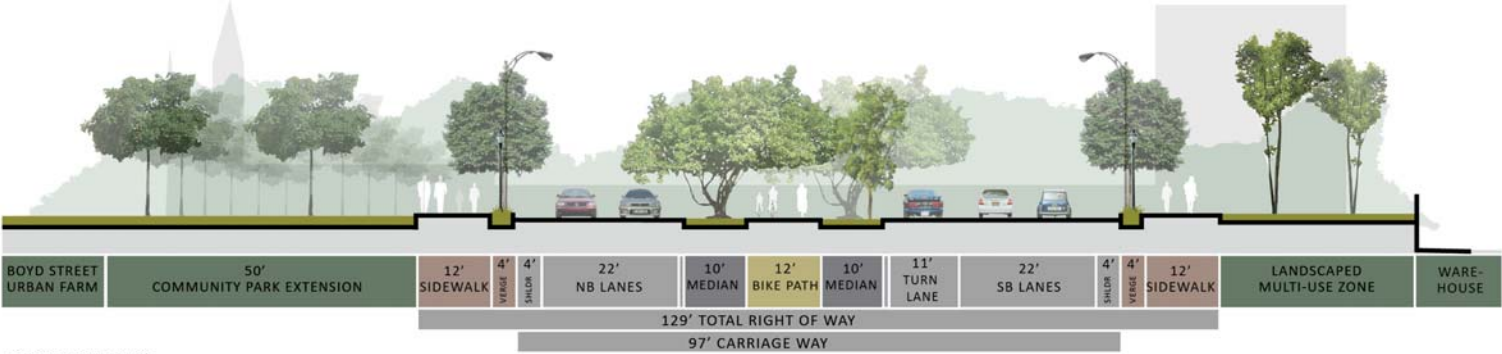


ALTERNATIVE 3 - URBAN PARKWAY

Exhibit 3.3 Alternative 3- Urban Parkway- Plan and Sections



SECTION A-A'  
Through Franklin Street Near Somerset St. Looking South



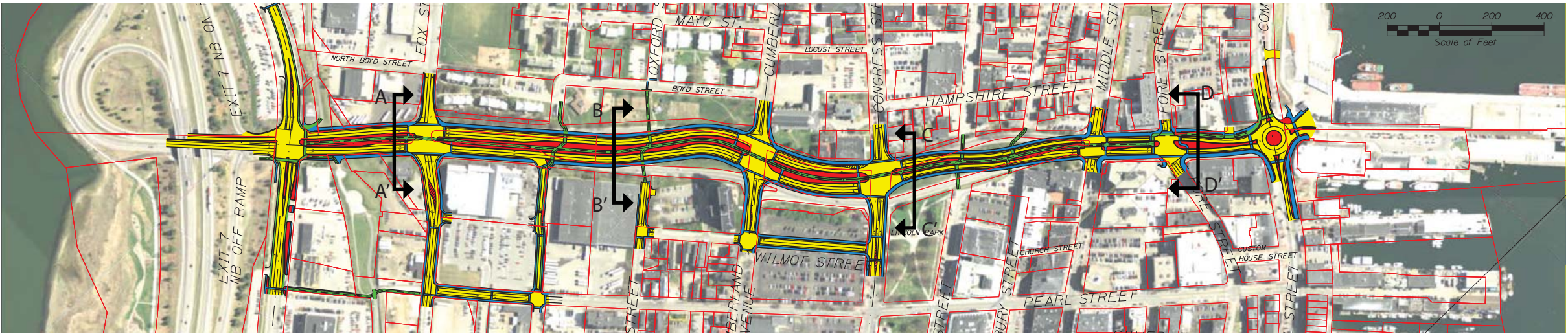
SECTION B-B'  
Through Franklin Street Near Oxford St. Looking South



SECTION D-D'  
Through Franklin Street Near Fore St. Looking North



SECTION C-C'  
Through Franklin Street Near Lincoln Park Looking North



- LEGEND
- Vehicle
  - Bike
  - Pedestrian
  - Right Of Way Lines
  - Traffic Flow Arrows
  - Parking
  - Buffers & Islands
  - Signalized Intersection



Table 3.1 Comparison of Alternatives

ELEMENTS	ALTERNATIVES		
	URBAN STREET	URBAN STREET	URBAN PARKWAY
	OPTION 1	OPTION 2	
VEHICLE RIGHT OF WAY	2 through lanes (22') each direction from I-295 to Congress Street, 1 through lane each direction from Congress to Commercial Street with turn lane/refuge.  Tighten turning radii where possible.  Roadway shifted to W where possible.  Typical cross section width of roadway ranges from 65'-71' including buffered bike path/cycle track and turn lanes.	Similar to option 1, except roadway moved to NE near Cathedral and more centrally at Lincoln Park opening up for development on SW and SE (or possible park expansion on SW and development SE).  Tighten turning radii where possible. Roadway shifted to E Oxford-Congress, more centrally Congress-Newbury.  Typical cross section width of roadway ranges from 50'-65' including turn lanes but not including side path.	2 through lanes (24') each direction from I-295 to Congress Street, 1 through lane each direction from Congress to Commercial Street.  Roadway shifted to E starting from Oxford.  Typical cross section width of roadway ranges from 63'-97'+ (depending on median) including turn lanes.
MEDIAN	Eliminate median.	Narrow island/refuge retained where no turning lane	Retain at minimum width (32') needed for future light rail from Marginal to Congress, and 22' south of Congress. Bike path in median
PEDESTRIAN INFRASTRUCTURE	Typical 22' sidewalk width with additional shared/multi-use area.  Sidewalks become narrower at intersections to accommodate cycle tracks but refuge islands are provided and crossing distances further shortened.	Narrower sidewalks in northern portion (10' + 4' verge) but NB side also has a 10' side path + additional 4' verge buffering from traffic. Sidewalk and mixed use zone in southern portion is ~27'.	10' sidewalk Congress to Middle and 14' Middle to Commercial, 12'+ elsewhere, with 4' verges.
BICYCLE INFRASTRUCTURE	Protected bicycle lanes/cycle tracks on the curb side of parking where parking exists Congress to Commercial.  5' bicycle lane and 3' striped buffer from traffic or parking.  Bicycle lanes where possible on side streets.  Bike boxes or improved crossings on signalized side street approaches that are identified as part of the planned bike network.	10' side path with 4' buffer each side.  Bicycles prioritized on Oxford and bike/ped only connections on Wilmot.  Shared lane markings on perpendicular streets.  Bike boxes or improved crossings on signalized side street approaches that are identified as part of the planned bike network.	Bidirectional median path (12' + minimum 5' verge/buffer each side). 4' shoulder also provides reasonable space for bicycles on roadway. Shared lane markings on perpendicular streets that are identified as part of the planned bike network.
TRANSIT	Improve bus stops at Congress Street and Franklin Street, moving EB stop to Lincoln Park side. Implement Franklin Shuttle on parallel route connecting Park and Ride to Casco Bay Lines Ferry Terminal.	Improve bus stops at Congress Street and Franklin Street, moving EB stop to Lincoln Park side.  11' outer lanes + 4' shoulder leaves 16' in outer lane for possible future enhanced transit (adequate for future fixed guideway transit like streetcar).	Allow curbside stops in near-term. Reserve median for future fixed guideway. 11' outer lanes + 4' shoulder also leaves 16' in outer lane for possible future enhanced transit (adequate for future fixed guideway transit like streetcar).
VEHICULAR TURNING MOVEMENTS / INTERSECTIONS	Turning lanes at all except Federal (left turns prohibited from Franklin onto Federal).  Signal warrants do not require signalization at Oxford, Newbury, Federal, Wilmot/Marginal, and Pearl/Marginal, so no signals are shown at this time	Unsignalized turns at Newbury and Federal. At Marginal Way, restrict left turn movements from eastbound Marginal Way to Franklin/I-295.	Turning lanes retained where currently existing. Roundabout at Commercial End. At Marginal Way, restrict left turn movements from eastbound Marginal Way to Franklin/I-295 AND restrict left turn movements northbound Franklin Street onto Marginal Way westbound. Roundabout at Commercial Street. Left turns restricted Franklin NB onto Fore and Middle.
TARGET SPEED	25 mph	25 mph	30 mph





ELEMENTS	ALTERNATIVES		
	URBAN STREET	URBAN STREET	URBAN PARKWAY
	OPTION 1	OPTION 2	
Perpendicular Street Reconnections	Lancaster (all modes unsignalized)	Lancaster (bike + ped only signalized/flashing beacon) – right turn only but remove slip lane.  W side still 1-way with contraflow bike lane.	Lancaster (bike + ped only signalized/flashing beacon with median refuge) - right turn only but remove slip lane.
	Oxford (all modes unsignalized)	Oxford (bike + ped only signalized/flashing beacon), bike boulevard	Oxford (bike + ped only signalized/flashing beacon with median refuge)
	Newbury (all modes unsignalized), convert to 2-way	Newbury (all modes unsignalized), retain 1-way	Newbury (bike + ped only unsignalized with median refuge)
	Federal (all modes unsignalized, no lefts), convert to 2-way	Federal (all modes unsignalized), retain 1-way	Federal (bike + ped only unsignalized with median refuge)
Parallel Street Connections	Wilmot: Somerset-Marginal (right turn in and out only), Oxford-Lancaster, and Congress-Cumberland (right turn in and out only at Congress)	Wilmot: Somerset-Marginal (ped/bike only, unsignalized or RFFB), Congress-Cumberland (right turn in and out only at Congress)	Wilmot: Congress to Cumberland (right turn in and out only at Congress)
	Boyd: to Marginal (bike + ped only) with new crossing N of Boyd at Marginal	Boyd: to Marginal (bike + ped only) with new crossing N of Boyd at Marginal	Boyd: to Marginal (bike + ped only) with new crossing N of Boyd at Marginal
	Pearl: Somerset to Marginal	Pearl: Somerset to Marginal	Pearl: Somerset to Marginal
Development	3 – 4 story buildings generally, with development nodes with up to 5-story buildings	3 – 4 story buildings generally, with development nodes with up to 5-story buildings	Green space and Parks generally. New development intended to be at a similar height as surrounding development
Zoning and Land Use	Mixed Use Zoning Overlay, promoting smaller block sizes and active frontages.	Mixed Use Zoning Overlay, promoting smaller block sizes and active frontages.	Emphasis on open spaces with form-based code for activating park edges.
Green Space / Plazas	Lincoln Park: Maintain size and form, development on SE side	Lincoln Park: Maintain size and form and develop on both sides OR expand on W side and develop on E side	Maximum expansion given road footprint, with no development. Development possible at Congress and Franklin.
	Boyd St. Community Gardens: Vehicular connection across Oxford may limit expansion/enhancement.  Maximize redevelop-able land near Oxford.	Boyd St. Community Gardens: Bike + ped-only reconnection at Oxford allows for development, however, Franklin Street is shifted E at Franklin Towers	Boyd St. Community Gardens: Bike + ped-only reconnection at Oxford allows for enhancement, however, Franklin is shifted E at Franklin Towers
	Federal Street: Vehicular connection may limit additional green space at Federal but plazas could be created on E side	Federal Street: Vehicular connection may limit additional green space at Federal but plazas could be created on W side	Federal Street: Maximize plaza/green space
	Franklin Towers: Maximize developable land across from Franklin Towers	Franklin Towers: Maximize plaza / green space in front of Franklin Towers to buffer from Franklin Street	Franklin Towers: Maximize plaza / green space in front of Franklin Towers to buffer from Franklin Street
Trail Connections	Back Cove Trail: Connection on W side via protected crossing	Back Cove Trail: Connection to side path on W side	Back Cove Trail: Protected crossing on W and S side of intersection to connect to median path
	Bayside Trail: No realignment but protected crossing at intersection in all direction. Added midblock crossings at Wilmot and Pearl.	Bayside Trail: No realignment, midblock crossing at Pearl	Bayside Trail: No realignment but protected crossing on W and S side of intersection to connect to median path
	Eastern Prom Trail: Protected crossing at intersection leading directly into protected bicycle lane.	Eastern Prom Trail: Connection to side path on W side	Eastern Prom Trail: Connects protected bicycle path to trail on E side of roundabout



## 3.2. Alternatives Evaluation

### 3.2.1. Purpose

The evaluation of the three alternatives and the No Project baseline was intended to assess their ability to meet the study’s goals and objectives. Each of the five overarching goals has a number of objectives associated with it. The goals and objectives were developed based on collaboration among the City, MaineDOT, PACTS and the PAC. The ability to meet the broader goals and objectives was assessed in this evaluation through the use of qualitative and quantitative measures of effectiveness (MOEs) assigned to each objective. These MOEs were vetted with MaineDOT, the City of Portland, PACTS, and the PAC in advance, and have been modified and honed as the study has progressed to be the best measures based on available data

### 3.2.2. Evaluation Tools

Each MOE required either quantitative input or a qualitative evaluation based on a scale of 0-4.

- The quantitative inputs, shown in the full matrix in Appendix B, are translated into relative scores on a scale of 0 to 100 to allow for comparison between the alternatives without setting absolute benchmarks.
- The qualitative inputs, shown in the full matrix in Appendix B, are translated as 0=0, 1=25, 2=50, 3=75, or 4=100 to put them on the same 0 to 100 scale as the quantitative measures.

The detailed alternative evaluation can be found in Franklin Street Alternatives Analysis - Task 7 Appendix B.

### 3.2.3. Quantitative Measures

Of the quantitative MOEs, about 40 were based on transportation measures, including level of service (LOS), speed, number of connections, turning movements, number of trips, facility type lengths, vehicle-miles, person-miles, mode choice, a project-specific exposure index, average travel times, and right of way widths. Some measures were associated with more than one objective. In some cases, the same measures were used in different ways; for example, in the case of safety-related objectives, lower traffic speeds were considered desirable, but in the case of accessibility related objectives, higher traffic speeds were considered desirable. This use of these measures allowed the team to assess the trade-offs among specific objectives.

#### Transportation Modeling and Level of Service Analysis

The project team worked with Kevin Hooper and Associates to update the PACTS

regional travel demand model to the 2035 design year for the study. The PACTS model follows a traditional four-step process: trip generation, trip distribution, mode split, and traffic assignment. A separate traffic operations simulation model was updated by Gorrill-Palmer Consulting Engineers to estimate vehicular LOS for this project. In addition, IBI Group used the Complete Streets software released by Dowling Associates, Inc., to estimate a multimodal level of service (MMLOS). The 2035 baseline (No Project) forecasts served as the baseline against which to compare the alternatives, which were also based on a 2035 design year. The traffic volumes used, more detail on the methodology, and MMLOS results can be found in Franklin Street Alternatives Analysis - Task 7.

The methodology for the MMLOS analysis follows the guidelines presented in National Cooperative Highway Research Program Report 616 Multimodal Level of Service Analysis for Urban Streets. An important note is that LOS results should always be considered in the context of goals and objectives for a study area. In the case of the Franklin Street Feasibility Study Phase II, an agreement among MaineDOT, the City of Portland, and PACTS stated that the LOS should not be worse than the future baseline (No Project) condition in the design year.

#### Exposure Index

The study team recognized a need for a specific safety metric. For the purposes of this study, IBI Group developed an ‘exposure index’ to consider both pedestrian and vehicular safety. It was adapted and simplified from the Federal Highway Administration’s (FHWA) Highway Safety Manual.<sup>4</sup> The exposure index took into consideration available data sources, and included:

- Highway traffic volumes along Franklin;
- Highway traffic volumes on streets crossing Franklin;
- Pedestrian volumes at intersections along Franklin;
- Pedestrian volumes at mid-block crossings of Franklin; and
- Number of curb access points along Franklin.

The index provided a sense of a relative increase or decrease in safety for pedestrians and vehicles when compared to the future baseline (no-build) case, based primarily on projected volumes. The Exposure Index analysis methodology can be found in Franklin Street Alternatives Analysis - Task 7 Appendix F.

#### Development Opportunities

The rights of way for the three alternatives were analyzed on the basis of new development opportunities and possible land use patterns created as the result of realignment. The change in the land utilization due to ROW realignment was

mapped for each of the alternatives, and assigned to the three following categories:

1. New development opportunities: land freed up as a result of narrowing and shifting of the ROW
2. Area taken by ROW alignment: previously free/occupied land taken by the new ROW alignment and street reconnections
3. Infill opportunities: presently underutilized land

Detailed analysis of these alternatives can be found in Franklin Street Alternatives Analysis - Task 7 Chapter 2.4.3.1.

Table 3.2 Summary of Development Opportunities

		Alternatives		
		Urban Street 1	Urban Street 2	Urban Parkway
Parcel Formation				
1	Total Infill Parcels (SFT)	685,000	666,000	564,000
2	Total New Parcels (SFT)	168,000	190,000	145,000
3	Total Area to be taken by ROW alignment (SFT)	155,000	130,000	86,000
Development Opportunities				
A	Total New Developable Land Made Available Without Consolidation	42,000	79,300	70,500
B	Potential Developable Land Made Available After Consolidation (SFT)	300,000	289,700	167,000
C	Parcels Created That Are Unsuitable For Development (SFT)	20,000	19,500	35,500
D	Total Stand-alone Infill Opportunities	491,000	461,500	436,000
	Total Development Opportunity (A+B+D) (SFT)	833,000	830,500	673,500

#### Public Realm Improvement Opportunities

Public realm improvement opportunities were identified through both quantitative and qualitative measures. The sizes of sidewalks, number of public plazas, available building frontage are all quantities that were used to compare the No Project baseline and the three alternatives in terms of their influence on the public realm. Improvements in connectivity to the neighboring activity centers and neighborhood streets through an enhanced public realm were measured and included. Any effect of historic places and public places was also measured through a count of the number of such places affected.

### 3.2.3.1. Qualitative Measures





The urban gateway: The scale of development combined with the ROW widths were used to assess the potential of each alternative for creating the feeling of entering an urban setting.

Placemaking elements: The space and opportunities available to install street furniture and art installations in each alternative were used to assess the potential for placemaking.

Quality of landscaping: The extent and type of landscaping possible, combined with storm water drainage systems, street lighting, and other public amenities were used to assess the quality of proposed landscape.

Active uses: The size of new development parcels and building scale were used to identify the potential of each alternative to attract active uses.

Community enhancement: The type of land use and transportation changes possible in each alternative were used to assess how much Franklin Street could contribute for enhancement of neighborhood characteristics. The appropriateness of the scale of the streets and development was determined through comparison with the characteristics of the surrounding neighborhood.

### 3.2.4. Preliminary Recommendations

There were shortcomings to basing an assessment on the numerical scores summarized in the following page. For example, the exaggeration of small differences in relative scorings mentioned might indicate a stronger preference for a solution than there really should be as indicated by stakeholder input. Because of these shortcomings, recommendations were not based on the numerical values alone. The narrative below comprise some “Preliminary Recommendations” that acknowledge some conflicts between the objectives as well as incorporates additional feedback received from stakeholders outside of these measures.

**Accessibility:** Urban St Option 1 ranked best for accessibility, largely because it allows for the greatest reconnection of the street network. However, after further modeling, it was found that not all reconnections were feasible given the requirement to not worsen LOS compared to the Future Baseline No-Project option.

The addition of a shuttle along or parallel to Franklin Street is recommended based on the goals but needs to be discussed further in terms of tradeoffs considering cost and potential additional conflicts/challenges for bicycles and automobiles.

In terms of bicycle and pedestrian facilities, PBPAC feedback as well as the evaluation indicated that buffered on-street bicycle facilities are preferred. Sidewalks are preferred to be 10’ to 12’ on the corridor, with some wider sections

where plaza space is warranted south of Congress Street.

**Urbanism and Land Use:** The Urban Street alternatives provided the most opportunity to enhance urbanism and improve land uses, contextualizing the urban realm more to the existing fabric surrounding it. These alternatives included a narrower ROW, balancing the expansion of Lincoln Park with development needs, mixed use zoning strategies, and high quality plaza space. The three-to-four story building heights were generally considered most appropriate.

**Environment and Energy:** In the case of environment and energy, the measures favored the Future Baseline No-Project primarily because all of the alternatives actually result in an increase in vehicle trips, due to the changes in development and the road network, and some of which disperse onto the neighborhood streets. These outcomes were not considered as desirable when using typical environmental and energy related measures. No-Project also includes the largest amount of green space due to the existing median, but more thoughtful assessment acknowledged that the current median is not likely the best use of space. Because PAC discussion about the retention of the median has indicated preference towards development and accessibility goals, recommendations include a reconnected Urban Street solution over the Future Baseline No-Project solution. These results indicated that the final design should include careful consideration of stormwater management and other environmental concerns at a minimum. These results also suggest that Lincoln Park should be enhanced and preferably expanded.

**Health and Safety:** In terms of health and safety, the Urban Street alternatives provided the preferred bicycle and pedestrian facilities, with details already discussed in the Accessibility results. Note that the exposure index measure indicated that the signalized reconnection as well as bicycle and pedestrian reconnections at intersections were preferred over unsignalized intersections or midblock reconnections.


**Community and Economic Development:** Urban Street Option 1 and Option 2 focused on creating a more integrated and connected network, as well as more development opportunity, and therefore ranked best in terms of community and economic development. Urban Street Option 2 seeked to continue the surrounding scale of development in the Franklin Street study area, and hides Franklin Towers, creating a more harmonious urban fabric. This goal should be pursued in the final recommendations.

**Summary:** As indicated in the discussion for each goal, overall, the Urban Street approaches ranked better than the No-Project or Urban Parkway. Because of this, recommendations will likely lean more toward greater reconnection, enhanced


bicycle and pedestrian facilities, and preference for development opportunity with enhanced green spaces. Although Urban Street Option 2 ranks highest overall, the final recommendations have taken into account the best features from the various alternatives to come up with a design that best meets all of the goals of the study.




Goal 1: Accessibility

	Objectives						Total
	1A	1B	1C <sup>a</sup>	1D	1E	1F	
	Access To City and Regional Destinations	Local Street Network Connectivity	Multi Modal Transportation	Current and Future Transit Operations	Pedestrian and Bicycle Facilities	Capacity and LOS	
Weight	27%	20%	14%	11%	15%	13%	100%
No build	7	2	3	2	0	4	18
Urban Street 1	21	20	7	6	12	7	72
Urban Street 2	14	9	8	8	10	7	56
Urban Parkway	7	3	2	9	8	9	38


Goal 3: Environment and Energy

	Objectives						Total
	3A	3B	3C	3D	3E <sup>b</sup>	3F	
	Reduce Impact Of Through Traffic	Reduce SOV Trips	Improve Transportation Efficiency	Enhance Green Space	Roadway Handling Storm Surge and Sea Level Rise	Activate Lincoln Park	
Weight	17%	14%	32%	11%	11%	15%	100%
No build	17	14	16	4	0	0	50
Urban Street 1	0	0	0	6	8	11	25
Urban Street 2	3	0	17	6	8	13	47
Urban Parkway	11	0	6	9	8	11	44

Goal 2: Urbanism and Land Use

	Objectives								Total
	2A	2B	2C	2D	2E	2F	2G	2H	
	Provide Urban Gateway	Enhance Built Heritage	Promote Mixed Use Development	Pedestrian Scale	Wayfinding and Navigation	Appropriate Urban Design	Integrated Street scape and land use	Balance between different uses	
Weight	10%	16%	11%	12%	9%	11%	16%	15%	100%
No build	0	8	0	0	0	4	0	0	12
Urban Street 1	7	14	11	11	9	8	16	13	89
Urban Street 2	7	15	11	8	9	8	14	15	87
Urban Parkway	2	16	7	5	9	6	7	9	60


Goal 4: Health and Safety

	Objectives			Total
	4A	4B	4C	
	Promote Physical Activity	Enhance Safety For All Modes	Reduce Vehicle Speed	
Weight	24%	51%	25%	100%
No build	0	25	0	25
Urban Street 1	24	36	25	85
Urban Street 2	21	42	24	87
Urban Parkway	13	16	15	45





Goal 5: Community and Economic Development

	Objectives					Total
	5A Enhance liveability and vitality	5B Improve transit to Casco bay terminal	5C Enhance neighborhood character	5D Access to employment, community and activity centers	5E Community sensitive infrastructure	
Weight	33%	12%	13%	24%	18%	100%
No build	0	0	0	16	0	16
Urban Street 1	33	12	13	16	10	84
Urban Street 2	32	12	13	14	15	96
Urban Parkway	19	0	3	12	6	40

3.2.5. Summary

Table 3.3 Overall Summary of Alternatives Evaluation

Goals	No build	Urban Street 1	Urban Street 2	Urban Parkway
1 Accessibility	18	72	56	38
2 Urbanism and Land Use	12	89	87	60
3 Environment and Energy	50	25	47	44
4 Health and Safety	25	85	87	45
5 Community and Economic Development	16	84	86	40
TOTAL	24	71	73	46

3.2.6. Cost Estimate

Table 3.4 Cost Estimates for Alternatives

	Urban Street Option 1	Urban Street Option 2	Urban Parkway
Construction Costs	\$13,290,000.00	\$11,369,500.00	\$10,556,600.00
Mobilization Costs (10%)	\$1,329,000.00	\$1,136,950.00	\$1,055,660.00
Maintenance Of Traffic (10%)	\$1,329,000.00	\$1,136,950.00	\$1,055,660.00
Contingency (25%)	\$3,322,500.00	\$2,842,375.00	\$2,639,150.00
Total Construction Costs	\$19,270,500.00	\$16,485,800.00	\$15,307,100.00
Preliminary Engineering (10%)	\$1,927,050.00	\$1,648,580.00	\$1,530,710.00
Construction Engineering (10%)	\$1,927,050.00	\$1,648,580.00	\$1,530,710.00
30 Foot Transit Bus	\$325,000.00	\$325,000.00	-
Right Of Way Costs	\$1,412,500.00	\$1,125,000.00	\$471,750.00
Total	\$24,862,100	\$21,232,960	\$18,840,270









## 4. Recommended Design Concept



# 4.1. Franklin Street Design Concept

## CONCEPT

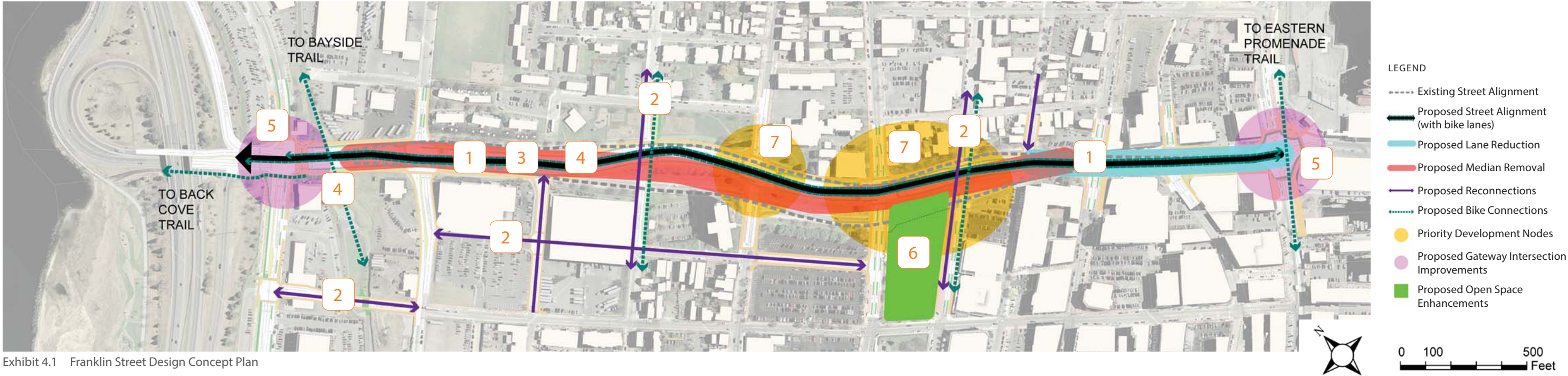


Exhibit 4.1 Franklin Street Design Concept Plan

## CONTEXT

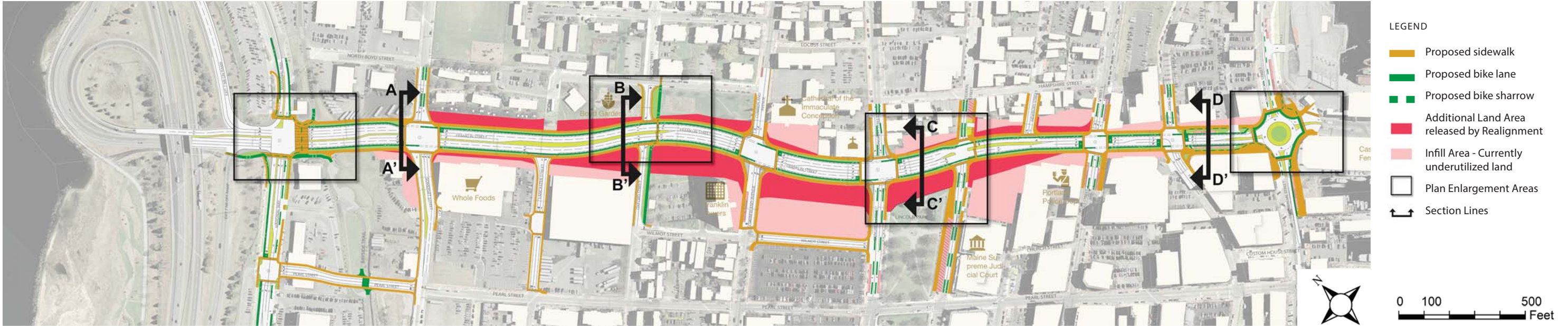


Exhibit 4.2 Franklin Street Context





### 4.1.1.Key Ideas

#### 1. Realignment

The study proposes realignment of Franklin Street with a consistent carriageway width of 71 feet between Marginal and Federal Streets, and 65 feet between Federal and Commercial Streets. Between Lancaster and Middle Streets, the proposed roadway will be aligned to the eastern edge of the present right-of-way. This shift will open up land for development and for expansion of Lincoln Park; it will also provide an opportunity for more separation between Franklin Towers and the revitalized streetscape. With appropriately scaled in-fill development to the east of Franklin Towers, this re-alignment will help to bring the streetscape character back in line with the surrounding building context. The alignment of lower Franklin, between Fore and Commercial Streets is centered between the building envelopes in order to create a symmetrical gateway experience, with multi-use street plazas framing the corridor, and providing ample room for observing and circulating through the active waterfront.

#### 2. Reconnections

Franklin Street currently divides neighborhoods from adjacent land uses. The principal local east-west travel desire lines are inadequately served. Exploring opportunities for reconnecting all modes of transportation to the extent feasible given both traffic needs and standards for safe pedestrian/cyclist crossings has been a priority of this Phase II Study. The proposed recommendations will reconnect four currently severed cross streets on Franklin to some degree, resulting in all nine cross streets between Marginal Way and Commercial Street having some level of connection. Of the four new cross street connections, Federal Street will include full reconnection for all modes of transportation. Lancaster, Oxford and Newbury Streets will acquire right turn vehicular connections to varying extents. Oxford Street will receive a mid-block crossing to support full pedestrian and bicycle reconnection. The proposed design does not preclude full vehicular reconnection of Oxford Street in the future.

#### 3. Streetscape Design

The recommended streetscape design reinforces the vision for Franklin Street as a vibrant, active and walkable urban corridor. It focuses on creating: (1) a safe and pleasant pedestrian environment; (2) a coherent urban character through the length of Franklin Street; and (3) a sustainable Green Street infrastructure along Franklin Street. Pedestrian, bicycle and vehicular movement are each accommodated in distinct zones. A 3-foot wide painted buffer clearly demarcates bike path from the vehicular travel lane. Pedestrians are further separated from bike traffic by a planting/ street furnishing verge. This verge consists of a vertical granite curb, followed by permeable pavement and a planter. The 18” wide band of permeable

pavers separates the planting zone from the street, protecting it from deicing salts and damage from snowplows, and also serves as a location for street lights and parking meters. Street trees (placed 40’ apart) and pedestrian lights are located within a 4’ wide planter, with 4” high curbs. It is recommended that one out of every four planters be designed for storm water treatment. These planters break every 100’ to accommodate a street furnishing area, to be paved with permeable pavers and house benches, trash receptacles, signage and bicycle racks as needed. Closest to the building edge is the sidewalk, consistently 10’-12’ wide and paved with brick, as recommended in the City Of Portland Technical Manual. All crosswalks are to be painted, with the exception of the crosswalks at both ends of Franklin Street. It is recommended that the crosswalks at the Marginal Way and Commercial Street intersections be brick edged with granite, to announce the entry to Franklin Street.

#### 4. Bike and Pedestrian Circulation

Enhancing bicycle and pedestrian service within the Study area is a critical component to realizing the vision of the project. At present, Franklin Street significantly under serves the cyclist and pedestrian communities. There are no bicycle facilities along the length of Franklin Street, nor on most streets within the study area, except for Marginal Way. Three important bike trails (Back Cove Trail, Bayside Trail and the Eastern Promenade Trail) cross through the study area, yet there is no dedicated bicycle facility connecting them. The sidewalk network along Franklin also has many significant gaps: on the east side of Franklin, the only consistent sidewalks are located between Commercial and Middle Streets, as well as between Congress and Cumberland; on the west side, sidewalks are missing between Middle and Congress Streets. The Phase II design recommends continuous sidewalks (10’-12’ minimum) on both sides of the street, from Marginal Way to Commercial Street. For cyclists, five-foot wide, on-street bike lanes (with three foot buffers from adjacent travel lanes) will be provided the full length of Franklin, in both directions; this design complies with the PBPAC preference.

#### 5. Intersection Improvements

The intersections at Marginal Way and Commercial Street presented unique challenges and opportunities for meeting the goals of the Phase II Study. Solutions for these two intersections will both contribute toward an improved gateway experience and achieve many of the ‘Complete Street’ objectives, while maintaining operational level of service. At the north end of the corridor, the proposed solution needed to continue to provide vehicular access to and from Interstate 295 and accommodate east/west arterial traffic on Marginal Way. Without a feasible vehicular solution, the study could not satisfy an interagency agreement not to worsen capacity or LOS in the future, as compared to a scenario without the project. While providing for vehicular operational needs, the proposed intersection design achieves significant improvements for other modes: crossings are provided on the

east, west and south sides of the intersection; the crossing on the south side will be 50 feet wide and constructed with pavers or stamped bituminous pavement; and pedestrians and cyclists will be able to cross in a single phase of the traffic signals. The size of the southern crossing is intended to engage the Bayside Trail while providing a strong visual cue to drivers that they are entering a realm of heightened pedestrian/cyclist activity. The south end of Franklin Street at Commercial Street offers a denser, more cohesive urban fabric than the north end, with existing traffic lanes sufficiently under capacity for the corridor to be reduced to one travel lane both northbound and southbound. The vehicular, pedestrian and cyclist circulation needs are nevertheless quite complex due to activities related to the Maine State Pier, Casco Bay Ferry, and tour and cruise ship services. As with the north end of the corridor, the Phase II Study proposes a significant change, in this case to an unsignalized roundabout which will reduce delays for the anticipated mix of traffic movements. The roundabout also presents a welcoming gateway to the City and waterfront area.

#### 6. Restoring Lincoln Park

Friends of Lincoln Park is an organization promoting the revitalization and restoration of Lincoln Park. The park is approximately 2.5 acres and is listed on the National Register of Historic Places; restoring the park to its original size was taken into account in the alternatives developed for the Phase I study. It was determined that full restoration of the original size of the park would not be feasible. However, the Phase II study explored several options for expansion which were weighed against alternative interests in expanding developable space. When polled on their preference, both the PAC and general public supported the concept of maximum expansion of the park. The Phase II concept plan accommodates an expansion of 75-80 feet. Redesign of Franklin Street and the reconnection of Federal Street will need to restore the original grading relationship between the park and the streetscape.

#### 7. Nodal Development

It is recommended that development be prioritized at two nodal locations:

- A. Congress Street to Federal Street: The restoration of Lincoln Park to close to its historic size creates an opportunity for developing the properties fronting the park. Mixed use developments with active frontages will contribute to the safety and vibrancy of the park. The Congress Street intersection is also a gateway to the Congress Street Historic District.
- B. Cumberland Street: This is the gateway to the Bayside neighborhood, an area with convenient access to downtown Portland and other facilities. Residential developments that can balance the influence of Franklin Towers, an existing high-rise, low-income apartment building on Cumberland Street, would contribute to developing a coherent scale and sense of place along Franklin Street.



RECONNECTING FRANKLIN STREET

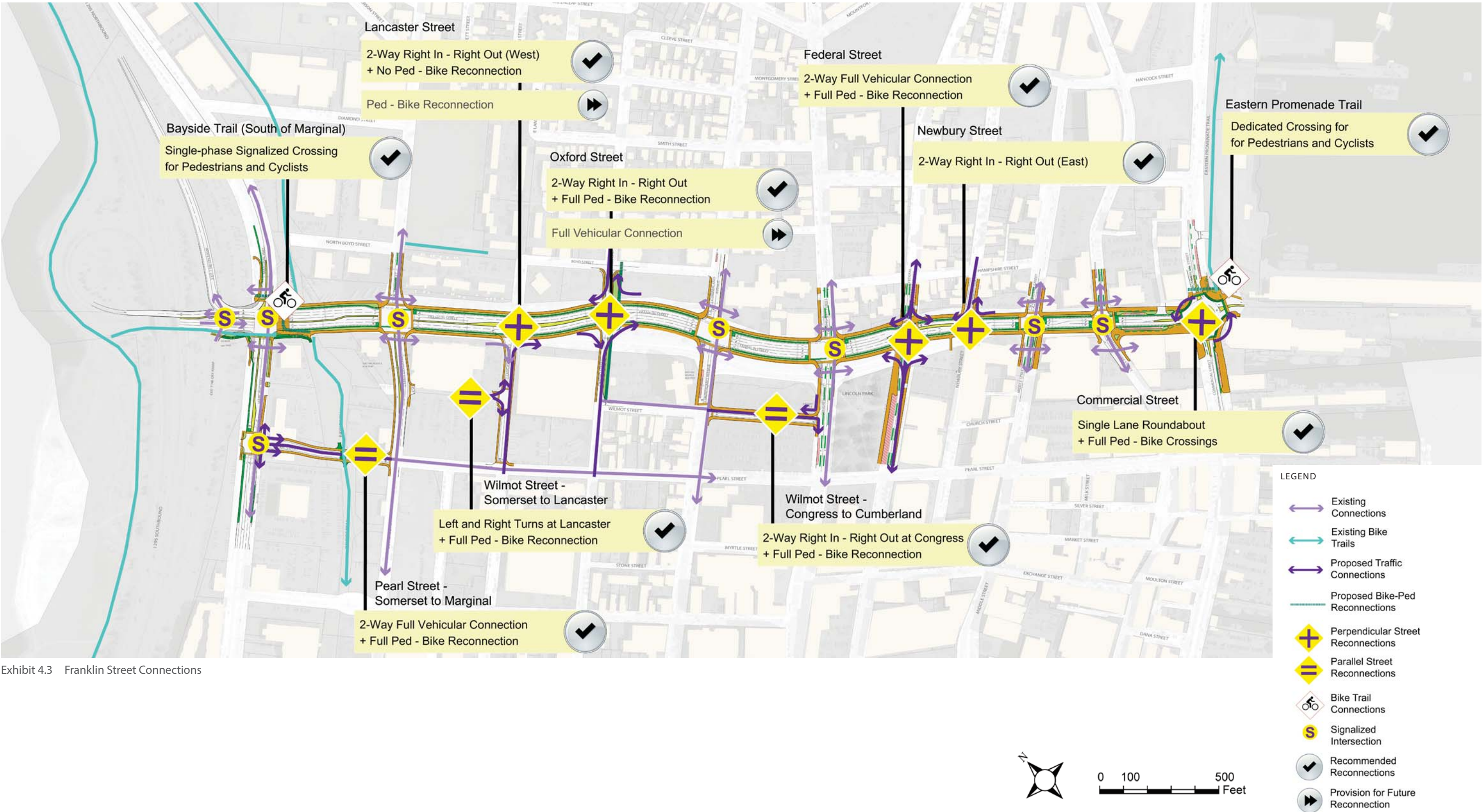


Exhibit 4.3 Franklin Street Connections





TRANSIT, BICYCLE AND PEDESTRIAN CIRCULATION AND PARKING

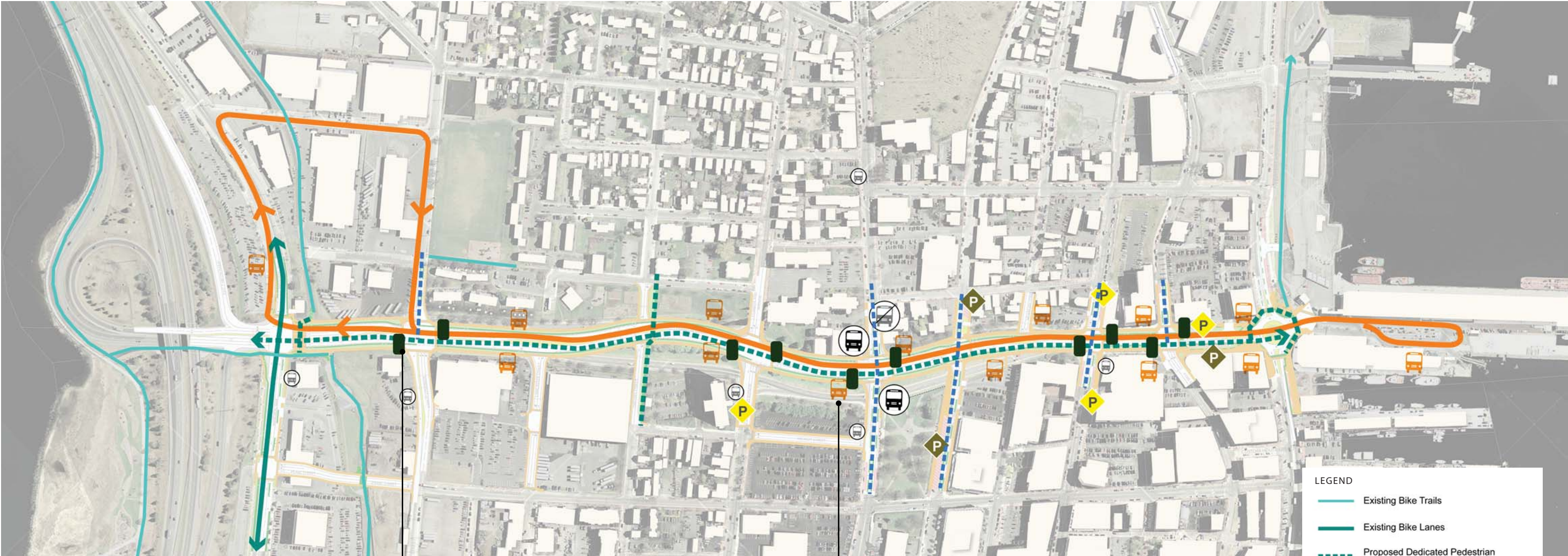


Exhibit 4.4 Franklin Street Connections



Bike box in Austin, TX; Image Source: NACTO



Bike lane weaving around bus stop in Seattle, WA; Image Source: NACTO



- LEGEND
- Existing Bike Trails
  - Existing Bike Lanes
  - Proposed Dedicated Pedestrian and Bike Facilities
  - Proposed Bike Sharrows
  - Proposed Bike Boxes
  - Existing Bus Stops
  - Existing Bus Stops Removed
  - New Congress Street Bus Priority Extension Bus Stops
  - Possible Franklin Street Shuttle Routing
  - Possible New Franklin Street Shuttle Bus Stops
  - Existing On-Street Parking Locations
  - Proposed On-Street Parking Locations



## 4.2. Traffic and Transportation Recommendations

### 4.1.1. Proposed Realignment

The preferred option for the Franklin Street corridor consists of multiple travel lanes, raised medians in certain locations, bike lanes with buffers from the travel lanes, roadside curbing with esplanades and variable width sidewalks. Cross walks are proposed along the corridor with on-street parking proposed in select locations. Intersection improvements are proposed with signalized intersections at Franklin Street crossings with Marginal Way, Fox/Somerset Street, Cumberland Ave, Congress Street, Middle and Fore Streets. Unsignalized intersections are proposed at Franklin Street crossings with Lancaster Street (right turn movements only), Oxford Street (right turn movements only), Federal Street and Newbury Street (right turn movements only). A single lane roundabout is proposed at the Franklin Street intersection with Commercial Street. Side street improvements are proposed at all of the cross streets and consist of travel lane, shoulder, parking, bicycle and sidewalk improvements. I-295 ramp improvements include widening for additional travel lanes of the NB and SB on-ramps.

Marginal Way Intersection: This signalized intersection proposes four (4) travel lanes on Franklin St SB approach (left, 2 thru, right lane), four (4) travel lanes on Franklin St NB approach (left, 2 thru, thru-right lane), three (3) travel lanes on Marginal Way EB approach (left, thru, right lane) and a single right turn lane providing interstate access only for Marginal Way WB approach. Raised medians are proposed at this intersection with variable width crosswalks (including a 50’ wide cross walk nearest the Bayside Trail crossing). Bicycles are accommodated through variable means including bike lanes with buffers, bike lanes without buffers, shared lanes, cycle tracks and multi-use paths. Bike and pedestrian connections are proposed to the adjacent roadways, Bayside trail and Back Cove trail. Special surface treatments such as flush concrete or stamped pavement are recommended along the intersection curbing edges to reduce the vehicular turning movement space.

Franklin Street (Marginal to Somerset): The section of roadway consists of two (2) travel lanes NB, two (2) travel lanes SB, left turn lanes separated by a raised median, shared right turn lanes, bike lanes with buffers, granite curbing with esplanades and sidewalks on both sides.

Somerset/Fox Street Intersection: This signalized intersection proposes three (3) travel lanes on Franklin St SB approach (left, thru, thru-right lane), three (3) travel lanes on Franklin St NB approach (left, thru, thru-right lane), three (3) travel lanes on the Somerset Street EB approach (left, left, thru-right lane) and two (2) travel lanes on the Fox Street WB approach (thru-left, right lane). Raised medians are proposed at all legs of this intersection except Fox Street. Cross walks are proposed on all intersection legs and bike boxes are proposed on Franklin Street. Bicycles are accommodated through variable means including bike lanes with buffers and shared lanes. Bike and pedestrian connections are proposed to the adjacent roadways.

Franklin Street (Somerset to Oxford): The section of roadway consists of two (2) travel lanes NB, two (2) travel lanes SB, left turn lane NB with a raised median, shared right turn lanes, bike lanes with buffers, granite curbing with esplanades and sidewalks on both sides.

Lancaster Street Intersection: This unsignalized intersection proposes right turn movements with Franklin Street. A raised median along Franklin Street prohibits left turn movements. A cross walk is proposed at the intersection and bike and pedestrian connections are provided to the side street.

Oxford Street Intersection: This unsignalized intersection proposes right turn movements with Franklin Street. A raised median along Franklin Street prohibits left turn movements. Cross walks are proposed at the side streets and on the Franklin Street NB approach. Bicycles are accommodated through variable means including bike lanes with buffers and cycle tracks. Bike and pedestrian connections are proposed to the adjacent roadways.

Franklin Street (Oxford to Cumberland): The section of roadway consists of two (2) travel lanes NB, two (2) travel lanes SB, left turn lane SB without a raised median, shared right turn lanes, bike lanes with buffers, granite curbing with esplanades and sidewalks on both sides.

Cumberland Ave Intersection: This signalized intersection proposes three (3) travel lanes on Franklin St SB approach (left, thru, thru-right lane), three (3) travel lanes on Franklin St NB approach (left, thru, thru-right lane), two (2) travel lanes on the Cumberland Ave EB approach (left, thru-right lane) and two (2) travel lanes on the Cumberland Ave WB approach (left, thru-right lane). No raised medians are proposed at this intersection. Cross walks are proposed on all intersection legs and bike boxes are proposed on Franklin Street. Bicycles are accommodated on Franklin Street through means including bike lanes with buffers. Pedestrian connections are proposed to the adjacent roadways. Special surface treatments such as flush concrete or stamped pavement are recommended along the intersection curbing edges to reduce the vehicular turning movement space.

Franklin Street (Cumberland to Congress): The section of roadway consists of two (2) travel lanes NB, two (2) travel lanes SB, left turn lane NB and SB without a raised median, shared right turn lanes, bike lanes with buffers, granite curbing with esplanades and sidewalks on both sides.

Congress Street Intersection: This signalized intersection proposes three (3) travel lanes on Franklin St SB approach (left, thru, thru-right lane), three (3) travel lanes on Franklin St NB approach (left, thru, thru-right lane), two (2) travel lanes on the Congress St EB approach (left, thru-right lane) and three (3) travel lanes on the Congress St WB approach (left, thru, right lane). No raised medians are proposed at this intersection. Cross walks are proposed on all intersection legs and bike boxes are proposed on Franklin Street. Bicycles are accommodated through

variable means including bike lanes with buffers and shared lanes. Bike and pedestrian connections are proposed to the adjacent roadways. Special surface treatments such as flush concrete or stamped pavement are recommended along the intersection curbing edges to reduce the vehicular turning movement space.

Franklin Street (Congress to Federal): The section of roadway consists of two (2) travel lanes NB, two (2) travel lanes SB, left turn lane NB without a raised median, shared right turn lanes, bike lanes with buffers, granite curbing with esplanades and sidewalks on both sides.

Federal Street Intersection: This unsignalized intersection proposes two (2) travel lanes on Franklin St SB approach (thru-left, thru-right lane), one (1) travel lane on Franklin St NB approach (left-thru-right lane), two (2) travel lanes on the Federal St EB approach (left, thru-right lane) and one (1) travel lane on the Federal St WB approach (left-thru-right lane). Raised medians are proposed along the Franklin St at this intersection. Cross walks are proposed at the side streets and on the Franklin Street NB approach. Bicycles are accommodated through variable means including bike lanes with buffers and shared lanes. Bike and pedestrian connections are proposed to the adjacent roadways.

Franklin Street (Federal to Newbury): The section of roadway consists of one (1) travel lane NB with a raised median, two (2) travel lanes SB transitioning to one lane, bike lanes with buffers, granite curbing with esplanades and sidewalks on both sides.

Newbury Street Intersection: This unsignalized intersection proposes right turn movements with Franklin Street on the east side (or NB) only. A raised median along Franklin Street prohibits left turn movements. A cross walk is proposed at the intersection and bike and pedestrian connections are provided to the side street.

Franklin Street (Newbury to Middle): The section of roadway consists of one (1) travel lane NB without a raised median, one (1) travel lane SB, bike lanes with buffers, granite curbing with esplanades and sidewalks on both sides.

Middle Street Intersection: This signalized intersection proposes two (2) travel lanes on Franklin St SB approach (left, thru-right lane), two (2) travel lanes on Franklin St NB approach (left, thru-right lane), two (2) travel lanes on the Middle St EB approach (left, thru-right lane) and two (2) travel lanes on the Middle St WB approach (left, thru-right lane). No raised medians are proposed at this intersection. Cross walks are proposed on all intersection legs and bike boxes are proposed on Franklin Street. Bicycles are accommodated through variable means including bike lanes with buffers and shared lanes. Bike and pedestrian connections are proposed to the adjacent roadways.

Franklin Street (Middle to Fore): The section of roadway consists of one (1) travel lane NB without a raised median, one (1) travel lane SB, bike lanes with buffers, granite





curbing with esplanades and sidewalks on both sides.

Fore Street Intersection: This signalized intersection proposes two (2) travel lanes on Franklin St SB approach (left, thru-right lane), two (2) travel lanes on Franklin St NB approach (left, thru-right lane), two (2) travel lanes on the Fore St EB approach (left, thru-right lane) and two (2) travel lanes on the Fore St WB approach (left, thru-right lane). No raised medians are proposed at this intersection. Cross walks are proposed on all intersection legs and bike boxes are proposed on Franklin Street. Bicycles are accommodated through variable means including bike lanes with buffers, shoulders and shared lanes. Bike and pedestrian connections are proposed to the adjacent roadways.

Franklin Street (Fore to Commercial): The section of roadway consists of one (1) travel lane NB without a raised median, one (1) travel lane SB, bike lanes with buffers, on-street parking, granite curbing with esplanades, cycle tracks and sidewalks on both sides.

Commercial Street Intersection: This single lane roundabout proposes single entering and exiting lanes with raised median separation on all approaches. Separated cross walks for pedestrian and bicycles are proposed on all intersection legs of the roundabout. Bicycles are accommodated through variable means

### 4.2.1. Recommended Transit Service

The recommended plan would establish a shuttle bus operating along Franklin Street between the park-and-ride lot northeast of the intersection of Franklin and Marginal Way and the Casco Bay Ferry Terminal south of Commercial Street. The route would operate every twenty minutes in each direction during METRO’s hours of service, making local stops at or near the locations shown in Figure 4.4. The final routing would be subject to revision during preliminary design, and whether the route is retained in the long term would depend on how successful it proves to be, in terms of removing single-occupancy vehicles from Franklin Street.

The recommended plan also makes minor changes to the operations of METRO’s bus routes 1, 6, and 7 on Congress Street, to effectively include Franklin Street in the recent bus priority improvements made on Congress:

- Eastbound buses would make a ‘nearside’ stop at the realigned Franklin Street; and
- The existing eastbound stop west of Hampshire Street would be discontinued.
- The westbound ‘nearside’ stop at Franklin would be upgraded to provide a shelter and amenities, comparable to the recently improved stops on Congress Street west of Franklin.



STREETSCAPE AND LANDSCAPE STRATEGY - MARGINAL WAY TO LANCASTER

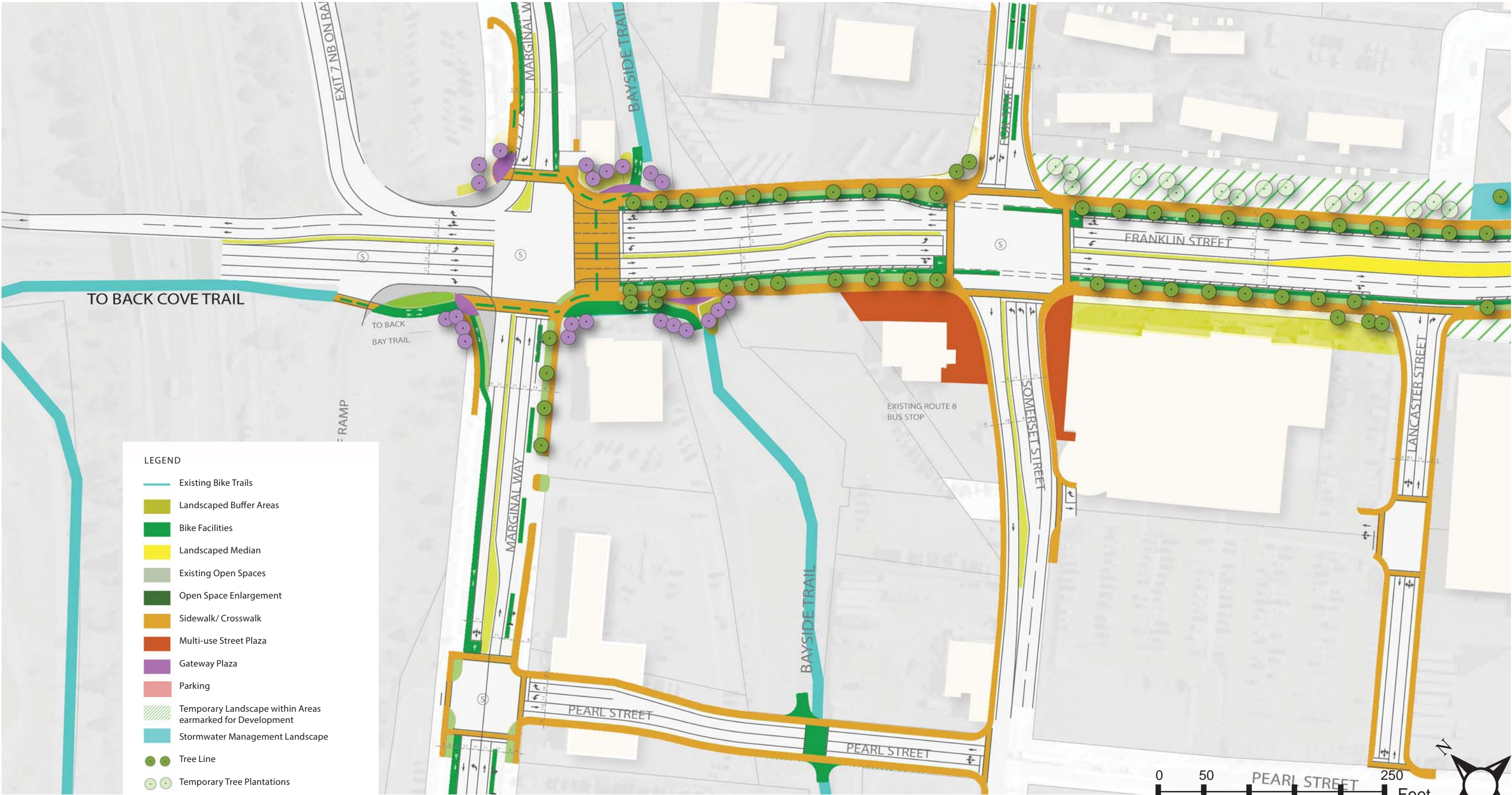


Exhibit 4.5 Streetscape and Landscape Strategy - Marginal Way to Lancaster





STREETSCAPE AND LANDSCAPE STRATEGY - LANCASTER TO FEDERAL



Exhibit 4.6 Streetscape and Landscape Strategy - Lancaster to Federal St.  
JULY 2015



STREETSCAPE AND LANDSCAPE STRATEGY - FEDERAL TO COMMERCIAL

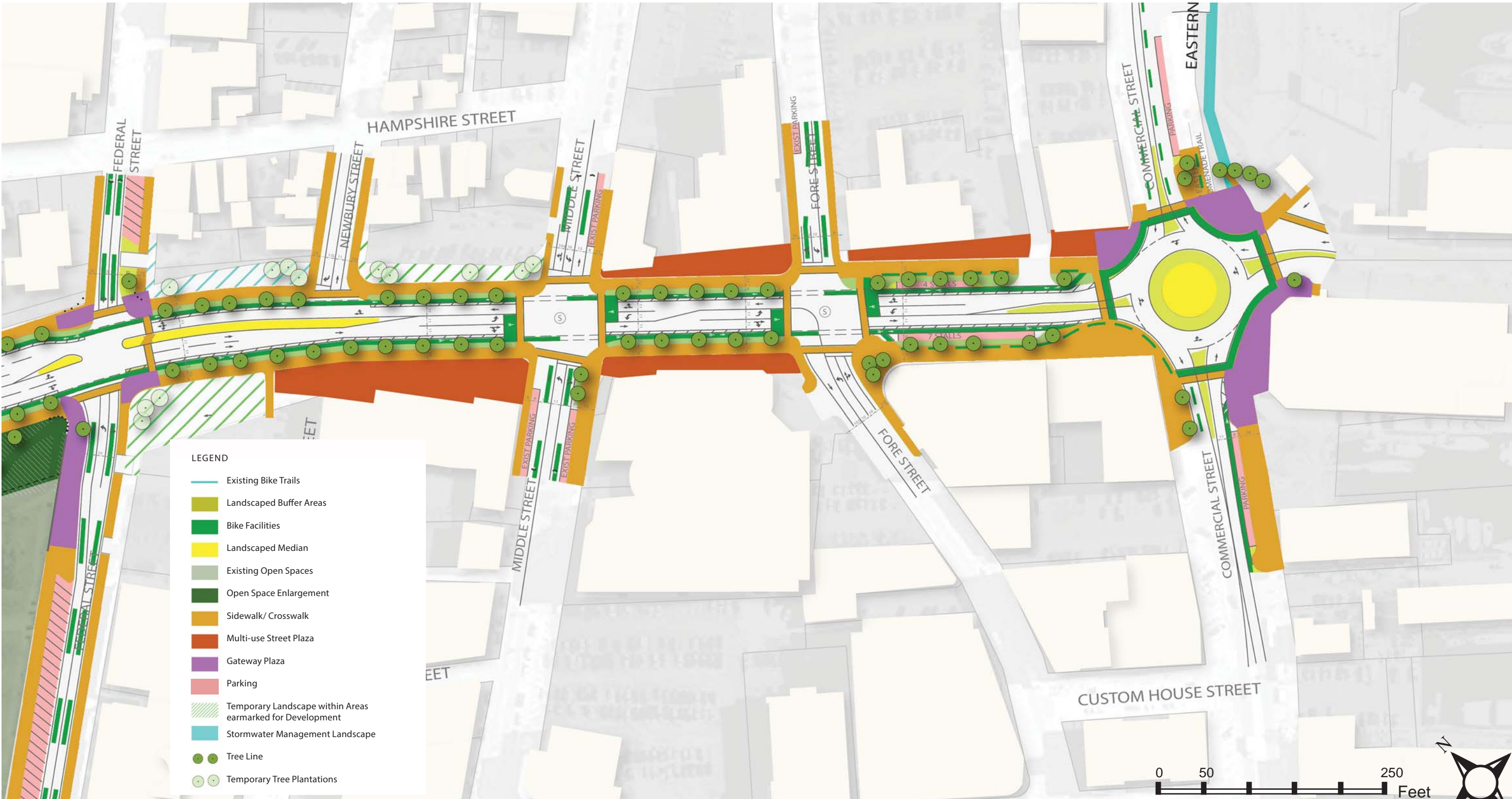


Exhibit 4.7 Streetscape and Landscape Strategy - Federal to Commercial



120' TOTAL RIGHT OF WAY

86' CARRIAGE WAY

BUS PARKING/  
POSSIBLE FUTURE  
DEVELOPMENT

10' SIDEWALK

4' VERGE

2' BUFFER

5' BIKE LANE

3' BUFFER

11' NB LANE

11' NB LANE

11' NB LANE

4' BUFFER

11' TURN LANE

11' SB LANE

11' TURN LANE

3' BUFFER

5' BIKE LANE

2' BUFFER

4' VERGE

10' SIDEWALK

26' MULTI USE ZONE

VERIZON OUTLET

Diagram illustrating the proposed street layout and right-of-way components:

- Lincoln Park
- 75' LINCOLN PARK EXTENSION (VARIES)
- 12' SIDEWALK
- 4' VERGE
- 2' BUFFER
- 5' BIKE LANE
- 3' BUFFER
- 11' SB LANE
- 11' SB LANE
- 11' TURN LANE
- 11' NB LANE
- 11' NB LANE
- 3' BUFFER
- 5' BIKE LANE
- 2' BUFFER
- 4' VERGE
- 12' SIDEWALK
- 45' INFILL DEVELOPMENT OPPOSITE LINCOLN PARK (VARIES)

107' TOTAL RIGHT OF WAY

71' CARRIAGE WAY

103' TOTAL RIGHT OF WAY

71' CARRIAGE WAY

BOYD STREET URBAN FARM

30' POTENTIAL STORM WATER MANAGEMENT LANDSCAPE (VARIES)

10' SIDEWALK

4' VERGE

2' BUFFER

5' BIKE LANE

3' BUFFER

11' NB LANE

11' NB LANE

11' MEDIAN (INCL. SHOULDER)

11' SB LANE

11' SB LANE

3' BUFFER

5' BIKE LANE

2' BUFFER

4' VERGE

10' SIDEWALK MIN.

AVAILABLE LAND FOR FUTURE DEVELOPMENT

EXISTING NOYES WAREHOUSE

109' TOTAL RIGHT OF WAY

65' CARRIAGE WAY



## 4.3. Green Street Infrastructure

Achieving a sustainable, Green Street infrastructure along the Franklin Street Corridor includes creation of physically green streets and shaded sidewalks and using sustainable storm water management techniques wherever possible.

### 4.3.1. Green Streets and Shaded Sidewalks:

The benefits of creating a robust and diverse urban forest of street trees and parkland trees along Franklin Street are extensive. These benefits apply to both the pedestrian and vehicular users of the Franklin Street corridor, to people living adjacent to the street, to those people looking out upon the streetscape and to the urban population as a whole.

Healthy and lush street trees are effective tools in combating the urban heat island effect and solar gain. Healthy street trees will cast shade across sidewalk and roadway alike, improve air quality and provide a physical buffer between automobiles and pedestrians. Street trees create a sylvan canopy of leaves and branches that brings the City's urban scale of large open spaces and tall buildings into proportions that are more human and comfortable.

An important factor in promoting a healthy urban forest is to provide adequate and ample planting soil volumes for long-term growth of all trees, whether in sidewalk conditions, medians or in park land.

Where trees are planted in open lawn and planting areas of parks, providing planting soil is relatively simple. Each tree should be provided with at least 1,000 cubic feet of rich, natural planting soil. Where-ever possible these beds of planting soil should be continuous, allowing roots of different trees to intermingle and spread as far and as wide as possible. Where trees share a continuous soil bed, the allocation of planting soil per tree can be reduced to 800 cubic feet.

Where trees are planted in sidewalk conditions, the challenges of providing a healthy soil volume to support tree growth increase. Developing adequate volumes of planting soil in sidewalk conditions requires a more intensive investment of planting soil infrastructure. The open soil bed of a verge must be as long and continuous as possible, allowing a free exchange of oxygen between planting soil and atmosphere and supplemental rain watering. Sidewalk contamination – high pH runoff from concrete, de-icing salts, dust and debris – must be prevented from flowing into the verges. A low, 4-inch wide and tall curb is the most expedient means of prevent flow contamination into the verges.

To achieve an adequate volume of horticultural soil for each tree, the space under sidewalks must be utilized for buried planting soil volumes. Planting soil under sidewalk pavement is called structural planting soil, designed to support the loading that sidewalk pavements are frequently subjected to. Structural soil

technologies include sand-based formulas, crushed stone & clay loam formulas (CU Soil™) or structural sidewalk support systems that house planting soil (SilvaCells™ by DeepRoot or similar systems). In all conditions, the structural soil must be aerated by perforated piping that vents to the surface, irrigated and under drained. Where possible, pervious pavement can directly benefit the root zone of the structural soil and reduce reliance on irrigation.

Equally important to creating an infrastructure of planting soil for mature tree growth, the selection of tree species is critical to long-term success of a healthy urban forest. Not all trees are suitable for urban conditions. Some trees are susceptible to sun scald from reflected heat from building facades. Other species of trees cannot accommodate urban atmospheric pollution, de-icing salts or the soil saturation that frequently occurs in compacted urban streetscape soils. Street trees should be selected for an upright form to accommodate the narrow growing space afforded by narrow sidewalks and close building facades. Tree species must be selected for zone hardiness, drought tolerance and a changing climate.

Species diversity of the urban forest is likewise critical. No more than 10 percent of the urban forest should be of the same species. No more than 20 percent of the forest should be of the General, and no single family should make up more than 30 percent of the City's tree inventory. These rules of species diversity should be applied to Portland as a whole and Franklin Street specifically. Genus species diversity can be applied block to block, so that there is design unity of trees within a single block of the Street.

Franklin Street runs in a northwesterly-southeasterly direction. In a number of locations solar gain will be greater on the north side of the corridor than on the south side. This is especially the case where buildings enclose the streetscape. In such conditions, the south side of the street will be in shade for much of the day. The north side of the street will be considerably hotter and drier due to solar gain and heat reflected from building facades.

In such conditions, having the same species of trees placed on both sides of the Franklin Street is not advised. Trees that will grow well in the shade and coolness of the south side of the Street will fare poorly on the brighter and warmer north side.

A list of trees that can form the backbone of a plant list of suitable tree species for the Portland area and Franklin Street specifically is provided on the following page. These trees can prosper into a mature urban forest if provided with a sensible infrastructure of ample soil that is underdrained, open to atmosphere and adequately provided with water.

### 4.3.2. Sustainable Storm Water Management Techniques:

Sustainable storm water management techniques include treating storm water as close to where it falls on pavement as possible, and infiltrating storm water back into groundwater wherever subgrade soil conditions will allow.

One technique that can be utilized for stormwater capture and treatment is to direct the first flush of stormwater into treatment planters installed in the sidewalk. The first flush is the initial surface runoff of a rainstorm when all of the pollution and contaminants that have collected on the roadway and sidewalk surfaces are concentrated.

Treatment planters are long, linear plant beds of the same dimensions as the raised and planted verges and placed in the same locations in the sidewalk. The treatment planters are filled with specially designed layers of crushed stone, gravel, coarse sands and planting soil that filter and clean the first flush of filthy stormwater, temporarily storing it for a slow release back into the system and, if subgrade soil conditions are optimal, infiltrate the water into the groundwater.

Treatment planters will remove suspended solids, absorb phosphorous and nitrogen from pavement surfaces and treat E. coli bacteria. They are planted with trees, shrubbery, grasses and perennials that are adapted to periodic flooding and are capable of absorbing many of the contaminates as they flow down through the plants' root systems. The treatment planters are set below the elevation of the sidewalk. Like the planted verges, raised curbs surround the treatment planters and a low, decorative fence installed to prevent stepping into the treatment planter.





Botanical Name	Common Name	Cultivar Or Variety	Use	Form	Mature Height	Family
Acer rubrum	Red Maple	Red Sunset, Autumn Flame, Bowhall	Back of sidewalk landscape	broad and upright forms	40'-60'	Aceraceae/ Maple
Acer x fremanii	Armstrong Red Maple	Armstrong	Street tree/back of sidewalk landscape	upright	35'-50'	Aceraceae/ Maple
Acer saccharum	Sugar Maple	Green Mountain	Street tree/ back of sidewalk landscape	oval, then round	60'-80'	Aceraceae/ Maple
Betulanigra	River Birch	Heritage	Street tree/ back of sidewalk landscape/ stormwater treatment	upright then oval upright		Betulaceae/ birch
Celtisoccidentalis	Hackberry	Prairie Pride	Street tree/ back of sidewalk landscape	upright then oval	40'-50'	Cannabaceae
Cladrastiskentukea (lutea)	Yellowwood		Back of sidewalk landscape	open arching, round	30'-50'	Fabaceae/ Pea
Fagussylvatica	European Beech		Back of sidewalk landscape	oval	60'-70'	Fagaceae/ Oak or Beech
Gleditsiatriacanthosinermis	Honeylocust	Skyline, Shademaster, Moraine	Street tree/ back of sidewalk landscape	very upright, broadly pyramidal	30'-40'	Fabaceae/ Pea
Liquidambar styraciflua	Sweetgum	Moraine	Street tree/ back of sidewalk landscape	upright round	60'-80'	Hammamelidaceae/ Witchhazel
Platanus x acerifolia	London Planetree	Bloodgood, Liberty, Columbia, Yarwood	Street tree/ back of sidewalk landscape	pyramidal, then round	60'-80'	Platanaceae/ Planetree
Quercusacutissima	Sawtooth Oak		Street tree/ back of sidewalk landscape	pyramidal, then round	40'-60'	Fagaceae/ Oak or Beech
Quercus bicolor	Swamp White Oak		Street tree/ back of sidewalk landscape	narrow, then round	60'-75'	Fagaceae/ Oak or Beech
Quercuscoccinea	Scarlet Oak		Street tree/ back of sidewalk landscape	pyramidal, then upright-spreading	60'-75'	Fagaceae/ Oak or Beech
Quercusmacrocarpa	Bur Oak		Street tree/ back of sidewalk landscape	columnar, then round	60'-70'	Fagaceae/ Oak or Beech
Quercuspalustris	Pin Oak		Street tree/ back of sidewalk landscape	pyramidal, then oval	60'-75'	Fagaceae/ Oak or Beech
Quercusrobur	English Oak		Street tree/ back of sidewalk landscape	pyramidal/oval, then round	50'-70'	Fagaceae/ Oak or Beech
Quercusrubra	Red Oak		Back of sidewalk landscape	upright/oval, then round	60'-75'	Fagaceae/ Oak or Beech
Sophora japonica	Scholar Tree	Regent	Street tree/ back of sidewalk landscape	upright round	40'-50'	Fabaceae/ Pea
Tiliaamericana	American Linden	Redmond	Street tree/ back of sidewalk landscape	oval	50'-60'	Tiliaceae/ Linden
Tiliatomentosa	Silver Linden	Sterling Silver	Street tree/ back of sidewalk landscape	broad/pyramidal, then upright/oval	60'-70'	Tiliaceae/ Linden
Ulmusamericana	American Elm	Princeton, Valley Forge	Street tree/ back of sidewalk landscape	upright arching vase	60'-70'	Ulmaceae/ Elm
Ulmusparvifolia	Lacebark Elm	Emer II/Allee/Emerald Vase	Street tree/ back of sidewalk landscape	upright vase	60'-70'	Ulmaceae/Elm
Ulmus hybrids	Hybrid Elms	Independence, Accolade, Cathedral, Frontier, Homestead, New Horizon, Patriot, Pioneer, Prospector, Regal	Street tree/ back of sidewalk landscape	Various forms	45'-70'	Ulmaceae/ Elm



DEVELOPMENT AND PLACEMAKING STRATEGY



Exhibit 4.14 Development Strategy





### 4.3.3. Development Strategy

Six properties can potentially be released for immediate development. These are seen in Exhibit 4.14. The details of each of these properties is as under:

NO.	PARCEL SIZE	PARCEL AREA	POSSIBLE USES	RECOMMENDED SCALE
1	100' x 340'	34,000 sq. feet	Residential, Public Uses, Offices	Up to 4 stories
2	200' x 415'	93,000 sq feet	Mixed Use Development - Residential, Hotel, Offices - with Active Retail Edge	Up to 5 stories
3	230' x 170'	39,500 sq feet	Mixed Use Development - Residential, Hotel, Offices - with Active Retail Edge	Up to 5 stories
4	63' x 85'	5,725 sq feet	Residential with Active Retail Edge	Up to 3 stories
5	55' x 175'	9,500 sq feet	Residential with Active Retail Edge	Up to 3 stories
6	70' x 200'	14,000 sq feet	Residential with Active Retail Edge	Up to 3 stories

Besides the properties listed above, development opportunities can be created through parcel consolidation with adjoining properties. Most of the space created by realignment in the northern section of the corridor will become developable only after parcel consolidation.

### 4.3.4. Land Use and Zoning

As stated in the Existing Conditions Analysis Memo, the City of Portland currently follows a typical Euclidean zoning code that divides land into distinct zones based on land uses. Due to this, the Franklin Street corridor is divided along its length into various parts - the Industrial and Warehouse districts abut Franklin Street on the northern end, while the downtown district and other business uses define its character on the southern end. A small amount of mid density apartments constituting the R6 zone lines Franklin street on the east between Fox street and Cumberland Avenue, with an exception of high-rise, high-density Franklin Towers on the west.

In addition, Franklin Street acts as a divider between predominantly residential land use to the east in the form of East Bayside and India Street neighborhoods, and commercial uses to the west in the Bayside and Downtown areas.

To achieve the primary objective of this study, that is to scale down the Franklin Street corridor make it more pedestrian friendly, and to re-stitch the urban fabric severed by the construction of the Franklin street arterial, it is imperative to re-imagine the approach to land use and zoning.

To create an attractive and active pedestrian environment on Franklin Street will require changes to the regulatory structure currently governing the area. Although there are opportunities along the street, the street currently acts as a barrier between the two neighborhoods.

A combination of layered Euclidean zoning along with Form Based Code can

achieve the desired vision of nodal development and gateway treatments. A mixed use overlay over the current zoning code would provide flexibility to add one or more land uses over and above the existing land use, to activate the street and to integrate the neighborhoods on the east and west sides of the Corridor. Associated development standards can further help to specify the kind of land uses and control the density in this zone.

A Form Based Code (FBC) focuses more on achieving specific urban form. These codes address the scale and type of blocks and streets and the relationship between buildings and public realms. The Development Nodes recommended in this study can be looked at from a FBC perspective to achieve the desired nodal development that would further act as a catalysts for the redevelopment of the adjoining east – west neighborhoods.

For example, the nodal locations of Congress and Cumberland around Franklin Towers can be looked at as an opportunity for greater density, with a vision of stepping down the urban form to the desired three to four-story development radiating away from Franklin Towers.

The layered Euclidean mixed use zoning can assist in continuing the land use across the corridor from one side to the other, and help in stitching the neighborhoods back together. It can critically look at the defunct land use and under-utilized development along the corridor, and innovatively redefine the development standards to adapt the same for today's needs.

For example, the larger land parcels along the north west portion of the Franklin Street corridor that contain mostly warehouses, have great potential for larger mixed use developments, multi – family residential developments and offices.

#### Incentivizing Development

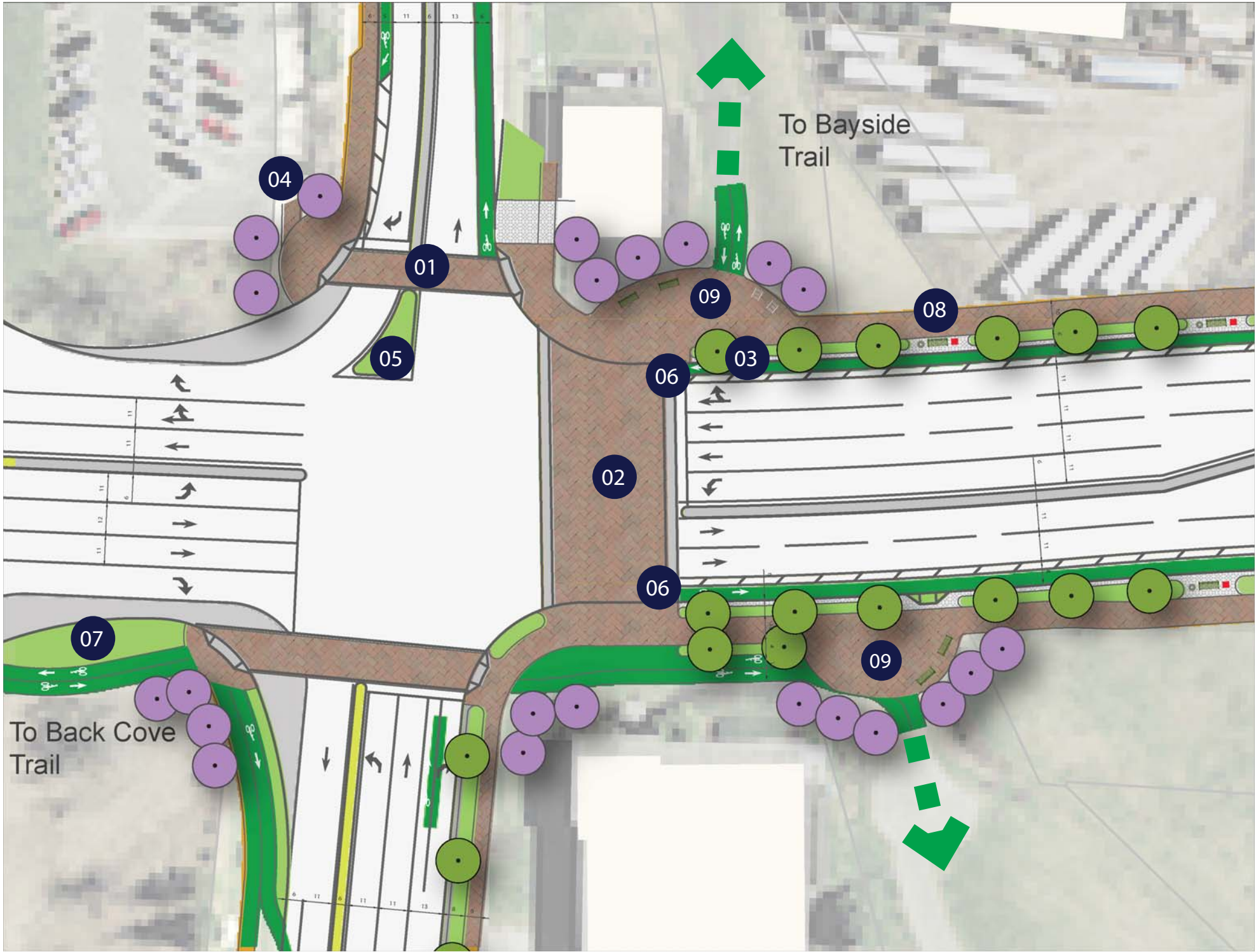
To ensure successful implementation of this vision of an active and integrated urban fabric it is necessary to incorporate various instruments that create incentives for desired developments. Some of the instruments are described below:

- Effective methods of land pooling through transfer of development rights and other tools can provide the needed incentive to create high density mixed use development.
- The combination of public realm improvements and mixed use private developments provide opportunities for increased tax base by increasing the value of the surrounding real estate. Tax increment financing and other tools, like setting up of a redevelopment trust fund for a definite period of time, can help subsidize redevelopment.
- Effective tools like providing density bonus in designated nodal areas can ensure much needed public street services in exchange of added development rights.
- A one stop procedural tool for land assembly can be adopted as an incentive for the developer.
- Expediting the approval process for desired development along the corridor can act as an incentive for redevelopment. However, this may be difficult to

implement in combination with a FBC, as the latter needs an extensive design review process for approvals.



4.3.5. Plan Enlargements - Marginal Way



KEY ISSUES

- INTRODUCE “COMPLETE STREETS” CONCEPT WHILE ACCOMMODATING TRAFFIC ISSUES RELATED TO I-295 ACCESS/OPERATION
- ENHANCE SAFETY AND CONVENIENCE FOR PEDESTRIANS AND CYCLISTS
- CELEBRATE AND LINK TRAIL CONNECTIONS
- PROVIDE WELCOME GATEWAY

- 01 New crosswalk connects parking lot with Franklin Street and Bayside Trail
- 02 Wide crosswalk (40'wide) of brick edged with granite and ornamental trees at corners announce entry into Franklin Street
- 03 Start of continuous street tree treatment along Franklin Street (trees at 40'O.C in curbed planter)
- 04 New walkway connects existing parking lot
- 05 New median allows right-turn only; no through traffic from west-bound side of Marginal Way
- 06 Start of dedicated bike lanes on both sides of Franklin Street
- 07 Enlarged landscape buffer between trail and roadway
- 08 Designated space for street furniture
- 09 Trail Entry Plaza with wayfinding/gathering/ bike “fix-it” opportunity





Continuous street tree treatment



Existing view of Marginal way Intersection



Ornamental trees at corners to announce entry



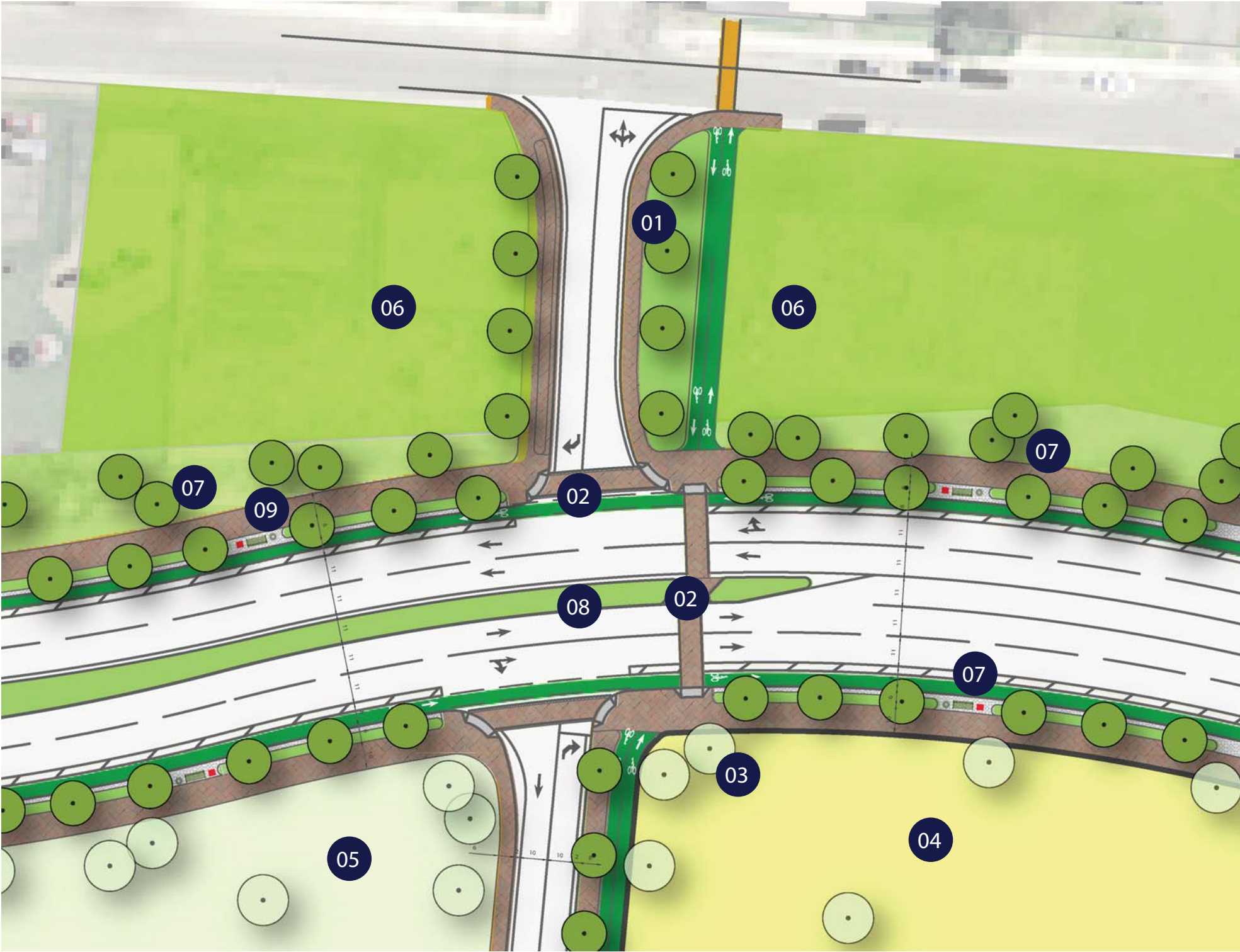
Tabletop brick crosswalk with granite edge



Proposed view of Pedestrian friendly Marginal way Intersection



4.3.6. Plan Enlargements - Oxford Street Reconnection



KEY ISSUES

- RESPOND TO STRONG PEDESTRIAN DESIRE LINE TO CROSS FRANKLIN
- ENHANCE SAFETY AND CONVENIENCE FOR PEDESTRIANS AND CYCLISTS
- LAY GROUNDWORK FOR FULL RECONNECTION IN THE FUTURE
- NEED TO RE-ESTABLISH STREETScape LINKAGE/IDENTITY BETWEEN ONCE SEVERED SIDES OF OXFORD

- 01 New sidewalks and street trees on both sides of extended Oxford Street.
- 02 New crosswalks connects pedestrians with East and West sides of Oxford Street
- 03 Temporary landscape of meadow grasses and a few trees in area earmarked for development.
- 04 Property earmarked for immediate development
- 05 Property earmarked for future development dependent on land parcel consolidation.
- 06 Existing Boyd Street urban farm to remain
- 07 Potential storm water management landscape
- 08 Planted median allows turns at Franklin street, does not allow through vehicular traffic on Oxford Street
- 09 Designated space for street furniture





Pedestrian crosswalks



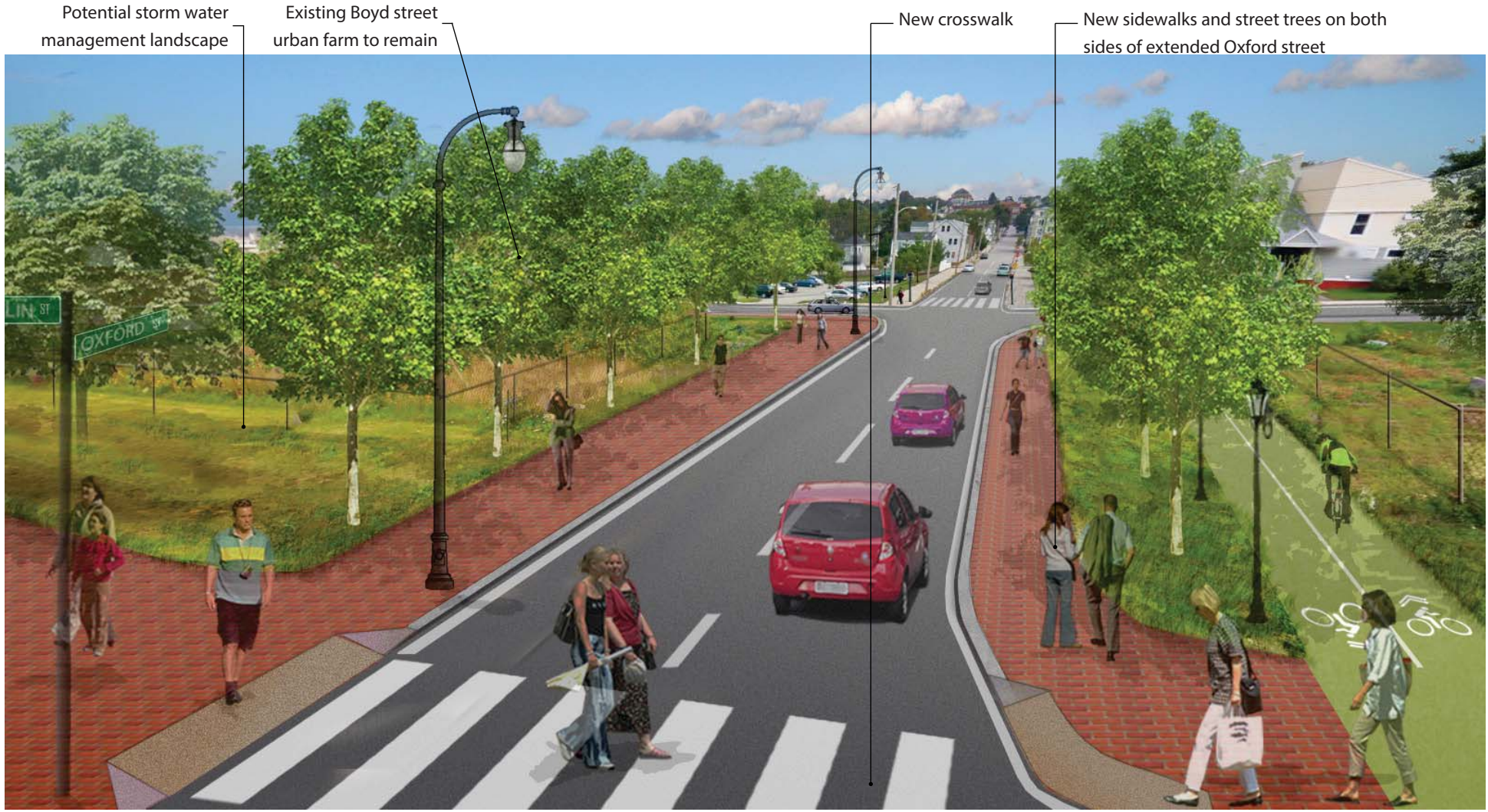
Storm water management landscape



Tree pits along street edge



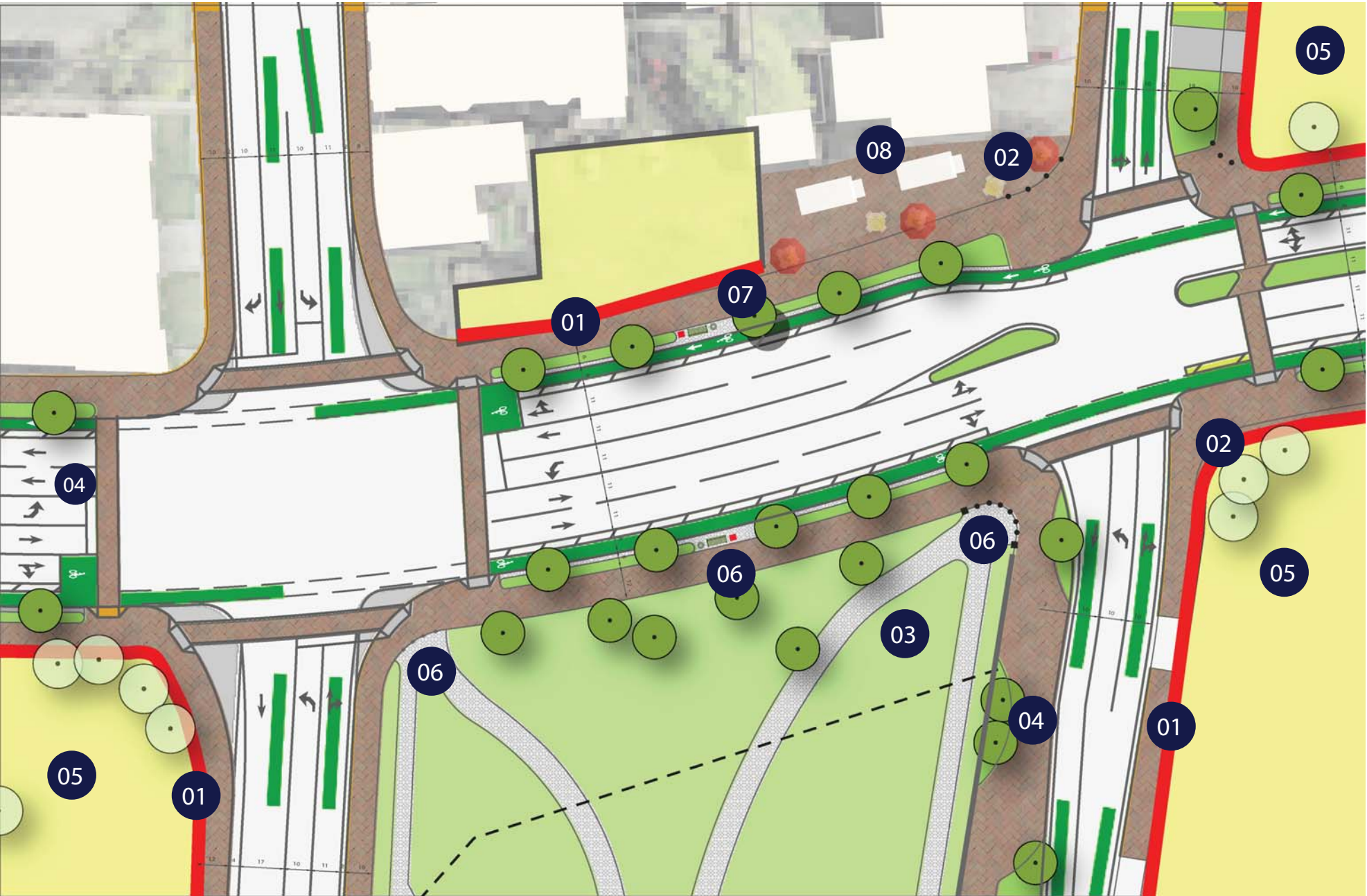
Existing view towards Oxford street



Proposed view of extended Oxford street connecting Franklin street



4.3.7. Plan Enlargements - Federal Street Reconnection



KEY ISSUES

- RE-ESTABLISH STREETScape/FULL RECONNECTION IN RESPONSE TO STRONG EAST/WEST DESIRE LINE
- ENHANCE SAFETY AND CONVENIENCE FOR PEDESTRIANS AND CYCLISTS
- PROVIDE MAXIMUM EXPANSION OF LINCOLN PARK
- SUPPORT INDIA STREET NEIGHBORHOOD DEVELOPMENT
- CREATE VIBRANT DESTINATION ANCHOR FOR FUTURE DEVELOPMENT

- 01 Active retail edges fronting Lincoln Park to create vibrant edges.
- 02 Streetscape of seating, planting and piers create small gathering nodes at the four corners of newly extended Federal Street and announce entry to Lincoln Park area
- 03 Lincoln Park expansion, to be planned in keeping with the historic shape
- 04 Planters and street furniture, space for street vendors create urban node along Federal Street
- 05 Areas earmarked for development - with temporary planting of meadow grasses in the immediate term.
- 06 New fence, piers and bollards at street edge of park expansion in keeping with historic precedent
- 07 Designated space for street furniture
- 08 Multi-use plazas in infill areas create space for flexible and informal uses





Corner plaza with landscaped edge



Active edges along Federal Street - Urban node



Landscaped intersection treatments



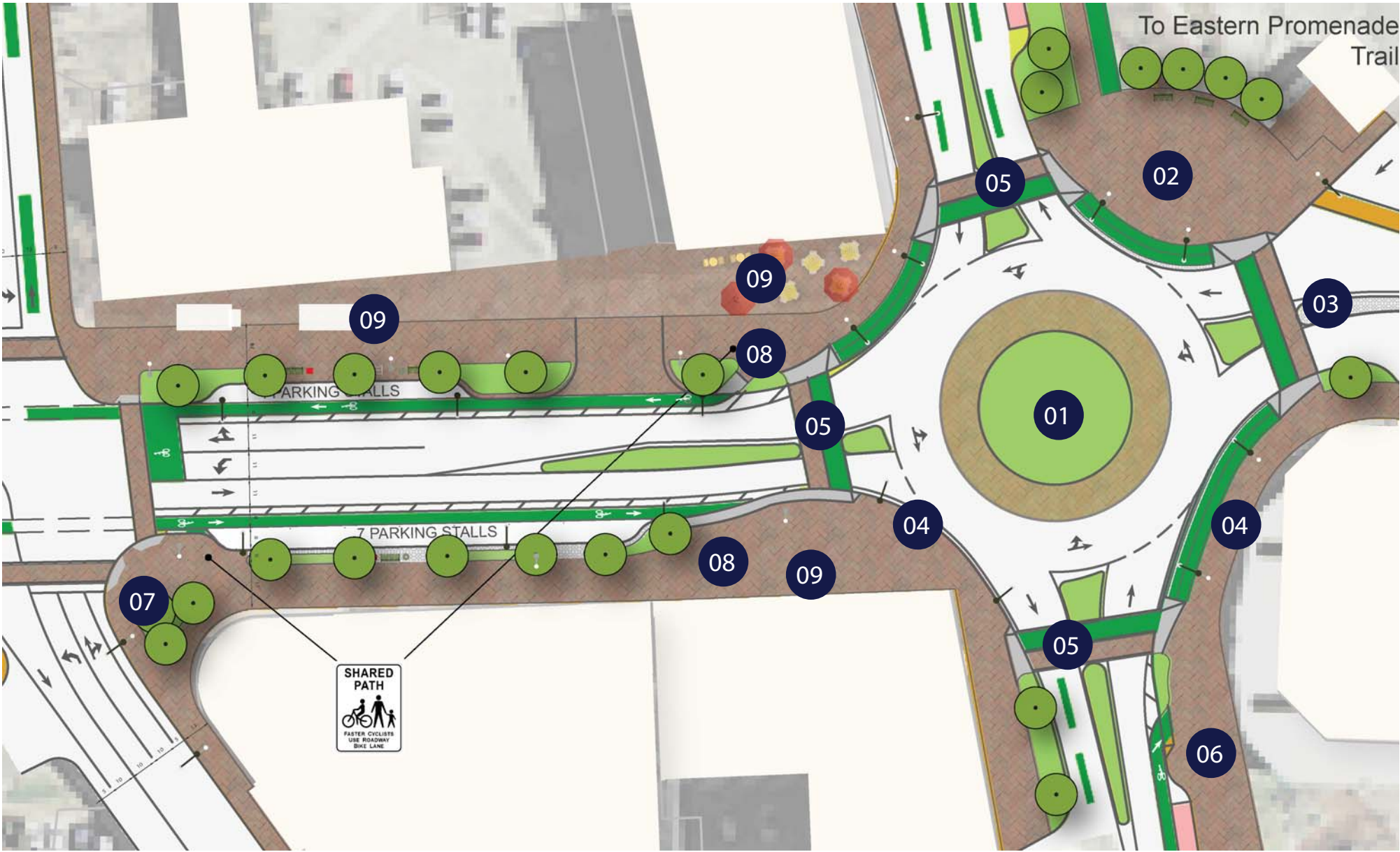
Existing view towards Federal Street and Lincoln Park



Proposed view of extension to Federal street along Lincoln Park



4.3.8. Plan Enlargements - Commercial Street Roundabout



KEY ISSUES

- ENHANCE SAFETY AND CONVENIENCE FOR PEDESTRIANS AND CYCLISTS
- CELEBRATE AND LINK TRAIL CONNECTIONS
- PROVIDE WELCOME GATEWAY
- SUPPORT NEIGHBORHOOD BUSINESS
- ACCOMMODATE WATERFRONT/FERRY ACCESS

- 01 Roundabout island as a showcase for Portland landscape/art
- 02 Enlarged plaza at entry into Eastern Promenade Trail with expanded pavement, seating
- 03 Cobble median allows vehicular entry into cruise terminal
- 04 Expanded sidewalk pavement on all corners of intersection allows for shared pedestrian/ bike
- 05 Brick crosswalks (edged with granite)
- 06 Expanded sidewalk creates plaza space and connects to existing plaza/open space at Bell Buoy Park
- 07 Urban plaza at street corner: special planting, seating
- 08 Expanded sidewalk pavement (min. 17' wide) allows for shared pedestrian/bike movement within sidewalk
- 09 Multi-use plazas in infill areas create space for flexible and informal uses





Active multi-use plaza space for sit-outs/food trucks



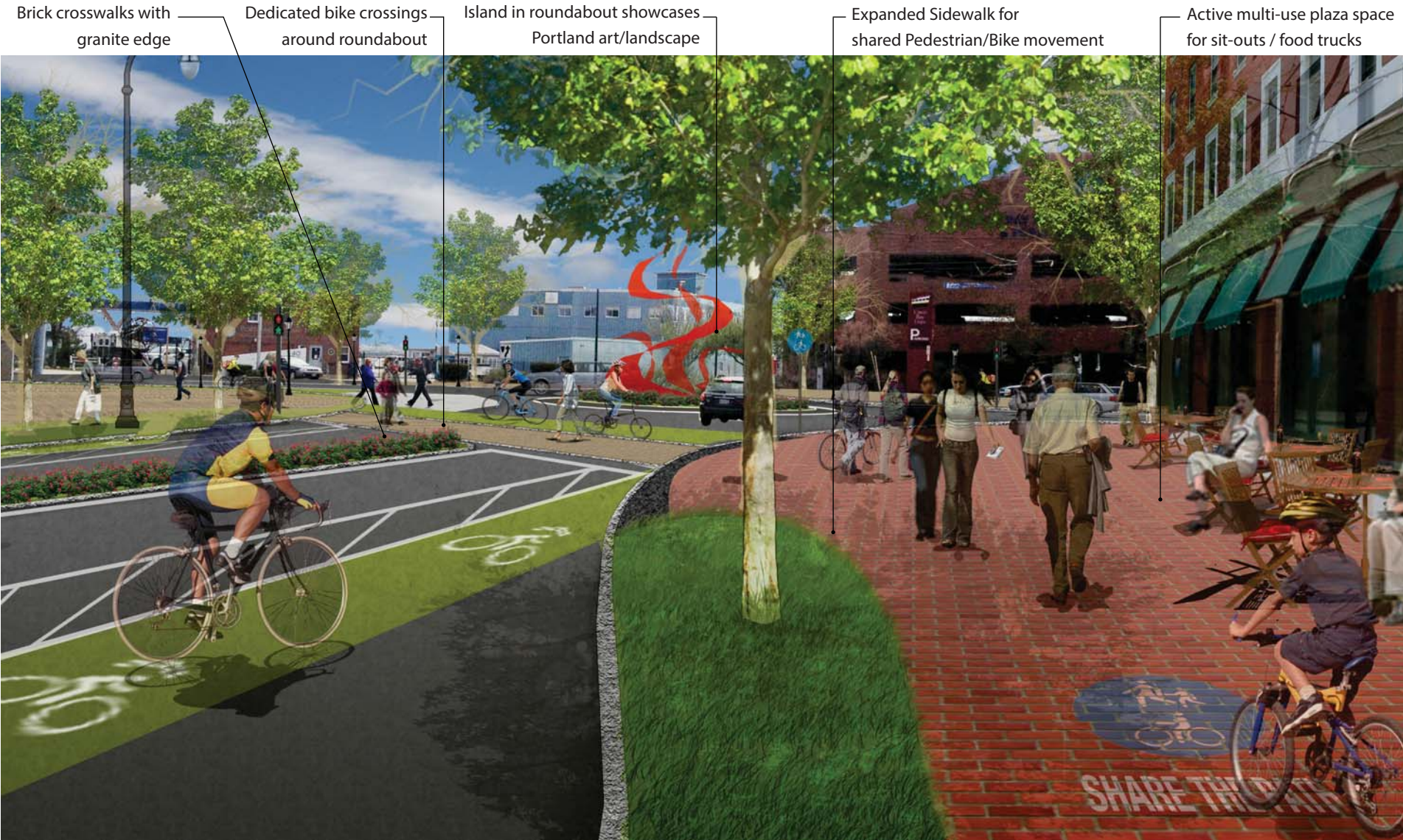
Paving treatments around roundabout



Landmark sculpture / art in roundabout



Existing view towards Commercial Street intersection



Proposed view of Commercial Street Roundabout









## 5. Transportation Conditions



# 5.1. Future Transportation Projection Methodology

The design year for this study was 2035. During the course of the study, projected future traffic volumes, motorized vehicle level of service (LOS), and multimodal LOS (MMLOS) were prepared for: a baseline ‘No Project’ condition, the three alternative plans that were evaluated, and the recommended plan presented in this document. The ‘No Project’ case serves as a basis for comparison both with existing conditions and with the alternative and final plans. In the baseline ‘No Project’ scenario, the only changes from the existing conditions are changes in traffic volumes estimated to occur with the passage of time, and committed changes in the transportation network. In the evaluation described in chapter 3, attention was focused on comparing the goals achievement of three alternatives under year 2035 demand conditions to find a basis for a recommended plan. Chapter 4 presented the features and characteristics of that plan. This chapter describes the projected transportation performance of the recommended plan relative to the ‘No Project’ scenario.

## 5.1.1. Regional Travel Demand Methodology

The project team worked with Kevin Hooper and Associates to update the PACTS regional travel demand model to the design year for the Franklin Street Feasibility Study Phase II (2035). The PACTS model follows a traditional four-step process: trip generation, trip distribution, mode split, and traffic assignment.

- The trip generation component estimates the numbers of person trips (inbound and outbound) generated within each of the model area. The person trips are estimated separately for four different trip purposes: home-based work, home-based shopping, home-based other, and non-home based.
- The trip distribution component matches appropriately compatible trip origins and destinations to produce a trip table for each trip purpose, with a distribution of trip lengths characteristic of that measured in travel surveys.
- The mode split component estimates the travel modes for all trips in the trip tables. The model divides person trips into trips as vehicle driver, vehicle passenger, transit rider, pedestrian, and bicyclist.
- The trip assignment component estimates the loading of vehicle and transit trips onto the roadway and transit networks. The highway route assignment process takes into account travel speeds under congested conditions, travel distance, and tolls paid.

A year 2010 study funded by the Maine Turnpike Authority (MTA) and Maine Department of Transportation (MDOT) produced a recommended land use forecast for the PACTS model area, called the Urban and Rural Form. For that forecast, the core urban communities of Portland, South Portland and Westbrook retain their high shares of regional employment and reverse a long-term trend toward lower shares of the region’s population and housing units. Housing growth pressure is projected to decrease in the fast-growing inner suburbs (Cape Elizabeth, Cumberland, Falmouth, Freeport, Gorham, Scarborough, Windham,

and Yarmouth) but they are expected to retain a significant proportion of jobs, population and housing units, much of which will be organized into dense nodes or town centers that include open space and public land use. In the more rural outer suburbs (Buxton, Gray, Hollis, New Gloucester, North Yarmouth, Pownal, Raymond, and Standish), population, housing unit and job growth is foreseen to slow down modestly compared with recent history, with an emphasis on placing the new residential and commercial development in proximity to each other to reduce the need for long-distance travel. The Urban and Rural Form forecast is the basis for the land use assumptions used in this study.

The base forecast includes development types and quantities that are currently planned or are considered likely to occur within the Franklin Street vicinity.

Listed in Table 5.1 are current and forecast values for employment and housing units in the PACTS model. Also shown in the table are employment and housing unit growth assumptions for areas in the vicinity of the Franklin Street corridor that are expected to grow. These forecasts are not designed to be used as economic forecasts, but as approximate growth projections developed solely to fulfill the data requirements of the regional travel demand model used in this study.

Table 5.1 AADT of Select locations

Employment				Housing Units		
Area	Fall 2011	Growth by 2035	% Growth	2010 census	Growth by 2035	% Growth
Region	182,680	27,146	15%	146,104	33,528	23%
Portland Total	63,758	7,858	12%	32,538	3,870	12%
Portland Peninsula	35,024	4,361	12%	13,271	2,438	18%
Bayside (Between Elm & Franklin)	1,399	500	36%	715	800	112%
Bayside (Between Elm and Forest)	2,177	170	8%	408	360	88%
Government District	1,576	150	10%	149	100	67%
Arts District	2,404	-	0%	722	-	0%
India Street Neighbourhood	977	375	38%	259	600	232%
Old Port District	6,014	510	8%	275	-	0%
Waterfront	2,817	1,045	37%	99	200	202%

The base year ‘No Project’ 2035 roadway network was defined with guidance provided by City of Portland staff. It includes the following:

- Extension of Pearl Street from Somerset Street to Marginal Way
- Extension of Somerset Street to Forest Avenue
- A new intersection of Forest Avenue and Somerset Street,
- Left turns will be permitted for northbound I-295 exiting traffic to turn into Bayside via Somerset Street

- Left turns will be permitted for southbound Forest Avenue traffic to turn into Bayside via Somerset Street
- For westbound Somerset Street traffic, only right turns will be allowed onto northbound Forest Avenue (i.e., no left turns to Forest Avenue or State Street from Somerset Street)

For the three alternative plans and the recommended plan, the local roadway reconnections featured in the plans were added to the PACTS model network.

## 5.1.2. Traffic Operations Model

The project team used updated traffic volumes obtained from the PACTS Regional Travel Demand Model update to complete Synchro / Simtraffic computer modeling of the eight signalized intersections along Franklin Street for 2035 conditions during the weekday AM and PM peak hours.

For the purpose of the No Project future conditions model, potential future roadway connections to Franklin Street from other side roads were not included. For the three alternative plans and the recommended plan, the local roadway reconnections featured in the plans were added to the Synchro/Simtraffic model networks.

For the 2035 AM and PM No Project’ analysis, the traffic signal phasing in the Synchro model was the same as the 2013 conditions, with timings optimized for 2035 traffic volumes. For the three alternative plans and the recommended plan, signal phasing was changed to correspond to permitted movements at both existing intersections and those with reconnections, and then timings were optimized for the projected traffic volumes.

Once signal timing plans were adjusted to achieve the best overall intersection LOS with the projected volumes, Simtraffic was used to estimate traffic queue lengths.



## 5.2. Future Transportation Conditions

### 5.2.1. Future No Project Conditions

See Exhibit 5.1 for projected 2035 No Project traffic volumes on Franklin Street. See Exhibit 5.2 for projected 2035 intersection level of service on Franklin Street as well as the overall arterial level of service without the project.

Figure 6 in the Future Conditions Report (No build) shows the 2013 Existing Conditions LOS for comparison and Figure 7 in that report shows the change in volumes from the existing (2013) conditions. Figure 8 and Figure 9 in that report show the projected 2035 No Project queue lengths and delay compared to the existing conditions. Based on the capacity analysis for the No Project 2035 conditions, the intersections from Congress Street to Commercial Street are projected to operate at overall acceptable levels of service with some decrease in LOS from the 2013 conditions from the increase in traffic volume. The three intersections with Franklin Street at Somerset / Fox Streets, Marginal Way, and the I-295 ramps are all forecast to be over capacity and effectively at gridlock in the 2035 Future Conditions, leading to queue lengths that interfere with proper functioning of the surrounding intersections, including I-295. In the PM peak hour, traffic is more oriented toward I-295. In the PM peak, the queuing from the three signalized intersections on the I-295 end is projected to affect operations of the signals at

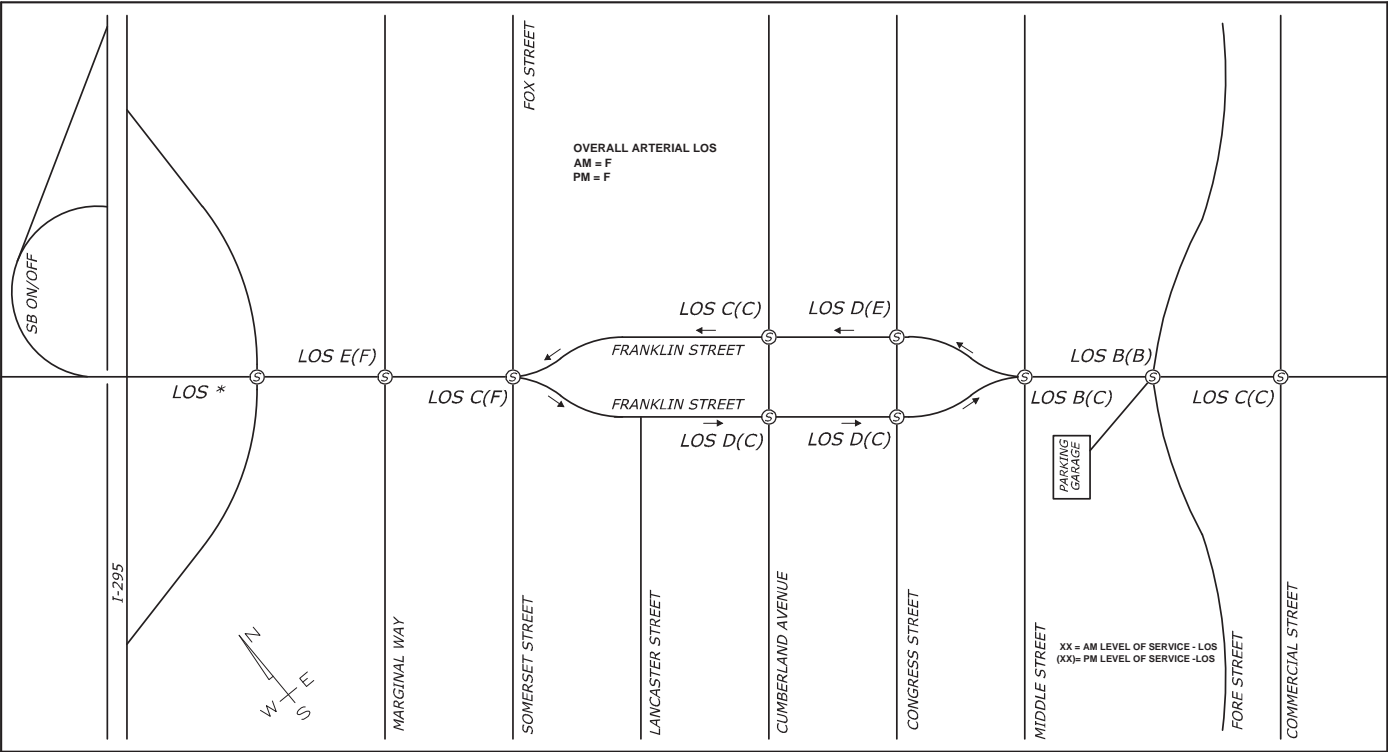


Exhibit 5.2 Intersection Level of Service for No project in 2035

Cumberland Avenue and Congress Street, which did not occur under the 2013 Existing Conditions.

### 5.2.2. Future Conditions with the Recommended Plan

See Exhibit 5.3 (on the following page) for projected 2035 traffic volumes on Franklin Street under the recommended plan. See Exhibit 5.4 (also on the following page) for projected 2035 intersection level of service on Franklin Street as well as the overall arterial level of service under the recommended plan. Figure 6 and Figure 9 show the projected 2035 queue lengths and delay under the recommended plan, compared to the existing conditions.

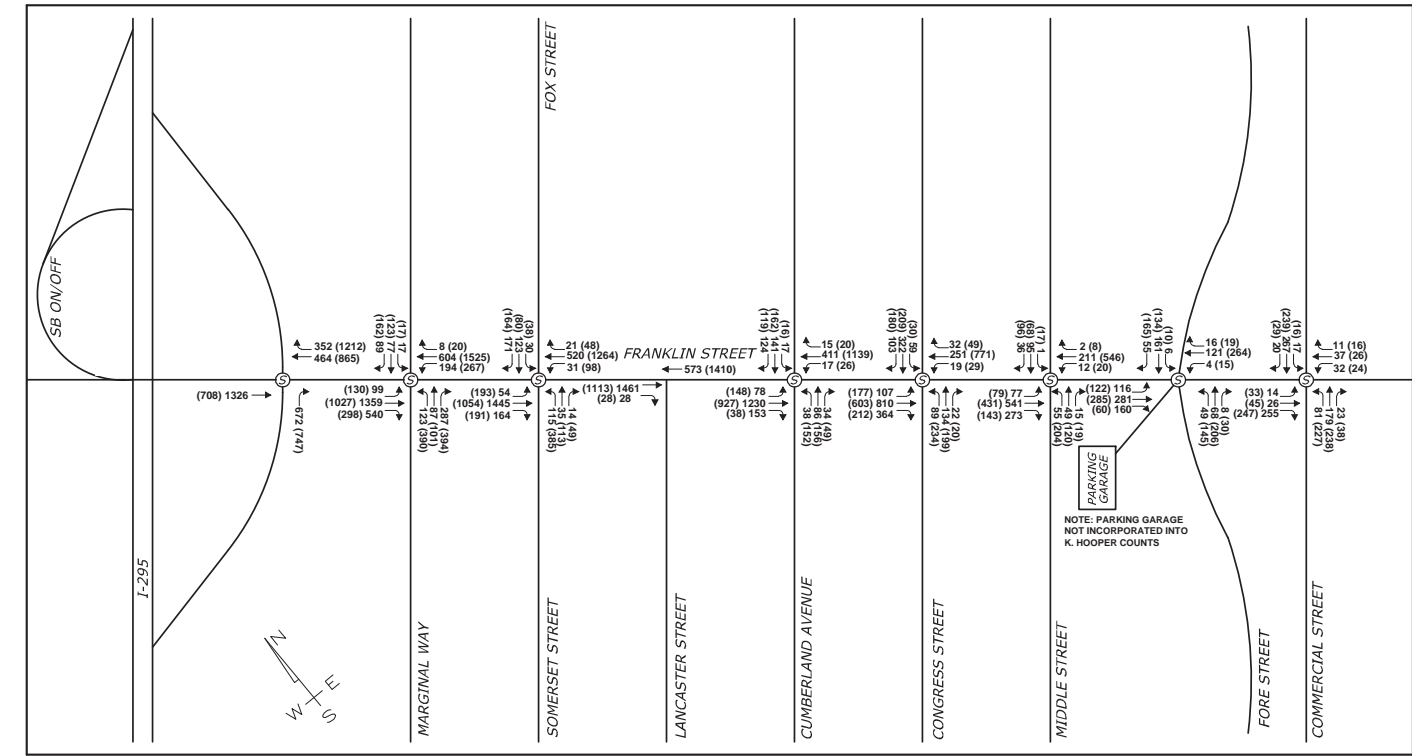


Exhibit 5.1 Peak Hour Traffic Movement No Project in 2035



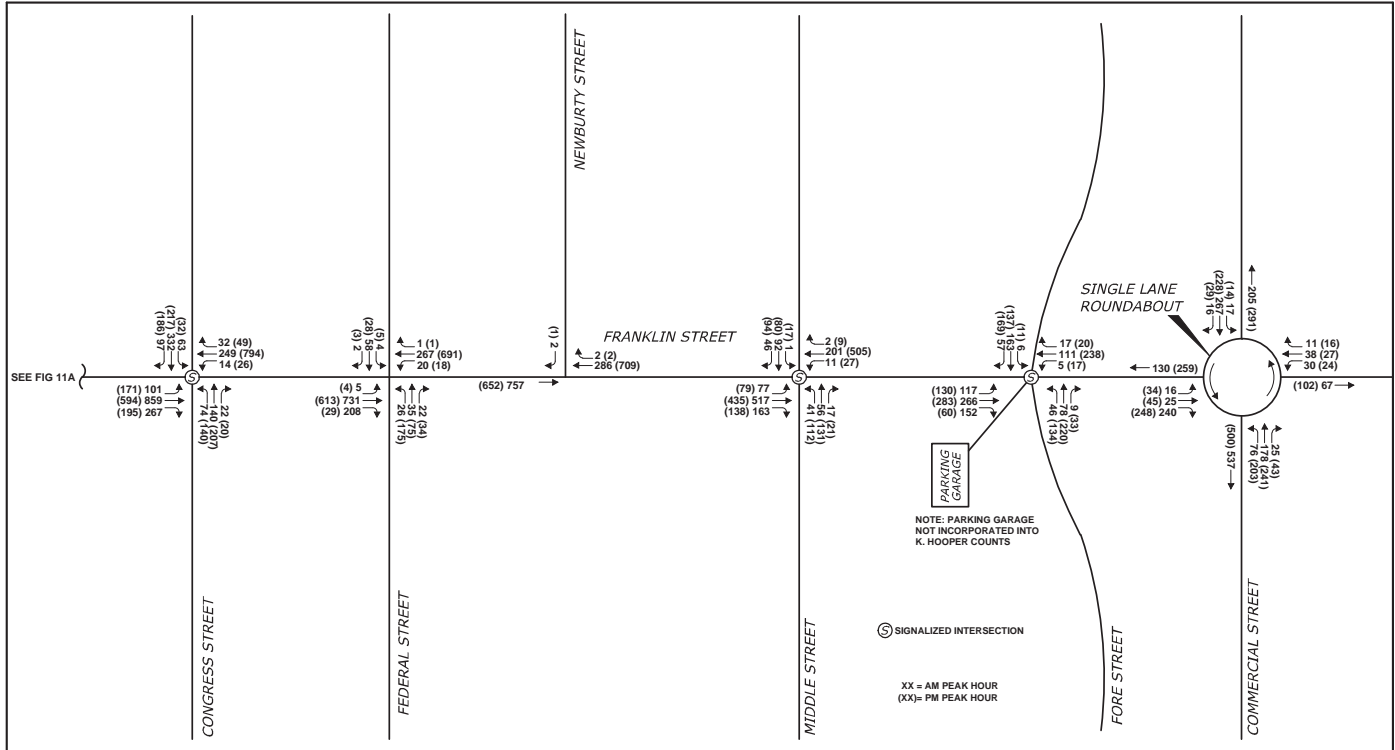
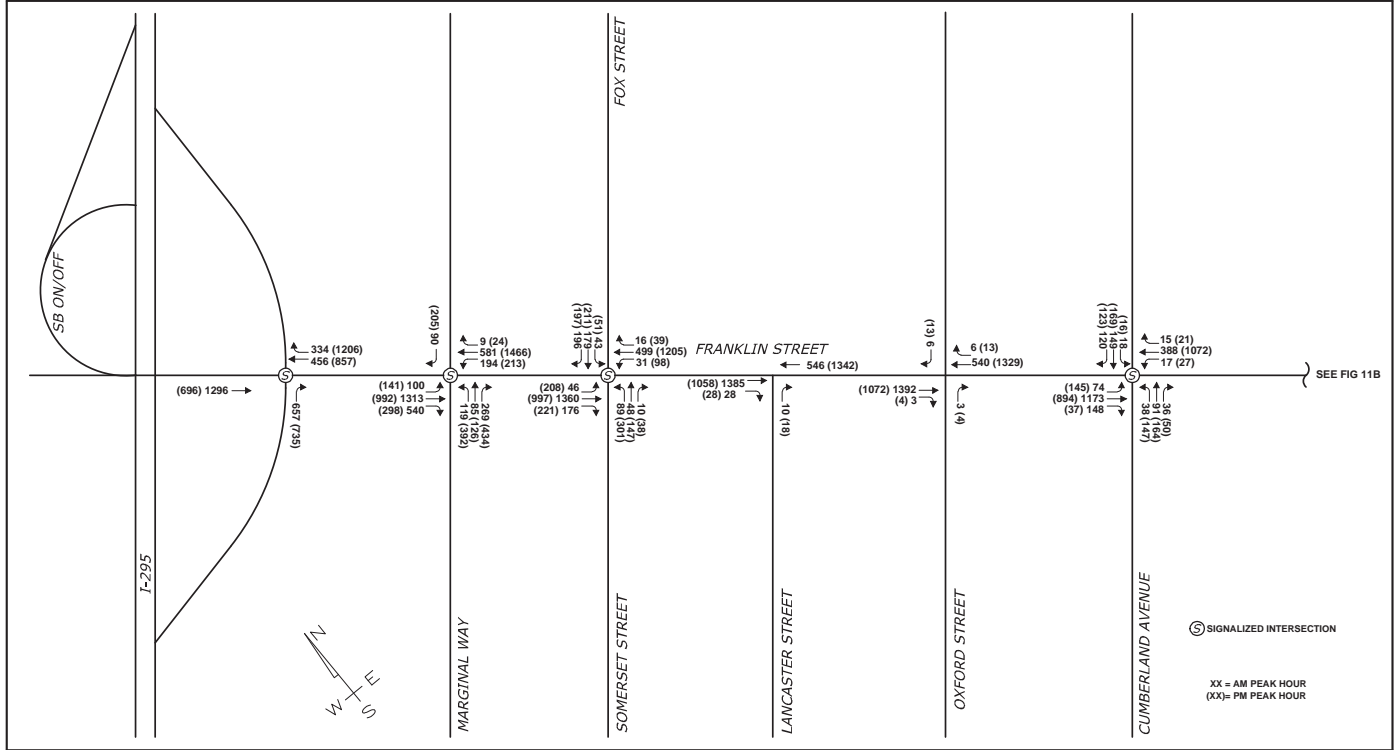


Exhibit 5.3 Peak Hour Traffic Movements for Recommended Plan in 2035

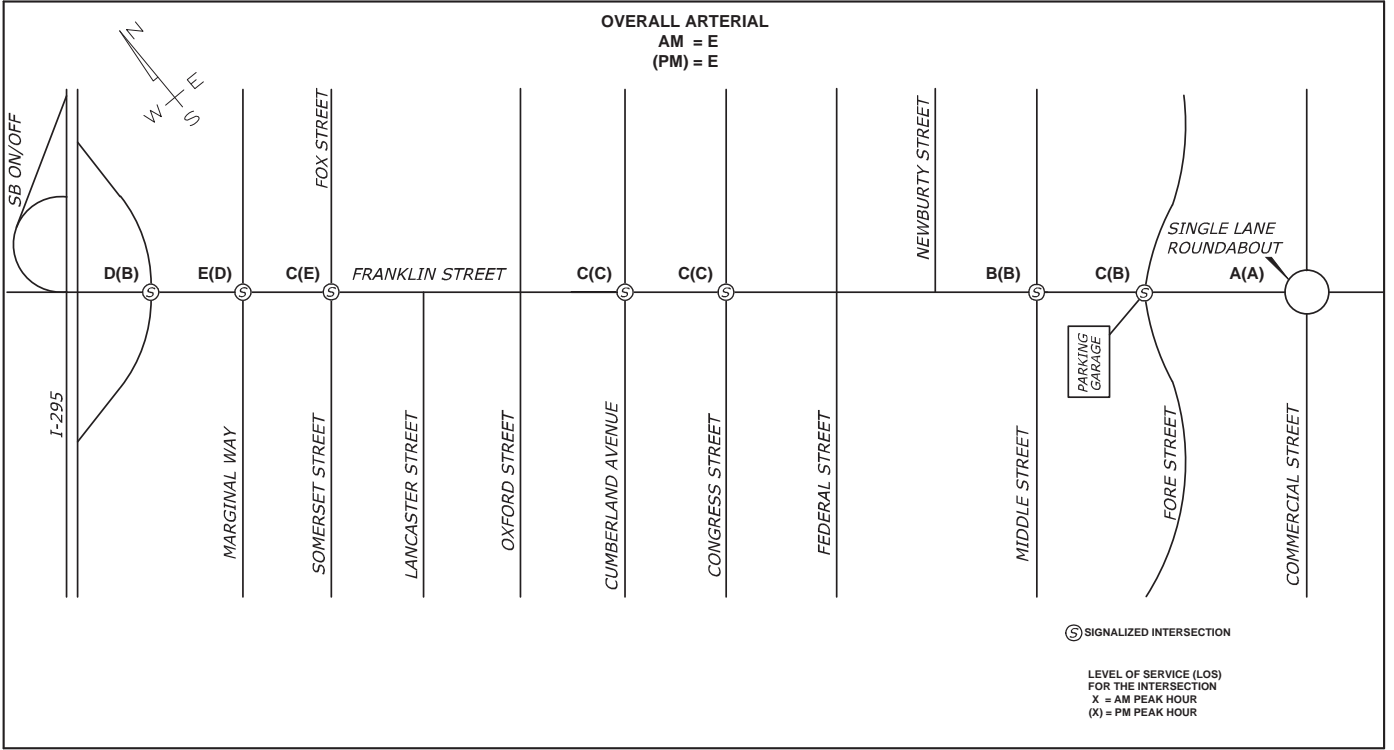


Exhibit 5.4 Level of Service for Recommended Plan in 2035





### 5.2.3. Comparison of Traffic Operations with and without the Recommended Plan

A cooperative agreement among the City of Portland, MaineDOT, and PACTS specifies that “the capacity and level of service (LOS) shall not be worse with a preferred alternative design than the future capacity and LOS of the current configuration”. It is possible to read this narrowly as referring to only highway capacity and LOS as defined in the Highway Capacity Manual (HCM), the original source of the LOS concept, and the only practical source for evaluating both capacity and LOS when the agreement was reached.

In keeping with the vision established for it, the Franklin project has been advanced with objectives related to all modes, including public transportation and non-motorized travel (bicycles and pedestrians), and has been informed by ‘Complete Streets’ principles. Therefore LOS could also reasonably be considered in this wider sense. Recently, frameworks have been evolved to evaluate a Multimodal Level of Service (MMLOS), and the project has kept this in view throughout the process.

Table 5.2 summarizes the projected MMLOS evaluations along Franklin by direction and peak hour for 2035 for both the ‘No Project’ (NP) case and the recommended plan (WP4). Inspection of this table shows that the LOS for each mode, direction, and peak period is the same or better with the project, with the single exception of the auto mode for the northbound direction in the AM peak.

Table 5.2 Comparison of Overall Facility Scores (Multimodal Level of Service )

	MODE	AM PEAK					PM PEAK				
		2035 NP		2035 WP4		CHANGE IN SCORE	2035 NP		2035 WP4		CHANGE IN SCORE
		SCORE	LOS	SCORE	LOS		SCORE	LOS	SCORE	LOS	
NB	Auto	0.45	D	0.32	E	-0.13	0.21	F	0.18	F	-0.03
	Transit	6.46	F	3.05	C	-3.41	6.50	F	3.83	D	-2.67
	Bicycle	3.47	C	2.73	B	-0.74	3.66	D	2.90	C	-0.76
	Pedestrian	3.04	C	2.62	B	-0.42	3.33	C	2.91	C	-0.42
SB	Auto	0.38	E	0.39	E	0.01	0.27	F	0.39	E	0.12
	Transit	6.48	F	3.00	C	-3.48	6.47	F	3.22	C	-3.25
	Bicycle	3.80	D	2.91	C	-0.89	3.69	D	2.87	C	-0.82
	Pedestrian	3.21	C	2.94	C	-0.27	3.13	C	2.87	C	-0.26

Because of the general LOS improvement achieved by the recommended alternative for all the non-auto modes, and given that capacity is a concept that is readily evaluated for the auto mode, it is worth looking in some more detail at the results for the auto mode.

In addition to the MMLOS component for the auto mode, the project also has been evaluating the auto LOS according to the established procedures of the HCM. This has allowed the recommended plan to be developed in more detail and with a higher confidence that conditions for auto flow will not be worse with the plan than without it in 2035, and that the preferred alternative will provide the capacity to move the traffic that would occur without the project.

The HCM looks at auto LOS from two perspectives:

- An intersection LOS that represents the level of motorist comfort with delays at an individual intersection; and

- An ‘arterial’ LOS that represents the level of motorist comfort with the average speed along a section of roadway through multiple intersections.

Table 5.3 shows a comparison of the intersection LOS values with and without the project. It is important to bear in mind that at the intersection level, the smallest overall delay (and therefore the best overall LOS rating) may require traffic signal timings that impose higher delays on small individual traffic movements to enable the predominant flows to avoid breaking down and causing gridlock.

Table 5.3 Comparison of Intersection Auto Levels of Service and Average Delay (seconds) in 2035

INTERSECTION W/ FRANKLIN STREET	AM PEAK HOUR LOS (DELAY IN SECONDS)		PM PEAK HOUR LOS (DELAY IN SECONDS)	
	NO PROJECT	PREFERRED ALT.	NO PROJECT	PREFERRED ALT.
Marginal Way	E (78.1)	E (57.6)	F (120.7)	D (35.2)
Somerset / Fox	C (30.9)	C (23.0)	F (88.3)	E (66.5)
Cumberland Ave	D (49.6)	C (22.3)	C (33.5)	C (25.7)
Congress St	D (52.9)	C (22.5)	E (56.0)	C (28.9)
Middle St	B (17.1)	B (13.9)	C (23.3)	B (16.1)
Fore St	B (16.4)	C (24.5)	B (17.6)	B (14.6)
Commercial St	C (20.8)	A (7.4)	C (30.5)	A (9.2)
Overall Corridor Delay/Veh (sec)	119.4	68.3	162.3	70.8

Not only does the project result in a significant decrease in overall traffic delay at intersections, but the intersection auto LOS improves at several intersections, and only gets slightly worse at one. At some locations, northbound traffic in the AM peak is projected to experience higher delays than without the project; this is a consequence of assuring that sufficient capacity is available to move the southbound traffic at these locations. Overall delay is reduced significantly, and intersection delays is reduced in 20 of the 21 cases in Table 5.3. The one instance of a decrease in auto LOS according to the MMLOS methodology, which is based on average directional speed alone, needs to be viewed in the context of overall intersection operations, which have been arranged to achieve a reduction in overall delay.

Looking at the entire length of Franklin for the standpoint of arterial LOS by the HCM methods, the corridor rates an ‘F’ for both existing (2013) and the year 2035 without the project. This needs to be placed in the perspective that the LOS standards reflect nationwide expectations of arterials, and that Franklin is a corridor in a relatively dense street grid where most intersections are signalized. The arterial LOS is projected to improve to ‘E’ with the project for both the AM and PM peaks. There will continue to be a perception of traffic congestion, but it is forecast to be less with the project than without it.

In summary, it is reasonable to conclude that the preferred alternative does satisfy the cooperative agreement. It makes marked improvements for the non-auto modes, and even when looked at narrowly in terms of the auto mode alone, can clearly be seen to offer an overall improvement in and LOS as well as the capacity needed to meet the projected demand.







# 6



## 6. Implementation Plan



# 6.1. Franklin Street – Phasing Plan

The recommended plan in this draft report has yet to enter the preliminary design process. At the level of a recommended plan, an implementation plan can reasonably be expected to cover the following elements:

Identification of major components of the overall plan that can be implemented independently;

A recommended sequence for implementation of the components, or identification of interdependencies; and

Identification of likely funding requirements

Because the roadway elements of the recommended plan figure prominently, there are recommended approaches to maintenance of traffic that are also included in this report to inform the preliminary design process. The overall recommended plan has been divided into three phases, which are summarized in the three following sections.

It is recommended that design activities, right-of-way activities, utility coordination, environmental assessment, and detailed identification of maintenance of traffic requirements be undertaken in parallel for all three phases.

## 6.1.1. Phase 1

Phase 1 includes the construction of the section of Franklin Street from Middle Street to Commercial Street. This section of Franklin Street includes two signalized intersections at Middle Street and Fore Street, as well as construction of a roundabout at Commercial Street. The limits of Phase 1 are shown in Exhibit 6.1.

Phase 1 is expected to account for about 30 percent of the estimated total project construction cost, and would extend for about one year following the completion of design activities. Phase 1 will be implemented first because it appears to be easier to stage, has relatively low traffic volumes, and fewer right-of-way issues. It is not essential that Phase 1 precede Phase 2.

In terms of maintenance of traffic, the primary challenge in Phase 1 is routing traffic from Commercial St., Fore St., and Middle St. around the work zones at Franklin Street. During construction, traffic will likely need to shift onto nearby



Exhibit 6.1 Implementation Plan Phases (1 of 5)





streets such as Congress St, Pearl Street, India Street and perhaps the southern section of Commercial Street. In addition, the construction work area will likely need to remain open to traffic with either one-lane of alternating two-way traffic or two-lanes with one-lane of traffic in each direction.

6.1.2. Phase 2

Implementation Phase 2 includes the construction of the section of Franklin Street from I-295 Exit 7 to Oxford Street. This section of Franklin Street includes two signalized intersections at Marginal Way and Somerset Street, a stop controlled intersection at Lancaster Street, and construction of a new portion of Oxford Street providing a connection to Boyd Street. The limits of Phase 2 are shown in Exhibits 6.2, 6.3 and 6.4.

Phase 2 is expected to account for about 40 percent of the estimated total project construction cost, and would extend for about one year following the completion of Phase 1. It is recommended that Phase 2 be constructed before Phase 3.

The primary maintenance of traffic challenge is maintaining access to the I-295 (Exit 7) ramps. During construction, traffic will likely need to shift onto nearby interchanges such as Forest Ave (Exit 6) and Washington Ave (Exit 8), to the extent possible. It is likely that night work will be necessary for the interchange and Marginal Way work areas. Otherwise, the construction work area will likely remain open to traffic of two-lanes with one-lane of traffic in each direction.

6.1.3. Phase 3

Implementation Phase 3 connects the previously constructed portions of Franklin Street from Oxford/Lancaster Street to Middle Street. This section includes signalized intersections at Cumberland Avenue and Congress Street, as well as stop controlled intersections at Oxford, Federal and Newbury Streets. Refer to exhibits 6.4 and 6.5.

Phase 3 is expected to account for about 30 percent of the estimated total project construction cost, and would extend

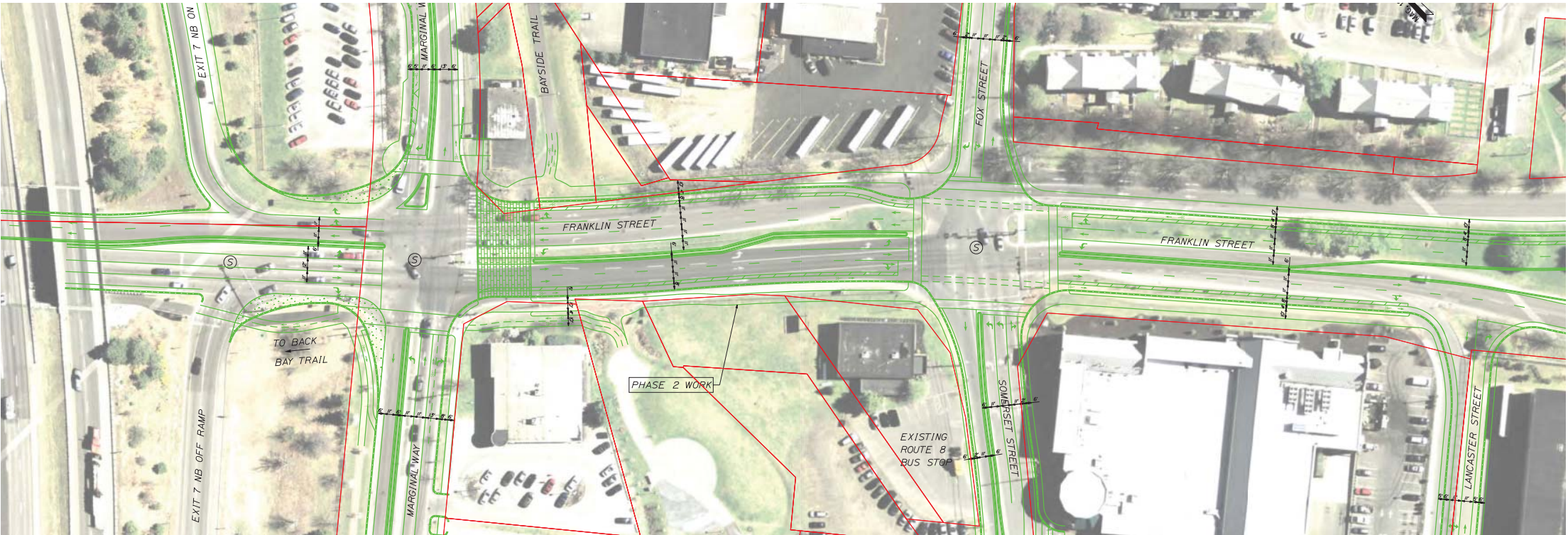


Exhibit 6.2 Implementation Plan Phases (2 of 5)



Exhibit 6.3 Implementation Plan Phases (3 of 5)



for about one year following the completion of Phase 2. Ideally, Phase 3 would be built following completion of the Marginal Way storage conduit project.

In terms of maintenance of traffic, the primary challenge in Phase 3 is routing traffic from Cumberland Avenue and Congress Street away from the work zone, as well as maintaining access to I-295 (Exit 7) for motorists accessing Franklin Street from Commercial Street. During construction, two lanes of traffic with one lane of traffic in each direction will likely be maintained on the existing inbound lanes of Franklin Street while the phase 3 construction occurs along the eastern portion of the Franklin Street corridor. Pearl Street will likely serve as a possible detour route. It is also recommended that reconstruction of the Congress Street and Cumberland Ave intersections with Franklin Street be sequenced to avoid simultaneous construction at both intersections.

Phase 1 is proposed for the waterfront end of Franklin because the work in that area appears to be less complicated, has less ROW impacts and has less traffic than Phase 2. It is possible to switch Phase 1 and 2, but this Study recommends that both Phase 1 and 2 be completed before working on Phase 3. Phase 1 and 2 are independent

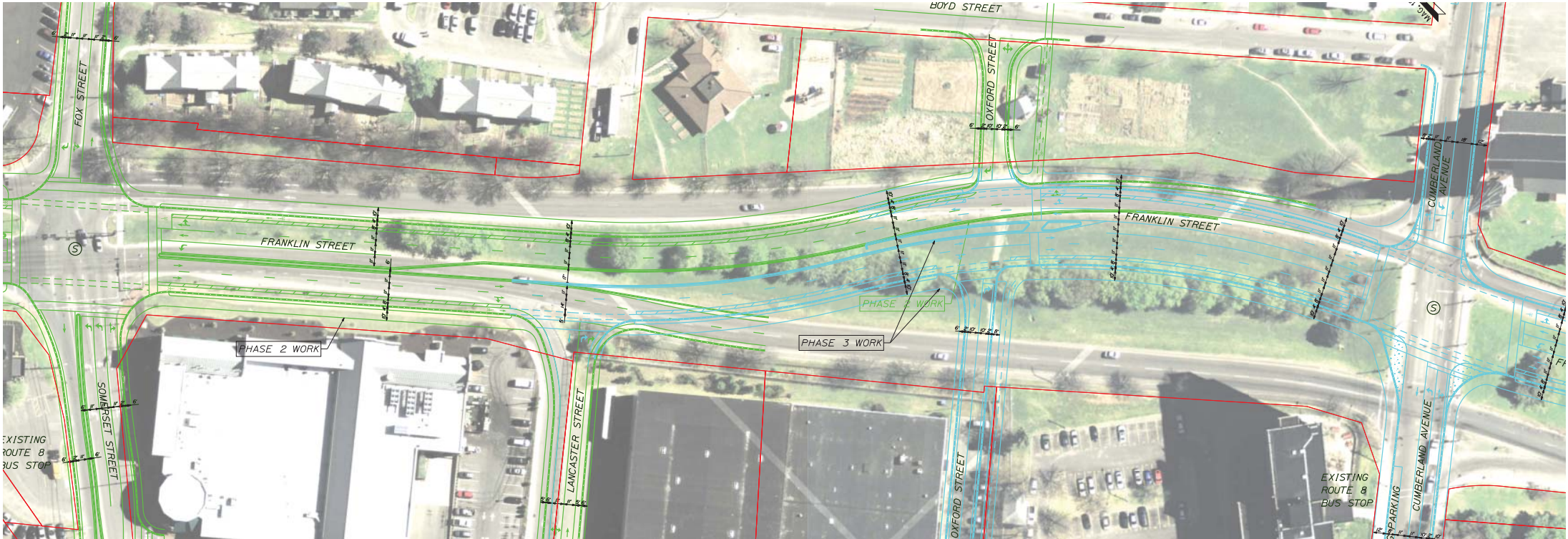


Exhibit 6.4 Implementation Plan Phases (4 of 5)



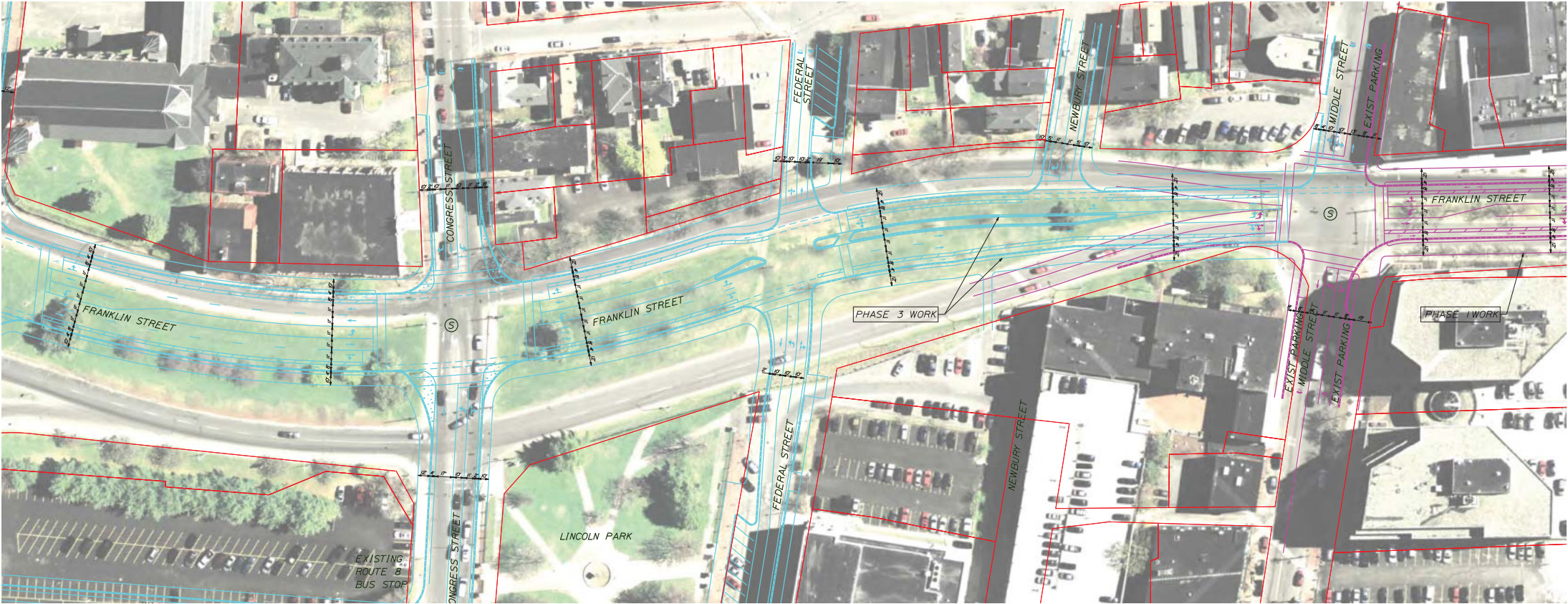
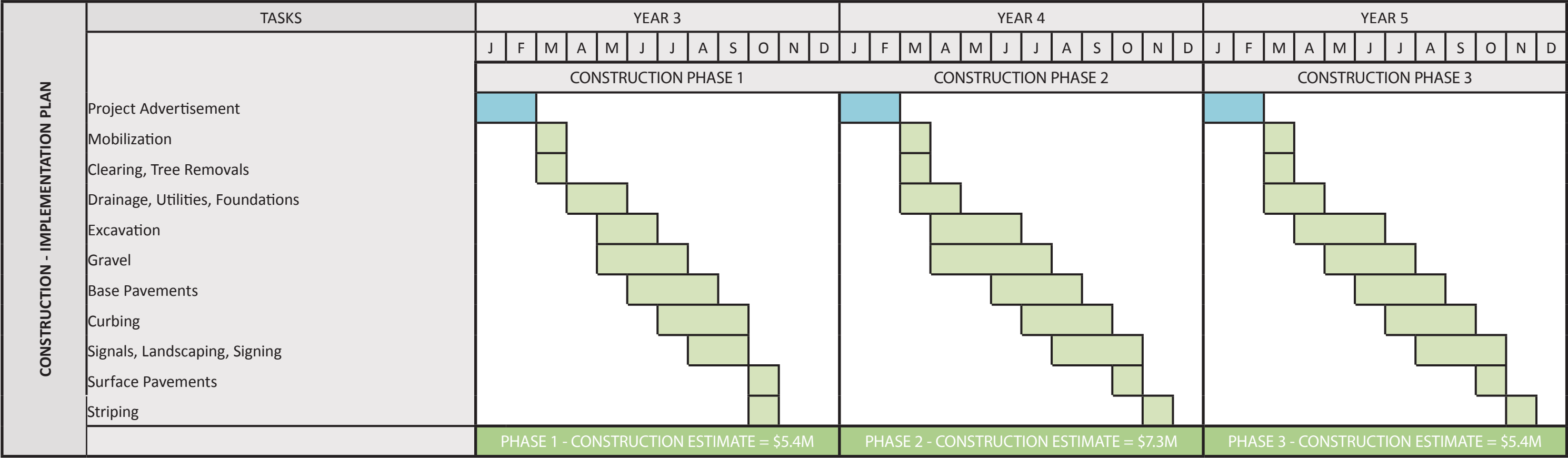
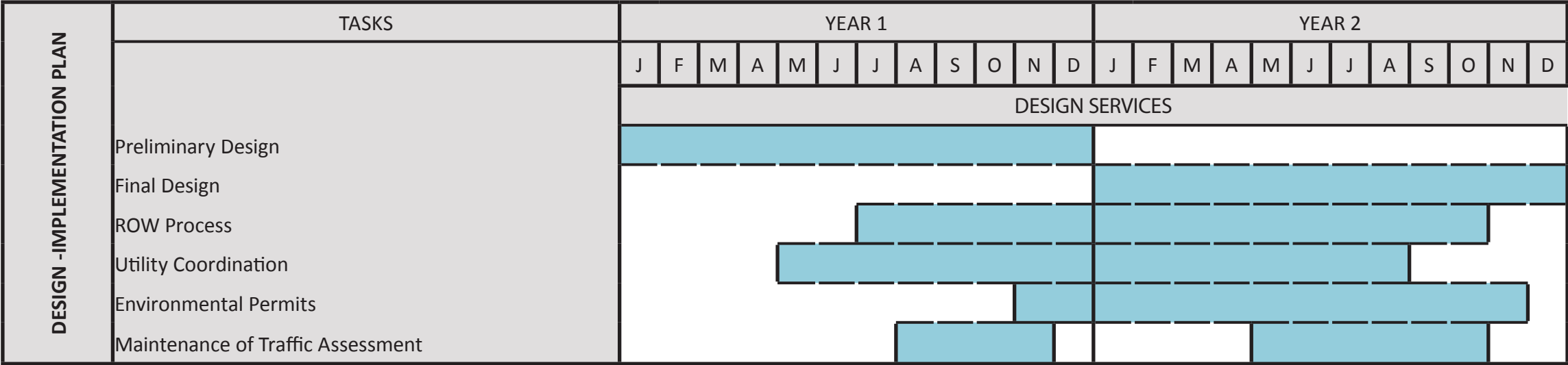


Exhibit 6.5 Implementation Plan Phases (5 of 5)



6.1.4. Implementation Timeline







COST ESTIMATE

Item Description	Unit	Unit Price	Quantity	Amount
COMMON EXCAVATION	CY	\$ 20.00	62900	\$ 1,258,000.00
AGGREGATE SUBBASE COURSE - GRAVEL	CY	\$ 30.00	57900	\$ 1,737,000.00
HOT MIX ASPHALT	T	\$ 100.00	24500	\$ 2,450,000.00
CATCH BASIN TYPE A1-P	EA	\$ 3,800.00	95	\$ 361,000.00
12" UNDERDRAIN TYPE C	LF	\$ 50.00	28200	\$ 1,410,000.00
BRICK SIDEWALK	SY	\$ 80.00	23700	\$ 1,896,000.00
VERTICAL CURB TYPE 1	LF	\$ 35.00	21400	\$ 749,000.00
CURB TYPE 5	LF	\$ 30.00	6800	\$ 204,000.00
LANDSCAPE CURB - 4" REVEAL	LF	\$ 30.00	12720	\$ 381,600.00
LOAM	CY	\$ 50.00	3180	\$ 159,000.00
STRUCTURAL SOIL	CY	\$ 60.00	9010	\$ 540,600.00
STREET TREES	EA	\$ 1,000.00	265	\$ 265,000.00
BACK OF SIDEWALK TREES	LS	\$ 1,000.00	39	\$ 39,000.00
MEADOW/BIOFILTRATION PLANTINGS	SY	\$ 2.00	6655	\$ 13,310.00
SEEDDED LAWN	SF	\$ 0.40	15105	\$ 6,042.00
SITE FURNSHINGS	LS	\$ 150,000.00	1	\$ 150,000.00
HIGHWAY LIGHTING	LS	\$ 1,000,000.00	1	\$ 1,000,000.00
TRAFFIC SIGNALS	EA	\$ 150,000.00	8	\$ 1,200,000.00
TYPE 'A' BUS STOP (CONGRESS STREET)	EA	\$ 37,500.00	2	\$ 75,000.00
TYPE 'B' BUS STOP (FRANKLIN SHUTTLE)	EA	\$ 22,500.00	10	\$ 225,000.00
PARK & RIDE LOT BUS STOP	EA	\$ 62,500.00	1	\$ 62,500.00
30-FOOT TRANSIT BUS	EA	\$ 325,000.00	1	\$ 325,000.00

CONSTRUCTION COSTS	\$ 14,507,052.00
MOBILIZATION (10%)	\$ 1,450,705.20
MAINTENANCE OF TRAFFIC (10%)	\$ 1,450,705.20
CONTINGENCY (25%)	\$ 3,626,763.00
TOTAL CONSTRUCTION COSTS	\$ 21,035,300.00
PRELIMINARY ENGINEERING (10%)	\$ 2,103,530.00
RIGHT OF WAY COSTS	\$ 1,092,000.00
CONSTRUCTION ENGINEERING (10%)	\$ 2,103,530.00
<b>TOTAL PROJECT COSTS</b>	<b>\$ 26,334,360</b>









7

7. Appendix







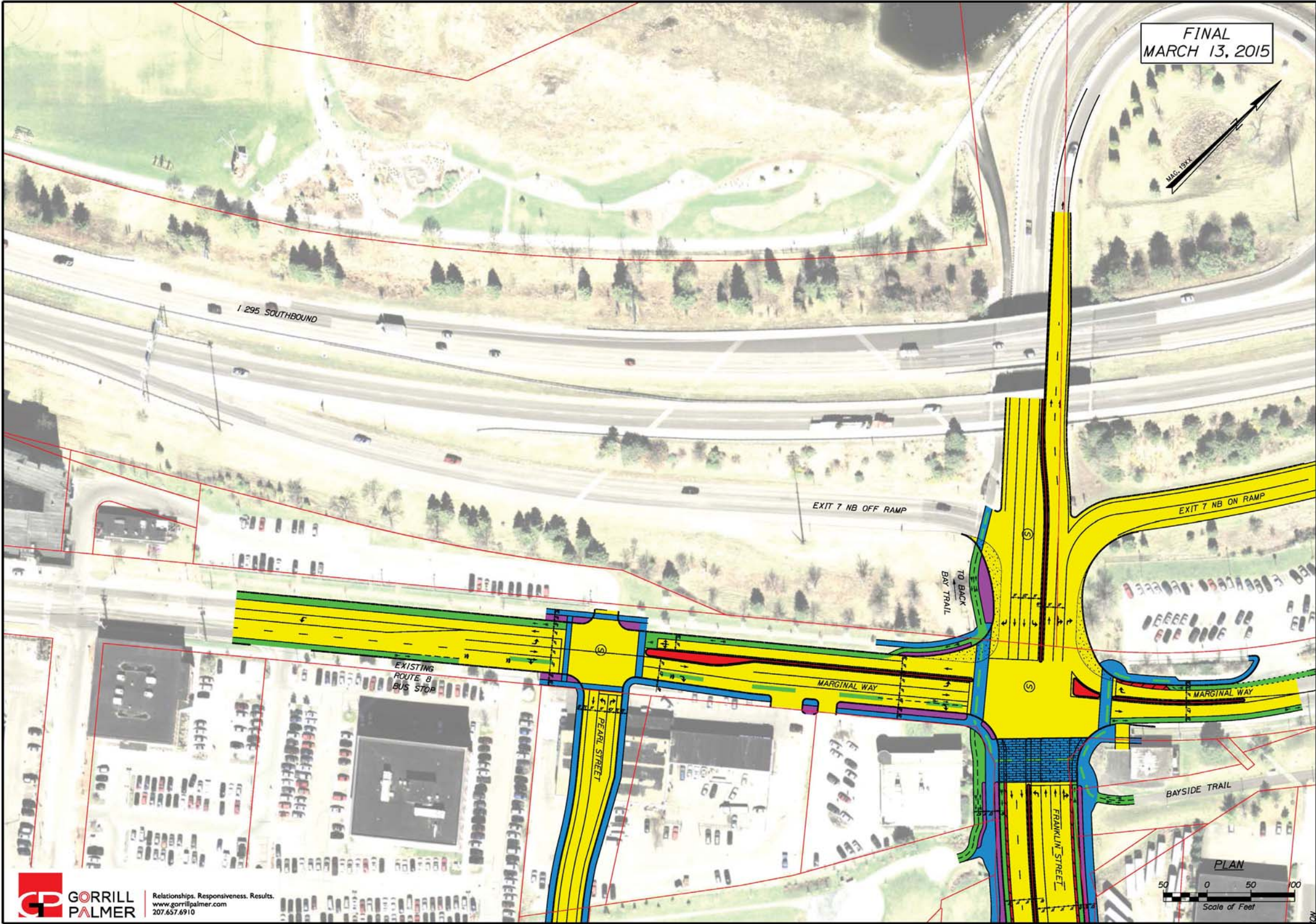


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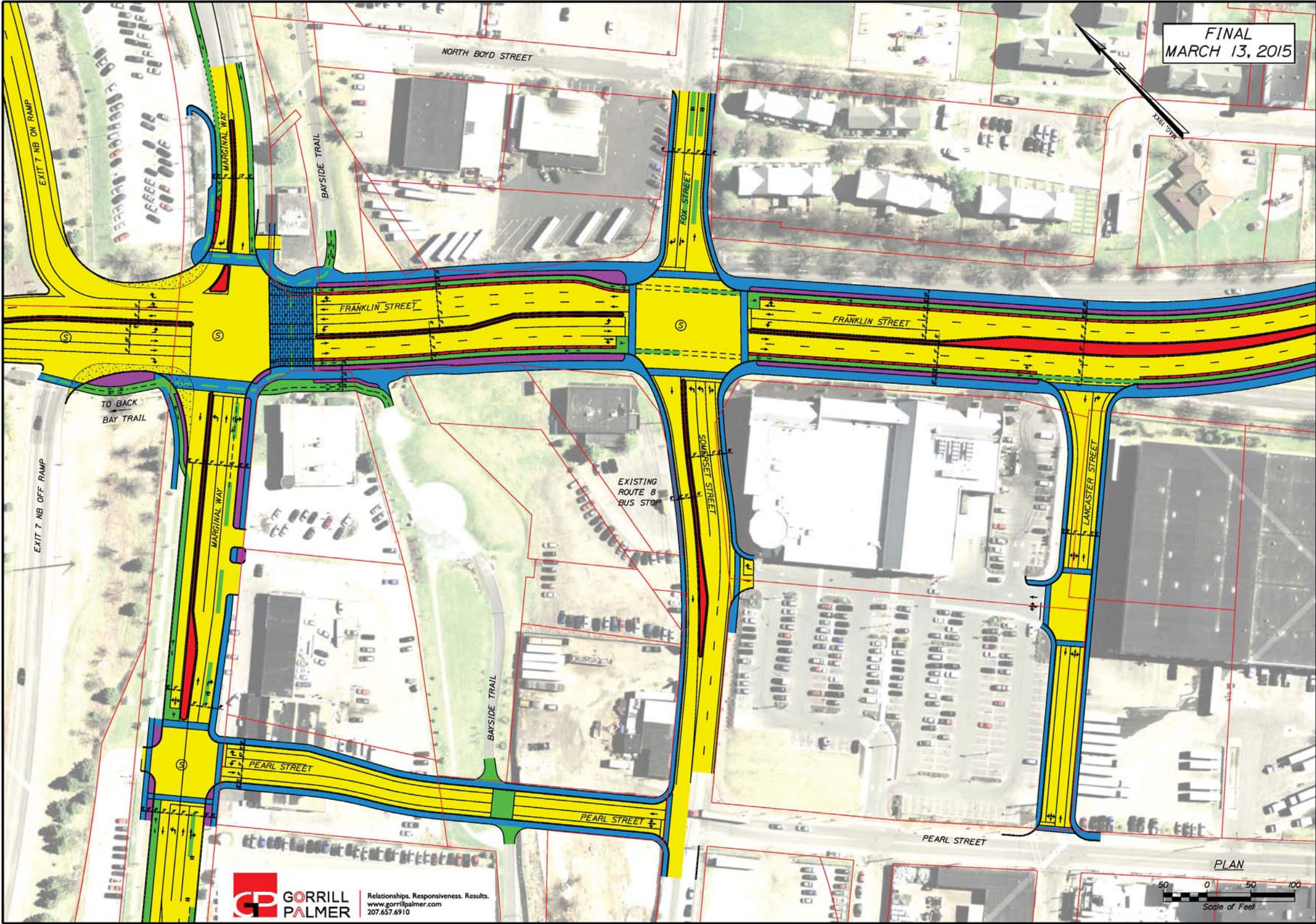








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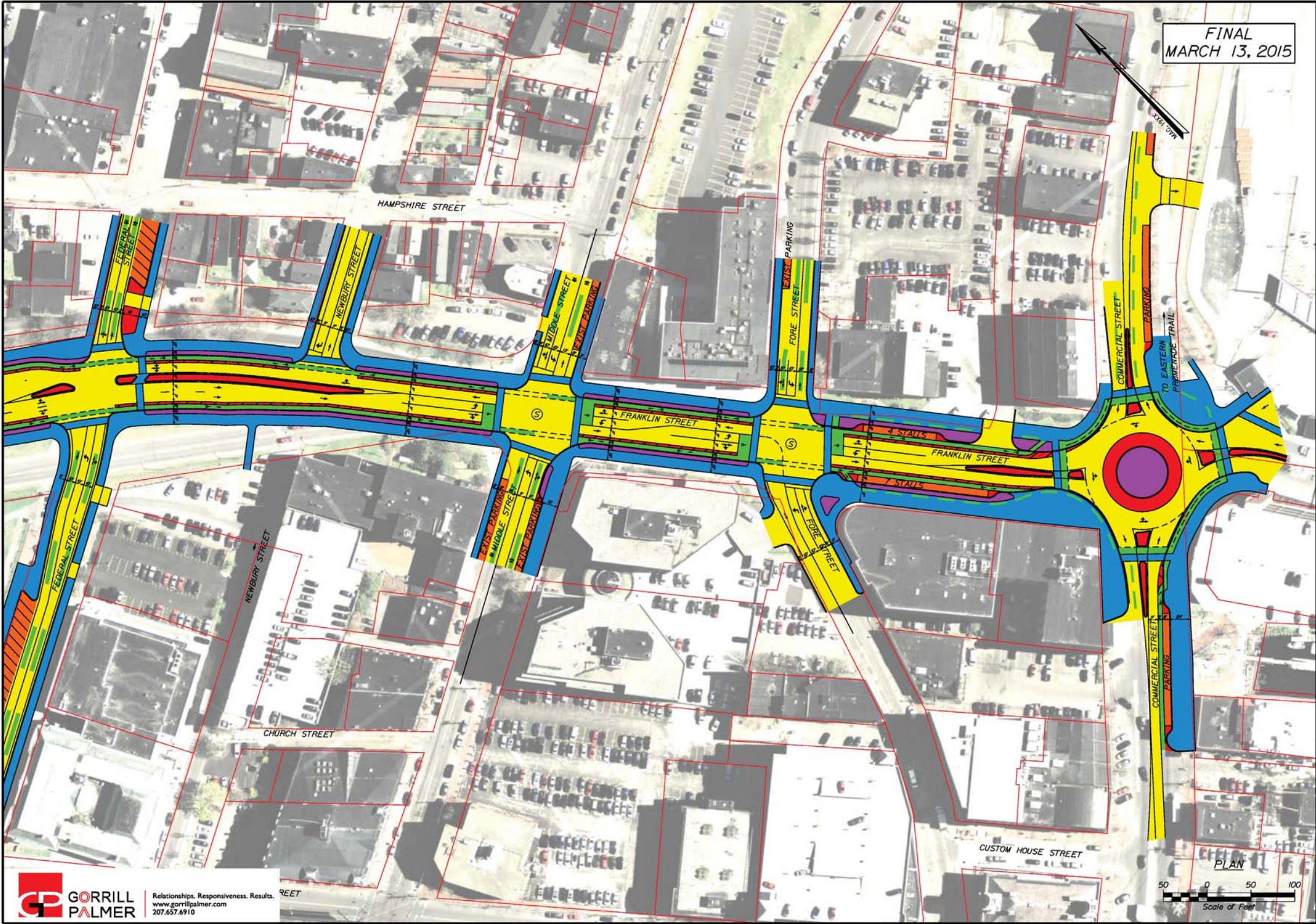








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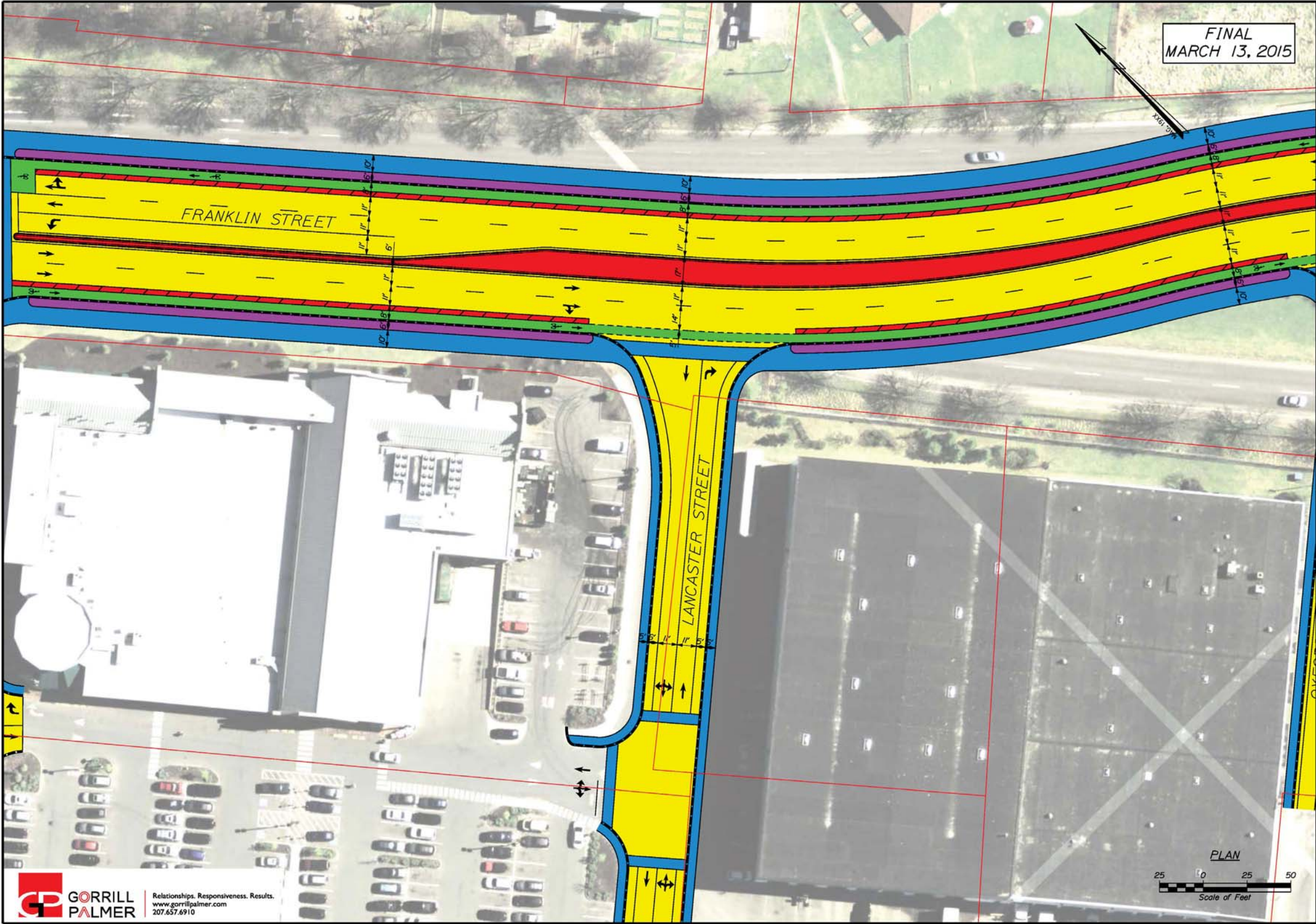








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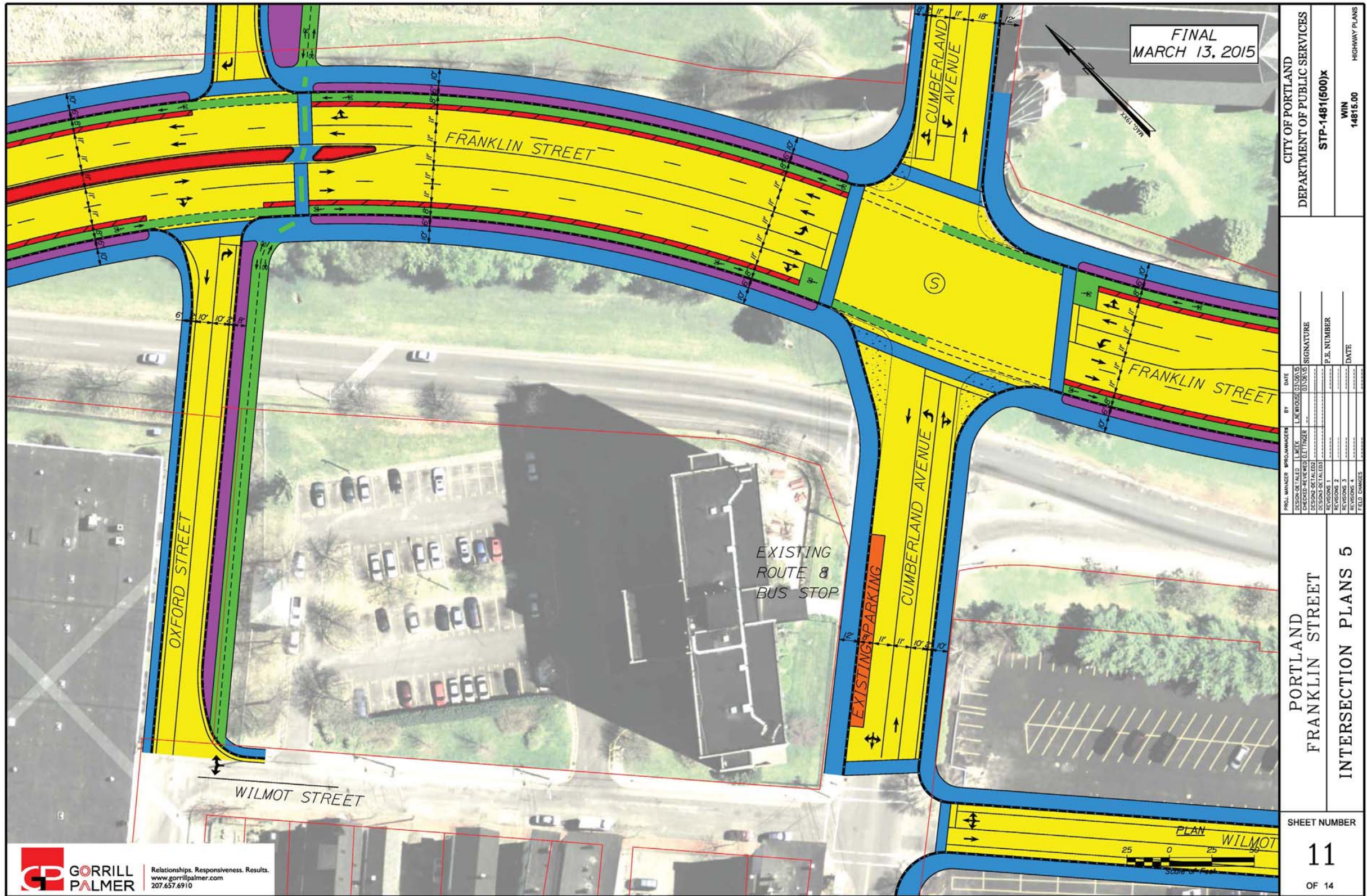
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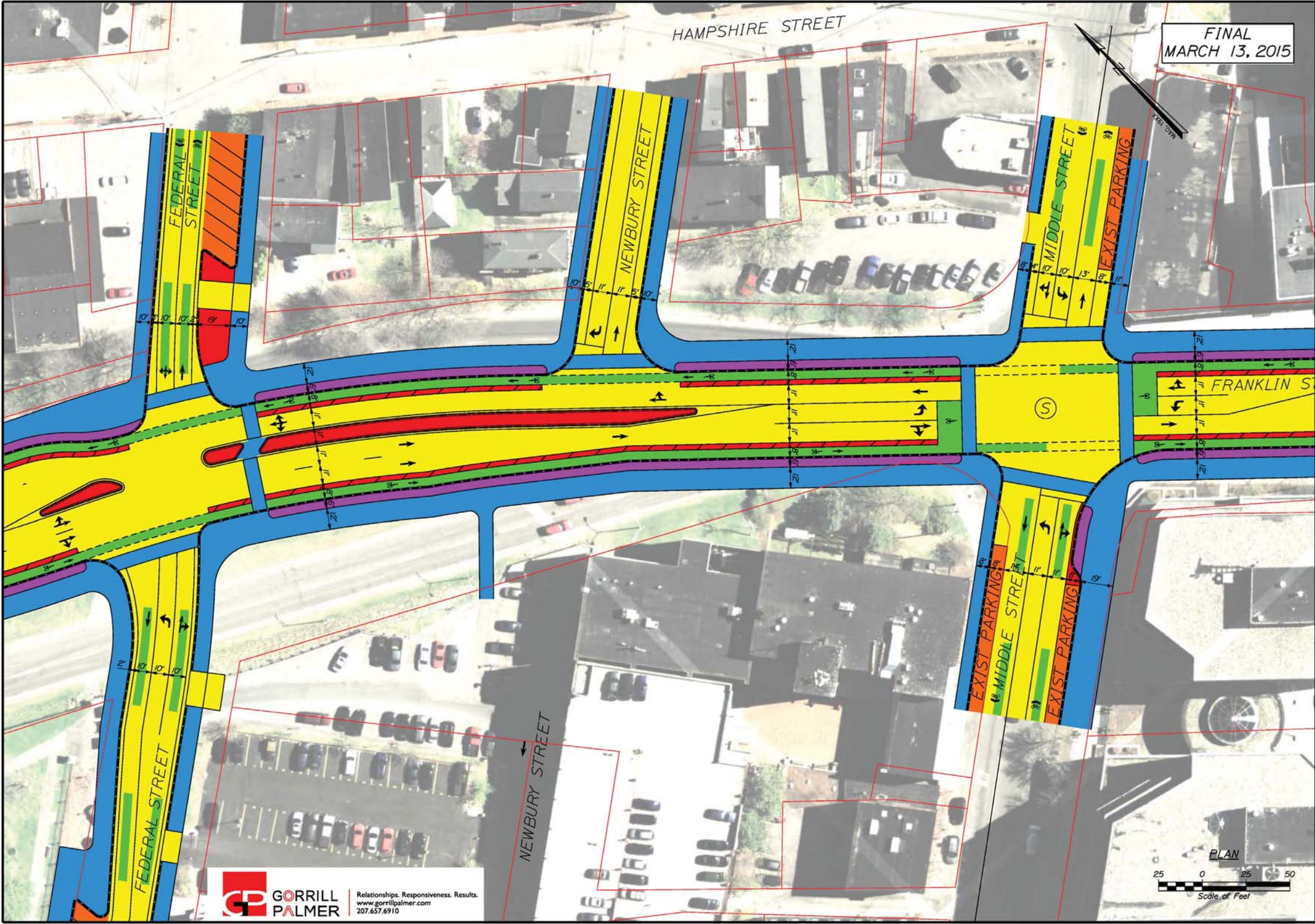
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INTERSECTION PLANS 7		HIGHWAY PLANS	
SHEET NUMBER		13	
		OF 14	

PROJ. MANAGER	DESIGNED	BY	DATE
LAURENCE GUNDS	LAURENCE GUNDS	LAURENCE GUNDS	3/13/2015
DESIGNED	LAURENCE GUNDS	SIGNATURE	
DESIGNED	LAURENCE GUNDS	P.E. NUMBER	
REVISIONS 1		DATE	
REVISIONS 2			
REVISIONS 3			
FIELD CHANGES			











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IBI Group is a multi-disciplinary organization  
offering services in four areas of practice:  
Urban Land | Facilities | Transportation | Intelligent Systems

We provide services from offices located strategically across  
Canada, the United States, Europe, the Middle East, India and China.

