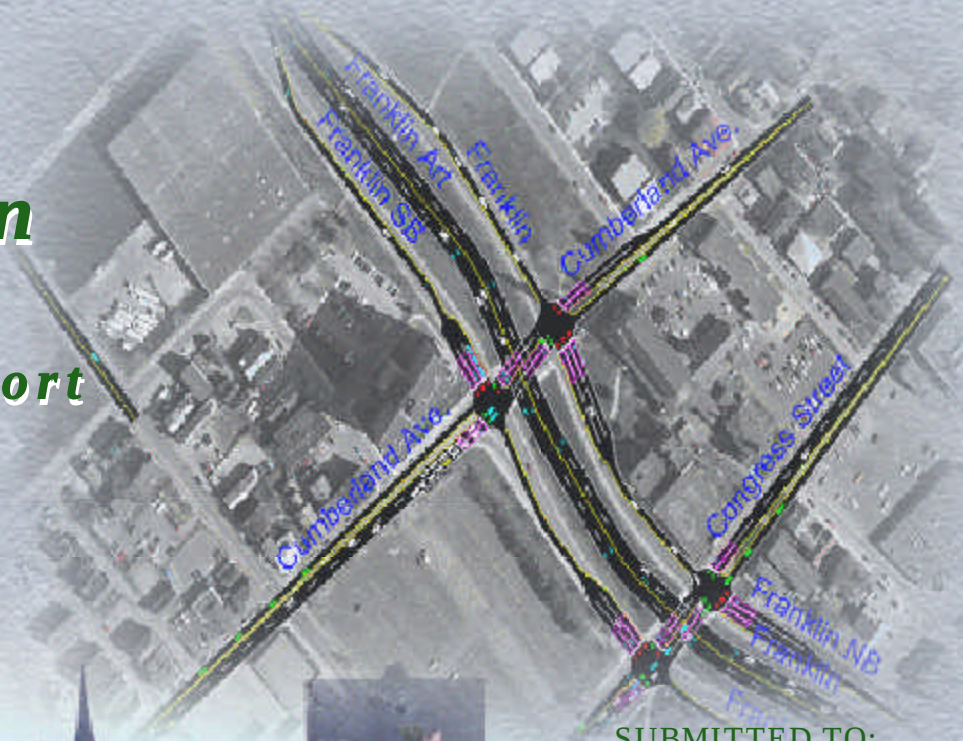
Portland Peninsula Traffic Plan

Draft Final Report



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SUBMITTAL DATE:

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SUBMITTED BY:

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Preface

The following study is the first comprehensive traffic evaluation of the Portland peninsula in over thirty years. Previous large-scale traffic projects in Portland have left a mixed legacy of increased traffic capacity with a corresponding decrease in pedestrian amenities and neighborhood quality of life. Indeed, when one looks at the division and demolition of Libbytown for Route 295, the destruction of the Franklin Street and lower Spring Street neighborhoods for arterial construction, and the introduction of high speed traffic in the historic Deering Oaks, Portland has historically paid a high price for improved traffic mobility.

While the price has been high, there have also been benefits. Portland remains a vibrant urban center serving the Northern New England region as a cultural, economic, educational and transportation center. All of these attributes require a roadway system that adequately and safely serves the traveling public.

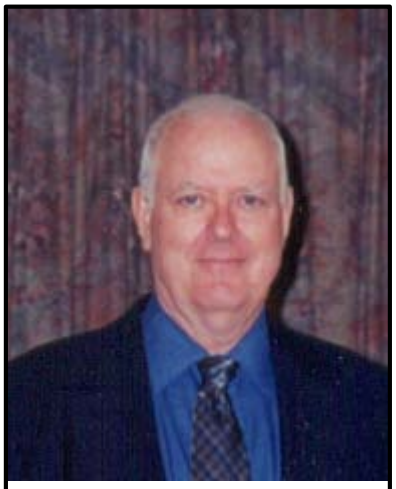
The charge of the Peninsula Traffic Study Committee has been to look toward the next twenty-five years of development on the Portland peninsula and to recommend a roadway master plan that best serves the range of City objectives (see Chapter 2 of the following report). Comprised of primarily neighborhood and business leaders, the Committee, along with the consultant team and City staff, has attempted to achieve the goals of the study in the face of competing, at times conflicting objectives. The objectives of reducing traffic congestion need to be balanced with the need to retain and improve pedestrian and bicycle opportunities. Likewise, the objectives of reducing impacts of traffic on neighborhoods and parks need to be balanced by the recognition that the peninsula needs to accommodate a significant amount of vehicles to ensure Portland's place as a destination community and economic center. The Committee has strived to strike an appropriate balance while working through a complicated body of technical and policy material.

The Committee wishes to convey two important points at the onset of this report. First, that this plan, as an outgrowth of a traffic study, is not a comprehensive transportation plan for the Peninsula. This report outlines a plan and recommendations for roadways and vehicle movement and should not be considered separately from broader transportation documents serving the City of Portland and the region. Importantly, the Committee feels that the anticipated and currently funded *Alternative Transportation Study* will be a critical complement to this traffic study for creating transportation policy for the City over the next twenty-five years.

Secondly, this plan, which concentrates on physical roadway improvements, should be accompanied and coordinated with amendments to other City policies and regulations. For example, the current City Site Plan Ordinance restricts development that reduces "*level of service below Level "D"* as described by national traffic engineering standards. Given that some degree of congestion is predictable in the urban environment of Portland's peninsula, this Committee recommends a reevaluation of this type of criteria to allow flexibility and creative response to downtown traffic conditions. In fact, the State's MDOT Traffic Permit *Criteria for Urban Environments* provides the City with a model worthy of consideration. The Committee hopes that this study and report will provide a basis for looking at alternatives to "*level of Service*" criteria at both the local regulatory level and at the regional funding level.

The Committee forwards the following report with the understanding that not all of the recommendations will be universally popular and that compromise underlies the reasoning and decision-making behind the plan. As Portland has experienced in the previous thirty years, traffic planning is fraught with challenges and opportunities. In this environment, compromise is a laudable tool and provides the balance that will guide the City for the next twenty-five years of growth.

Dedication



Larry Ash, City of Portland Traffic Engineer, 1996-2003.

During the course of completing this study, we lost a valuable member of the 'Team,' Larry Ash. Larry's efforts were key to initiating the study at both the City and PACTS level. This document was made possible by Larry's understanding of the many issues related to transportation that are particular to Portland. His common sense, straight-forward style and innovative thinking guided the process to near completion. His personal approach was never more apparent than during discussions of the Deering Oaks area, where he worked with the Committee to balance numerous complex issues, and surprised and pleased many with his non-traditional traffic engineering approach.

While the Committee and consultants have completed their final work without him, there has been a void in this effort, and the full comprehension of how much he meant to all of us has set in. He will be sorely missed.

Executive Summary

The Past

A generation ago, the City of Portland retained Victor Gruen, a Boston-based consultant, to aid the City in drafting a long-term traffic plan for the City. In the early 1970's, Portland was losing much of its vitality to the suburbs, with signigicant office, retail, and residential development taking place in such places as South Portland, Scarborough, and Falmouth, among others. The result of the consultant's efforts was *Patterns for Progress*, a document that visioned a city far more accessible to the automobile than the city that existed. It provided schematics for a city with an Insterstate highway (I-295), a major divided arterial crossing the Peninsula itself (Franklin Street Arterial), and numerous other concessions to a more mobile society.

This plan resulted in significant changes to vehicular access and the face of this City itself. Simultaneously beneficial and destructive, the additional roadways have served the Portland Peninsula for the past generation.

The Present

The Portland Area Comprehensive Transportation Committee (PACTS) commisioned a new Peninsula Traffic Plan in 2000 to define the City's transportation needs for the next generation. With significant proposed development and anticipated traffic increases throughout the Peninsula, it had become apparent that the current Plan had reached the end of its ability to serve the City's transportation needs. It was important that the study built on an earlier transportation plan for the City completed in 1990.

Therefore, the Consulting Team of Gorrill-Palmer Consulting Engineers, Inc. Wilbur Smith Associates, and Kevin Hooper Associates were selected to provide technical insight and assist in guiding the plan creation process. At the same time, the Portland Traffic Plan Committee was formed to define the City's need and desires for the next generation of the Peninsula.

The desired result is to create a document detailing the goals of a Transportation Plan for the next 25 years, which will be utilized as a guide for future transportation improvements, as well as City policy.

Guiding Principles and Objectives

Key to the Committee's work on the Plan was the development of the Guiding Principles and Objectives. The Principles allowed the Committee several statements on the nature of transportation planning for improvements on the Peninsula, while the Objectives served to provide goals to strive for.

The *Guiding Principles* include the following items:

- Development should be mixed-use in nature, and should serve the needs of the Peninsula's residents.
- Change the City's Ordinance so that level of service (LOS) criteria are not neccesarily the driving force behind roadway improvements.
- When roadway changes are made, equal attention should be given to infrastructure in support of pedestrian safety and mobility.
- Traffic planning should fully respect end encourage pedestrian, bicycle, transit and other modes of transportation.
- Traffic flows should be routed where they will have the least impact on sensitive areas such as neighborhoods and open spaces.
- Traffic plans should route future flows to gateway entrances to the Peninsula, complete with attactive and safe entry treatments.
- Traffic management techniques should be employed to avoid congestion and minimize the physical affects of increased roadway infrastructure and loss of valuable land.
- Adopt appropriate land use changes on streets chosen as high-volume preferred routes.

The *Objectives* include the following items:

- Maintain efficient traffic flow, acceptable levels of service, and minimize air pollution.
- Minimize impacts on and traffic through residential neighborhoods.
- Serve Downtown, Bayside, Amtrak train station, Ocean Gateway and other on-Peninsula transportation and economic development projects that are traffic generators and employment centers.
- Reduce the presence of highway corridors through Deering Oaks and restore State Street as a park entrance from Park Avenue.
- Facilitate access to designated destinations by appropriate signage.
- Address the I-295 corridor and interchanges, future volumes, and safety issues in a manner consistent with the Bayside Master Plan.
- Address capacity issues along arterials.

Land Use Policy

The transportation plan recommends that the City should continue to encourage opportunities for the development of additional residential units within the Peninsula. The City has addressed these issues through the adoption of land use and housing policies that encourage opportunities for the development of additional residential units throughout the City. As additional residential units are developed on the Peninsula, it will become increasingly important that the City address transit issues for Peninsula residents. Such development, close to the workplace, can be more readily served by transit than more dispersed development, thereby reducing the transportation infrastructure which would otherwise be required for traffic commuting to the Peninsula.

Parking Policy

To promote types of travel other than automobile, and to recognize that land is limited on the Peninsula, the Committee recommends the following:

- Adoption of a parking impact fee for new development.
- Develop remote parking areas away from the Peninsula.
- Promote ridesharing programs.
- Institute fee structure changes to favor short-term parking.
- Develop a shared parking supply on the Peninsula that recognizes the importance of offset demand of parking between office, residential, and recreational uses.

Transit Study

A strong recommendation of this plan is to complete a comprehensive transit study. Such a study would determine what changes should be made to the current system to increase ridership to adequately serve remote parking lots, neighborhoods, and adjacent communities to the Peninsula to the extent that transit usage will significantly reduce future traffic congestion. The potential reduction in future traffic congestion due to transit should be taken into account when considering infrastructure improvements. The recommended study should retain a recognized expert specializing in the development of realistic integrated systems with demonstrated ridership. This is a key component in a transportation plan for the Peninsula since reduced congestion cannot be achieved without an optimal mix of safe, convenient, reliable alternatives.

Eastern Waterfront and Ocean Gateway

The Eastern Waterfront includes the portion of the Peninsula east of India Street and south of Fore Street currently occupied primary by former warehouses and parking. The Master Plan for the redevelopment of this area, which comprises the Ocean Gateway project as well as redevelopment of upland areas from the water will have a significant effect on the face of the Peninsula from Portland Harbor. In addition, it has ramifications for traffic volumes and patterns in this part of the Peninsula. Based on an examination of future volumes, the Plan recommends the following long-term improvements to the Peninsula's transportation network:

- *Franklin Street Arterial*: Provide additional turn lanes from Franklin onto Middle Street.
- *Commercial Street*: Extend Commercial Street past Mountfort Street. Restripe Commercial Street to have a two-way left turn lane from Center Street to the Casco Bay Bridge.
- *Hancock Street*: Extend Hancock Street to Commercial Street.
- *Mountfort Street*: Extend Mountfort Street to Commercial Street.
- *India Street*: Install signals at Fore Street and Middle Street. Provide turn lanes for India southbound at Fore Street and India at Commercial Street.

Pedestrian improvements include the following items:

- That the signal at the intersection of Commercial Street and Franklin Street Arterial be phased to accommodate pedestrian movements with safe and ample crossing opportunities.
- The exclusive right turn lane from the Franklin Street Arterial onto Commercial Street has been removed by the City to facilitate pedestrian crossings.
- The Ocean Gateway project should be designed with a pedestrian connection to the Eastern Promenade Trail.
- The proposed extensions of Commercial Street, Mountfort Street and Hancock Street should include sidewalks on both sides.

Wayfinding improvements include the following items:

- All vehicles routed from I-295 north will be signed to the Franklin Street Arterial interchange. Vehicles would be directed to Commercial Street via Franklin Street Arterial.
- All vehicles routed from I-295 south will also be signed to the Franklin Street Arterial interchange.
- Local vehicles originating from inner Washington Avenue will be routed to Congress Street and India Street. Special signing should be considered that discourages use of Mountfort Street (e.g. “Residential Traffic Only”).
- All vehicles originating from the Casco Bay Bridge will be routed to Commercial Street.
- Vehicles originating from Forest Avenue, Congress Street and Washington Avenue outside of I-295 will be routed to I-295 and the Franklin Street Arterial interchange.
- Installation of a Highway Advisory Radio System with appropriate informational signage to guide the motorist to the Eastern Waterfront and Ocean Gateway.

The Redevelopment of Bayside

Long considered a blighted area, with scrapyards facing I-295 as motorists approach the City, Bayside is beginning the experience a rebirth with the construction of new offices, retail, and housing. A significant portion of the Peninsula, Bayside comprises the northern portion of the Peninsula bound by Forest Avenue, Marginal Way, Cumberland Avenue, and Washington Avenue. Long-term plans call for the construction of hundreds of thousands of square feet of office space, retail space, hotel rooms, and residences. Based on forecast volumes, the Plan calls for the improvements shown on the following table:

Recommended Improvements for Bayside Area

Franklin/Somerset/Fox

Somerset Dual lefts onto Franklin

Somerset 50' right turn lane onto Franklin

Fox 400' right turn lane

Separate Left, Right and Thru lanes on Fox

Franklin outbound & inbound 200' right turn lane

Franklin 275' Left turn pocket onto Somerset

Franklin Dual left turn lanes onto Fox

Franklin/Marginal

Franklin outbound 100' right turn lane

Franklin outbound addition of a third through lane

Franklin inbound addition of a third through lane

Dual left turn lanes for outbound Franklin to turn onto Marginal

Marginal Eastbound dual left turn lanes onto I-295

Marginal 250' Eastbound right turn lane onto Franklin

Relocate Marginal Way (east leg of intersection)

Intersection of Forest/State

Addition of a westbound 50' left turn pocket

Marginal/Chestnut

Traffic Signal/turn pockets

Intersection of Franklin/I-295

Signalize NB Off Ramp Intersection

Additional lane on NB Off Ramp for right turning traffic

Additional lane on SB Off Ramp (full length of ramp)

Three lanes inbound from Marginal extend 500 feet up the SB off ramp

Franklin Street

Addition of a third lane outbound and inbound from Congress to I-295

High Street

Addition of a third outbound lane

Forest

Addition of a third lane between Park and Marginal

Intersection of Forest/High

Relocate State Street to High Street

Addition of Somerset Street Extension to the intersection

Intersection of Forest/Marginal

Allow left turn from inbound Forest onto Marginal

Relocate State Street to High Street

Closure of Kennebec Street leg of the intersection

Intersection of Forest/I-295 NB Ramps

Signalize Intersection

Additional lane on NB Off Ramp for right turning traffic

Chestnut Street

Extend to Marginal Way

Turn pockets at Chestnut/Marginal & Chestnut/Somerset

Somerset/Elm

Turn pockets

Construction of Somerset Street Extension to Forest Avenue

Deering Oaks and State & High Streets

Deering Oaks is the keystone in a city-wide network of parks, public spaces, and trails. The Oaks help beautify the City, provide important recreational areas for residents and tourists, and serve as a counterpoise to adjacent commercial and densely-populated residential districts.

In recent decades, Deering Oaks has been affected by significant roadway projects such as the construction of I-295 as well as the extentions of State and High Streets. As a result, the historic rose garden was cut off from the park, and large volumes of traffic routes by the duck pond.

The traffic Plan recommends that the following changes be implemented to restore the Park as well as accommodate long-term traffic patterns in the Peninsula:

- *The State and High Street extensions* are to be combined into a single boulevard through the Park.
- *The Rose Garden* is to be reconnected to the main portion of the Park.
- *The original Park entrance on Park Avenue* is to be restored to provide controlled, dead-end pedestrian and vehicular access and parking.
- *The restoration of two-way traffic* on State and High Streets between Park Avenue and York Street.
- *Creation of a new road* combining Forest Avenue and High Street between Park Avenue and Kennebec Street.
- *Creation of a Deering Oaks Entrance* at the Forest Avenue/Somerset Street Extension intersection.
- *Prohibiting left-turn movements* on westbound Park Avenue at High Street.
- *Prohibiting left-turn movements* on northbound High Street at Park Avenue.
- *Restricting movements* at the Park Avenue/Forest Avenue intersection.

It is important to realize that these changes to State and High Streets result in the loss of some on-street parking as well as operational efficiency at certain locations. In addition, these changes will have the potential for geometric alterations at major intersections along State and High Streets. However, the potential benefits, in terms of vehicular speed and accessibility improvements offset these losses.

It should also be noted that the changes to State and High Street assume that the I-295 Connector Road is operational. This roadway, to be complete within a few years, will provide direct access from I-295 to the western waterfront as well as the Casco Bay Bridge. The expectation is for reductions in traffic volumes along State and High Streets as a result.

Wayfinding

Wayfinding is the use of either fixed or variable message signage to direct motorists to destinations via preferred routes. In a downtown area such as the Peninsula with residential areas in close proximity to office, retail, and recreational areas, wayfinding can be an effective tool in directing motorists away from sensitive areas. What follows is a summary of wayfinding recommendations:

I-295 wayfinding improvements include the following items:

- Install a "variable message" sign north of Tukey's Bridge that will inform motorists of possible congestion in the Franklin Street Arterial/Forest Avenue area with directions for alternative routes via the Anderson Street ramp.
- Install a "variable message" sign south of Exit 4 (Veteran's Bridge) that will inform motorists of possible congestion in the Franklin Street Arterial/Forest Avenue area with directions to Veteran's Bridge or Congress Street.
- Direct motorists originating from the north, destined to the Casco Bay Bridge, to utilize Exit 5A and the I-295 Connector and Commercial Street.
- Direct motorists originating from I-295 (north and south) destined to the International Ferry (Ocean Gateway) to Exit 7 Franklin Street Arterial.
- Provide signage directing motorists from I-295 south to the Casco Bay Bridge to Exit 4 Veteran's Bridge.
- Exits signs on I-295 should be supplemented with directions to Downtown Portland. For example at Forest Avenue a supplemental message indicating "Downtown Portland" would be added to Exit 6A.

Future Bayside wayfinding improvements include the following items:

- All vehicles routed from I-295 north (with destinations to Bayside east of Franklin Street Arterial) will be signed to the Washington Avenue interchange. Vehicles would be directed to the Anderson Street ramp.
- All vehicles routed from I-295 north (with destinations to Bayside west of Franklin Street Arterial) will be signed to the Franklin Street Arterial interchange. Vehicles would be directed to Marginal Way or Somerset Street.
- All vehicles routed from I-295 south (with Destinations to Bayside west of Preble Street) will be signed to the Forest Avenue Interchange. Vehicles would be directed to either Marginal Way or the proposed Somerset Street Extension.
- All vehicles routed from I-295 south (with Destinations to Bayside east of Preble Street) will be signed to the Franklin Street Arterial Interchange. Vehicles would be directed to either Marginal Way or Somerset Street.
- All vehicles originating from the Casco Bay Bridge will be routed to Commercial Street, the I-295 Connector, and I-295.
- All vehicles originating from Park Avenue will be routed to High Street and to the Somerset Street Extension or Marginal Way.
- Vehicles originating from Forest Avenue will be routed to the Somerset Street Extension or Marginal Way.
- Variable message signs should be installed on I-295 to re-route vehicles destined to Bayside to alternative interchanges when warranted. An example includes times when severe congestion exists on Franklin Street Arterial due to rail crossings. In this case vehicles would be routed to Washington Avenue from the North.

Eastern Waterfront wayfinding improvements include the following items:

- All vehicles routed from I-295 will be signed to the Franklin Street Arterial interchange. Vehicles would be directed to Commercial Street via Franklin Street Arterial.
- Local vehicles originating from inner Washington Avenue will be routed to Congress Street and India Street. Special signing should be considered that discourages use of Mountfort Street (e.g. "Residential Traffic Only").
- All vehicles originating from the Casco Bay Bridge will be routed to Commercial Street.
- Vehicles originating from Forest Avenue, Congress Street and Washington Avenue outside of I-295 will be routed to I-295 and the Franklin Street Arterial interchange.
- Installation of a Highway Advisory Radio System with appropriate signage to guide motorists to the Eastern Waterfront.

General wayfinding improvements include the following principles:

- Gateway or entry signs, along major arterial routes into the downtown Portland area.
- Parking signs, keeping with the established character of the wayfinding program, to guide, identify and direct to convenient places for tourists/residents to leave their vehicles.
- Pedestrian oriented kiosks (you are here maps), at strategic points throughout the downtown area, that provide information regarding orientation to, locations of, and information about attractions.
- Pedestrian directional signs to assist with the directions to attractions noted on the kiosks.

In general, the planning process for wayfinding should result in designs that are consistent, easy to read, and allow for dynamic allocation of traffic during peak periods, special events, or other changes such as the proposed AMTRAK service to access the Peninsula. Specific recommendations for area roadways can be found in Chapter 9.

Costs

An important component of any traffic plan is to have an understanding of the costs associated with the plan's improvements. As part of this plan, preliminary opinion of probable construction cost have been prepared for those improvements requiring immediate action, implementation within five years (short-term) and those projects to be completed by the end of the plan's forecast period (long-term.) The total costs for each plan are summarized below:

Immediate:	**$415,000.00**
Short Term:	**$13,499,000.00**
Long Term:	**$37,000,000.00**

It will be important to establish funding mechanisms for these improvements, which are expected to be a mixture of local, state, and federal funding as well as private-sector funding to offset impacts from future developments. In addition, the City may wish to develop and administer an impact fee system for to defray traffic, transit, and parking improvement costs.

The Future

It is the goal of the Committee that this documentation of the Peninsula Traffic Plan be utilized as a guide for downtown Portland as it seeks to accommodate future development. It is the hope of the both the Committee and the consultants, that, when combined with other regional traffic and transportation plans will allow for the long-term ability of the Peninsula to serve residents, employees, and visitors in a safe, effective, manner that continutes to capitalize on Portland's vitality as an economic center for northern New England.

Chapter 1
Introduction

Project Introduction

The City of Portland and the Portland Area Comprehensive Transportation Committee (PACTS) undertook this study to develop a comprehensive approach to address current and future traffic issues and related infrastructure needs throughout the Portland Peninsula. As the City and region face the consequences of sprawl, and opportunities such as Bayside redevelopment, Ocean Gateway, and passenger rail emerge, the importance of integrating this plan into the Peninsula development strategy has taken on increasing importance. The team of Gorrill-Palmer Consulting Engineers Inc., Wilbur Smith Associates, and Kevin Hooper Associates have worked with the Peninsula Traffic Study Committee to develop this 20-year master plan incorporating phased strategies for meeting the traffic demand from these emerging redevelopment opportunities. The plan has been guided by numerous goals and objectives identified by the Advisory Committee and incorporates numerous public comments suggested throughout the process.

History of Study Area

Local Infrastructure

As recently as the 1950's, Portland's transportation infrastructure functioned very differently then it does now. The major route into the City for vehicular traffic was via Route 1 and local State Routes; the closest "modern" highway was the Maine Turnpike, which provided no direct highway links to the downtown Peninsula. Passenger rail, although in rapid decline, was still available to commuters and other travelers. Air service, although available, was quite limited.

In the early 1960's, passenger rail service had been discontinued throughout Maine, and Union Station on Saint John Street was viewed as an aging relic of a bygone era. A Boston-based developer purchased the land, demolished the station, and constructed a modern strip mall in its place. This began a period of change for the City's transportation network.

During this same period, planners devised plans for encouraging vehicular flow through the downtown Peninsula. The narrow streets of a Victorian city built over a Colonial framework were viewed as restrictive and obsolete. Spring Street and Franklin Street Arterial were constructed to accommodate the desire for greater volumes of traffic, and High and State Streets converted to a one-way pair. However, the creation of Spring and Franklin resulted in the destruction of so many structures that public outcry prevented the Spring Street project from being completed.

I-295

In 1974, Interstate 295 was opened for general use. A two-lane divided highway with controlled access, this roadway allowed people to enter and exit the City without resorting to local roadways. Unlike many highways in Maine, a significant proportion of traffic along

this roadway was local traffic. In particular, the routing of Washington Avenue onto the Interstate at Tukey's Bridge resulted in many people traveling to and from the Peninsula via this route.

The transportation infrastructure of the Portland Peninsula has changed dramatically in the past half century. Future proposals show that this infrastructure will continue to change.

Access into the downtown has and will continue to be an issue for Portland motorists. With multiple interchanges on I-295, several alternatives exist for travelers. But with these options different issues are apparent. At the Washington Avenue interchange, motorists must travel through a dense neighborhood/commercial area where vehicular speeds have been identified as being problematic. The Franklin Street Arterial interchange has long been identified as being both safety and operationally deficient. For motorists originating from the south, back-ups and delays are significant. The Forest Avenue interchange is currently problematic, but there are plans for improving the interchange. The Congress Street interchange is being modified but capacity and safety issues will likely continue, and the Veteran's Bridge connection to Commercial Street experiences severe congestion during both AM and PM peak hours.

Restoration of Deering Oaks

Portland has a long, proud tradition of wisely blending vigorous economic activity with a livable urban fabric. Deering Oaks is the keystone in a city-wide network of parks, public spaces, and trails. The Oaks help beautify the City, provide important recreational areas for residents and tourists, and serve as an "oasis" in a landscape of commercial and densely-populated residential districts.

Sadly, in the middle decades of the last century, Deering Oaks was in decline. To accommodate motor vehicles, large swaths of the park were sacrificed for Interstate 295, and high-speed, one-way extensions of State and High Streets. The historic rose garden was cut off from the park, and large volumes of traffic routed right next to the duck pond – the most popular section of the park. The vehicles thus accommodated traversed the densely populated Parkside and West End neighborhoods, impairing the quality of life in some of the City's oldest neighborhoods, and impeding pedestrian and local automobile traffic.

In the 1990's, the City drew up a master plan for the Oaks, and a committed group of volunteers – Friends of Deering Oaks – made good progress toward implementing it. Today, pending changes in the City's transportation infrastructure provide an opportunity to ameliorate the drastic impacts of cut-through roads filled with high-speed and high-volume traffic.

The Peninsula Traffic Study Committee recommends that the High and State Street extensions be unified in a single, broad avenue through the park; that the rose garden be reunited with the Oaks; and that the original entrance on Park Avenue – at the foot of State Street – be restored to provide controlled, dead-end pedestrian and vehicular access and parking. The Committee further recommends that two-way traffic be restored to both State and High Streets, for the critical purposes of reducing high–speed and cut-through traffic, renewing and preserving the residential and commercial areas currently isolated by these streets, and broadening the alternative routes available to drivers whose destination is Portland itself. The Committee recommends that these changes be coordinated with the construction of the I-295 Connector, which is expected to provide quicker and less harmful access for drivers to and from adjacent communities from I-295.

Future Development

Future development will place additional pressures on the transportation system. How will Ocean Gateway, Bayside, Amtrak, etc. affect traffic? It will be critically important to closely coordinate with each of these projects and others as well.

What implications do recommendations of this study have on already programmed and approved projects? The City of Portland has approved and programmed improvements at Longfellow Square (Through the Downtown Traffic and Streetscape Study). If State Street and High Street are converted to two-way streets, should the Streetscape improvements be postponed or modified? Coordination between programmed projects and study recommendations need to be considered.

Proposed Initiatives

As the largest city north of Boston along the Interstate 95 corridor, Portland is a significant financial, technical, and cultural center for Maine and northern New England. In addition, the Port of Portland serves many needs, including fishing and related industries, oil, standard freight, and the cruise ship industry. Portland is often mentioned in national travel guides as an excellent city for tourists, and many of its neighborhoods in the downtown Peninsula have become desirable for the influx of young professionals into the area.

Looking to the 21st century, several projects are on the horizon as well as planning and policy initiatives that may further affect the downtown Peninsula, and its livability and viability as a dense urban core:

Redevelopment of Bayside

Considered one of the last frontiers for urban development in the City, the 110 acres that comprise the Bayside region are seen as an area with much potential. Currently, the majority of this area consists of little more than blighted lots, scrap metal yards, and suburban-style sprawling development along Marginal Way. Given the visibility of this area from Interstate 295, the major corridor through Portland, the current state of Bayside represents an area of underutilization and poor appearance fronting an otherwise vibrant and attractive downtown.

The City has set an ambitious redevelopment agenda for Bayside as described in *A New Vision for Bayside – an urban redevelopment plan*. The Bayside plan outlines the Community's vision for city-building in the area and calls for mixed-use development to infill the underutilized lands between Cumberland Avenue and Marginal Way With the recent development of the natural food store and the Department of Human Services building, the AAA building, and proposals for a new passenger rail station and new retail and housing, the City has begun to make progress in the implementation of the plan. These proposals, as well as the return of federal agencies and offices to the Federal Building at 151 Forest Avenue, show great promise for nothing less then the transformation of Bayside.

Eastern Waterfront

In addition to Bayside, the City's Eastern Waterfront Area also has significant potential for large-scale urban development. Located east of Franklin Street Arterial, the redevelopment of the area is described in the *Redevelopment Master Plan for the Eastern Waterfront* - usually referred to as the *Eastern Waterfront Master Plan*. The Master Plan shows a

proposed international marine passenger terminal (the Ocean Gateway project) and up to 570,000 sq. ft. of potential new mixed use development.

The Ocean Gateway facility, when combined with the existing Casco Bay Island Ferry Terminal provides a consolidated passenger terminal complex estimated to serve up to 1.1 million passengers annually.

It is anticipated that this area will host consolidated passenger service for all of the City's island commuter demands, the Scotia Prince, and the ever-growing cruise ship presence in the area. All freight traffic would be relocated to the ferry terminal near the Casco Bay Bridge. Given this area's proximity to the Old Port and access to Commercial Street and Franklin Street Arterial, projects such as new office space and hotels are either under construction or proposed.

I-295 Connector

The proposed I-295 Connector Road between I-295 and Route 1 is to cross largely undeveloped land adjacent to the Fore River. As part of this project, Veterans' Circle will be completely reconstructed and the new Connector Roadway will provide Veterans' Circle traffic direct access to the I-295/Congress Street interchange. This project will consist of approximately 4,000 feet of new road, three new bridges, new signalized intersections, and a bicycle/pedestrian trail with landscaping.

Potential Developments

In addition to the Bayside and the Eastern Waterfront re-development, there are a number of potential developments which are ongoing including the following:

- 655,000 square feet of office space, 117,000 square feet of retail space, 100 hotel rooms, and 853 dwelling units in Bayside.
- 289,000 square feet of office space, 102,000 square feet of retail space, 220 hotel rooms, and 91 dwelling units in the Eastern Waterfront and Ocean Gateway areas.
- Relocation of Mercy Hospital to the I-295 Connector.
- Re-use of the existing Mercy Hospital space.
- A convention center west of the Old Port.
- An aquarium on Commercial Street. The Gulf of Maine proposal includes a 60,000 sq. ft. research facility on the former Naval Reserve site as a first phase, with plans to build a major exhibition aquarium on the adjacent Coast Guard site. While the zoning for and feasibility of the exhibition aquarium remain in doubt, the potential traffic generated by such a facility was included as a study assumption for the sake of providing a conservative estimate.

Chapter 2
Project Goals

Overarching Guiding Principles and Objectives

It was important to develop a set of guiding principles to serve as a benchmark by which to evaluate the effectiveness and impact of various improvement strategies and policy recommendations from a variety of perspectives. The Advisory Committee reviewed principles which were utilized by for various sub-areas on the Peninsula including Bayside, Deering Oaks, and The Eastern Waterfront as well as those contained in the Request for Proposals issued for this effort. Following this review, the Committee adopted a new set of guiding principles and objectives for this effort which are summarized below:

Guiding Principles

- ***Serve the Residents:*** Portland is home to the largest residential population in the State, including people of all ages, incomes and nationalities, whose well-being as pedestrians should be fully respected in traffic and transportation planning. Mixed-use development, with a substantial residential component that reduces the need for auto trips, should be emphasized.

- ***Mobility and Access:*** Portland is a regional economic center and, as such, traffic mobility, property access and recreational opportunities should be facilitated. Peak hour congestion, in an urban environment, may be acceptable in certain instances, provided that gridlock does not result in a compromise of public safety or degradation in air quality. Levels of service, as commonly defined by traffic engineers, should be balanced against other principles and objectives in evaluating roadway and traffic modifications. Increased capacity to handle peak hour volumes should not compromise the urban environment and the pedestrian experience. Greater emphasis should be placed on managing rather then facilitating traffic. We recommend a level of service (LOS) change in the Ordinance for the Peninsula that allows for a low level of service where roadway improvements are not appropriate.

- ***Pedestrian Infrastructure:*** When roadway changes are made, equal attention should be given to infrastructure in support of pedestrian safety and mobility.

- ***Alternative Modes:*** Traffic planning should fully respect and encourage pedestrian, bicycle, transit and other modes of transportation. Consideration should be given to the appearance, comfort, frequency, cost and benefits of alternative modes of transportation. New concepts should be actively monitored, such as Car Share, implementation of pilot programs to build support, and enhancement of public awareness of transportation alternatives. Given the impact of additional infrastructure, development of a viable public transit system should be a priority.

- ***Minimize Impacts:*** To the extent possible, traffic flows should be directed to routes that can accommodate the volume without undue affect on neighborhoods, open spaces, or pedestrian movement within the city.

- ***Gateways:*** Traffic planning should focus on the preferred gateway entrances to the City, which should be designed to assure attractive entries to the downtown, with minimum impact on neighborhoods.

- ***Effective Land Use:*** Recognizing that as the City continues to grow both its residential and business base on the Peninsula, traffic management techniques should be employed to avoid congestion and minimize the physical affects of increased roadway infrastructure and loss of valuable land. Traffic and parking management should be employed during peak hours in lieu of large-scale infrastructure or permanent access limitations. Additional parking on the Peninsula is needed in the near term to support appropriately dense urban mixed-use development and avoid parking spillover into the neighborhoods. However, stand-alone lots should be avoided in the long-term in favor of garages that fit into the architectural fabric of the community. In the long term, the City should work to make a transition from an auto-oriented infrastructure to promotion of alternative modes with the parking supply serving as a shared resource for joint use by workers, shoppers, residents and other users.

- ***Land Use Policy:*** Adopt appropriate land use changes on streets chosen as high-volume preferred routes.

Objectives

- Maintain efficient traffic flow, acceptable levels of service, and minimize air pollution.

- Minimize impacts on and traffic through residential neighborhoods.

- Serve Downtown, Bayside, Amtrak train station, Ocean Gateway and other on-Peninsula transportation and economic development projects that are traffic generators and employment centers.

- Reduce the presence of highway corridors through Deering Oaks and restore State Street as a park entrance from Park Avenue.

- Facilitate access to designated destinations by appropriate signage.

- Address the I-295 corridor and interchanges, future volumes, and safety issues in a manner consistent with the Bayside Master Plan.

- Address capacity issues along arterials.

Chapter 3
The Traffic Plan In Context

Background

The focus of this effort is development of a 20 year plan to address traffic issues within the Peninsula. While there have been recommendations for public transportation in the past, traditional outcomes of previous plans, such as the last comprehensive traffic plan for the Peninsula completed in the 1960's, resulted in recommendations for new interchanges, new roadways, arterials, additional lanes, etc. While the outcome of this effort will include infrastructure recommendations, the impact of such changes on the quality of life within the Peninsula and on the surrounding environment, as discussed in the previous chapter, is a major factor in determining whether such recommendations are appropriate and justified. New roadways or arterials are no longer viewed as the presumed outcome of these plans. Instead, the traffic plans should seek to maximize and enhance the use of the existing roadway system to the extent possible and not be relied on as the sole component of a transportation plan for the Peninsula.

The relationship of traffic congestion to development, land use policy, parking, and alternative transportation modes has recently emerged as a factor in municipal and State planning of infrastructure improvements. A noteworthy example is the 1993 transportation plan, which has guided transportation policy and municipal standards in Portland for the last decade. Much has been written in recent years documenting the lack of success in building ourselves out of roadway congestions. Infrastructure improvements have been criticized due to their impact on the neighborhood fabric particularly in urban areas, increased sprawl, and the additional capacity has been quickly absorbed leading to additional congestion, noise and air quality issues and fostering auto dependency.

Portland is an emerging small city that has an excellent national reputation for its livability, business and recreational opportunities. This reputation along with the State's initiative to limit sprawl are creating opportunities for Portland to prosper for years to come. However, these opportunities also create a challenge to create a flexible and viable transportation plan for the Peninsula of which the traffic improvement are but one component integrated with a comprehensive parking management plan, transit plan, and a pedestrian and bicycle plan.

PACTS has recently completed and adopted a comprehensive Transportation Plan, called *Destination Tomorrow*, addressing many of these issues. This plan is intended to be consistent with Destination Tomorrow. Again, while the focus of this plan is on traffic improvement and management, we feel it is important to briefly discuss and highlight the relationship of some of these issues to traffic in order to fully understand the context of this plan. Indeed, depending on the success of integrating some of these other elements of the plan, the need for some of the recommendations in this plan such as the widening of the Franklin Street Arterial may be reduced, or even eliminated. Given the detrimental effects of sprawl, it is obviously not a realistic option to limit or curtail development within the Peninsula, but rather to focus on how the potential traffic impacts can be managed.

Land Use Policy

Land use policy has historically been complex and controversial in nature. With the advent of sprawl, municipal, regional and state planners have focused on this subject for the last few decades. The advances in automobiles, the highway transportation system, and family affluence and lifestyles in the second half of the twentieth century, led to increased residential development of the suburbs we commonly identify as sprawl today. This sprawl has led to increased highway and roadway congestion since well over 95% of the workers from these areas commute to work by themselves in the individual automobile. Unless this trend is gradually reversed, we will face congestion on the roadway system which will be well beyond our ability to address without major impacts to the quality of life in Portland. Thus, it is our recommendation that the City should continue to encourage opportunities for the development of additional residential units within the Peninsula. The City has addressed these issues through the adoption of land use and housing policies that encourage opportunities for the development of additional residential units throughout the City. As additional residential units are developed on the Peninsula, it will become increasingly important that the City address transit issues for Peninsula residents. Such development, close to the workplace, can be more readily served by transit than more dispersed development, thereby reducing the transportation infrastructure which would otherwise be required for traffic commuting to the Peninsula. The Portland Peninsula is one of the few candidates for transit in Maine where sufficient density may make transit viable.

Parking Policy

Adequate parking on the Peninsula is viewed by the community as vital to maintaining a positive residential and business environment, and Portland has done a good job in providing spaces distributed throughout the city. However, as the City matures, the real estate consumed by parking, particularly surface parking, becomes increasingly valuable. In addition, if the transportation policy includes a parking space in close proximity to where people work, then the car will continue to be their transportation choice and congestion will continue to increase. In order to reverse this trend in the long run, it is our opinion that the City should explore alternatives to gradually de-emphasize the single automobile. Some of the alternatives which we recommend be evaluated include the following:

- Adopt a parking impact fee for new development rather than requiring the developer to build new spaces. The City could then be responsible for managing the parking supply and constructing new spaces, preferably structured as needed.
- Construct and promote the use of high quality remote parking in partnership with the business community. Such parking would be dependant on a reliable, comfortable and safe transit or shuttle system.
- Develop and promote a rideshare program jointly with the business community which would give preferential parking to participants.
- Institute fee structure changes to favor short term parking for retail businesses and visitors but to encourage use of other viable options for long term parking.
- Develop a shared parking supply for the Peninsula that encourages efficiencies by taking advantage of off-setting periods of use by complimentary uses (i.e., office and residential.)

In the long term, the City should work to make a transition from an auto oriented infrastructure to promotion of alternative modes. Periodic assessments of the urban density and parking supply should be undertaken to determine whether the evolving densities are sufficient to support a shift in investment strategy from parking and roadways to transit and alternative modes. The combined public and private investment in transportation infrastructure should be strategically balanced to promote a transition from auto dependency to a more sustainable mix of auto and transit modes. Ideally this balance must be achieved at a regional level.

Transit Study

A strong recommendation of this plan is to complete a comprehensive transit study. Such a study would determine what changes should be made to the current system to increase ridership to adequately serve remote parking lots, neighborhoods, and adjacent communities to the Peninsula to the extent that transit usage will significantly reduce future traffic congestion. The potential reduction in future traffic congestion due to transit should be taken into account when considering infrastructure improvements. The recommended study should retain a recognized expert specializing in the development of realistic integrated systems with demonstrated ridership. This is a key component in a transportation plan for the Peninsula since reduced congestion cannot be achieved without an optimal mix of safe, convenient, reliable alternatives.

Pedestrians and Bicyclists

The City of Portland has gained its reputation in part because it is a very walkable and bikeable City. Pedestrian accommodations should be viewed as a critically important element of the overall transportation plan for the City. This plan has considered the effect of each proposed strategy on the pedestrian and bicyclist. While this has been a difficult balance on some of the busy arterials, the plan has incorporated appropriate measures. This plan builds on prior efforts in the City:

- The biennial transportation improvement plan (BTIP) for bicycle lane striping in the City.
- The Portland Bicycle Plan developed by PACTS in 1996.
- The 1995 PACTS Regional Bike Plan.

Due to these efforts, and the actions of bicycle and pedestrian groups in the City, Portland is more bicycle and pedestrian friendly than many cities of comparable size.

Chapter 4
Origin-Destination Survey

Background

As a basis for understanding existing traffic volumes and travel patterns to and from the Peninsula, an origin-destination survey was conducted of motorists entering and leaving the Portland Peninsula in the Spring of 2001. The purpose of the survey was to supplement current understanding of travel patterns to, from and through the Peninsula. This information was also used to update the regional traffic model to be more specific to the Peninsula and to create visual simulations of the travel patterns. This chapter summarizes key findings from the survey effort. The actual data set is housed at PACTS and will enable more detailed analysis if desired.

Elements of the Survey

A mailback survey instrument was mailed to motorists who had been observed either entering or departing the Peninsula. Information was collected on their trip origin and destination and the route taken on the Peninsula.

The ten Portland Peninsula locations (that describe a cordon) are illustrated in Figure 1 and are defined as follows:

- Washington Avenue at its interchange with I-295
- Franklin Street Arterial at its interchange with I-295
- Preble Street Extension, north of Marginal Way
- Forest Avenue, north of Marginal Way
- Deering Avenue, north of Park Avenue
- St. John Street, north of Park Avenue
- Park Avenue, west of St. John Street
- Congress Street, west of St. John Street
- Veterans Bridge
- Casco Bay Bridge

We will characterize these locations as Portland Peninsula Portals.

The following questions were answered as a result of the survey:

General Composition of Traffic at Portland Peninsula Cordon

- What is the distribution of traffic at the Portland Peninsula portals?
- Who drives to, from or through the Peninsula during the morning and evening peak hours?
- Does the proportion of through-trips and local-trips vary by portal?

Characteristics of Traffic Traveling Through the Peninsula

- What are the primary through-traffic movements on the Peninsula?
- Where are the through-trips coming from and going to?

Characteristics of Traffic Headed To or From the Peninsula

- Where do motorists destined to the Peninsula come from?
- Where do trips destined to the Peninsula enter the Peninsula?
- Does the destination distribution vary according to trip origin location on the Peninsula?
- Are there additional potential uses of the origin-destination survey data?

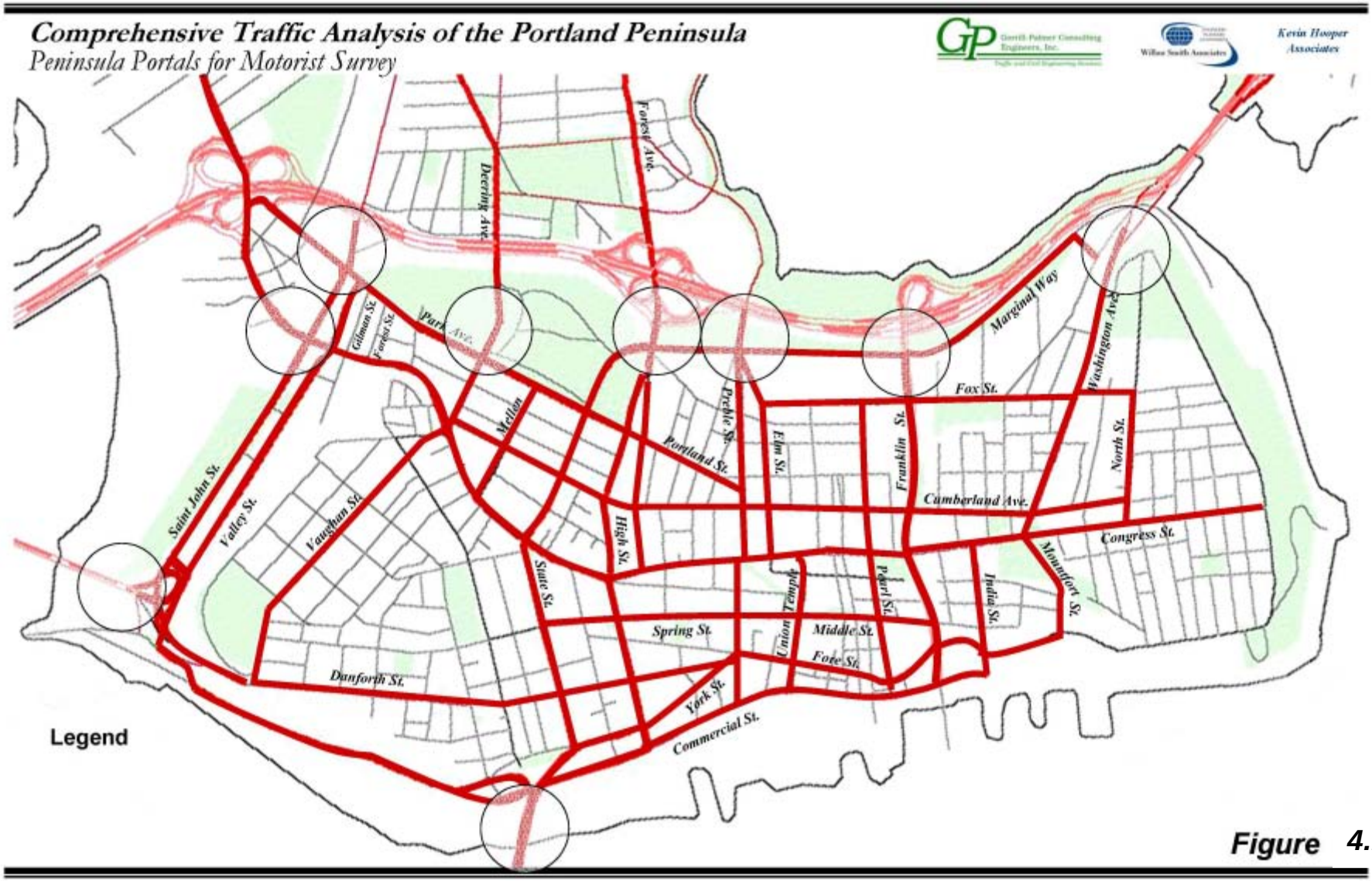

Comprehensive Traffic Analysis of the Portland Peninsula
Peninsula Portals for Motorist Survey
Gorrill-Palmer Consulting Engineers, Inc.
Wilbur Smith Associates
Kevin Hooper Associates
Forest Ave.
Deering Ave.
Gilman St.
Forest St.
Park Ave.
Marginal Way
Washington Ave.
Fox St.
Preble St.
Portland St.
Elm St.
Franklin St.
North St.
Cumberland Ave.
Congress St.
Mellen
Saint John St.
Valley St.
Vaughan St.
High St.
State St.
Spring St.
Union
Temple
Pearl St.
India St.
Mountfort St.
Middle St.
Fore St.
Danforth St.
York St.
Commercial St.
Legend

Figure 4.1

What is the distribution of traffic at the Portland Peninsula portals?

Table 4.1 lists AM and PM peak hour volumes for each of the ten portals. During the morning peak hour, a total of 17,043 vehicles cross (Enter or Depart) the Portland Peninsula cordon. During the evening peak hour, this total increases to 20,654.

In the morning, the two portals with the largest traffic volumes are Forest Avenue and the Casco Bay Bridge (each with roughly 19% of the cordon volume). Veterans Bridge, Franklin Street Arterial, and Congress/Park are next in line in terms of traffic volume (each with roughly 13%). In descending order of traffic volume, the other four cordon points are Preble Street, Washington Avenue, Deering Avenue and St. John Street.

In the evening, the portal with the highest volume is again Forest Avenue (19% of total cordon volume). However, in contrast with morning peak hour, the Congress/Park portal moves up to the second highest volume (18%), followed by Casco Bay Bridge (17%), Franklin Street Arterial (14%), and Veterans Bridge (11%). The lowest four remain Preble Street, St. John Street, Washington Avenue, and Deering Avenue.

Table 4.1: AM and PM Peak Hour volumes at Peninsula Cordon

Location of Portal	AM Peak Hour			PM Peak Hour		
	Inbound	Outbound	Total	Inbound	Outbound	Total
Washington Avenue	798	339	1,137	324	602	926
Franklin Street Arterial	1,569	619	2,188	925	2,009	2,934
Preble Street	1,149	383	1,532	541	1,124	1,665
Forest Avenue	1,918	1,314	3,232	1,708	2,188	3,896
Deering Avenue	449	345	794	340	522	862
St. John Street	344	281	625	473	586	1,059
Park Avenue	0	765	765	0	2,164	2,164
Congress Street	1,374	0	1,374	1,503	0	1,503
Veterans Bridge	1,581	654	2,235	926	1,287	2,213
Casco Bay Bridge	2,074	1,087	3,161	1,262	2,170	3,432
TOTAL	**11,256**	**5,787**	**17,043**	**8,002**	**12,652**	**20,654**

Who drives to, from or through the Peninsula during the morning and evening peak hours?

As shown in Table 4.2, a total of 16,030 vehicles enter, exit, or pass through the Portland Peninsula during the morning peak hour. (This total is slightly below the total shown in Table 4.1 as explained following Table 4.2 below) Of that total, 64 percent are vehicles entering the Peninsula with a destination on the Peninsula. Another 30 percent of the morning cordon traffic represents vehicles that exit the Peninsula after beginning the trip on the Peninsula. Finally, six percent of the vehicles crossing the cordon during the morning peak hour pass through the Peninsula without making a stop.

During the evening peak hour, the through-traffic proportion remains at six percent of the total number of vehicles at the Peninsula cordon.

Shown later in this document are the communities in which these through-trips start and end. But, because it helps the understanding of through-trips, this anecdote is offered here:

roughly half of the trips that pass through the Peninsula have one end of their trip located within the remainder of Portland (e.g., a trip between Woodfords Corner and South Portland). Therefore, the proportion of vehicles crossing the Portland Peninsula cordon that do not stop in Portland (e.g., trips between Yarmouth and South Portland) is roughly three percent.

Table 4.2: Trip Types at Portland Peninsula Cordon

	AM Peak Hour	PM Peak Hour
Vehicles that Enter the Peninsula with a Destination on the Peninsula	10,243 (64%)	6,920 (35%)
Vehicles that Begin a Trip on the Peninsula and Exit the Peninsula	4,774 (30%)	11,570 (59%)
Vehicles that Pass Through the Peninsula	1,013 (6%)	1,082 (6%)
Total Trips at Portland Peninsula Cordon During Peak Hour	**16,030**[1]	**19,572**[1]

[1]The cordon volume totals shown in this table do not match the cordon volume totals in the table on the previous page because this table counts "through-vehicles" only once; on the previous page, a "through-vehicle" is counted twice, once entering the Peninsula, once exiting the Peninsula. The numbers do correspond, however. For example, this table reports there are 16,030 vehicles crossing the cordon during the morning peak hour. If the "through-vehicles" are counted twice (i.e., add another 1,013 to the total), the total cordon crossing volume becomes 17,043, which matches the total in the table on the previous page.

Does the proportion of through-trips and local-trips vary by portal?

Yes, through-traffic comprises a much larger proportion of traffic at some portals. As illustrations, Tables 4.3 and 4.4 present the composition of traffic at the Forest Avenue portal and on Casco Bay Bridge, respectively.

On Forest Avenue, the through-traffic proportions are 19 and 16 percent during the morning and evening hours, respectively. The through-traffic proportions on Casco Bay Bridge are substantially higher, 29 and 28 percent during the morning and evening peak hours, respectively.

Through-traffic proportions for all Portland Peninsula portals are presented in Appendix B.

Table 4.3: Trip Types at Forest Avenue Portal

	AM Peak Hour	PM Peak Hour
Vehicles that Enter the Peninsula via Forest Avenue and Stop at a Destination on the Peninsula	1,659 (51%)	1,348 (34%)
Vehicles that Begin a Trip on the Peninsula and Exit the Peninsula via Forest Avenue	953 (30%)	1,930 (50%)
Vehicles that Pass Through the Peninsula, Either Entering or Exiting via Forest Avenue	620 (19%)	618 (16%)
Total Forest Avenue Trips During Peak Hour	**3,232**	**3,896**

Table 4. Trip Types on Casco Bay Bridge

	AM Peak Hour	PM Peak Hour
Vehicles that Enter the Peninsula via Casco Bay Bridge and Stop at a Destination on the Peninsula	1,521 (48%)	869 (25%)
Vehicles that Begin a Trip on the Peninsula and Exit the Peninsula via Casco Bay Bridge	716 (23%)	1,594 (47%)
Vehicles that Pass Through the Peninsula, Either Entering or Exiting via Casco Bay Bridge	924 (29%)	969 (28%)
Total Casco Bay Bridge Trips During Peak Hour	**3,161**	**3,432**

What are the primary through-traffic movements on the Peninsula?

Nearly all of the through-traffic on the Peninsula either enters or exits via Casco Bay Bridge. Figure 4.2 on the following page depicts the through-traffic patterns linked with Casco Bay Bridge. The figure also presents the two-way through-traffic volume, summed for the AM and PM peak hours, as estimated for each through-traffic pattern.

For example, during the two morning and evening peak hours, an estimated 1,225 vehicles pass through the Portland Peninsula between Casco Bay Bridge and Forest Avenue, continuing either on Forest Avenue or I-295. This through-traffic link to Forest Avenue represents 65 percent of all through-trips on Casco Bay Bridge (1,225 of the 1,893 total through-trips on Casco Bay Bridge).

The second tier of through-traffic movements linked to Casco Bay Bridge are Veterans Bridge, St. John Street, Congress Street/Park Avenue, and Deering Avenue. Each portal comprises between 9 and 12 percent of the Casco Bay Bridge through-traffic volume.

The lowest through-traffic volumes linked to Casco Bay Bridge are Franklin Street Arterial, Washington Avenue, and Preble Street. In total, these three portals comprise only 3 percent of the Casco Bay Bridge through-traffic.

The other through-traffic patterns on the Peninsula are relatively minor and typically skirt the edge of the Peninsula. Examples of these minor through-traffic patterns include (1) trips between Preble Street Extension (Hannaford Plaza, Baxter Boulevard) and the I-295/Franklin Street Arterial interchange and (2) trips between Outer Congress Street and St. John Street.

Comprehensive Traffic Analysis of the Portland Peninsula

Through-Traffic Movements on Casco Bay Bridge

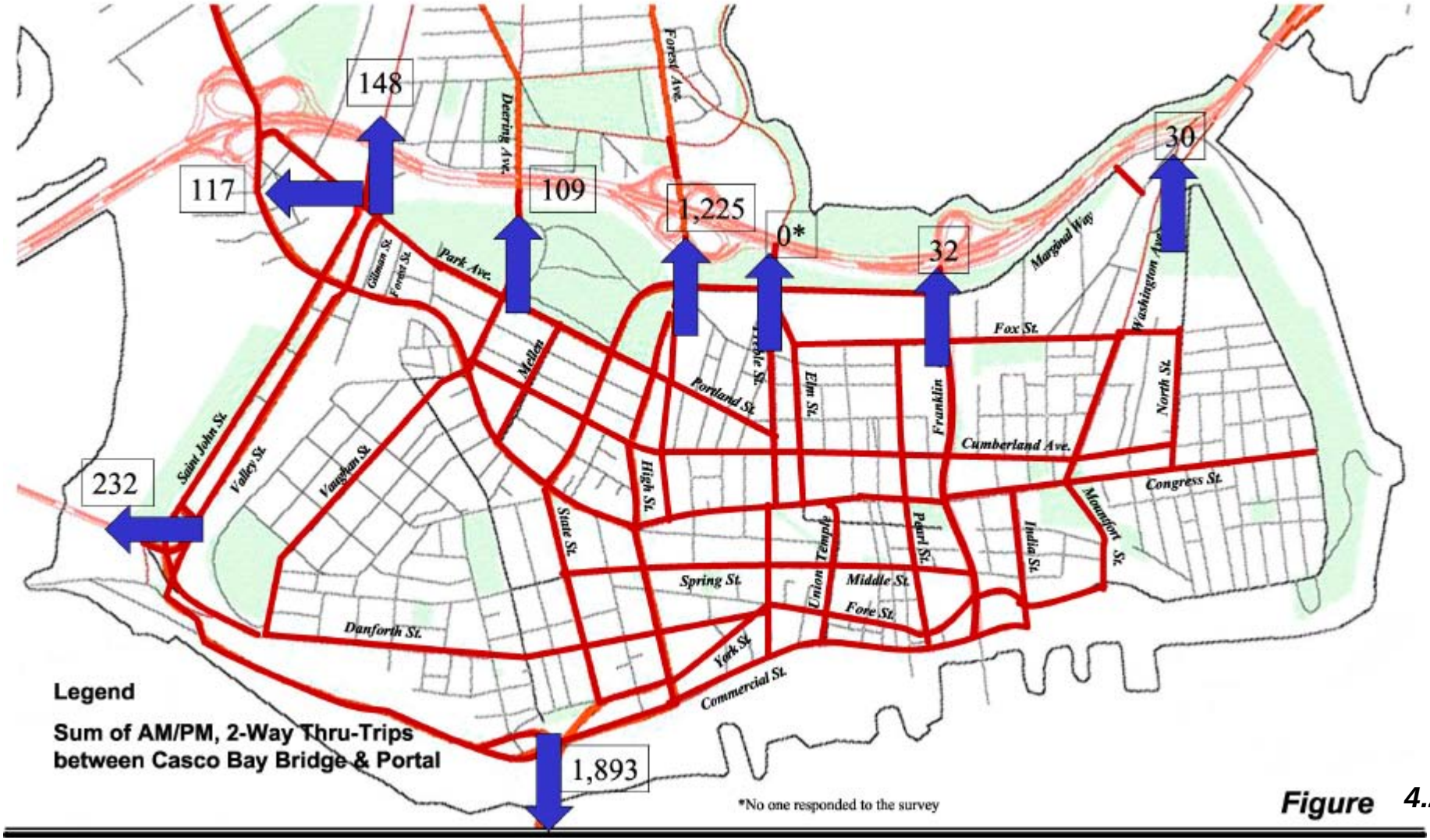


Figure 4.2

Where are the through-trips coming from and going to?

Table 4.5 on the following page presents the origins and destinations of the Portland Peninsula through-trips surveyed during the morning and evening peak hours. For example, the first numeric column of the table lists the through-trips which start or end in Portland (but outside the Peninsula). The survey measured 369 trips between Cape Elizabeth and Portland that passed through the Peninsula.

As shown in the table, the majority of through-trips have at least one end in Portland (1,142, or 55% of the 2,095 total). The largest quantities of through-trips are between Portland and South Portland and between Portland and Cape Elizabeth. Together, these two movements comprise 48% of all through-trips.

The next largest number of through-trips, in terms of jurisdiction-pairs, is between the combination of Cape Elizabeth and South Portland on the south and the combination of Falmouth and the Northeast and North districts[1]. These jurisdiction-pairs have a total of 468 peak hour through-trips (22% of all Portland Peninsula through-trips). All of these through-trips cross Casco Bay Bridge, with nearly all (91 percent) using Forest Avenue to enter/exit the Peninsula. The remainder use Washington Avenue (5 percent) and Franklin Street Arterial (4 percent). [note: this information is not presented in the table]

The table indicates there are 160 through-trips (94 plus 66) between South Portland and South Portland and between Cape Elizabeth and South Portland. At first glance, both movements appear implausible. An examination of the entry and exit portals for these two movements reveals these through-trips travel between Casco Bay Bridge and Veterans Bridge. For trips between Ferry Village and Maine Mall, for example, one possible route would follow Casco Bay Bridge, Commercial Street, Veterans Bridge and I-295. During time periods with traffic congestion along Broadway, this path through the Peninsula may indeed be preferable.

[1] Falmouth and the North and Northeast districts comprise towns along the I-95 and Maine turnpike corridors to the north of Portland.

Table 4.5: Jurisdiction-Pairs for AM and PM Peak Hour Through-Trips

	Portland	Cape Elizabeth	Falmouth	Gorham	Scarb.	South Portland	Total
Portland	34						34
Cape Elizabeth	369	0					369
Falmouth	5	41	0				46
Gorham	0	25	0	0			25
Scarborough	19	3	0	0	0		22
South Portland	638	94	84	33	7	66	922
Westbrook	12	42	0	0	0	43	97
Northeast*	10	83	0	0	0	166	259
North*	20	0	0	0	0	94	114
Northwest*	14	12	0	0	0	14	40
West*	6	4	0	0	0	21	31
Southwest*	0	23	0	0	0	27	50
South*	15	17	0	0	0	54	86
Total	1142	344	84	33	7	485	2095

*district definitions -- listed are jurisdictions for which survey responses were received

Northeast	**North**	**Northwest**	**South**	**Southwest**	**West**
Augusta	Auburn	Bridgton	Arundel	Alfred	Cornish
Bath	Cornville	Casco	Biddeford	Buxton	Hiram
Blue Hill Falls	Gray	Denmark	Eliot	Dayton	Limerick
Boothbay	Kingfield	Fryeburg	Kennebunk	Durham	Limington
Boothbay Harbor	Lewiston	Harrison	Kenne-bunkport	Hollis	Standish
Bowdoinham	Lisbon Falls	Naples	Massa-chusetts	Lebanon	Steep Falls
Brunswick	Litchfield	S Casco	New Hampshire	Lyman	
Cumberland	Livermore	Windham	Ocean Park	S Berwick	
Damaris-cotta	Minot		OOB	Sanford	
Edgecomb	New Glster.		Waterboro		
Freeport	Otisfield		Saco		
Friendship	Oxford		Wells		
Harpswell	Poland				
Jefferson	Pownal				
Mechanic Falls	Raymond				
Montville	Strong				
Nobleboro	W Gardiner				
North Yarmouth					
Phippsburg					
Searsmont					
Southport					
St George					
Topsham					
Vassalboro					
W Bath					
Waterville					
Yarmouth					

Where do motorists destined to the Peninsula come from?

Table 4.6 presents the distribution of origins of surveyed trips that have a destination within the Peninsula (i.e., this table excludes through-trips). The table lists town-by-town values for both the morning and evening peak hours.

During the morning peak, an estimated 26 percent of all trips with a Peninsula destination originate within Portland (but outside the Peninsula). Another 36 percent originate from the six neighboring communities of Cape Elizabeth, Falmouth, Gorham, Scarborough, South Portland and Westbrook. The remaining 38 percent originate beyond the core seven communities of the region.

The largest percentage of morning peak-hour trips destined to the Peninsula originate within Portland (26 percent, as noted above). The next largest proportion originates in the "northeast" district (13 percent), defined as Cumberland, Yarmouth and the I-95 corridor. South Portland is in the third place with 11 percent. Fourth on the list is the "south" district with 10 percent, defined as Saco, Biddeford and the Turnpike corridor.

During the morning peak hour, a substantial proportion of the inbound traffic flow is comprised of commuters. During the afternoon peak hour, the proportion of inbound commuters decreases as other trips become part of the traffic mix. As a result, the distribution of trip origins changes. Portland (with 38 percent of the trips) still comprises the largest proportion of trip origins. Another 40 percent originate within the six neighboring communities (about the same as the morning peak hour proportion) but only 22 percent originate outside the core communities (a significant decrease from the morning peak hour).

Table 4.6: Origins of Trips with a Destination on the Peninsula

	AM Peak Hour		PM Peak Hour	
Origins of Trips with a Peninsula Destination	**# of Entering Vehicles**	**% of Entering Vehicles**	**# of Entering Vehicles**	**% of Entering Vehicles**
Portland (outside Peninsula)	2,665	26 %	2,604	38 %
Cape Elizabeth	665	6 %	458	7 %
Falmouth	412	4 %	242	3 %
Gorham	284	3 %	161	2 %
Scarborough	678	7 %	334	5 %
South Portland	1,139	11 %	1,109	16 %
Westbrook	502	5 %	491	7 %
Northeast	1,327	13 %	847	12 %
North	521	5 %	123	2 %
Northwest	416	4 %	108	2 %
West	266	3 %	133	2 %
Southwest	348	3 %	82	1 %
South	1,021	10 %	227	3 %
TOTAL	**10,244**	**100 %**	**6,938**	**100 %**

Where do trips destined to the Peninsula enter the Peninsula?

Table 4.7 lists the primary routes of access to the Peninsula for each jurisdiction of trip origin during the morning peak hour. For example, a total of 2,665 vehicles have a trip origin in Portland and a destination in the Peninsula. The greatest proportion of those vehicles enter the Peninsula via Preble Street (25 percent), followed by Forest Avenue, Congress Street and Deering Avenue. Throughout the table, only entry portals with at least 15 percent of the total are shown, except for Portland trips.

Table 4.7: Primary Routes of Access to the Peninsula

Origins of Trips to Peninsula During AM Peak Hour	# Entering Vehicles	Primary Entry Portals into Peninsula
Portland (outside Peninsula)	2,665	25% via Preble Street, 21% via Forest Avenue, 14% via Congress St, 13% via Deering Avenue
Cape Elizabeth	665	100% via Casco Bay Bridge
Falmouth	412	43% via Franklin Street Arterial, 32% via Forest Ave, 22% via Washington Ave
Gorham	284	49% via Congress Street, 18% via Preble St
Scarborough	678	53% via Veterans Br, 15% via Casco Bay Br
South Portland	1,139	66% via Casco Bay Br, 24% via Veterans Br
Westbrook	502	37% via Congress Street, 26% via Preble Street, 18% via Forest Avenue
Northeast	1,327	38% via Franklin Art, 23% via Washington Ave, 22% via Forest Avenue, 15% via Congress Street
North	521	39% via Franklin Street Arterial, 20% via Forest Avenue
Northwest	416	44% via Forest Avenue
West	266	41% via Congress Street
Southwest	348	44% via Veterans Bridge, 22% via Congress St
South	1,021	58% via Veterans Bridge
TOTAL	**10,244**	

As part of the data reduction process, the on-Peninsula traffic analysis zone (comprised of multiple blocks) was identified for every trip that ended or began in the Peninsula. Therefore, trip origin-destination patterns are available for each traffic analysis zone within the Peninsula. To simplify analysis of data relative to this question, the Peninsula was subdivided into eight sectors, as shown in Figure 3.

The distribution of traffic at entry portals, disaggregated by Peninsula sector, is shown in Table 8. For example, morning peak hour traffic destined to Bayside (sector 2) enters the Peninsula at the following portals:

- 8 percent via southbound I-295 to Washington Avenue
- 23 percent via southbound I-295 to Franklin Street Arterial
- 13 percent via northbound I-295 to Franklin Street Arterial
- 23 percent via Preble Street
- 9 percent via southbound Forest Avenue
- 4 percent via northbound I-295 to Forest Avenue
- 2 percent via Deering Avenue
- 11 percent Congress Street

- 6 percent via Casco Bay Bridge

Outbound distributions and PM peak hour distributions are included in Appendix C.

An interesting observation can be made about the distributions for sectors 3 and 7 (i.e., the Portland Waterfront and the Old Port). During the morning peak hour, 22 and 29 percent of the traffic to sectors 3 and 7, respectively, enter the Peninsula via Veterans Bridge. At the same time, 4 percent of the traffic to those sectors arrives via the northbound I-295 interchange with Franklin Street Arterial. During the evening peak hour, however, 27 and 25 percent of the sector 3 and 7 traffic, respectively, exit the Peninsula via Franklin Street Arterial to I-295. In contrast, only 14 percent of the sector 3 and 7 traffic exits in the evening via Veterans Bridge. Therefore, there is a significant traffic flow that uses Veterans Bridge and Commercial Street in the morning, likely in order to avoid traffic congestion at the Franklin Street Arterial interchange.

Table 4.8: Distribution of Traffic at Entry Portals During AM Peak Hour

Location of Entry Portal	Sector 1	Sector 2	Sector 3	Sector 4	Sector 5	Sector 6	Sector 7	Sector 8
Enter via SB Washington Ave	27%	8%	10%	3%	5%	1%	24%	2%
Enter via SB 295 to Franklin Street Arterial	8%	23%	17%	13%	4%	1%	3%	4%
Enter via NB 295 to Franklin Street Arterial	25%	13%	4%	2%	0%	0%	4%	0%
Enter via SB Preble Street	17%	23%	13%	14%	5%	0%	17%	2%
Enter via SB 295 to SB Forest Ave	0%	0%	0%	14%	11%	11%	0%	15%
Enter via SB Forest Ave to SB Forest Ave	0%	9%	5%	21%	12%	5%	4%	7%
Enter via NB 295 to SB Forest Ave	0%	4%	1%	12%	0%	0%	0%	0%
Enter via SB Deering Ave	0%	2%	1%	2%	9%	18%	0%	7%
Enter via SB St John St	0%	0%	1%	0%	0%	13%	0%	16%
Enter via EB Congress St	0%	11%	9%	3%	16%	37%	4%	30%
Enter via Veterans Bridge	7%	0%	22%	0%	9%	0%	29%	6%
Enter via Casco Bay Bridge	17%	6%	16%	17%	30%	14%	15%	12%
Total to Peninsula Sector	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Comprehensive Traffic Analysis of the Portland Peninsula

Portland Peninsula Sectors

Figure 4.3

Does the distribution of jurisdiction origins / destinations vary according to trip origin location on the Peninsula?

The short answer is yes. Table 9 presents the origin and destination distribution for three sectors adjacent to I-295 (sectors 2, 4 and 6) and three sectors adjacent to Portland Harbor (sectors 3, 5 and 7).

During the morning peak hour, 32 percent of trips to the 'northerly-half' of the Peninsula originate to the south. This proportion increases to 44 percent when the destination is the 'southerly-half' of the Peninsula. The reverse occurs for trips from the north where the higher percentage is seen for the 'northerly-half' of the Peninsula. During the evening peak hour (the bottom half of the table), the same phenomenon is observed.

Table 9. Origins and Destinations of Trips by Sector of Portland Peninsula

	Proportion of trips to sectors 2, 4 & 6	Proportion of trips to sectors 3, 5 & 7
From Portland	27 %	23 %
From south (Cape Elizabeth, South Portland, South, Scarborough, Southwest)	32 %	44 %
From northeast (Falmouth, Northeast, North)	24 %	20 %
From northwest and west (Westbrook, Gorham, Northwest, West	17 %	13 %
	Proportion of trips from sectors 2, 4 & 6	**Proportion of trips from sectors 3, 5 & 7**
To Portland	28 %	26 %
To south (Cape Elizabeth, South Portland, South, Scarborough, Southwest)	30 %	39 %
To northeast (Falmouth, Northeast, North)	22 %	18 %
To northwest and west (Westbrook, Gorham, Northwest, West)	20 %	16 %

Are there additional potential uses of the origin-destination survey data?

The anticipated primary uses of the origin-destination survey data are as follows:

- Refine and validate the PACTS travel demand model
- Assist with estimation of trip distribution for specific developments in the Peninsula (e.g., Bayside, Waterfront)
- Assist with estimation of traffic impacts associated with roadway system changes (e.g., modifications to Veterans Bridge access to the Peninsula during reconstruction of Veterans Circle)

Chapter 5
Traffic Forecasts

The traffic forecasts for the Peninsula Study were developed based on Land Use Forecasts furnished by the City of Portland Planning Staff and the PACTS traffic forecasting model. The predevelopment traffic volumes; the estimated volumes without the development, were determined by Kevin Hooper Associates, using the PACTS model. This model was based on traffic counts collected at intersections within the Peninsula during the summers of 1999 and 2000.

The PACTS travel demand forecasting model was used to forecast year 2025 traffic volumes for the Portland Peninsula Traffic Study. PM peak hour turn movements were estimated from directional roadway link forecasts by using turn movement estimation procedures documented in NCHRP Report 255, Using the Urban Transportation Planning Process for Project Development and Design. AM peak hour turn movements were estimated by assuming the same growth from current morning volumes as estimated for 'opposite' evening peak hour movements.

The assumed future roadway network is different from the current roadway network. The assumed changes are as follows:

- Closure of Marginal Way east of its intersection with Franklin Street Arterial and relocation of that section of Marginal Way to tie into Fox Street and ultimately the Fox Street intersection with Franklin Street Arterial as part of the City/MDOT Agreement for the extension of AMTRAK passenger rail service - Reference Figure 7.5 and Chapter 7.
- Extension of Chestnut Street from Somerset Street to Marginal Way as part of the City's Bayside redevelopment plan – Reference Figure 7.5 and Chapter 7.
- Extension of Somerset Street from Preble Street to the existing intersection of Forest Avenue and High Street as part of the City's Bayside redevelopment plan to improve access from Preble Street to Washington Avenue and Munjoy Hill - Reference Figure 7.5 and Chapter 7.
- Closure of the Kennebec Street leg of the current Forest Avenue/Kennebec Street intersection as part of the City/MDOT Agreement for the AMTRAK extension to improve operations at the Forest Avenue/State Street intersection, currently a five-leg intersection - Reference Figure 7.5 and Chapter 7.
- Relocation of State Street so that it intersects with Forest Avenue at the current Forest Avenue/High Street intersection and intersects Park Avenue at its current location to minimize roadway encroachment into Deering Oaks - Reference Figure 7.5 and Chapter 8.
- Restrict the Marginal Way approach at Forest Avenue to right-turns-only. - Reference Figure 7.5 and Chapter 7.
- Construction of the I-295 Connector- Currently in design and construction phase - A plan

of this connector is included on Figure 7.11 in the Appendix.

- Extension of Commercial Street past Mountfort Street in conjunction with redevelopment of the Eastern Waterfront – see Figure 5.1 and Chapter 6.
- Extension of Mountfort Street to Commercial Street in conjunction with redevelopment of the Eastern Waterfront – see Figure 5.1 and Chapter 6.
- Extension of Hancock Street to Commercial Street, also as part of the Eastern Waterfront redevelopment – see Figure 5.1 and Chapter 6.

For this study, the assumed residential and commercial development for the Portland Peninsula exceeds that which is assumed in the base PACTS model (as developed in concert with the Greater Portland Council of Governments). The following represents potential development assumed in the Portland Peninsula Traffic Study:

- 655,000 square feet of office space, 117,000 square feet of retail space, 100 hotel rooms, and 853 dwelling units in Bayside.
- 289,000 square feet of office space, 102,000 square feet of retail space, 220 hotel rooms, and 91 dwelling units in the Eastern Waterfront and Ocean Gateway areas.
- Relocation of Mercy Hospital to the I-295 Connector,
- Re-use of the existing Mercy Hospital space.
- A convention center west of the Old Port.
- An aquarium on Commercial Street. The Gulf of Maine proposal includes a 60,000 sq. ft. research facility on the former Naval Reserve site as a first phase, with plans to build a major exhibition aquarium on the adjacent Coast Guard site. While the zoning for and feasibility of the exhibition aquarium remain in doubt, the potential traffic generated by such a facility was included as a study assumption for the sake of providing a conservative estimate

Important Note

It is very important to understand that the traffic forecast is based on the current modal split between the private automobile and other modes as well as maintaining the current ratio of parking to development which currently exists on the Peninsula. Further, the traffic forecasts may be high as the Peninsula is an urban setting rather than more suburban or rural settings, and takes into account in the projections utilized from the Institute of Transportation Engineers. Since the forecast may be high, as traffic volumes increase over time, monitoring should be done and the timing of the improvements extended accordingly. To the extent that other measures described in Chapter 3 are successful, some of the traffic recommendations in this report may be postponed, reduced in scope or eliminated altogether.

Chapter 6
Eastern Waterfront and Ocean Gateway

The two major initiatives projected to occur within the study horizon include the Eastern Waterfront Master Plan and the Ocean Gateway marine passenger facility. These projects generally encompass the area east of the Franklin Street Arterial and South of Fore Street. The traffic impacts from these projects were evaluated as part of the Peninsula study. This effort included developing the trip generation estimates for each project as summarized in the following paragraphs.

Eastern Waterfront Master Plan

The Eastern Waterfront Master Plan envisions incremental development over a ten-year period consisting of approximately 570,000 s.f. of mixed use development established within a system of street extensions forming new city blocks. The area is upland of the area known as Pier 2 on the waterfront, the former BIW site, and is encompassed by Commercial Street Extension, Fore Street, India Street, and Mountfort Street Extension. The trip generation estimates were furnished by Wilbur Smith Associates, resulting in an estimate of 914 trip ends during the weekday peak hour from 4:30 to 5:30 PM. This information was based on information published by The Institute of Transportation Engineers (ITE) from a national database. It is likely that the resulting trip forecast overestimates the traffic since these projects are located in a downtown area and will be linked with pedestrian and transit facilities which can reasonably be expected to reduce vehicular trips.

Ocean Gateway

The Ocean Gateway project is located on the waterfront and encompasses the Maine State Pier and adjacent City owned land formerly used as a ship repair facility by Bath Iron Works. The site will be re-developed as a multi-use waterfront transportation facility for marine passenger operations and is anticipated to be operational in 2006. The trip estimates for Ocean Gateway were developed based on the following ships being docked simultaneously:

- The Scotia Prince
- One 5,000 Passenger Ship
- One 3,000 Passenger Ship

To estimate the trips which will be generated for these ships, Gorrill-Palmer Consulting Engineers, Inc. completed twelve hours of turning movement counts at the intersection of Franklin Street Arterial and Commercial Street during two days; one with a 1,420 passenger cruise ship docked which departed around 6:30 PM and one without any cruise ships. The difference in traffic was 86 trips which were attributed to the cruise ship, yielding a trip rate of 0.0606 trip ends per passenger from 4:30 to 5:30 PM resulting in a total estimate of 485 PM peak hour weekday trip ends. Gorrill-Palmer Consulting Engineers, Inc. also completed traffic counts at the existing Scotia Prince Facility at the International Terminal from 3:00 to 9:00 PM and determined it generates approximately 54 PM peak hour weekday trip ends

between 4:30 and 5:30 PM. These existing trips were reassigned to the proposed Ocean Gateway facility as part of the trip assignment procedure.

Combined Traffic Volumes

The assignment of these trips for Eastern Waterfront and Ocean Gateway project on the roadway network was done using the PACTS model described in Chapter 5. The PM peak hour traffic volumes for 2025 predevelopment were combined with the traffic anticipated from the combined projects to result in the 2025 post development volumes.

Analyses and Findings

The operational analyses were completed utilizing 'Synchro' and 'Sim-Traffic' modeling software. The analyses included the extension of Commercial Street, Hancock Street, and Mountfort Street as envisioned in the City's planning process for these developments to create an urban street network in the eastern waterfront area. The results of our analyses indicate that improvements will be required in 2025 without the development and further improvements will be required with the developments. The following Tables have been prepared and are enclosed following this chapter:

Table 6.1 - Improvements required in 2025 without either of the developments.

Table 6.2 - Additional Improvements required in 2025 to accommodate Ocean Gateway and the Waterfront Master Plan.

Figure 6.1, at the end of this chapter, presents a graphic summary on an aerial base of the improvements required in 2025 with and without the developments. With the improvements summarized in Tables 6.1 and 6.2, the traffic generated by the combined development can be accommodated. There will be areas where delay and significant queuing occurs, but this should not pose an operational problem. We envision that the Franklin Street Arterial will play an important role in Portland's transportation network and thus it is important that the Franklin Street Arterial be upgraded which will be discussed as part of the Bayside analysis in the next Chapter.

Pedestrian Circulation

Pedestrian connections to both the Ocean Gateway project and the waterfront development project is critical to minimize traffic. The project team recommends the following measures to maximize walkability:

- That the signal at the intersection of Commercial Street and Franklin Street Arterial be phased to accommodate pedestrian movements with safe and ample crossing opportunities.
- The exclusive right turn lane from the Franklin Street Arterial onto Commercial Street has been removed by the City to facilitate pedestrian crossings.
- The Ocean Gateway project should be designed with a pedestrian connection to the Eastern Promenade Trail.
- The proposed extensions of Commercial Street, Mountfort Street and Hancock Street should include sidewalks on both sides of these streets.

Impacts to Munjoy Hill

A major goal in developing this plan is to be sensitive to long-standing neighborhoods such as the Munjoy Hill area. A certain volume of traffic to and from the proposed eastern waterfront redevelopment is anticipated to utilize the street network in the Munjoy Hill area. However, it is important to understand that impacts to this area will be relatively low. The most significant volumes anticipated by the development would be on Fore Street east of Mountfort Street, where traffic is expected to increase by approximately five percent. Increases to Congress Street, Cumberland Avenue, and North Street are anticipated to be less then five percent, while increases to the Eastern Promenade are anticipated to be negligible. Traffic on Mountfort Street could be reduced by making Mountfort Street one way toward Fore Street, from Congress Street, and one way toward Fore Street, between Commercial Street and Fore Street. This would discourage through traffic on Mountfort Street which is narrow and has sight line restrictions at Federal Street.

As previously discussed, the proposed improvements to the Franklin Street Arterial are critical in minimizing traffic on Munjoy Hill. It is a strong recommendation that the City work with the MDOT and PACTS to prioritize the recommended improvements in this plan to minimize delay along this arterial. Without these improvements, delay on Franklin Street Arterial may become unacceptable for drivers, resulting in diversions to local streets both on Munjoy Hill and other neighborhoods in Portland.

Eastern Waterfront Wayfinding Signage

A wayfinding signage system directing motorists to areas of the Eastern Waterfront and Ocean Gateway will be important to ensure that vehicles are directed to streets that are able to adequately carry additional traffic, and that traffic is not routed through sensitive areas such as residential neighborhoods. Accordingly, the following general wayfinding scheme is proposed:

- All vehicles routed from I-295 north will be signed to the Franklin Street Arterial interchange. Vehicles would be directed to Commercial Street via Franklin Street Arterial.
- All vehicles routed from I-295 south will also be signed to the Franklin Street Arterial interchange.
- Local vehicles originating from inner Washington Avenue will be routed to Congress Street and India Street. Special signing should be considered that discourages use of Mountfort Street (e.g. “Residential Traffic Only”).
- All vehicles originating from the Casco Bay Bridge will be routed to Commercial Street.
- Vehicles originating from Forest Avenue, Congress Street and Washington Avenue outside of I-295 will be routed to I-295 and the Franklin Street Arterial interchange.
- Installation of a Highway Advisory Radio System with appropriate informational signage to guide the motorist to the Eastern Waterfront and Ocean Gateway.

More detailed recommendations on Wayfinding are included in Chapter 9.

Table 6.1
Improvements Required for 2025 Traffic Volumes without Eastern Waterfront Redevelopment

Franklin @ Marginal:

Franklin NB 100' right turn lane
Marginal EB dual LT lanes to I-295
Franklin NB dual LT turn lanes
Marginal 250' EB RT lane onto Franklin
Marginal 150' WB RT lane onto Franklin
Franklin NB addition of 3rd thru lane

Franklin @ Somerset/Fox:

Somerset dual LT lanes onto Franklin
Fox 400' RT lane
Franklin NB & SB 200' RT lanes
3 NB thru lanes

Cumberland @ Franklin:

3 EB approach lanes, two LT lanes, one through lane

Congress @ Franklin:

3 EB approach lanes, two LT lanes, one through lane

Commercial @ Franklin:

Restripe to provide 100' WB LT lane

Park & Commercial Streets:

Place signal

Washington @ Cumberland:

Extend 2 lane approach 150' long (EB)

Commercial Street

Restripe Commercial Street for two-way center left-turn lane from Center Street to Casco Bay Bridge, with dedicated left turn lanes at Park and High Streets

Table 6.2
Improvements Required for 2025 Postdevelopment Traffic Volumes with Eastern Waterfront Development

Franklin @ Marginal:

Franklin NB 100' right turn lane
Marginal EB dual LT lanes to I-295
Franklin NB dual LT turn lanes
Marginal 250' EB RT lane onto Franklin
Marginal 150' WB RT lane onto Franklin
Franklin NB addition of 3rd thru lane

Franklin @ Somerset/Fox:

Somerset dual LT lanes onto Franklin
Fox 400' RT lane
Franklin NB & SB 200' RT lanes
3 NB thru lanes

Cumberland @ Franklin:

3 EB approach lanes, two LT lanes, one through lane

Congress @ Franklin:

3 EB approach lanes, two LT lanes, one through lane

Commercial @ Franklin:

Restripe to Provide 100' WB LT lane
Add exclusive pedestrian phase

Franklin at Middle

Construct 200' SB left turn lane

Park & Commercial Streets:

Place signal

Washington @ Cumberland:

Make 2 lane approach 150' long (EB)

Washington @ Fox:

Construct 50' LT lanes for Washington at Fox and Walnut

Commercial Street

Restripe Commercial Street for two-way center left-turn lane from Center Street to Casco Bay Bridge, with dedicated left turn lanes at Park and High Streets
Extend Commercial Street

India Street at Fore Street

Install traffic signal
Add 50' SB LT lane

India Street at Middle Street

Install traffic signal

Mountfort Street at Fore Street

Stripe for separate 100' SB TH/LT and RT lanes

India Street at Commercial Street

50' SB LT Lane
150' EB LT Lane

Hancock Street

Extension of Hancock Street to Commercial Street Ext.

Mountfort Street

Extension of Mountfort Street to Commercial Street Ext.

Chapter 7
Bayside

The Bayside area bounded by I-295, Forest Avenue, Cumberland Avenue, and the Franklin Street Arterial. It is adjacent to three major corridors used by traffic to enter downtown Portland; the Franklin Street Arterial corridor, Forest Avenue/High/State Street Corridor and Washington Avenue. Franklin Street Arterial has two through lanes in each direction and runs from I-295 to Commercial Street and the Forest Avenue/High/State Street corridor runs from I-295 to the new Casco Bay Bridge. A large percentage of the traffic destined for downtown Portland uses one of these corridors to enter or exit the downtown.

As stated in the introduction and described in the Bayside Vision Plan, the City is actively working to redevelop the Bayside area to include a significant amount of offices, retail, residences and hotels and the Maine DOT is planning to extend AMTRAK through this area adjacent to I-295. This proposed redevelopment is anticipated to result in an increase in traffic entering and exiting the Bayside area. Accordingly, this sub-area was the subject of a great deal of attention during this study.

The Bayside Development Committee developed Transportation Principles as an implementation tool for realizing the Bayside plan. The work of the Bayside Transportation Sub-committee addressed general principles as well as specific critical objectives and was instrumental in developing evaluative criteria for this plan. The principles and objectives are bulleted below and the full text is included in the Appendix.

The Guiding Principles for Transportation Planning in Bayside address the following issues:

- Gateways
- Neighborhood Impacts
- Traffic Management
- Property Access
- Parking
- Streetscape
- Pedestrians/Bicycles
- Transit

The Critical Objectives for Bayside address:

- Forest Avenue/State Street
- Franklin Street Arterial
- Preble Street/Elm Street
- Fox Street/Somerset Street/Kennebec Street
- Marginal Way

AMTRAK

AMTRAK initiated service to the City of Portland in December 2001, and is expected to locate an auxiliary train station adjacent to Marginal Way, with connections to points north in the next several years. The routing of passenger trains through Bayside is an exciting but complicated initiative that was the subject of extensive analysis and negotiations regarding impacts to the local street system. The following narrative describes the State and City process where the initial roadway mitigation strategy suggested by the State was analyzed and reviewed for its impacts to the Bayside area and conformance with the Bayside Vision plan and transportation principles. The results of this process produced a negotiated agreement, *Terms of Agreement between City of Portland & Maine DOT on Bayside/Rail & I-295*, where the needs of all parties were equitably addressed including local mobility, highway safety, train function, and access to private properties.

The AMTRAK train would be traveling between I-295 and Marginal Way with at-grade crossings at Forest Avenue, Preble Street and at Franklin Street Arterial. Currently the train is expected to leave and depart Marginal Way during the AM and PM peak commuter hours. The Federal Highway Administration (FHWA) and the Maine DOT are concerned with the potential for vehicles queuing up the I-295 off ramps and onto I-295, as it would create safety issues for vehicles on I-295 traveling at a high rate of speed. In late 2001 the Maine DOT developed a traffic model using Synchro & Sim-Traffic computer software. The Maine DOT model included I-295, Marginal Way from Franklin to Forest, Franklin at Fox, and Forest at High. The Maine DOT evaluated several different alternatives with their preferred alternative proposing the following changes to the roadway network to accommodate the at grade railroad crossing:

Maine DOT Proposal (Not Accepted by the City)

- Eliminate the east leg of Marginal Way at the intersection of Franklin Street Arterial
- Eliminate the left turn from Franklin onto the remaining leg of Marginal Way
- Eliminate the left turn from Marginal Way onto Franklin/I-295
- Eliminate the left turn from Forest onto Marginal Way
- Eliminate the left turn from Marginal Way onto Forest

The proposed changes above would eliminate the need for traffic signals at the intersections of Franklin/Marginal and Forest/Marginal, resulting in free flow of the through traffic on Franklin Street Arterial and Forest Avenue. These proposed changes reduce the potential for the I-295 ramps to queue onto I-295.

The Maine DOT model used a traffic growth rate of eight percent over a ten year period to analyze the future conditions. In early 2002, Gorrill-Palmer worked with the City to review issues regarding the at-grade railroad crossings and the access to Marginal Way. The work completed included:

Bayside Train Analysis

- The review of the Maine DOT model.
- Expansion of the study area beyond the Maine DOT model to determine if any other improvements may be required to accommodate the train.
- Addition of an aerial photo as background to the model to improve orientation.
- Review other potential alternatives that would preserve access to Marginal Way.

- Review the Maine DOT Alternatives.
- Review possible changes to Maine DOT Alternative.

Analyses and Findings

The Bayside analysis was completed utilizing the 'Synchro' and 'Sim-Traffic' modeling software. The Maine DOT model was expanded to include the intersections of Franklin/Cumberland, Forest/Park, High/Park, and State/Park and an aerial base was added to the model to facilitate its context. A summary of our analysis is presented below for roadways in the vicinity of Bayside in the context of the Maine DOT Agreement.

Franklin Street Arterial

Franklin Street Arterial will play a key role in Portland's transportation network and thus it is important that Franklin Street Arterial allow vehicles to enter and exit the Peninsula without encountering large delays or vehicle queues to ensure the vitality of downtown Portland and to minimize vehicle diversions to local streets and neighborhoods, such as Munjoy Hill. Several alternatives were evaluated as part of this plan in an effort to preserve access to Marginal Way while ensuring that traffic does not queue onto I-295. Gorrill-Palmer Consulting Engineers, Inc. worked with the City and the Bayside Committee and developed alternatives to be evaluated. The Bayside Committee reluctantly accepted the closure of Marginal Way east of its intersection with Franklin Street Arterial and relocation of that section of Marginal Way to tie into Fox Street and ultimately the Fox Street intersection with Franklin Street Arterial. However, they strongly desired to retain left turns from Marginal to I-295, from Franklin to Marginal and from Forest to Marginal. In order to preserve these movements at the intersection of Franklin and Marginal Way, it is necessary to have dual left turn lanes for both left turn movements, thereby increasing the pavement width on Franklin Street Arterial.

Maine DOT Agreement

The City reached an agreement in November 2002 after extensive discussions with the Maine DOT for the trains to pass through the Bayside area adjacent to I-295. The agreement allows the left turn movements referenced above, with the understanding that if vehicles queue up the ramps onto I-295 thirty or more times in one year, then the left turns will be eliminated one at a time. A copy of the Agreement is included in the Appendix to this study and additional highlights of the plan are summarized below:

- The addition of a lane to the I-295 northbound and southbound off-ramps by the Maine DOT.
- Installation of a traffic signal at the Northbound and Southbound off ramps improvements to the intersection of Franklin Street and Marginal Way by the Maine DOT.
- Construction of an additional right-turn lane from Marginal Way to Franklin Street.
- The Maine DOT will initiate a study of I-295 to develop long range traffic management alternatives.
- The Maine DOT will review the hours of operation with the operator to see if changes can be made to minimize impacts to the adjacent street system.
- The Maine DOT will review their traffic movement permit process to limit the scope of roadway work required to minimize impacts from developments.

In order to preserve the left turns as long as possible, it is recommended that variable message signs be employed. Variable message signs could be placed on I-295 prior to the southbound Washington Avenue exit and on Franklin Street Arterial outbound prior to Fox Street to alert people that a train is crossing Franklin Street Arterial. With variable message signs located on I-295 vehicles could use the Washington Street exit to access Franklin Street Arterial via Fox Street and Anderson Street. With variable message signs on I-295 vehicles may choose to use a different route altogether, such as exiting at Congress Street and using the I-295 connector road to access the Peninsula.

Recommendations for Franklin Street Arterial

The improvements necessary to accommodate the forecasted growth and the train are presented in Table 7.1 at the end of this section. Included in the table is the addition of a third through lane in each direction on Franklin Street Arterial between Marginal way and Somerset Street. At the intersection of Forest/Marginal/State the preferred alternative has relocated State Street to the intersection of Forest Avenue and High Street. The relocation of State Street is discussed in the next chapter of the report on the Deering Oaks area. It is important to note that the majority of the improvements in Table 7.1 are required with or without the train passing through the Bayside area. Without the train passing through Bayside it would be possible to reduce storage lengths of selected lanes adjacent to the at-grade crossing; however the number of lanes in Table 7.1 would not be affected.

At the interchanges of Franklin Street Arterial and Forest Avenue the AM peak hour is the critical movement in regards to the train crossing, because of the large number of inbound vehicles. Since the trips model used by PACTS is a PM peak hour model and does not model the AM peak hour it was necessary to interpolate to get the 2025 AM volumes.

Significant vehicle queues occur during the AM and PM peak hours along Franklin Street Arterial today. During the AM peak hour vehicles are queuing from the intersection of Franklin and Marginal up the northbound I-295 ramps. During the PM peak hour queuing occurs on Franklin from Marginal eastward beyond Cumberland Avenue. With the proposed improvements in Table 7.1 there will be locations in 2025 where delay and significant queuing occur, particularly when the train is going through. We estimate that the queues will dissipate within approximately fifteen minutes.

Interchange of Franklin Street Arterial and I-295

An important finding of the analysis was the need to provide additional capacity on I-295. The modeling showed that as traffic grows on the Franklin Street Arterial, the on ramps cannot accommodate the volume of traffic merging onto I-295. Without improved operation, vehicles may seek other routes to reduce the delay which may affect residential neighborhoods. The Maine DOT has agreed to complete a study of the I-295 corridor as part of the Agreement with the City discussed above to address this issue. This study was initiated by the Maine DOT in October of 2003 as part of the I-95 study.

Creation of Single Intersections at Cumberland Avenue and Congress Street

A long-standing concern for Franklin Street Arterial at Cumberland Avenue and Congress Street is the utilization of an intersection for each direction of Franklin Street Arterial. Although this situation has not resulted in excessive delays, spillback, or queuing at one intersection often inteferes with operations at another, increasing delay and resulting in

significant safety concerns. Franklin Arterial at Congress Street, for example, is currently considered a High Crash Location by Maine DOT largely due to this reason.

One solution to this situation would be to consolidate both directions of Franklin Street Arterial at Congress Street and Cumberland Avenue, resulting in a single intersection. The result would be an intersection with improved operations for traffic, and potentially fewer collisions. However, it should noted that this closure would result in wider intersections, creating a more difficult environment for pedestrians coming to or from the Munjoy Hill area. Please refer to Figure 7.9 for this layout.

Grade Separation at Cumberland Avenue and at Congress Street

We recommend a long range objective of grade separating the intersections of Franklin Street Arterial with Cumberland Avenue and Congress Street so through traffic on Franklin Street Arterial would pass underneath these intersections. The traffic flow on Franklin Street Arterial is improved under this alternative possibly eliminating the need for an additional through lane on the Franklin Street Arterial northbound as you approach Congress Street and reducing the number of through and turning lanes that would be required at the intersections of Franklin with Cumberland Avenue and Congress Street. Pedestrian movements along Congress Street and Cumberland Avenue would also be enhanced. The grade separation would involve the construction of travel lanes in the existing grass median areas of Franklin Street Arterial going under Cumberland Avenue and Congress Street. The existing Franklin Street Arterial through lanes would be maintained to provide access to Cumberland Avenue and Congress Street, however the through lanes could be reduced to one lane. The existing intersections at Cumberland Avenue and Congress Street would be maintained to provide access to both streets. Printouts from the SimTraffic model, depicting the intersections with and without grade separation, are included at the end of this chapter. Due to the cost of these improvements, we recommend that grade-separation be viewed as a long-term solution and given less priority than improving Franklin Street Arterial in the vicinity of I-295. Please refer to Figure 7.10 for this concept.

Franklin Street Arterial Summary

In summary, Franklin Street Arterial will play an important role in Portland's transportation network and thus it is important that the Franklin Street Arterial be upgraded to allow vehicles to enter and exit the Peninsula without encountering large delays or vehicle queues to ensure the vitality of downtown Portland and to minimize vehicle diversions to local streets. In particular, concern has been repeatedly expressed by the East End neighborhood that eastern waterfront traffic will divert through the neighborhood. Franklin is the preferred route for high volume usage, and must maintain a sufficient flow capacity to encourage its use rather than distributing traffic through the neighborhood streets. The on ramps will also need to be upgraded to reduce the delay for vehicles entering I-295.

In order to accommodate the traffic growth forecast to occur through 2025, additional through lanes and turning lanes will be required on Franklin Street Arterial. There are Travel Demand Management (TDM) measures that can be taken to attempt to reduce both the existing and future traffic volumes, while allowing the development to occur. These may include:

- Increase transit ridership
- Increase carpooling

- Limit the amount of parking downtown and creation of remote parking area with shuttle service
- Encourage non-peak hour commuting

The City and PACTS intend to consider the potential benefits from these options in the near future.

Somerset Street Extension

At the intersection of Forest Avenue/State Street/Kennebec Street, in order to preserve the left hand turn from Forest Avenue on to Marginal Way, the Kennebec Street traffic would need to be re-directed. We recommend the Kennebec Street leg be eliminated and that Somerset Street be extended to intersect Forest Avenue opposite the current location of High Street. This recommendation is due in part to the need to make the proposed rail corridor work with the Forest Avenue interchange and Marginal Way. An alignment, as well as typical sections have been developed for the extension of Somerset Street, which are included at the end of this chapter. This alignment has also been evaluated in Chapter 8.

Chestnut Street Extension

We recommend the extension of Chestnut Street from Somerset Street to Marginal Way in order to enhance travel options and internal vehicle and pedestrian connections within the Bayside area. This project is ongoing with the writing of this report.

Pedestrian Circulation

We recommend that sidewalks be constructed on both sides of the Franklin Street Arterial to enhance pedestrian safety and connections between streets and neighborhoods. With the proposed improvements to the Franklin Street Arterial corridor and the Forest/High/State Street corridor, pavement width increases, making the pedestrian crosswalks longer and therefore more challenging to cross. We recommend that measures to enhance pedestrian safety such as center islands for pedestrian refuge be considered wherever possible. In addition to sidewalks and improved grade crossings, the City of Portland Planning department is pursuing funding for a pedestrian overpass for each of these corridors. The proposed pedestrian overpasses would be located in the proximity of the Union Branch Rail Corridor, as shown on Figure 7.1 in the Appendix. Similarly, the crossing would be located across Franklin Street Arterial south of Marginal Way along the Union Branch Rail Corridor, as shown in Figure 7.2 in the Appendix. At the signalized intersections there would be concurrent pedestrian phasing (pedestrians cross the side streets while the through street has a green light.) In order to reduce the impacts on the pedestrian environment along these corridors, while providing for development it will be important to reduce the traffic growth via the TDM measures mentioned previously. If the TDM measures are successful in reducing traffic volumes it may postpone the need for the construction of some of the improvements listed in Table 7.1.

Grade separation of Franklin Street Arterial at Cumberland and Congress Streets would eliminate through traffic on Franklin at these intersections. This would reduce the number of lanes at these intersections, resulting in better pedestrian access than if the intersections were not grade separated.

It would be important to develop a pedestrian connection between the Bayside Area and trail system in Deering Oaks. Marginal Way and Somerset Street should be designed with

sidewalks that encourage pedestrian activity. The provision of the grade-separated crossings at Forest Avenue and Franklin Street Arterial will further aid in creating these connections.

Bayside Wayfinding

A wayfinding signage system directing motorist to the Bayside Area of Portland will be important to ensure that vehicles are directed to streets that are able to adequately carry additional traffic, and that traffic is not routed through sensitive areas such as residential neighborhoods. Accordingly, the following general wayfinding scheme is proposed:

- All vehicles routed from I-295 north (with destinations to Bayside east of Franklin Street Arterial) will be signed to the Washington Avenue interchange. Vehicles would then be directed to the Anderson Street ramp.

- All vehicles routed from I-295 north (with destinations to Bayside west of Franklin Street Arterial) will be signed to the Franklin Street Arterial interchange. Vehicles would then be directed to Marginal Way or Somerset Street.

- All vehicles routed from I-295 south (with destinations to Bayside west of Preble Street) will be signed to the Forest Avenue Interchange. Vehicles would be signed to either Marginal Way or the proposed Somerset Street Extension.

- All vehicles routed from I-295 south (with destinations to Bayside east of Preble Street) will be signed to the Franklin Street Arterial interchange. Vehicles would be signed to either Marginal Way or Somerset Street.

- All vehicles originating from Park Avenue will be routed to High Street and to the Somerset Street Extension or Marginal Way.

- Vehicles originating from Forest Avenue will be routed to the Somerset Street Extension or Marginal Way.

- Variable message signs should be installed on I-295 to re-route vehicles destined to Bayside to alternative interchanges when warranted. An example includes times when severe congestion exists on Franklin Street Arterial due to rail crossings. In this case vehicles would be routed to Anderson Street from the north. Anderson Street would have to be signed to facilitate this routing.

The placement of this signage will allow for better use of the existing roadway capacity. More detailed recommendations on Wayfinding are included in Chapter 9.

Table 7.1: Recommended Improvements for Bayside Area

Franklin/Somerset/Fox Somerset Dual lefts onto Franklin Somerset 50' right turn lane onto Franklin Fox 400' right turn lane Separate Left, Right and Thru lanes on Fox Franklin outbound & inbound 200' right turn lane Franklin 275' Left turn pocket onto Somerset Franklin Dual left turn lanes onto Fox	**Franklin Street** Addition of a third lane outbound and inbound from Congress to I-295 **High Street** Addition of a third outbound lane **Forest** Addition of a third lane between Park and Marginal
Franklin/Marginal Franklin outbound 100' right turn lane Franklin outbound addition of a third through lane Franklin inbound addition of a third through lane Dual left turn lanes for outbound Franklin to turn onto Marginal Marginal Eastbound dual left turn lanes onto I-295 Marginal 250' Eastbound right turn lane onto Franklin Relocate Marginal Way (east leg of intersection)	**Intersection of Forest/High** Relocate State Street to High Street Addition of Somerset Street Extension to the intersection **Intersection of Forest/Marginal** Allow left turn from inbound Forest onto Marginal Relocate State Street to High Street Closure of Kennebec Street leg of the intersection **Intersection of Forest/I-295 NB Ramps** Signalize Intersection Additional lane on NB Off Ramp for right turning traffic
Intersection of Forest/State Addition of a westbound 50' left turn pocket **Marginal/Chestnut** Traffic Signal/turn pockets	**Chestnut Street** Extend to Marginal Way Turn pockets at Chestnut/Marginal & Chestnut/Somerset **Somerset/Elm** Turn pockets
Intersection of Franklin/I-295 Signalize NB Off Ramp Intersection Additional lane on NB Off Ramp for right turning traffic Additional lane on SB Off Ramp (full length of ramp) Three lanes inbound from Marginal extend 500 feet up the SB off ramp	**Construction of Somerset Street Extension to Forest Avenue**

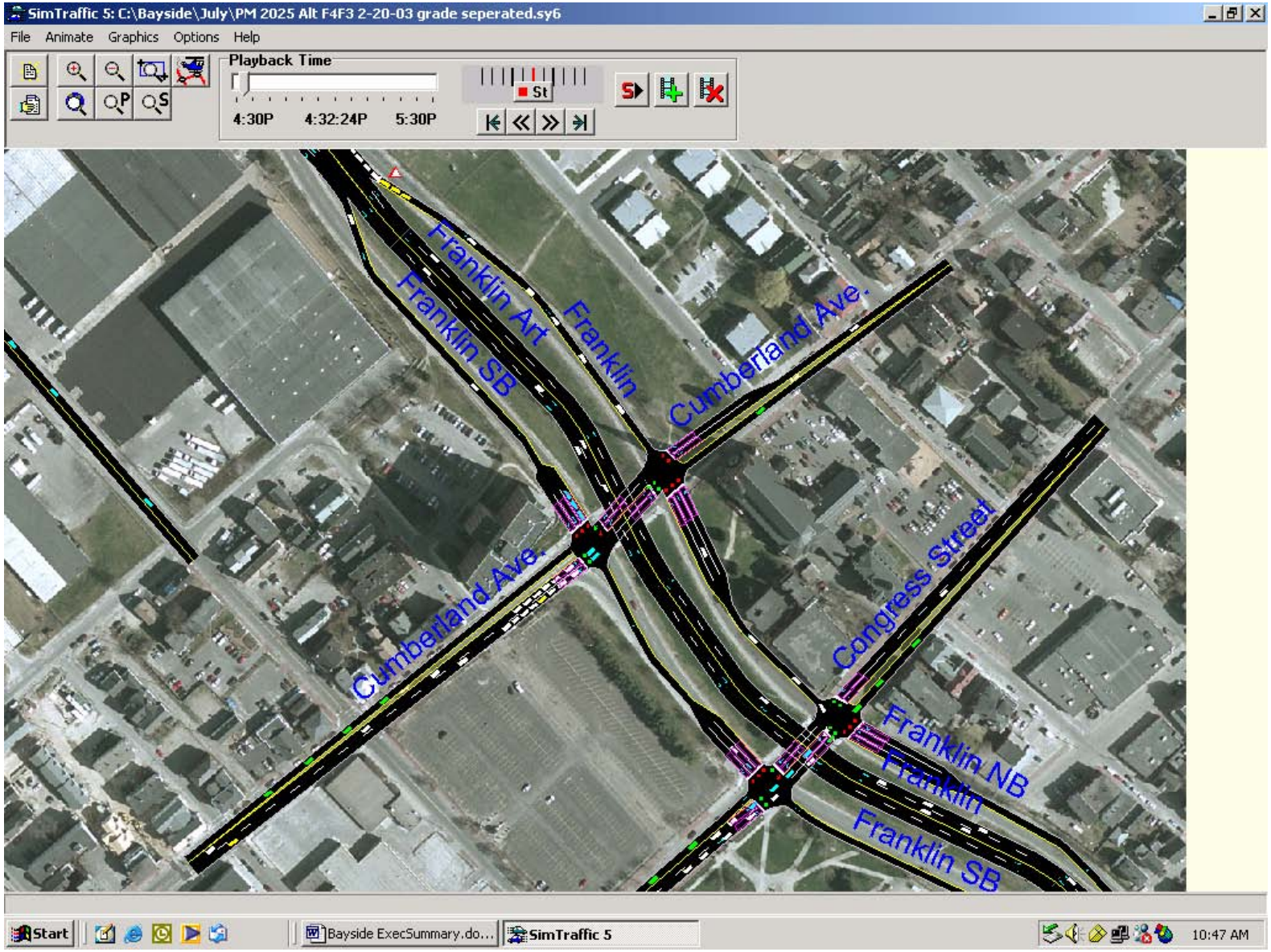


Figure 7.12: 2025 Grade Separated

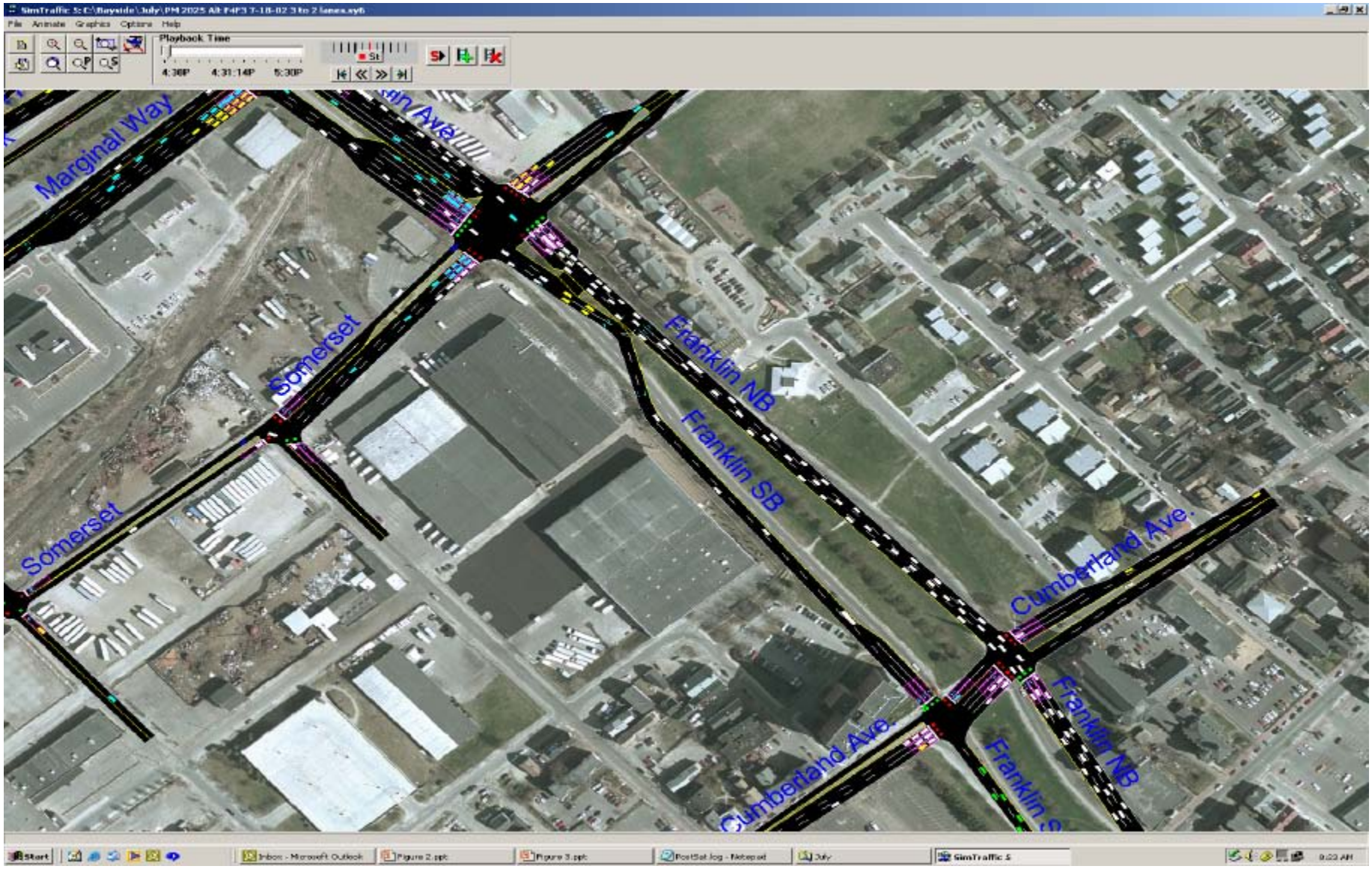


Figure 7.13: 2025 Not Grade Separated

Order 96-02/03
Tab 12 11-4-02

KAREN A. GERAGHTY (MAYOR) (2)
PETER E. O'DONNELL (1)
NATHAN H. SMITH (3)
CHERYL A. LEEMAN (4)
JAY M. HIBBARD (5)

CITY OF PORTLAND
IN THE CITY COUNCIL

JAMES F. CLOUTIER (A/L)
PHILIP J. DAWSON (A/L)
JILL C. DUSON (A/L)
NICHOLAS M. MAVODONES (A/L)

ORDER APPROVING TERMS OF AGREEMENT BETWEEN CITY OF PORTLAND AND MDOT RE: BAYSIDE/RAIL & I-95 INTERCHANGES AT FRANKLIN STREET ARTERIAL AND FOREST AVE.

ORDERED, that the terms of the agreements between the City of Portland and the Maine Department of Transportation re: the Bayside/Rail and I-95 interchanges at Franklin Street Arterial and Forest Avenue are hereby approved as stated in Attachment 1 hereto, and

BE IT FURTHER ORDERED, that the City Manager is authorized to sign the document containing these terms of agreement and any other document or documents necessary to implement the terms.

BAYSIDE RAIL/TRAFFIC CORRIDOR AGREEMENT

A. The MDOT will allow the left-turn movement from eastbound Marginal Way to I-295 and the left-turn movement from northbound Franklin St. Arterial to Marginal Way until conditions on I-295 mainline and its ramps are adversely impacted by operating conditions at the marginal Way/Franklin St. Arterial intersection. "Adverse conditions" are defined as when vehicle queues on one/both off-ramps back to the gore area of the Interstate mainline 30 times or more in any one year. Off-ramp queues caused by normal traffic flow conditions will be measured and monitored by sensors imbedded in the off-ramp lanes. The City/MDOT will jointly monitor conditions, so that the City can plan, consider and possibly implement local solutions that avoid/delay elimination of the left turn movements. The MDOT will first remove the left-turn movement from eastbound Marginal Way to I-295 to reduce the backup of traffic beyond the off-ramp/mainline gore area. If the off-ramp queues continue to extend beyond the gore areas under typical traffic flow conditions for 30 or more occurrences, then the northbound Franklin St. Arterial to Marginal Way left-turn movement will also be eliminated. The traffic signals at Marginal/Franklin and the I-295 ramps intersection will be programmed using the sensor information to reduce the potential for these backups to occur.

B. The City of Portland will be responsible for the entire construction cost of the dual left-turn lanes from Franklin St. Arterial onto Marginal Way. The MDOT will support the City's use of FHWA funding as approved and authorized by the local MPO (PACTS).

C. The MDOT will initially allow the existing left-turn movement from Forest Avenue onto Marginal Way. If increased traffic flow on Forest Avenue or on I-295 causes the off-ramps to queue back to the mainline gore areas 30 or more times in any one year, requiring a modification to the Forest Avenue interchange area and elimination of the left-turn movement is considered necessary, then the MDOT shall consider and review all feasible alternatives with the City prior to actual elimination of the movement. Off-ramp queues caused by normal traffic flow conditions will be measured and monitored by sensors imbedded in the off-ramp lanes.

D. Funding of improvements necessitated by the train movement will be financed by the MDOT. Improvements necessary to respond to normal traffic growth will require a 10% local share, consistent with existing project cost-share policy.

E. MDOT will initiate a study in 2003 of long-range traffic management alternatives along the I-295 corridor. Alternatives to be studied will include, at a minimum, proposed improvements to the Maine Turnpike, interchange reconfigurations, treatment of high collision locations, new auxiliary and through travel lanes, ITS and other viable options. Some of these alternatives have already been examined in a previous study prepared for the Maine Legislature, and further studied by the PACTS Regional Transportation Study. The MDOT has included funding in its FY2000-2001 BTIP for this purpose.

F. MDOT agrees to review, with the operator of the passenger-rail service through Portland's Bayside district, hours of operation for the train in an attempt to minimize the I-295/local street network traffic impacts.

Terms of Agreement between City of Portland & MDOT on Bayside/Rail & I-295

1) **I-295 Franklin St. Arterial Interchange**

a. Construction of 2nd lane on NB off-ramp for full length of ramp, and construction of a third lane at some point down the ramp and extending to the intersection of the SB off-ramp.

b. Construction of a second lane on the SB off-ramp for the full length of the ramp, and construction of a third lane from the point of tangency of the ramp and extending to the intersection of the NB off-ramp. Then the combined ramps will become a 4-lane approach to the intersection of Marginal Way.

c. Installation of a traffic signal at the intersection of the NB and SB off-ramps.

d. Modification of the traffic signal at the intersection of Franklin Arterial and Marginal Way, to ensure compatibility with other signal and intersection improvements.

e. Complete an auxiliary lane on I-295 SB from its present terminus at Washington Street underpass to the southbound off-ramp.

f. Elimination of the north leg of Marginal Way at Franklin St. Arterial.

g. Improvements at the Fox St./Somerset St./Franklin St. Arterial intersection that may be required as a result of the elimination of the north leg of Marginal Way at Franklin St. Arterial, to include construction of a connector road from Marginal Way to Fox St. The design of the connector road will insure continuation of adequate access to all properties between Franklin Street Arterial and the northerly end of Marginal Way. All improvements to be constructed using normal traffic growth projections for the next 20 years. Pedestrians and bicycle crossings will be considered in the intersection design improvements.

h. Construction of an additional right-turn lane from Marginal Way to Franklin St. Arterial.

2) **I-295 Forest Avenue Interchange**

a. Consider alterations in lane configurations on Forest Avenue to address: traffic weaving, safety, capacity and pedestrian and bicycle crossing issues.

3) **Other Intersections**

a. Other locations not included in the above, which are directly affected by the rail corridor, will be studied, evaluated, and improved as necessary.

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION
16 STATE HOUSE STATION
AUGUSTA, MAINE
04333-0016

ANGUS S. KING, JR.
GOVERNOR

JOHN G. MELROSE
COMMISSIONER

October 16, 2002

Mr. Joseph Gray
City Manager
City Hall, 389 Congress St.
Portland, ME. 04101-3503

Dear Mr. Gray:

Enclosed please find a document entitled Terms of Agreement between the City of Portland and MDOT for Bayside/I-295 Traffic Improvements and Regulations.

This document, which was developed through a joint effort of City of Portland and MDOT staff, represents the key elements related to train service, traffic impacts, and Bayside development in the City. It is not intended to be all inclusive or conclusive in terms of what will ultimately be the final product for rail, highway, or development in the greater Bayside area. Rather it will act as the framework by which analysis, response, and actions will be guided once train service arrives.

I would be pleased to discuss the various elements contained in this document, at your convenience. Please review it with your administrative staff and if you concur you may sign it and return it for my concurrence and adoption.

As always, the Maine Department of Transportation remains dedicated to the full implementation of rail service to all of Portland and the mid-coast. Similarly, we know the importance of the Bayside district as a developable property in the City. We feel that this document establishes the ground work for making both of those goals a reality, and we look forward to working with you to see that they are attained.

Sincerely,

John G. Melrose
Commissioner

JGM/BAI/kh

CC: Bruce Ibarguen, State Traffic Engineer 624 3650
Bill Bray
John Dority, Chief Engineer
Carl Croce, Bureau of Planning
Jane Lincoln, Deputy Commissioner

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION
16 STATE HOUSE STATION
AUGUSTA, MAINE
04333-0016

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ANGUS S. KING, JR.
GOVERNOR

JOHN G. MELROSE
COMMISSIONER

File

November 20, 2002

Joseph E. Gray, Jr.
City Manager
389 Congress Street
Portland, ME. 04101

Dear Joe:

I have enclosed a copy of the document entitled Terms of Agreement between City of Portland & MDOT on Bayside/ Rail & I-295, which John Melrose signed on November 7, 2002. As you know this agreement contains guidelines on certain City of Portland and Department of Transportation actions related to the insertion of rail service along the I-295 corridor and development in the Bayside area. We agree that all of the effort which went toward creation of this document was a very positive experience, in that it simply states the basic tenets for future growth in this vitally important region to the City and to the State of Maine.

As Acting Commissioner, I too want to thank you and your staff for the many hours spent on developing the document language. The Department is pleased to be able to work with you on this important matter and we look forward to seeing the plan become a reality.

Sincerely,

Jane Lincoln
Acting Commissioner

BAI/JL/kh

CC: John Dority, Chief Engineer
Carl Croce, Planning
Russ Spinney, Multimodel
Bruce Ibarguen, State Traffic Engineer

G. MDOT agrees to undertake a comprehensive review of the site law and the Traffic Movement Permit process as it relates to development projects in an "urban core" area. The study will examine level of service criteria, safety, cost sharing arrangements for off-site traffic improvements, local parking requirements, flexible work shifts, alternative modes of transportation, etc. Within the discretionary authority allowed MDOT and the City, the recommendations of the study will become the framework used by the City, which has local delegated review authority, and the MDOT for administering all site law development projects. Until the study is complete and changes to the site law have been promulgated by MDOT, development projects will be reviewed in a cooperative manner by MDOT with an emphasis to limit the scope of work a developer would have to do to mitigate impacts.

MDOT, however, will retain the authority to sustain the capacity of the interstate system, and will evaluate each development's traffic impact to determine proper mitigation actions should vehicle queues affect mainline traffic flow.

John G. Melrose, Commissioner
11/7/02

Joseph E. Gray, Jr., City Manager

APPROVED BY
~~AWARDED BY~~
~~CONCURRED~~
~~NOTED~~
DEPUTY
COMMISSIONER OF
TRANSPORTATION
11/13/02
DATE

Chapter 8
Deering Oaks

The 1994 Deering Oaks Master Plan identifies many actions to improve and preserve the park, including one recommendation to "knit" together the areas of the park that are separated by State Street and High Street in order to make the area safer and more accessible for pedestrians. The City of Portland undertook a study of High and State Streets in the vicinity of the Deering Oaks with Wilbur Smith Associates in 1999 with the goal of identifying alternatives to reduce the impact of these streets on the Park. The outcome of the study included several alternatives, but the City realized that to properly assess their feasibility, the analysis needed to be viewed in the larger context of the Peninsula which was one of the reasons this study was undertaken. This analysis included the evaluation of several alternative strategies to improve the Deering Oaks environment in the area along State Street between Forest Avenue and Park Avenue. Specifically, the evaluation looked at the feasibility of realigning State Street between Forest Avenue and Park Avenue in order to enhance and improve Deering Oaks and its surroundings.

State and High Streets – This included the evaluation of converting both State and High Streets from their current one-way flow to two-way flow. Two scenarios were reviewed including:

- Full two-way conversion of both State and High Streets between Park Avenue and York Street.
- Partial two-way conversion, which comprises two-way flow on both State and High Streets with the exception of the segment between Danforth Street and York Street where the current one-way flow pattern would remain.

Deering Oaks Area – The evaluation looked at the feasibility of realigning State Street between Forest Avenue and Park Avenue in order to enhance and improve Deering Oaks and its surroundings.

Evaluation Criteria

Early in the study process a set of alternative evaluation criteria was established to help guide the development of alternatives as of the follows:

- Reunite portions of the park now divided by a high-speed traffic corridor.
- Retain traffic mobility.
- Reduce neighborhood impact.
- Reduce speed and improve safety along the park roads.
- Retain/enhance parking lot access.
- Minimize tree impacts.
- Minimize "Rose Circle" impacts.
- Minimize statuary impacts.
- Retain park "Gateway" to the City for vehicles.
- Re-establish/enhance the historic park entrance and historic park character.

The alternatives are summarized in a matrix table on the following page:

Peninsula Traffic Study
Deering Oaks Circulation Alternatives Evaluative Matrix

Review Criteria	Alternatives for Evaluation				
	A "Calmed" State Street	**B-2 Realigned State Street with Park Ave entrance to Deering Oaks**	**S-2 Major boulevards at Forest Ave and Park Ave**	**S-3 Major boulevards at Forest Ave and Park Ave**	**Partial Two-way on State and High Street**
Reunite portions of the park now divided by high-speed traffic corridors.	No, retains divided park	Yes, but other portions divided near Park Ave	Maximum gains	Maximum gains	No impact - Depends on Alternative
Retain traffic mobility.	Status quo	Status quo	Diminished mobility (may be improved with diversion to I-295 Connector)	Diminished mobility (May be improved with diversion to I-295 Connector)	Diminished Vehicle mobility, better ped. To be evaluated with **S-1**
Reduce neighborhood impact.	Status quo	Status quo	Status quo. Pedestrian impacts at Forest and Park.	Status quo. Pedestrian impacts at Forest and Park.	Improved (some on-street parking impacts)
Speed and safety along park roads.	Somewhat, slower traffic	Somewhat, slower traffic	Greatly improved w/in park. High speeds moved to park perimeter	Greatly improved w/in park. High speeds moved to park perimeter	No impact
Retention/enhancement of parking lot access.	Reduced (w/out left turns from Forest) access	Improved Park Ave access	Improved Park Ave access	Recreates Historic Entance	Depends on Alternative
Tree impacts.	None	Yes, near Park Ave	Minor	Minor	Depends on Alternative
Rose circle impacts.	Improved marginally	Improved, to the west, worsened to the east	Greatly improved	Greatly improved	Depends on Alternative
Statuary impacts.	None	Move easterly gate pillar	None	State Street Statues no longer used for vehicle entrance	Depends on Alternative
Retention of a park "Gateway" to the City.	Retained	Somewhat diminished	Somewhat diminished	Somewhat diminished	Depends on Alternative
Retention/enhancement of the historic park entrance and Park character	No change	Park entrance significantly diminished	improved	Greatly improved	Depends on Alternative

Analyses and Findings

The traffic analyses utilized the 'Synchro' and 'Sim-Traffic' modeling software. The results for the two tasks are summarized below.

Deering Oaks

Four alternatives have been evaluated and their summaries are presented in this document as noted below. Figures 8.1 through 8.5 illustrate the alternatives which are located in the Appendix.

Alternative "A" – Traffic Calming Improvements on State Street

Major Features:

- Implementation of Traffic Calming Strategies on State Street between Forest Avenue and Park Avenue.
- Installation of a Traffic Signal at Park Entrance on State Street.
- Allowing the through movement from Marginal Way westbound to State Street. However, if this movement is allowed, the left turn from Forest Avenue onto Marginal Way will need to be prohibited since both movements cannot occur without backing up traffic onto I-295 when a train passes.

Alternative "B2" – Realigned State Street

Major Features:

- Existing State Street segment between Forest Avenue and Park Avenue closed to through traffic.
- Construction of a new southbound roadway adjacent to High Street connecting to the Park Avenue/State Street intersection.
- Creation of a Deering Oaks Entrance on Park Avenue opposite State Street.
- Access to Deering Oaks from Forest Avenue restricted to southbound right only.

Alternative "S-1" – Major Boulevard Concept

Major features:

- Existing State Street segment between Forest Avenue and Park Avenue closed to through traffic.
- Creation of a new road combining Forest Avenue and High Street between Park Avenue and Kennebec Street.
- Creation of a Deering Oaks entrance at the Park Avenue and State Street intersection.
- Restricting movements at the Park Avenue/Forest Avenue intersection

- State Street and High Street remain in their current one-way condition

Alternative "S-2" – Major Boulevard Concept with Two-Way State and High Streets

Major features:

- Existing State Street segment between Forest Avenue and Park Avenue closed to through traffic.
- Creation of a new road combining Forest Avenue and High Street between Park Avenue and Kennebec Street.
- Creation of a Deering Oaks entrance at the Park Avenue and State Street intersection.
- Restricting movements at the Park Avenue/Forest Avenue intersection
- Converting State Street and High Street to Two-Way flow between Park Avenue and York Street
- Prohibiting left-turn movements on westbound Park Avenue at High Street
- Prohibiting left-turn movements on northbound High Street at Park Avenue
- High Street is widened to five lanes north of Park Avenue.

Alternative "S-3" – Major Boulevard Concept with Two-Way State and High Streets and Deering Oaks Access via Somerset Street Extension Location

This option is very similar to Alternative "S-2" with the exception of relocating the primary access/egress drive for Deering Oaks from Park Avenue opposite State Street to Forest Avenue opposite the future Somerset Street Extension. There is some information that suggests that there was once an entrance in this vicinity. In general this Alternative changes traffic flow at two locations when compared to Alternative "S-2", the Park Avenue/State Street and Forest Avenue/Somerset Street Extension intersections. At both locations, acceptable traffic conditions will be provided. Any consideration of this alternative would need to be assessed for conformance by the Secretary of the Interior's standards for alternation to historic landscapes.

Major features:

- Existing State Street segment between Forest Avenue and Park Avenue closed to through traffic.
- Creation of a new road combining Forest Avenue and High Street between Park Avenue and Kennebec Street.
- Creation of a Deering Oaks entrance at the Forest Avenue/Somerset Street Extension intersection.
- Restricting movements at the Park Avenue/Forest Avenue intersection.
- Converting State Street and High Street to Two-Way flow between Park Avenue and York Street.
- Prohibiting left-turn movements on westbound Park Avenue at High Street

- Prohibiting left-turn movements on northbound High Street at Park Avenue
- High Street is widened to five lanes north of Park Avenue.

Recommendation

It is recommended that the S-2 alternative be considered for implementation because it meets many of the previously evaluation criteria. However, it should be noted that while S-2 is superior from an overall criteria perspective, poor traffic flow is still identified as a concern.

State and High Streets

During the study process and evaluation of traffic mobility on the Peninsula, there was an interest by the Study Committee to evaluate the implication of converting both State and High Streets from its current one-way configuration to two-way flow. In 1972 State and High Streets were converted from two-way to one way for the following reasons: 1) during winter months with snow, parking became problematic and initiated discussion on prohibiting parking along both streets; 2) traffic congestion was problematic at some intersections under two-way flow; 3) increase overall roadway capacity; and 4) truck deliveries was problematic.

Four alternatives were evaluated for State and High Street, which are summarized below. Figures 5 through 8 illustrate the alternatives, which are located at the end of this chapter.

Full Two-Way State and High Streets

Major Features:

- Conversion of State Street between Park Avenue and York Street to a two-way street.
- Conversion of High Street between Park Avenue and York Street to a two-way street.
- Implementation of Alternative B2.

Alternative Pros:

- Improved accessibility.

Alternative Cons:

- Poor traffic operations at several intersections.
- Loss of on-street parking.
- Geometric constraints at the Congress Street/State Street intersection.

Part Two-Way State and High Streets

Major Features:

- Conversion of State Street between Park Avenue and Danforth Street to a two-way street.

- Conversion of High Street between Park Avenue and Danforth Street to a two-way street.
- Implementation of Alternative B2.

Alternative Pros:

- Improved accessibility.

Alternative Cons:

- Poor traffic operations at several intersections.
- Loss of on-street parking.
- Geometric constraints.

Full Two-Way State and High Streets with Deering Oaks Alternative S-2

Major Features:

- Conversion of State Street between Park Avenue and York Street to a two-way street.
- Conversion of High Street between Park Avenue and York Street to a two-way street.
- Restricting movements from Forest Avenue at Park Avenue to right turns.
- Restricting movements from the Casco Bay Bridge at State Street to through only.
- Providing two WB York Street approach lanes at State Street
- Implementation of Alternative S-2.

Alternative Pros:

- Improved accessibility.

Alternative Cons:

- Poor traffic operations at several intersections on High Street.
- Loss of on-street parking.
- Geometric constraints at the Congress Street/State Street intersection.

Full Two-Way State and High Streets with Deering Oaks Alternative S-2 and Peak Period Four Lane High Street

Major Features:

- Conversion of State Street between Park Avenue and York Street to a two-way street.
- Conversion of High Street between Park Avenue and York Street to a two-way street.
- Restricting movements from Forest Avenue at Park Avenue to right turns.

- Restricting movements from the Casco Bay Bridge at State Street to through only.
- Implementation of Alternative S-2.
- Prohibiting parking on High Street between Park Avenue and York Street during peak periods and providing two travel lanes in each direction
- Prohibiting left turns from High Street onto Congress Street
- Providing two approach travel lanes on westbound York Street at High Street.
- Providing two WB York Street approach lanes at State Street

Alternative Pros:

- Improved accessibility.

Alternative Cons:

- Loss of on-street parking.
- Geometric constraints at the Congress Street/State Street intersection.

Traffic Operations

The following tables summarize the results of capacity analyses conducted during the future 2025 PM peak hour condition for the four alternatives noted, a No-Build option (no roadway changes), and for existing volume conditions assuming Alternative S-2 is implemented. Intersection operations were based upon procedures contained in the 2000 Highway Capacity Manual, Transportation Research Board. The standard used to evaluate traffic operating conditions of the transportation system is referred to as the Level of Service (LOS). This is a qualitative assessment of the quantitative effect of factors such as speed, volume of traffic, geometric features, traffic interruptions, delays, and freedom to maneuver. Six levels of service are defined in the Highway Capacity Manual. They are given letter designations ranging from LOS A to LOS F, with LOS A representing the best operating condition and LOS F the worst. The general standard for level of service is that "D" or better be obtained. However, in an urban environment where constraints exist perhaps due to buildings parks or other urban features, acceptance of lower levels of service may be appropriate.

Table 8.1: State Street Intersections
PM Level of Service and Delay

INTERSECTION	2025 NO-BUILD	2025 FULL TWO-WAY	2025 PART TWO-WAY	2025 ALT. S-2	2025 ALT. S-3
State @ Park	C(25)	E(60)	E(58)	C(22)	C(20)
State @ Cumberland	A(9)	B(16)	B(15)	C(21)	C(21)
State @ Congress	B(15)	D*(48)	D*(47)	C(32)	C(32)
State @ Spring	B(18)	D*(49)	D*(55)	C(26)	C(26)
State @ Danforth	B(14)	C(24)	C(27)	C(33)	C(33)
State @ York	F (88)	F (189)	F (88)	D(42)	D(42)

X – level of service
(xx) – delay in seconds
* Some movements with LOS of E or F

Table 8.2: High Street Intersections
PM Level of Service and Delay

INTERSECTION	2025 NO-BUILD	2025 FULL TWO-WAY	2025 PART TWO-WAY	2025 ALT. S-2	2025 ALT. S-3
High @ Park	C(27)	D(42)	D(44)	D*(36)	D*(36)
High @ Cumberland	B(12)	C(21)	C(20)	D(43)	D(43)
High @ Congress	E(79)	F(103)	F(104)	C(26)	C(26)
High @ Spring	C(27)	C*(35)	C*(30)	C(29)	C(29)
High @ Danforth	B(15)	B(11)	D*(50)	C(26)	C(26)
High @ York	C(19)	D*(41)	C*(21)	C*(24)	C*(24)

X – level of service
(xx) – delay in seconds
* Some movements with LOS of E or F
As noted in the previous tables several locations are anticipated to experience greater congestion and some intersection levels of service will deteriorate to poor levels of service (LOS E or F).

On-Street Parking Impacts

A qualitative evaluation of parking impacts associated with the conversion of State and High Streets to two-way circulation was conducted. The evaluation was based upon current parking restrictions, projected vehicle queues, turn lane needs at intersections under future traffic volumes, and implementation of Alternative S-2. It should be noted that reduced parking impacts are likely under a short-term traffic volume condition where requirement for turn lanes are lessened. The following summarizes the results on each street between Park Avenue and York Street.

High Street

- High Street between Park Avenue and Cumberland Avenue – Under the Alternative S-2 concept, High Street will need to provide five lanes of traffic (three northbound approach lanes at Park Avenue and two departing lanes) to attain the best possible level of service at the Park Street/High Street intersection. Accordingly, all on-street parking (three spaces eliminated on the east side of High Street) will be prohibited between Park Avenue and Grant Street. North of Cumberland Avenue, five spaces (from either side) will be eliminated due to the need for a left-turn lane to accommodate 74 PM peak hour left-turning vehicles onto eastbound Cumberland Avenue. **[8 lost Parking Spaces]**
- High Street between Cumberland Avenue and Congress Street – High Street north of Congress Street is 33 feet wide. Three-lanes on High Street approaching Congress Street will be necessary to accommodate the left-turning volume (103 PM peak hour vehicles) onto eastbound Congress Street. Two approach lanes and one departing lane. Parking (seven spaces) will need to be eliminated on the west side of High Street near Congress Street. It should be noted that some widening of the curb line may be necessary to accommodate maneuvers for large vehicles. **[7 Lost Parking Spaces**]
- High Street between Congress Street and Spring Street – High Street is 47 feet wide north of Spring Street. Three-lanes on High Street approaching Spring Street will be necessary to accommodate the left-turning volume (36 PM peak hour vehicles) onto eastbound Spring Street. Two approach lanes and one departing lane. Parking (six spaces) will need to be eliminated on the east side of High Street near Spring Street. **[6 Lost Spaces]**

- High Street between Spring Street and Danforth Street – High Street is approximately 40 feet wide near Danforth Street. Three-lanes on High Street approaching Danforth Street will be necessary to accommodate the left-turning volume (64 PM peak hour vehicles) onto eastbound Spring Street. Two approach lanes and one departing lane. Parking (five spaces) will need to be eliminated on the east or west side of High Street near Danforth Street. Danforth Street is approximately 39 feet wide and 10 parking spaces may be lost on the south side of Danforth Street on both east and west of High Street due to the provision left-turn lanes. The Danforth parking reduction is not included **[5 Lost Spaces]**
- High Street between Danforth Street and York Street – High Street is approximately 40 feet wide. With the need to provide four travel lanes near York Street, a loss of 10 spaces is likely. The provision of four lanes is necessary to accommodate the two lanes turning from York Street northerly up the hill toward Danforth Street and the need to provide two approach lanes on southbound High Street at York Street. Six spaces would be lost from the east side and four spaces from the west side. **[10 Lost Spaces]**

Total Lost Parking Spaces on High Street = 36+/- Parking Spaces

Total Parking Spaces Provided on High Street = 113 Parking Spaces

Percent Reduction in On-Street Parking = 32%

State Street

- State Street between Park Avenue and Cumberland Avenue – State Street between Park Avenue and Grant Street is 40 feet wide and State Street will need to provide three lanes of traffic (two northbound approach lanes at Park Avenue and one departing lane) to attain the best possible level of service at the Park Street/State Street intersection. Accordingly, all on-street parking (8 spaces eliminated) on the east side of State Street will be prohibited between Park Avenue and Grant Street. **[8 lost Parking Spaces**]
- State Street between Cumberland Avenue and Congress Street – If a left-turn lane is not provided at Cumberland Avenue in the northbound direction no parking loss. **[0 lost Parking Spaces]**
- State Street between Congress Street and Spring Street – Due to the need for intersection improvements at Congress Street (provision of two northbound approach lanes at the Congress Street/State Street intersection) three parking spaces will be eliminated. **[3 Lost Spaces]**
- State Street between Spring Street and Danforth Street – State Street is approximately 42 feet wide. It is assumed that left-turn lanes on both northbound and southbound State Street are required resulting in a loss of three parking spaces on either side. Danforth Street west of State Street is approximately 40 feet wide. Assuming prohibiting parking on one side to allow for a left-turn lane, 8 parking spaces will be lost. The Danforth reduction is not included **[3 Lost Spaces]**
- State Street between Danforth Street and York Street – **[0 Lost Spaces]**

Total Lost Parking Spaces on State Street = 14 +/- Parking Spaces

Total Parking Spaces Provided on State Street = 136 Parking Spaces

Percent Reduction in On-Street Parking = 10%

Impacts at Congress Square and Longfellow Square

Longfellow Square

A conceptual design was prepared to quantify the impacts of converting State Street to two-way flow. Based upon the preliminary evaluation, conversion of State Street to two-way flow is feasible. The following should be noted:

- The right-turn channelization island from Congress Street to southbound State Street is being eliminated.
- Some parking would need to be prohibited on State Street near Pine Street.
- The corner near the Longfellow Monument would need to be modified, but impacts to the monument are not anticipated.
- On State Street north of Congress Street some parking impacts are expected, but no loss is anticipated, only a shifting from the east curb to the west curb.

Congress Square

A conceptual design was prepared to quantify the impacts of converting High Street to two-way flow. Based upon the preliminary evaluation, conversion of High Street to two-way flow is feasible. The following should be noted.

- Minor widening on High Street north of Congress Street will be required. It may be possible to avoid minor widening if turn restrictions are implemented.
- Corner curbing will need to be enlarged.
- Some existing parking spaces will need to be eliminated on High Street.

Deering Oaks Recommendations

The primary objectives of the analyses in this chapter were to determine the best approaches to reconnect Deering Oaks and recapture State and High Streets as integrated elements of the City of Portland. The analyses of the various options to realign State and High around Deering Oaks and to implement two-way operation show that the aesthetic and community gains of these actions would result in degraded traffic operations at several City intersections.

Given the potential cost in dollars, loss of parking, motorist delay, and congestion in the City, a stepped approach to achieving the desired goals is recommended. As has been discussed in other areas of this report, the I-295 connector to Commercial Street/Casco Bay Bridge is currently under construction. When that project is complete, a viable alternative to the State/High one-way pair will be in place. As indicated in Table 4 of Chapter 4, there is a pool of 924 AM and 969 PM peak hour trips that could potentially divert to the new connector. This could significantly reduce traffic flow along the State/High one-way pair. Therefore, it would be advisable to allow traffic patterns to stabilize once this new route becomes available to see if there is significant volume reduction. An interim step if volumes have not dropped after the traffic patterns stabilize would be to consider disrupting the progression along State and High to discourage their use by through traffic, thereby maximizing diversion to the I-295 connector.

The major objective in undertaking the analysis of traffic flow through the Deering Oaks area was to determine if there was a feasible alternative to improve conditions in the Park. This was a difficult assignment given the heavy traffic volumes and desired travel patterns in the area and therefore resulted in evaluation of a considerable number of alternatives, many of which have not been discussed here due to inherent flaws. The majority of the alternatives failed after evaluation except for alternatives S-2 and S-3. These alternatives are feasible but compromise mobility to a certain extent in favor of other policy objectives which raises a number of policy issue which need to be considered by the City in determining a course of action:

- What is level of delay to motorists is appropriate in this area? Traditionally, the City has required a level of service no less that a “D” at signalized intersections.
- Is the City willing to implement these improvements if they will reduce the level of service?
- Would the project be eligible for PACTS and or the MAINE DOT cost sharing if the level of service is not enhanced?
- Would the MAINE DOT allow alternative S-2 or S-3 even if they were not funding the project? Their approval would be required since State and High Streets are designated as State Route 77.

These policy issues are critical to advancing traffic mobility in the City. Other objectives like maintaining its natural infrastructure and promoting neighborhood quality of life and stability. The City should enter into high level talks with MDOT to explore these issues.

For any of the improvement strategies, it is recommended that landscaping be a key consideration in the design process. Traffic islands should be landscaped and roadway should have a high level of streetscape incorporated.

Chapter 9
Wayfinding

A wayfinding signage system directing motorists to areas on the Portland Peninsula will be important to ensure that vehicles are directed to streets that are able to adequately carry additional traffic, and that traffic is not routed through sensitive areas such as residential neighborhoods. A general recommendation on directing motorists from I-295 to and across the Peninsula as well as to destinations on the Peninsula was conducted. This work is also consistent and builds upon many of the recommendations contained in the Portland Downtown Traffic and Streetscape Study. A summary of the results is noted below.

I-295 Wayfinding

Figure 9.1 illustrates the existing signage along I-295. Recommendations include the following:

- Install a "variable message" sign north of Tukey's Bridge that will inform motorists of possible congestion in the Franklin Street Arterial/Forest Avenue area with directions for alternative routes via the Anderson Street ramp.
- Install a "variable message" sign south of Exit 4 (Veteran's Bridge) that will inform motorists of possible congestion in the Franklin Street Arterial/Forest Avenue area with directions to Veteran's Bridge or Congress Street.
- Direct motorists originating from the north, destined to the Casco Bay Bridge, to utilize Exit 5A and the I-295 Connector and Commercial Street.
- Direct motorists originating from I-295 (north and south) destined to the International Ferry (Ocean Gateway) to Exit 7 Franklin Street Arterial.
- Provide signage directing motorists from I-295 south to the Casco Bay Bridge to Exit 4 Veteran's Bridge.
- Exits signs on I-295 should be supplemented with directions to Downtown Portland. For example at Forest Avenue a supplemental message indicating "Downtown Portland" would be added to Exit 6A (figure ST.1, sign type D2).
- Incorporate "district identification" text and graphics onto signage at exits leading to the downtown area (sign type D1+)

Peninsula/Local Wayfinding

Figure 9.3 illustrates existing wayfinding signs on the Peninsula. The signs provide direction to destinations such as:

- Civic Center
- Old Port
- Downtown Arts District
- Waterfront
- Visitor Information Center
- Hospitals
- Public Market
- India Street Shopping District
- Historic Districts
- Casco Bay Ferry
- Marginal Way
- Eastern Promenade
- International Ferry

Recommendations – (with I-295 Connector)

Congress Street Signage

Note: The 1999 *Portland Downtown Traffic and Streetscape Study* recommends replacing all existing "city directional" signs with new signs that have a simplified typography and high "message to background contrast" (making destinations easier to read). The study also recommends using a single arrow for each direction grouped with other destinations in the same direction (rather than using an individual directional arrow for each individual destination).

Congress Street: Maintain sign as noted on Figure 9.2, but install a new sign (type D3) on Congress Street west of I-295 with the following:

- Downtown Arts District ↑
- Old Port →
- Waterfront →
- Civic Center →
- Visitor Center →
- Hospitals ↑
- Public Market ↑

Add the following sign (type D3) on the I-295 Connector at Veteran's Bridge:

- Old Port ↑
- Waterfront ↑
- Civic Center ↑
- Visitors Center ↑

Franklin Street Arterial Signage

- Revise wayfinding such that motorists destined to the "Public Market" are directed to Cumberland Avenue. Add sign display at Cumberland Avenue (type D4).

- Revise wayfinding such that the "Public Market" sign plate is removed at Middle Street and Commercial Street.

Washington Street Signage

- Revise wayfinding such that motorists destined to the "Public Market" are directed to Cumberland Avenue. Add sign display at Cumberland Avenue (type D4).

- At Congress Street motorists should be directed left to "Eastern Promenade"(type D4).

State Street Signage

Add sign display (type D3) at York Street with the following:

- ←Visitor Center
- ← Waterfront

Deering Avenue Signage

Add sign display (type D3) at Park Avenue with the following:

- ← Downtown Arts District
- ←Old Port
- ←Waterfront
- ←Civic Center
- ←Visitor Information
- ← Public Market
- Hospital ↑

Veteran's Bridge Signage

Add sign display (type D3) on Veteran's Bridge approach to I-295 Connector with the following:

- Downtown Arts District →
- Old Port →
- Waterfront →
- Civic Center →
- Visitor Center →
- Hospitals ↑
- Public Market →

Danforth Street Signage

Remove sign display at Vaughn Street.

Other Sign Locations

Additional wayfinding signs should be considered at the following locations:

- Commercial Street @ High Street
- Congress Street @ High Street
- Park Avenue @ State Street
- Congress Street @ Elm Street

Future Development Wayfinding Principles

Bayside Area (see Figure 9.3)

- All vehicles routed from I-295 north (with destinations to Bayside east of Franklin Street Arterial) will be signed to the Washington Avenue interchange. Vehicles would be directed to the Anderson Street ramp.
- All vehicles routed from I-295 north (with destinations to Bayside west of Franklin Street Arterial) will be signed to the Franklin Street Arterial interchange. Vehicles would be directed to Marginal Way or Somerset Street.
- All vehicles routed from I-295 south (with Destinations to Bayside west of Preble Street) will be signed to the Forest Avenue Interchange. Vehicles would be directed to either Marginal Way or the proposed Somerset Street Extension.
- All vehicles routed from I-295 south (with Destinations to Bayside east of Preble Street) will be signed to the Franklin Street Arterial Interchange. Vehicles would be directed to either Marginal Way or Somerset Street.
- All vehicles originating from the Casco Bay Bridge will be routed to Commercial Street, the I-295 Connector, and I-295.
- All vehicles originating from Park Avenue will be routed to High Street and to the Somerset Street Extension or Marginal Way.
- Vehicles originating from Forest Avenue will be routed to the Somerset Street Extension or Marginal Way.
- Variable message signs should be installed on I-295 to re-route vehicles destined to Bayside to alternative interchanges when warranted. An example includes times when severe congestion exists on Franklin Street Arterial due to rail crossings. In this case vehicles would be routed to Washington Avenue from the North.

Eastern Waterfront Area (see Figure 9.2)

- All vehicles routed from I-295 will be signed to the Franklin Street Arterial interchange. Vehicles would be directed to Commercial Street via Franklin Street Arterial.
- Local vehicles originating from inner Washington Avenue will be routed to Congress Street and India Street. Special signing should be considered that discourages use of Mountfort Street (e.g. “Residential Traffic Only”).
- All vehicles originating from the Casco Bay Bridge will be routed to Commercial Street.
- Vehicles originating from Forest Avenue, Congress Street and Washington Avenue outside of I-295 will be routed to I-295 and the Franklin Street Arterial interchange.
- Installation of a Highway Advisory Radio System with appropriate informational signage to guide the motorist to the Eastern Waterfront and Ocean Gateway.

General Wayfinding Suggestions

The wayfinding signs currently in place provide the impetus to continue the development of a comprehensive tourist-oriented directional system. The enhanced system would provide an effective marketing tool that would assist tourists as well as residents around the Portland

Peninsula. The information presented should create an awareness of "things to see and do" and contribute to a general sense of welcome.

Also important is the understanding of the wayfinding system as a *hierarchical* and *sequential* system that begins with the general and progresses to the specific. As stated in the 1999 *Portland Downtown Traffic and Streetscape Study*, our senses move from a large and general perception of things to a more specific and intimate view of the streetscape. We see things from afar, we move toward them, past them and can then focus on the smaller, human-scaled elements in the streetscape. This system must be visible and versatile, flexible and adaptable—constructed from a kit of parts that is both engaging and attractive.

In addition to the vehicular directional signs, other types of signs should be considered. These include:

- Gateway or entry signs, along major arterial routes into the downtown Portland area (type A1).
- Street signs that reinforce district identification (type A2).
- Parking signs, keeping with the established character of the wayfinding program, to guide, identify and direct to convenient places for tourists/residents to leave their vehicles (type D5).
- Pedestrian oriented kiosks (you are here maps), at strategic points throughout the downtown area, that provide information regarding orientation to, locations of, and information about attractions (type B1/B2).
- Pedestrian directional signs to assist with the directions to attractions noted on the kiosks (type D6).
- Place-specific informational/educational signage at sites or buildings of historic or cultural interest (type B3).
- Banners reinforcing district identification (type C1/C2).

In order to further implement these various sign types, comprehensive planning, graphic design and traffic and civil engineering need to be undertaken. (Note: vehicular signage mentioned earlier in this section of the report should also be looked at graphically as part of the wayfinding system so that the opportunity to create a unified graphic language from the "top down" is not lost.) As part of the planning process, a group of interested stakeholders/individuals need to be assembled to oversee and provide feedback during the planning process. This stakeholder group also needs to oversee the program once implemented to ensure long-term compliance and updating compatibility.

Based on the current vehicular directional wayfinding signs, consideration needs to be given to the amount of information displayed on any given sign. Messages should be limited to three to four lines per sign. Other factors to be considered include: posted speed limit along roadway, viewing distances, and general environmental conditions, as well as, state and local regulations governing these sign types. Combining all these factors will impact the selection of the typeface, colors and letter heights required, to ensure maximum visibility and user comfort. The planning process needs to consider existing landmarks, established routes and nodes as the basis for selection of signage routes. Defining and identifying specific districts within the total area will assist in dividing the downtown into smaller parts, and increase the individual's ability to understand the geography of the downtown.

Figure 9.1: Existing Wayfinding along I-295

Figure 9.2: Proposed Wayfinding Routing for Eastern Waterfront

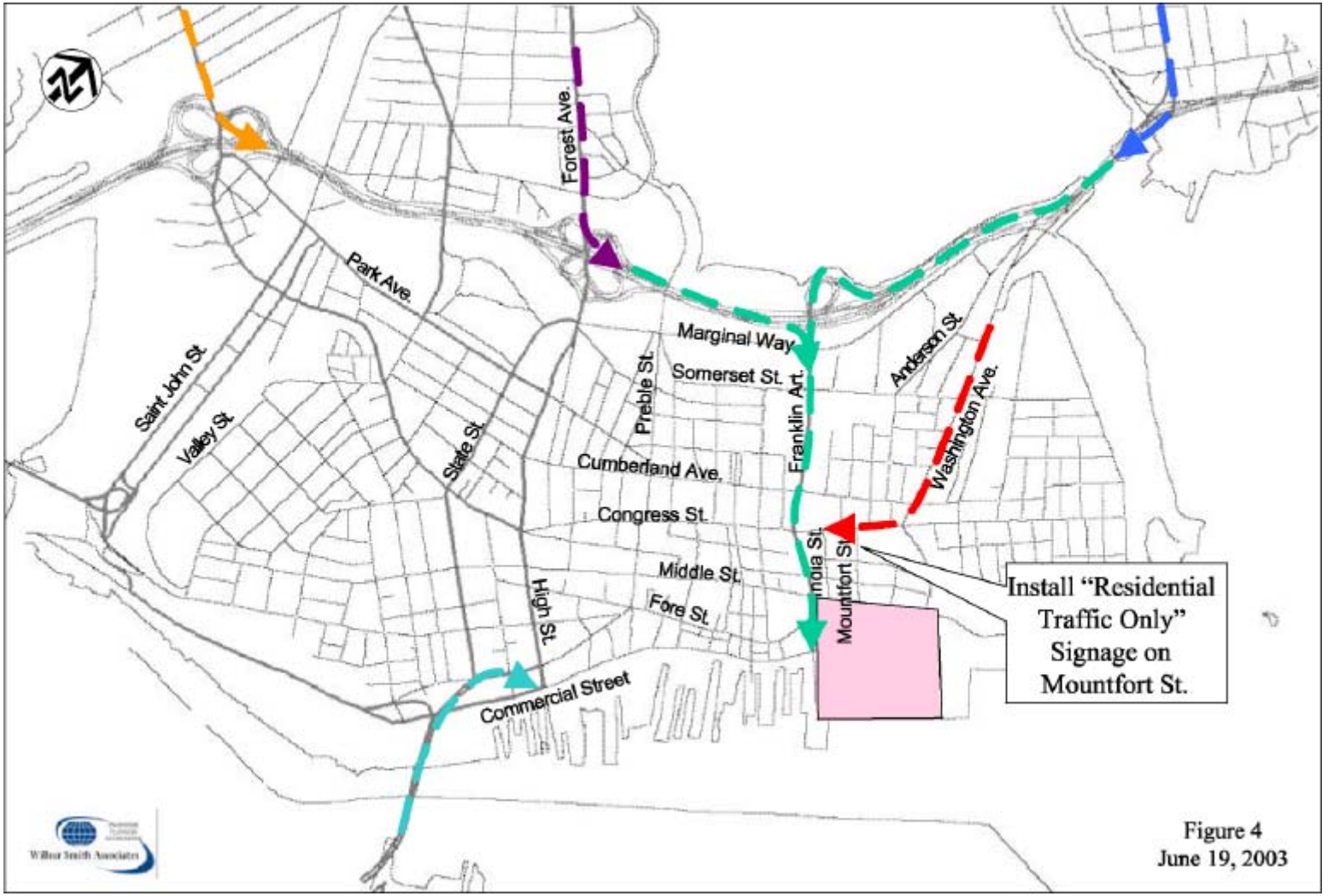

Figure 9.3: Proposed Wayfinding Signage for Eastern Waterfront

Chapter 10
Costs / Phasing

Given the scale and complexity of planned improvements in association with this plan, it is important to compile preliminary opinions of probable construction cost in order to create a funding plan to complete each improvement as it is determined necessary. It should be noted that these opinions are based on limited information for rough budgetary purposes only. Actual construction estimates require a full understanding of potential right-or-way and utility issues, among other items, and would require a full survey. The timing for these improvements has been placed into three categories, which are explained below:

Immediate

Improvements included in this category are those seen as necessary to remedy existing deficiencies identified in the Peninsula transportation network. These improvements also tend to be lower in cost, which allows funding to be obtained more readily. An example of an immediate improvement would be the installation of a traffic signal at the intersection of Park and Commercial streets.

Short-Term

Short-term improvements are those recommended to be implemented within five years. These improvements are generally of a scale that requires additional funding mechanisms to be identified. An example of a short-term improvement would be widening of Franklin Street Arterial to three lanes in each direction from Marginal Way to Congress Street. Many of these improvements, particularly those for the extensions of Somerset and Chestnut Streets, are based on the timing of future development. In addition, many of the Bayside improvements are contingent on the extension of AMTRAK passenger rail service through the Peninsula.

Long-Term

Improvements identified as long-term are those required to satisfy volumes forecast in the PACTS model for 2025. These solutions tend to be the most significant and costly. An example of a long-term improvement would be placing Franklin Street Arterial below-grade at Cumberland Avenue and Congress Streets, resulting in grade-separated intersections.

An Explanation of Costs

Due to the inflationary nature of construction costs, the same project completed in 2005, for example, would require fewer dollars than a project completed in 2025. Therefore, costs identified for long-term improvements in particular appear as more costly than immediate and short-term improvements. These costs are presented in current dollars, but based on projections cited by the Engineering New Record (EBR), construction costs are expected to increase by 3.7 percent per year. The costs associated with Eastern Waterfront as well Bayside developments are presented on the following tables:

Gorrill-Palmer Consulting Engineers, Inc.
Preliminary Opinion of Probable Construction Cost

PORTLAND PENINSULA

NOTES:
1. Opinion of cost does not include Legal Costs.
2. Opinion of cost does not include the remediation or removal of any special or hazardous materials such as Asbestos, PCB's, etc.
3. Opinion of cost does not include costs associated with right of way
4. Opinion of cost does not include costs associated with wetlands
5. Opinion of cost is based on MDOT 2003 unit prices
6. Unit Prices Adjusted 3.7% per Year to account for inflation
7. Opinion of cost does not include utility relocations

EASTERN WATERFRONT

Improvements	Costs		
	Immediate (2004)	Short Term 2009 (Cost Increased to 2009)	Long Term 2029 (Cost Increased to 2029)
Park/Commercial			
Install Signal	$ 120,000.00		
Franklin/Middle			
Construct 200' SB left turn lane	$ 110,000.00		
Commercial/Franklin			
Restripe WB Approach for Left and Thru/Right Lanes		$ 9,000.00	
India/Commercial			
Restripe SB Approach to Include a 50' SB left lane	$ 3,000.00		
Restripe EB Approach to Include a 150' SB left lane	$ 3,000.00		
Washington/Fox			
Remove Parking on Northside of Washington Avenue and Restripe NB and SB Lanes to Include 50' Left Turn Lanes and a Concrete Island	$ 12,000.00		
Washington/Cumberland			
Restripe WB Approach for Two Lane Approach	$ 5,000.00		
India/Middle			
Install traffic signal (Coordinate with signal at Fore Street)		$ 160,000.00	
India/Fore			
Install traffic signal (Coordinate with signal at Middle Street)	$ 130,000.00		
Restripe WB Approach to Include a 50' Left Turn Lane	$ 5,000.00		
Mountfort/Fore			
Restripe Mountfort SB Approach to Include Left/Thru and Right Lanes	$ 7,000.00		
Commercial Street			
Restripe Commercial Street for two-way center left turn lane from Union Street to Casco Bay Bridge with dedicated left lanes at Park and High	$ 20,000.00		
TOTAL EASTERN WATERFRONT IMPROVEMENTS	**$ 415,000.00**	**$ 169,000.00**	**$ -**

Gorrill-Palmer Consulting Engineers, Inc.
Preliminary Opinion of Probable Construction Cost

PORTLAND PENINSULA

NOTES:
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2. Opinion of cost does not include the remediation or removal of any special or hazardous materials such as Asbestos, PCB's, etc.
3. Opinion of cost does not include costs associated with right of way
4. Opinion of cost does not include costs associated with wetlands
5. Opinion of cost is based on MDOT 2003 unit prices
6. Unit Prices Adjusted 3.7% per Year to account for inflation
7. Opinion of cost does not include utility relocations
8. All Improvements listed below must be completed as one project to perform properly, this is reflected in the prices

BAYSIDE (CONTINUED)

Improvements	Costs		
	Immediate (2004)	Short Term 2009 (Cost Increased to 2009)	Long Term 2029 (Cost Increased to 2029)
Forest Avenue			
Forest/I-295 NB Ramps			
Additional Northbound Off Ramp with Retaining Wall		$ 390,000.00	
Signalize Intersection		$ 160,000.00	
Forest/Marginal			
Dual Right Westbound Lanes With Islands		$ 290,000.00	
Forest/State			
Addition of westbound 50' left turn pocket		$ 60,000.00	
Forest/High			
Addition of Somerset Street Extension to the intersection		$ 530,000.00	
Closure of Kennebec Street leg of the intersection		$ 60,000.00	
Forest Avenue			
Addition of a third lane between Park and Marginal (With Islands)		$ 530,000.00	
Misc.			
Somerset/Elm			
Addition of 100' right turn pocket with 75' taper from Somerset onto Elm		$ 270,000.00	
Chestnut/Somerset			
Addition 100' LT Turn Pockets w/ 125' tapers		$ 240,000.00	
Marginal/Chestnut			
Traffic signal/turn pockets		$ 230,000.00	
Chestnut Street			
Extend to Marginal Way		$ 400,000.00	
TOTAL BAYSIDE IMPROVEMENTS	**$ -**	**$ 9,470,000.00**	**$ 37,000,000.00**

Gorrill-Palmer Consulting Engineers, Inc.
Preliminary Opinion of Probable Construction Cost

PORTLAND PENINSULA

NOTES:

1. Opinion of cost does not include Legal Costs.
2. Opinion of cost does not include the remediation or removal of any special or hazardous materials such as Asbestos, PCB's, etc.
3. Opinion of cost does not include costs associated with right of way
4. Opinion of cost does not include costs associated with wetlands
5. Opinion of cost is based on MDOT 2003 unit prices
6. Unit Prices Adjusted 3.7% per Year to account for inflation
7. Opinion of cost does not include utility relocations
8. All Improvements listed below must be completed as one project to perform properly, this is reflected in the prices

BAYSIDE

Improvements	Costs		
	Immediate (2004)	Short Term 2009 (Cost Increased to 2009)	Long Term 2029 (Cost Increased to 2029)
Franklin Street			
Franklin/Somerset/Fox			
Somerset dual Lefts onto Franklin		$ 110,000.00	
Somerset 50' right turn lane onto Franklin		$ 90,000.00	
Fox Right Turn Lanes and Receiving Lanes		$ 230,000.00	
Franklin outbound & inbound 200' right turn lane		$ 220,000.00	
Franklin 275' left turn pocket onto Somerset		$ 180,000.00	
Traffic Signal Improvements		$ 160,000.00	
Overlay Project Area		$ 90,000.00	
Franklin/Marginal			
Franklin outbound 100' right turn lane		$ 80,000.00	
Dual left turn lanes for outbound Franklin to turn onto Marginal way		$ 50,000.00	
Marginal eastbound dual left turn lanes onto I-95		$ 50,000.00	
Marginal 250' eastbound right turn lane onto Franklin		$ 120,000.00	
Relocate Marginal Way (east leg of intersection)		$ 500,000.00	
Traffic Signal Improvements		$ 160,000.00	
Overlay Project Area		$ 90,000.00	
Franklin/I-295			
Additional lane on SB off ramp (full length of ramp)		$ 1,020,000.00	
2 Additional lanes on NB off ramp (full length of ramp)		$ 660,000.00	
Install Traffic Signal		$ 160,000.00	
Overlay Project Area		$ 80,000.00	
Franklin Street			
Addition of a third lane outbound and inbound from Cumberland to I-295		$ 2,260,000.00	
Grade Separation Franklin/Cumberland and at Franklin/Congress			$ 37,000,000.00

Gorrill-Palmer Consulting Engineers, Inc.
Preliminary Opinion of Probable Construction Cost

PORTLAND PENINSULA

NOTES:

1. Opinion of cost does not include Legal Costs.
2. Opinion of cost does not include the remediation or removal of any special or hazardous materials such as Asbestos, PCB's, etc.
3. Opinion of cost does not include costs associated with right of way
4. Opinion of cost does not include costs associated with wetlands
5. Opinion of cost is based on MDOT 2003 unit prices
6. Unit Prices Adjusted 3.7% per Year to account for inflation
7. Opinion of cost does not include utility relocations
8. All Improvements listed below must be completed as one project to perform properly, this is reflected in the prices

STATE/HIGH STREET

Improvements	Costs		
	Immediate (2004)	Short Term 2009 (Cost Increased to 2009)	Long Term 2029 (Cost Increased to 2029)
Deering Oaks S-2		$ 3,180,000.00	
Conversion of State/High Street to Two-way		$ 680,000.00	
TOTAL DEERING OAKS IMPROVEMENTS	**$ -**	**$ 3,860,000.00**	**$ -**
TOTAL IMPROVEMENTS	**$ 415,000.00**	**$ 13,499,000.00**	**$ 37,000,000.00**