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Final Report

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Maine Mall Area Transportation Plan

Submitted to:

PACTS/Portland Area Comprehensive Transportation Committee

Portland, Maine

Submitted by:

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1 Introduction

The Portland Area Comprehensive Transportation Committee (PACTS) and the Maine Department of Transportation (MDOT) retained the consulting firm of Vanasse Hangen Brustlin, Inc. (VHB) to conduct a transportation planning study for the Maine Mall area and surrounding roadways. This area includes parts of the communities of South Portland, Westbrook, Gorham, Scarborough, and Portland. The study was undertaken to evaluate the existing transportation deficiencies, project future changes in travel patterns/demands, and define the short- and long-term transportation improvements needed in the Maine Mall area.

This section of the report provides a general overview of the goals for the study. Chapter 2 presents a review of the existing conditions for the study area transportation system. Chapter 3 presents the future conditions analyses and Chapter 4 overviews the study area environmental constraints. Chapters 5 and 6 describe the improvement alternatives that were considered and, finally, recommendations and a plan of action for the study area.

1.1 Project Purpose and Need Statement

The purpose and need statement for this project was defined prior to the initiation of the consultant selection process by the PACTS Technical Committee. This statement provides the context for this study effort.

1.1.1 Needs

The Maine Mall area is an important destination point for employment and shopping within the region. It provides a vital economic resource base for the state, region, and local communities. To efficiently and safely accommodate existing and future travel demand, the transportation system needs to be improved. The following important issues have been identified by South Portland, the Maine Department of Transportation, and the Maine Turnpike Authority:

Traffic Congestion (especially during the Christmas shopping season)

- Heavy congestion has lowered a number of intersections in the Mall area to an unacceptable level of service.
- Congestion in the Maine Mall area has hindered future development.

- There are increased travel times for through travel.
- There is insufficient capacity along bridges over State Route 703 and in many other places in the area.

Safety Concerns

- There are high accident ratings at five or more Mall area locations.
- There is inadequate pedestrian safety.

Inadequate Access

- There are unclear access points for the travelling public.
- There is poor vehicular access to the Maine Mall area.
- There is inadequate pedestrian access.

1.1.2 Purpose

The Maine Mall Area Transportation Plan should include strategies to address the following purposes:

- Reduce traffic congestion
- Preserve arterial capacity
- Improve safety
- Facilitate the safe movement of people and goods
- Improve access to the Maine Mall area
- Improve regional east-west access
- Improve access to the Interstate system

Separate studies examined strategies to improve pedestrian and transit access to the Maine Mall area.

1.2 Project Goals

This study's goal was to develop a comprehensive transportation master plan that will assist policy makers in determining the programming of future transportation improvements to the Maine Mall area. This study is intended to update a similar study, referred to as the *Maine Mall/Jetport Area Traffic Study* that was completed by PACTS in 1988. This master plan includes the development and recommendation of a series of integrated transportation solutions designed to address existing deficiencies and accommodate long-term growth in the Maine Mall area. Specifically, this study:

- Defines the constraints under which the existing traffic infrastructure operates;
- Projects future traffic demand;
- Evaluates the ability of the transportation infrastructure to accommodate the current and long-term growth and traffic shifts associated with changing land uses, increased traffic demands, and roadway system enhancements;

- Investigates various alternatives to address identified deficiencies and accommodate increased demand;
- Considers and summarizes the ramifications of each improvement alternative on the surrounding properties, roadways, and the environment; and,
- Provides recommendations to policy makers based on the relative measures of effectiveness of each alternative on the transportation system, its cost, and the overall impact of the alternative on the surrounding environment.

The end result of the study is a transportation master plan, which, in concert with the Maine Mall Signal Study, the Maine Mall Area Transit Systems Report, and Maine Mall Area Pedestrian Master Plan,[1] will serve as a planning tool for the cities and towns within the Maine Mall area for programming future improvements. This planning tool will enable the communities to identify future transportation infrastructure needs related to growth, and help define future expenditures of funds needed within the area to address these growth issues.

1.3 Study Area

The study area for this transportation master plan includes key roadways and intersections in the communities of South Portland, Westbrook, Gorham, Scarborough, and Portland, Maine. Figure 1-1 presents a general study area map for this project. Actual descriptions of each of these roadways and intersections are provided in the Appendix to this report.

In general, the majority of the study area is located in South Portland and is focused on the Maine Mall Road, Johnson Road, Gorham Road (South Portland), Running Hill Road, Western Avenue and Turnpike Spur (SR 703) corridors. In Westbrook, the study area includes County Road and its intersection with Spring Street. The western limit of the study area includes the Route 22/114 "overlap" area in Gorham. In Scarborough, the study area is bound by County Road (Route 22) to the north and Gorham Road (Route 114) to the south. Through Portland, the study area includes the County Road/Congress Street (Route 22) corridor extending to Johnson Road in the vicinity of the Portland International Jetport.

1.4 Study Process

The study process included seven major tasks. These tasks are as follows:

- Task 1—Study Management/Public Participation
- Task 2—Project Initiation/Compilation of Background Data
- Task 3—Analysis of Existing Conditions
- Task 4—Analysis of Future Conditions

1 The Maine Mall Area Transit Systems Report was completed by the Greater Portland Council of Governments. The Maine Mall Signal Study was completed under contract to PACTS by Gorrill Palmer Consulting Engineers, Inc. The Maine Mall Area Pedestrian Master Plan was completed under contract to PACTS by Wilbur Smith Associates.

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Ⓢ Signalized Intersection

Study Area Limits

Westbrook

Portland

Gorham

South Portland

Scarborough

South Street

Saco Street

County Road

Spring Street

Thomas Drive

Cummings Road

Congress Street

Portland International Jetport

Fore River

Exit 5

Exit 7A

Western Avenue

Maine Mall Road

Maine Mall

Exit 7

Philbrook Road

John Roberts Road

Exit 1

Exit 2

Exit 3

Exit 4

Long Creek

Broadway

Exit 6A

Exit 6

Payne Road

Mussey Road

Burnham Road

Beech Ridge Rd

Gorham Road

New Road

Running Hill Road

22

114

95

295

1

9

0 1250 2500 Feet

Vanasse Hangen Brustlin, Inc.

Figure 1-1

Project Study Area

Maine Mall Area Transportation Plan

- Task 5—Identification of Preliminary Transportation Alternatives
- Task 6—Refinement of Transportation Alternatives
- Task 7—Development of Transportation Recommendations

Throughout the process, VHB presented findings to the PACTS Technical Committee who served as an advisory committee for this study. The committee, which was supplemented with six members of the public and several MDOT staff members for this study, guided the study process, reviewed all technical material, and provided input on the recommendations. Most importantly, the committee helped foster regional cooperation and consensus for the study recommendations. Through the course of the project, a total of seven Technical Committee meetings were held at critical decision points. The Appendix to this report provides a list of the technical committee members.

1.5 Public Participation

A meaningful component of this project was public participation. Aside from the PACTS Technical Committee meetings, public input was solicited through local outreach meetings and public informational meetings. Local outreach meetings were targeted meetings with key stakeholders to discuss specific issues and the viability of solutions. Public informational meetings were informal, "open-house" meetings where input was solicited broadly from the public.

Outreach meetings occurred throughout the course of the project and included meetings with local officials, the Maine Department of Transportation, the Maine Turnpike Authority, and area business people. An ad hoc South Portland Traffic Committee was formed by the South Portland City Manager during the latter stages of the study and became the sounding body for review of South Portland transportation recommendations. The study team met several times with this group as part of the outreach program.

Three public informational meetings were also held at key project milestones: Project Initiation-December, 1999; Discussion/Input on Project Alternatives-April, 2000; and Draft Recommendations-June, 2000.

Contact the PACTS office (207-774-9891) for more information on the public participation process for this study.

2

Existing Conditions

A broad understanding of the existing transportation conditions is an essential foundation to define both the short-term and long-term improvements and address safety concerns within the Maine Mall study area. This chapter presents an assessment of the existing transportation conditions in the study area. Specifically, this section focuses on existing roadway infrastructure, highlights current safety issues, and provides a discussion of how well the transportation system is accommodating current demands placed upon it. The evaluation of the existing transportation system includes a qualitative evaluation of operations within the study area and is supplemented with a quantitative evaluation of highway operations. The existing physical and operating conditions of the roadway system provide a basis for developing an understanding of the existing (and future) deficiencies and the needs of the system.

2.1 Background Information Sources

As part of the initial effort of this project, Vanasse, Hangen, Brustlin, Inc. (VHB) reviewed a wealth of existing traffic data and relevant information collected for numerous other studies in the area. The specific relevant studies that were reviewed include:

- Maine Mall/Jetport Area Traffic Study prepared by Vanasse Hangen Brustlin, Inc., September 1988;
- The Spring Street Corridor Study prepared by Gorrill/Palmer Consulting Engineers, Inc., August 1999;
- The Maine Mall Traffic Signal Study preliminary reports prepared by Gorrill/Palmer Consulting Engineers, Inc., January 2000;
- The Route 22/114 Overlap Study prepared by VHB, September 1998;
- The Route 114/I-295 Ramps Feasibility Study prepared by VHB, July 1999;
- The I-295 Ramps Safety and Capacity Study prepared by VHB, June 1998;
- Proposed Christmas Tree Shops Plaza Traffic Impact Study prepared by Eaton Traffic Engineering, March 1999;
- Sakego Office Park Traffic Impact Study prepared by Gorrill/Palmer Consulting Engineers, Inc., June 1999;

- Maine Crossing Traffic Impact Study prepared by R.D. Vanasse & Associates, Inc., April 1999; and,
- Existing Conditions Maine Mall Area Pedestrian Master Plan prepared by Wilbur Smith Associates, February 2000.

All of these studies are directly relevant to this Maine Mall Area Plan because of the recent nature of the information they provide and their findings. Each of these reports contributed in some way towards this existing conditions analysis.

2.2 Existing Traffic Demand

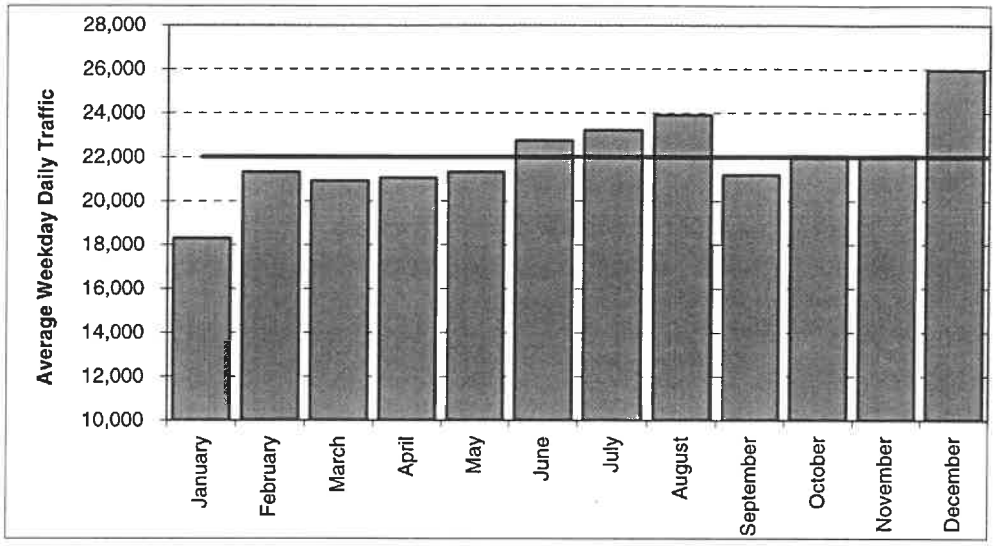
Traffic volume data presented within this section are based on a combination of sources. In addition to the previously referenced individual traffic reports, data were provided for the study area roadways by the Maine Department of Transportation (MDOT), Maine Turnpike Authority (MTA), and several manual counts conducted at locations where information was not available. This section provides the monthly, daily, and design hour traffic volumes for key study area roadway links and intersections. Because all the volumes researched were gathered in 1998 and 1999 and then factored to the design hour condition, all volumes are assumed to represent current design hour traffic conditions.

2.2.1 Monthly Traffic Demand Variation

To provide a basis for comparison of how traffic fluctuates during different months of the year in the Maine Mall area, MDOT provided traffic volume data from a permanent count station located on Maine Mall Road, north of Philbrook Road. While additional sources of traffic data were researched, this is the only location within the study area where a complete year of data is available. This permanent count station records vehicles in both directions as they pass over the observation station and provides a breakdown of monthly, daily, and hourly volumes.

Based on the data gathered from this count station, Maine Mall Road carried an average of approximately 22,000 vehicles per weekday in 1998 (the most recent full year of traffic data available). Traffic volumes on Maine Mall Road peak in the month of December at approximately 26,000 vehicles per weekday. This is not surprising, given the heavy influence that retail traffic has on the study area. Weekday traffic volumes were the lowest in the month of January at approximately 18,300 vpd. The data presented in the following Figure 2-1 presents the weekday average daily traffic data for Maine Mall Road; study area roadways further from the Mall area would not be expected to show as much retail-based pattern as Maine Mall Road.

Figure 2-1
Monthly Variation of Weekday Traffic on Maine Mall Road



Source: MDOT Permanent Count Location on Maine Mall Road north of Philbrook Road (1998)

■

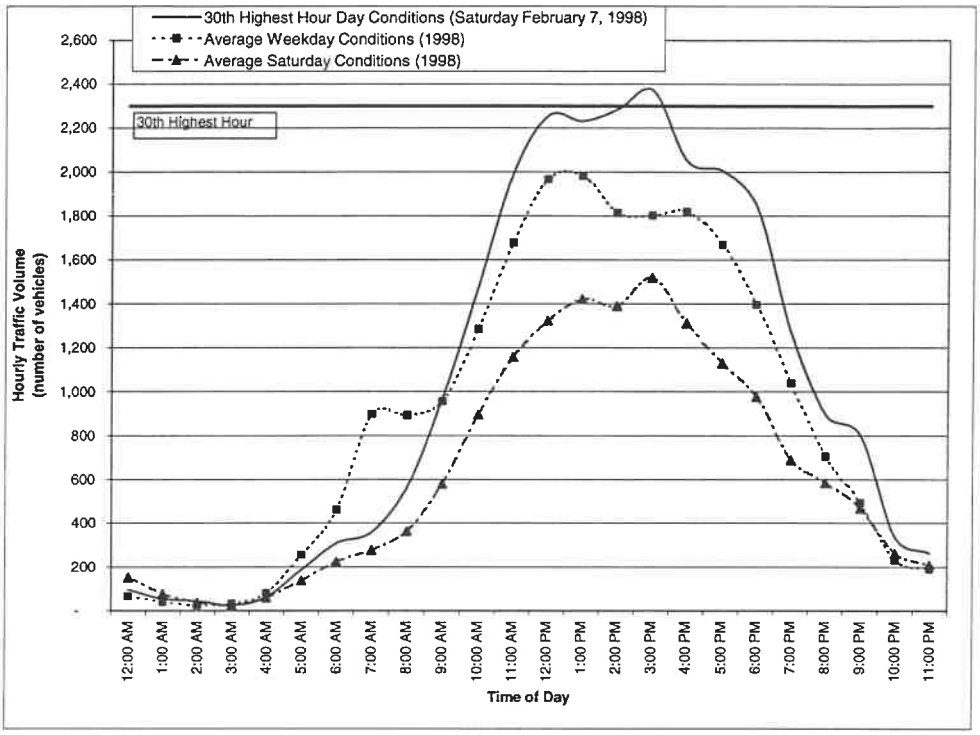
2.2.2 Hourly Traffic Demand Variation

While the daily and monthly traffic data indicates the fluctuations in traffic by season, another set of valuable information to evaluate is the use of the roadways by time-of-day, particularly during peak periods. Looking at the peaking characteristics of demands over the course of the day helps to further understand traffic operations on a given roadway. One focus of this study was to evaluate how the key study area roadways are able to accommodate the fluctuations in hourly demands. Figure 2-2 presents the weekday and Saturday daily traffic demand profiles for Maine Mall Road using the MDOT traffic monitoring data.

On an average weekday, traffic demands on Maine Mall Road exhibit a distinct peak period during the middle of the day at about 12:00 noon. Two other peaks occur during the morning and evening peak periods. The midday demand is about ten percent higher than the evening peak hour. The morning peak hour demands on Maine Mall Road are about 50 percent lower than the evening peak hour demands.

Saturday traffic demands on Maine Mall Road exhibit different peaking characteristics than weekday traffic demands. On a peak Saturday, as shown by February 7, 1998 in Figure 2-2, Maine Mall Road has an extended peak period from 11:00 AM to about 5:00 PM. The peak traffic demands occur in the early afternoon at about 2,400 vph. Average Saturday traffic, also shown in Figure 2-2, follows the same pattern, although traffic demands peak considerably lower (at 1,500 vph).

Figure 2-2
Hourly Variation of Vehicles on Maine Mall Road (1998)



Source: MDOT Permanent Count Location on Maine Mall Road, South of Philbrook Road (1998)

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2.2.3 Design Hour Traffic Volumes

Existing traffic count data and statewide traffic statistics were used to determine an appropriate design hour condition for this traffic analysis study. The design hour, as defined by MDOT, is generally represented by the 30th highest hour of traffic volumes for the year along a given roadway segment. For this study, the 30th highest design hour for the overall study area is representative of the weekday evening peak hour. The weekday evening peak hour demands are similar to the peak Saturday midday demands on Maine Mall Road and higher than the peak hour demands on typical Saturdays, which lack the influence of weekday commuter traffic.

Table 2-1 presents a comparison between select links within the study area of the weekday evening traffic volumes presented in this report and Saturday midday peak hour volumes presented in the Maine Mall Signal Study prepared by Gorrill-Palmer Consulting Engineers, Inc.

As the table indicates, most traffic volumes are higher during the Design Hour traffic condition than the Saturday traffic condition. Where the Saturday traffic volume is higher, it is within 10 percent of the weekday demand. The location where there is the most notable difference between the Saturday condition and the Design hour condition is along Gorham Road (South Portland), just west of Western Avenue, and along Gorham Road (South Portland) east of Maine Mall Road. The retail influence on the Saturday traffic volumes at these locations is the likely source of the higher Saturday volumes. Overall, these data confirm that the weekday evening condition is, in fact, an appropriate design hour for this study.

Table 2-1
Comparison of Design Hour Volumes vs.
Peak Saturday Volumes for Key Study Area Roadways

Location	Design Hour Volumes*	Saturday Peak Hour Volumes**	Percent Difference
Johnson Road (east of Congress Street)	2,340	853	-63.5
Johnson Road (north of Maine Mall Road)	2,505	1,866	-25.5
Western Avenue (north of Gorham Road)	1,165	720	-38.2
Gorham Road (west of Western Avenue)	2,030	2,228	9.7
Westbrook Street (south of I-295 off-ramp)	2,520	2,140	-15.1
Maine Mall Road (north of Gorham Road)	1,755	1,832	4.4
Maine Mall Road (south of Gorham Road)	1,890	1,864	-1.3
Gorham Road (west of Maine Mall Road)	1,425	1,283	-10.0
Gorham Road (east of Maine Mall Road)	1,660	1,777	7.0
Maine Mall Road (south of Exit 7 Spur)	2,545	2,499	-1.8
Exit 7 Spur WB ramp at Maine Mall Road	1,415	806	-43.0
Exit 7 Spur EB ramp at Payne Road	1,675	1,131	-32.5
Running Hill Road (north of Cummings)	2,260	935	-58.6
Payne Road (north of Wal-Mart drive))	2,305	1,872	-18.8
Route 114 (west of Payne Road)	1,180	904	-23.4
Payne Road (south of Route 114)	1,695	1,188	-29.9

* As presented in Figure 2-3 entitled Existing Design Hour Traffic Volumes.
** As presented in the Maine Mall Signal Study, prepared by Gorrill-Palmer Consulting Engineers, Inc. From Figure entitled Maine Mall Counts, December 4, 1999 Peak Hour Volumes, Raw Data.

All of the data compiled for this report were factored to the design hour condition (the 30th highest hourly volume) using the weekly mean factors provided by MDOT. Based on the MDOT data, the 30th highest hour typically occurs in July, where traffic volumes are approximately 12 percent over the average condition throughout the study area. Figure 2-3 presents the existing evening design-hour traffic volume network.

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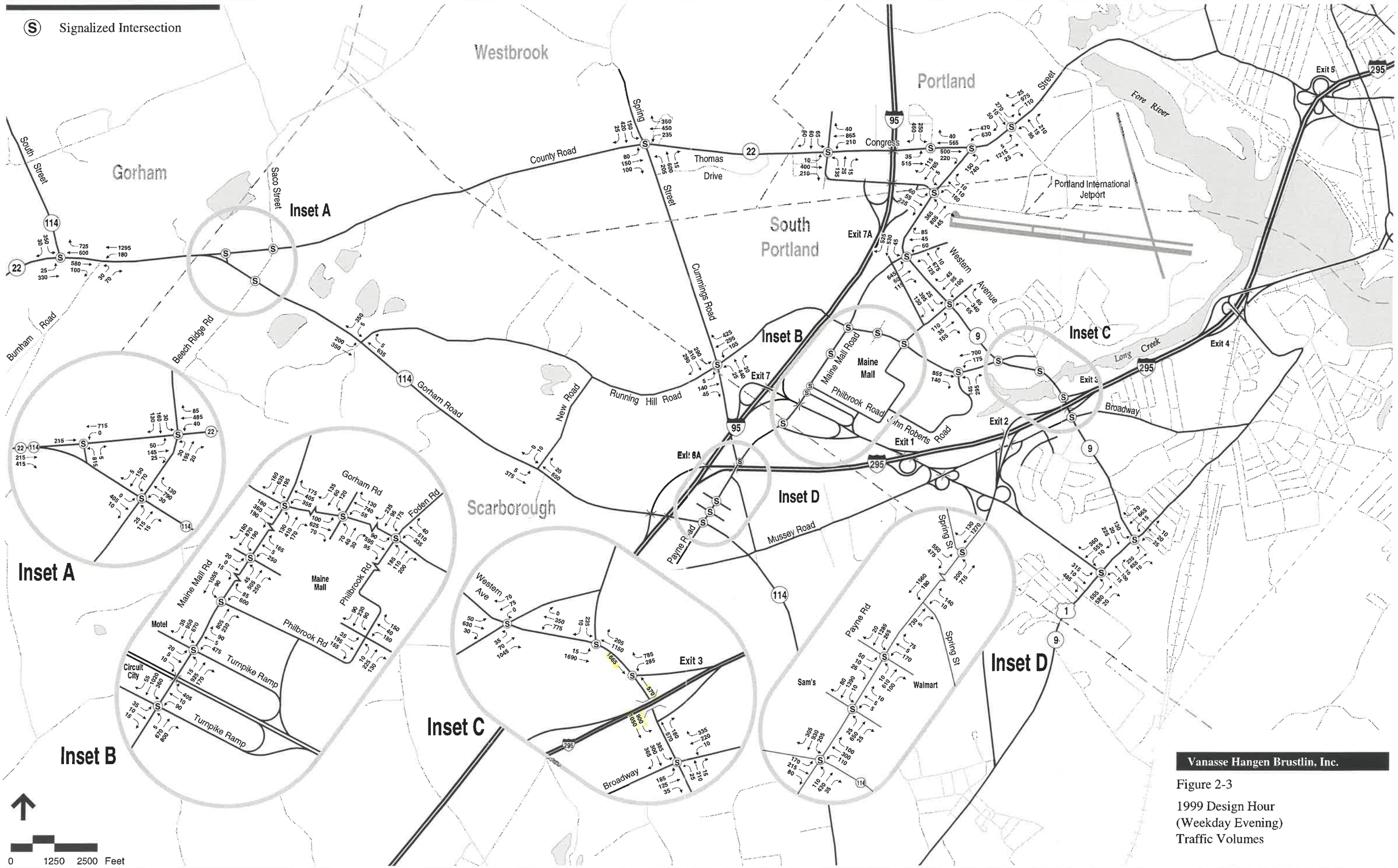
Ⓢ Signalized Intersection



Vanasse Hangen Brustlin, Inc.

Figure 2-3

1999 Design Hour
(Weekday Evening)
Traffic Volumes

2.2.4 Maine Turnpike Traffic Volume Comparison

Another factor considered in the development of the traffic volumes is associated with the opening of Exit 7A on the Maine Turnpike (also known as the Jetport Interchange) in October 1999. The new interchange resulted in a change in traffic demands at Exit 7 in South Portland and at Exit 8 in Westbrook and had some impacts to the local roadway system as well. Table 2-2 presents a comparison of Turnpike traffic demands (pre- and post-opening of Exit 7A) for the months of September 1999 and December in 1999. Based on traffic counts conducted by HNTB for the Maine Turnpike, the new Exit 7A carried approximately 9,350 vehicles per day (vpd) in December of 1999. According to the December traffic counts, the majority of the traffic entering and exiting the Exit 7A interchange is oriented to the north (6,100 vpd to/from the north and 3,250 vpd to/from the south). Between September and December 1999, there was an overall reduction in traffic at the Exit 7 interchange by approximately 4,900 vpd. Exit 8 experienced a 2,000-vpd reduction in overall traffic using the interchange.

Based on traffic observations along the Maine Turnpike, it is clear that the new interchange is both diverting traffic from adjacent interchanges and drawing new traffic to the turnpike. As more data becomes available and traffic utilization of the new interchange matures, the influence of this interchange will undoubtedly increase.

Table 2-2
Maine Turnpike Interchange Demand Comparison

Location	Observed September 1999 ADT (pre-Exit 7A)	Observed December 1999 ADT (post Exit 7A)	Difference (vpd)[1]
Exit 7 – SB Off ramp	6,450	5,100	-1,350
Exit 7 – SB On-ramp	7,200	5,600	-1,600
Exit 7 – NB On-ramp	6,700	5,600	-1,100
Exit 7 – NB Off-ramp	7,500	6,800	-700
Exit 7A – SB Off-ramp	NA	3,200	NA
Exit 7A – SB On-ramp	NA	1,600	NA
Exit 7A – NB On-ramp	NA	2,900	NA
Exit 7A – NB Off-ramp	NA	1,650	NA
Exit 8 – SB Off-ramp	6,750	4,700	-2,050
Exit 8 – SB On-ramp	6,800	7,050	+250
Exit 8 – NB On-ramp	6,350	6,000	-350
Exit 8 – NB Off-ramp	7,400	7,500	+100

Data Source: HNTB Corp.
N/A - The Exit 7A interchange was not in operations in September 1999. No data exists for this time period.
1 - Unadjusted for seasonality in toll plaza operations or other influences like toll diversions to Exit 7.

Local shifts in traffic patterns were also observed as part of a post Exit 7A traffic

assessment performed by DeLuca-Hoffman Associates Consulting Engineers and are incorporated into the Design Hour traffic networks for this report. The traffic counts conducted around the new Exit 7A interchange on Johnson Road, Congress Street, the northern sections of Maine Mall Road and Western Avenue are reflected in Figure 2-3, presented previously. Traffic counts in the vicinity of State Route 703 were taken after Exit 7A was opened and account for some diversions to/from Exit 7. Traffic shifts further away from these locations are not expected to significantly alter study area traffic volumes. For this reason, the traffic counts at other study locations presented in this report, which were conducted prior to the opening of Exit 7A, were not adjusted.

More recent traffic data on Maine Mall Road made available late in this study by MDOT confirms that Exit 7A has relieved traffic demands in the vicinity of Exit 7. When comparing the last quarter of 1998 with the last quarter of 1999 (October through December), traffic demands on Maine Mall Road just north of Philbrook Road decreased by 16.7 percent. This is during a period when volumes most everywhere else in the region were increasing. More recent data, as it becomes available, will be useful to review and gauge the full impact of the new interchange.

2.3 Existing Traffic Operations

The next step in the study process was to evaluate the operations of the study area roadway system. This analysis provides a technical assessment of the operational qualities of intersections, roadway links, and other standard highway capacity operations using the procedures documented in the *1994 Highway Capacity Manual*[2] and compares them with the hourly traffic demand volumes. The traffic analysis was conducted using the 1999 existing evening peak hour traffic volumes, as previously discussed, and the geometric design conditions as they currently exist along the study area roadways.

Understanding the relationship between the supply and demand on a roadway is a fundamental consideration in evaluating how well a transportation facility fulfills its objective to safely and efficiently accommodate the traveling public. The traffic operations analysis procedures used to evaluate the study area roadways assigns a level-of-service (LOS) rating for each specific segment, intersection, or area of roadway analyzed. LOS is a qualitative measurement of the operating conditions of a roadway facility or intersections taking into account a number of variables such as speed, vehicle maneuverability, driver comfort, and safety. Similar to a report card, LOS designations are letter based, ranging from A to F, with LOS A representing free flow conditions and LOS E and F represent conditions where a roadway is operating at capacity or failing. LOS D is the generally acceptable condition by which these facilities should operate (under peak conditions within urbanized areas such as this study area).

2 Special Report 209 – Highway Capacity Manual, Third Edition; Transportation Research Board, National Research Council; Washington D.C. 1994

2.3.1 Roadway Level of Service

Traffic operating conditions along various sections of study area roadways were evaluated based on existing design hour traffic demand levels and existing geometric conditions. In areas of closely spaced traffic signals, such as near the Mall, roadway segment LOS is defined by the operations of the traffic signals and not by the actual capacity of the roadway. With traffic being released by the signals in platoons, the roadway segment LOS would not be indicative of the actual operations of the segment. For this reason, no segment analysis was performed in certain areas where multiple signals are present. The roadway segment LOS results for the specific links within the overall study area are shown in Table 2-3.

Table 2-3
Roadway Segment Capacity Analysis- Existing Design Hour Conditions (1999)

Roadway Segment (non-access controlled roadways)	Volume	V/C[1]	LOS[2]
County Road, at the Route 22/114 Overlap	2,125	0.92	E
County Road, east of Saco Street	805	0.36	D
Route 114 (Gorham Road), north of Running Hill Road	1,535	0.65	E
Running Hill Road, east of Route 114 (Gorham Road)	560	0.24	C
Route 114 (Gorham Road), north of Payne Road	1,180	0.49	D
Cummings Road, south of Running Hill Road	1,445	0.61	E
Running Hill Road, west of Maine Mall Road	1,275	0.54	D
Spring Street, south of County Road	1,575	0.63	E
Congress Street, east of Spring Street	1,360	0.61	E
Johnson Road, north of Maine Mall Road	2,505	0.99	E

1 V/C - Volume-to-capacity ratio.
2 LOS - Level-of-service.

As Table 2-3 indicates, there are a number of roadway links that currently operate at LOS E during the peak period conditions. This is particularly true of the Route 22/114 "overlap" area in the western portion of the study area and on the Johnson Road link north of Maine Mall Road (the latter is programmed for widening as part of airport related improvements). While some other sections currently operate at LOS E, the volume-to-capacity ratios are still relatively low and can accommodate additional traffic volume growth.

2.3.2 Intersection Level of Service

The procedures for analyzing the operational conditions of signalized and unsignalized intersections are based on analysis procedures presented in Chapter 9 (Signalized Intersections) and Chapter 10 (Unsignalized Intersections) of the *1994 Highway Capacity Manual*. Level of service designation is reported differently for signalized and unsignalized intersections as briefly discussed below. A detailed discussion of the LOS criteria for both signalized and unsignalized intersections is provided in the Appendix to this report.

Signalized Intersections

Intersection operations along the study area roadways are based on current geometry and observed signal timings and phasings. Capacity analyses were conducted at all signalized intersections within the study area. The results of the intersection analysis under existing design hour traffic volume conditions are summarized in Table 2-4 for signalized intersections.

There are seven signalized locations that currently operate at or over capacity, under current design hour conditions. The locations that are operating at or near capacity are discussed in further detail below.

- **County Road (Route 22) and South Street (Route 114)** – This intersection currently operates at LOS F with a v/c ratio greater than 1.2 during the weekday evening design hour. This location was identified as operating as "over-capacity" in the Route 22/114 Overlap Study. Based on the capacity analysis and field observations, the heavy volume of traffic along westbound County Road cannot be accommodated by the current intersection geometry. Traffic queues regularly develop on this approach during the evening peak period.

- **County Road (Route 22) at Route 114 (Gorham Road)** – This intersection currently operates at LOS F with a V/C ratio greater than 1.2 during the weekday evening design hour. This intersection was identified as operating at capacity in the Route 11/114 overlap study. Based on this capacity analysis and field observations, the heavy volume of traffic approaching the intersection along Gorham Road (Route 114) cannot be accommodated by the current intersection geometry. Specifically, while there are two turn-lanes at the Route 114 approach only one of these lanes is effectively being utilized due to the lane-drop along Route 22/114 just west of the intersection.

- **Gorham Road (Route 114) at Saco Street/Beech Ridge Road** – This intersection currently operates at LOS F with a v/c ratio greater than 1.2 during the weekday evening design hour. Similar to the previously identified intersection, based on this capacity analysis and field observations, the heavy traffic along Route 114 cannot be accommodated by the current intersection geometry. Additionally, the Saco Street approach to the intersection is used as a bypass to the more congested intersection of Route 22 at Route 114.

- **County Road (Route 22) at Spring Street** – This intersection currently operates at LOS E with a v/c ratio of 0.96 during the weekday evening design hour. This location was identified as operating at capacity in the Spring Street Corridor Study. Based on visual observations, traffic queues along both the Spring Street and County Road approaches to the intersection during both the morning and the evening peak hour. Generally, the Spring Street northbound approach experiences the heaviest congestion during the evening peak period.

- **Maine Mall Road at Gorham Road and Running Hill Road** – This intersection is currently operating at LOS F with a v/c ratio greater than 1.2 during the design hour condition. This location has been identified by several sources as operating in an "over-capacity" condition under the design hour condition. Queues develop along several approaches to this intersection during the peak periods associated with heavy demands on many approaches.

- **Western Avenue at Foden Road** – This intersection currently operates at LOS E with a v/c ratio of 0.99 during the weekday evening design hour. Observations at this intersection identified that traffic queues developed along all the approaches to the intersection. However, the westbound approach from Foden Road, which is striped as a single approach lane, operates as two lanes under peak period operations.

- **Running Hill Road at Cummings Road** – This intersection currently operates at LOS F with a v/c ratio greater than 1.2 during the weekday evening design hour. This location was identified as operating as over-capacity in the Maine Crossing Traffic Impact and Access Study. Observations at this intersection identified that traffic queues developed along all the approaches to the intersection.

Table 2-4
Signalized Intersection Capacity Analysis- Existing Design Hour Conditions

Signalized Intersections	1999 Existing Weekday Evening Peak Design Hour		
	V/C[1]	Delay[2]	LOS[3]
County Road (Route 22) at South Street (Route 114)	> 1.2	> 60	F
County Road (Route 22) at Route 114 (Gorham Road)	>1.2	>60	F
County Road (Route 22) at Saco Street	0.70	21.6	C
Route 114 (Gorham Road) at Saco Street/Beech Ridge Road	>1.2	>60	F
Route 114 (Gorham Road) at Payne Road	0.71	18.5	C
County Road (Route 22) at Spring Street	0.96	22.9	E
Congress Street at Hutchins Drive	0.76	17.9	C
Congress Street at Unum Access Driveway	0.66	8.5	B
Congress Street at Johnson Road	0.51	8.1	B
Payne Road at Sam's Club	0.62	20.7	C
Payne Road at Wal-Mart Entrance	0.72	13.0	B
Payne Road at Spring Street	0.83	15.6	C
Johnson Road at Jetport Access Road (north)	0.88	21.8	C
Johnson Road at Jetport Access Road (south)	0.86	29.4	D
Western Avenue at Maine Mall Road/Johnson Road	0.96	27.7	D
Western Avenue at Foden Road	0.99	41.4	E
Western Avenue at Gorham Road	0.78	21.2	C
Gorham Road at Clarks Pond Parkway	0.50	6.2	B
Gorham Road at Philbrook Road/Foden Road	0.67	22.1	C
Maine Mall Road at Gorham Road/Running Hill Road	>1.2	>60	F
Maine Mall Road at Philbrook Road	0.62	10.2	B
Maine Mall Road at Maine Mall Entrance/Sheraton	0.55	10.3	B
Gorham Road at Maine Mall Entrance	0.55	10.3	B
Maine Mall Rd at Maine Turnpike Approach Rd (north)	0.80	25.7	D
Maine Mall Rd at Maine Turnpike Approach Rd (south)	0.85	16.1	C
Running Hill Road at Cummings Road	> 1.2	> 60	F
Western Avenue at Westbrook Street	0.72	6.8	B
Westbrook Street at I-295 Off Ramp	0.88	17.1	C
Westbrook Street at Broadway	1.00	25.9	D
Westbrook Street at Main Street (Route 1)	0.59	15.6	C
Main Street at Maine Turnpike Spur	0.90	26.4	D

The HCM analysis reflecting a volume-to-capacity ratio exceeding 1.00 does not fully account for the forced flow operations through this location. In essence, the intersection is operating at capacity and the excess demands are reflected by corridor queues observed at the location.

1 Volume-to-capacity ratio
2 Delay is expressed in seconds per vehicle.
3 Level-of-service

Unsignalized Intersections

The results of the intersection analysis under existing design hour traffic volume conditions are summarized in Table 2-5 for key unsignalized intersections in the study area. It is important to note that the unsignalized intersection analysis presents operating conditions for the critical side street movements. The unsignalized analysis assumes that traffic along the major roadway is not affected by the delays occurring on the side streets.

Table 2-5
Unsignalized Intersection Capacity Analysis- Existing Conditions

	1999 Existing Weekday Evening Peak Design Hour			
Unsignalized Intersections	Movement[1]	Demand	Delay[2]	LOS[3]
Route 114 (Gorham Road) at Running Hill Road	WB R	350	12.9	C
County Road (Route 22/114) at Burnham Road	NB L	30	> 45	F
Philbrook Road at John Roberts Road	WB LT	165	70.2	F
Running Hill Road at New Road	SB LR	10	14.0	C
Payne Road at Spring Street	WB L	10	> 45	F
Westbrook Street at I-295 On Ramp	SB L	900	> 45	F

1 For unsignalized intersections, the operations of the critical movements from the minor street and the left-turn movement from the major street are reported.
2 Approach delay, expressed in seconds per vehicle.
3 LOS: Level-of-service.

As Table 2-5 indicates, there are 4 key unsignalized intersections that currently operate at or over capacity based on the project criteria. LOS F under existing conditions is an indication of a forced-flow operation. Forced-flow operations generally indicate that drivers have to merge into gaps in the mainline traffic stream, which are shorter than they would normally accept. This is typically an unsafe maneuver that tends to lead to a higher frequency of turning movement collisions. The accident summary, presented in the next section, tends to support this analysis.

Key unsignalized intersections that are operating at or near capacity include:

- **County Road (Route 22/114) at Burnham Road** – This intersection operates at LOS F and is affected by the heavy peak period traffic flows through the overlap area. Most delays are experienced by vehicles exiting left from Burnham Road, which is a low volume demand.

- **Philbrook Road at John Roberts Road** – This intersection operates at LOS F and can be characterized as a location with fairly even traffic demands by approach and many conflicting turning movements.

- **Payne Road at Spring Street** – This intersection operates at LOS F, although this designation may be somewhat misleading as it is largely controlled by the operations of upstream and downstream traffic signals on Payne Road and has little to no effect on overall corridor operations.

- **Westbrook Street at I-295 On-ramp** – This intersection operates at LOS F and has been a long-standing operational issue in the study area. The operating condition is defined by the heavy left-turn demand for vehicles seeking access to I-295 northbound.

There are many other unsignalized driveways and minor intersections located along the arterials under study. Generally speaking, left-turns and through movements from all of these minor approaches at these arterials become difficult, and delays are experienced, during peak periods. Unsignalized intersections that may be candidates for future signalization will be reviewed as part of a later stage of this study.

■

2.3.3 Maine Turnpike Spur (State Route 703)

A significant link in the Maine Mall area transportation network is provided by the Maine Turnpike Spur or State Route 703 (SR 703). This facility provides access between the Maine Turnpike (I-95) to the west and Route 1 to the east, with connections to I-295, Broadway, and the Scarborough Connector. One impetus behind the conduct of this study was the desire to investigate ways in which the SR 703 might be better utilized to provide local and regional access to the Maine Mall area.

The SR 703, as shown in Figure 2-4, was constructed as a controlled-access, "interstate quality" highway (although its design does not meet interstate standards, principally due to the close spacing of interchanges). There are a number of geometric issues associated with SR 703 and its interface with local arterials, as defined in Figure 2-4.

Estimated traffic volumes along SR 703, are based on a combination of machine counts, historical information, and the PACTS regional model. Data were collected by MDOT in 1994 for the Route 703 corridor and ramp system. This information was then supplemented by additional counts along Route 703 by VHB in April 2000. Design hour volumes for the corridor were also developed to conduct an analysis of current operations. Furthermore, the PACTS regional model was used to project future use of the Route 703 corridor to the 2025-design year for the Maine Mall Area Transportation Study.

Traffic operating conditions along Route 703 were evaluated based on existing (1994 and 2000) demand levels. Because the traffic volume data did not include a breakdown of truck/heavy vehicles, it was assumed that 5 percent of the peak hour vehicles along the corridor could be classified as trucks or heavy vehicles. This percentage was conservatively estimated based on the percentage of trucks using the corridor on a typical day that ranges between 8 and 10 percent of daily traffic. Additionally, because the traffic analysis was prepared for the design hour (evening) commuter peak period, it was assumed that the driver characteristics along the roadway were primarily commuter traffic familiar with the general traffic conditions on the corridor.

Tables 2-6 and 2-7 summarize the existing LOS for the SR 703 corridor under the design hour (evening) condition.

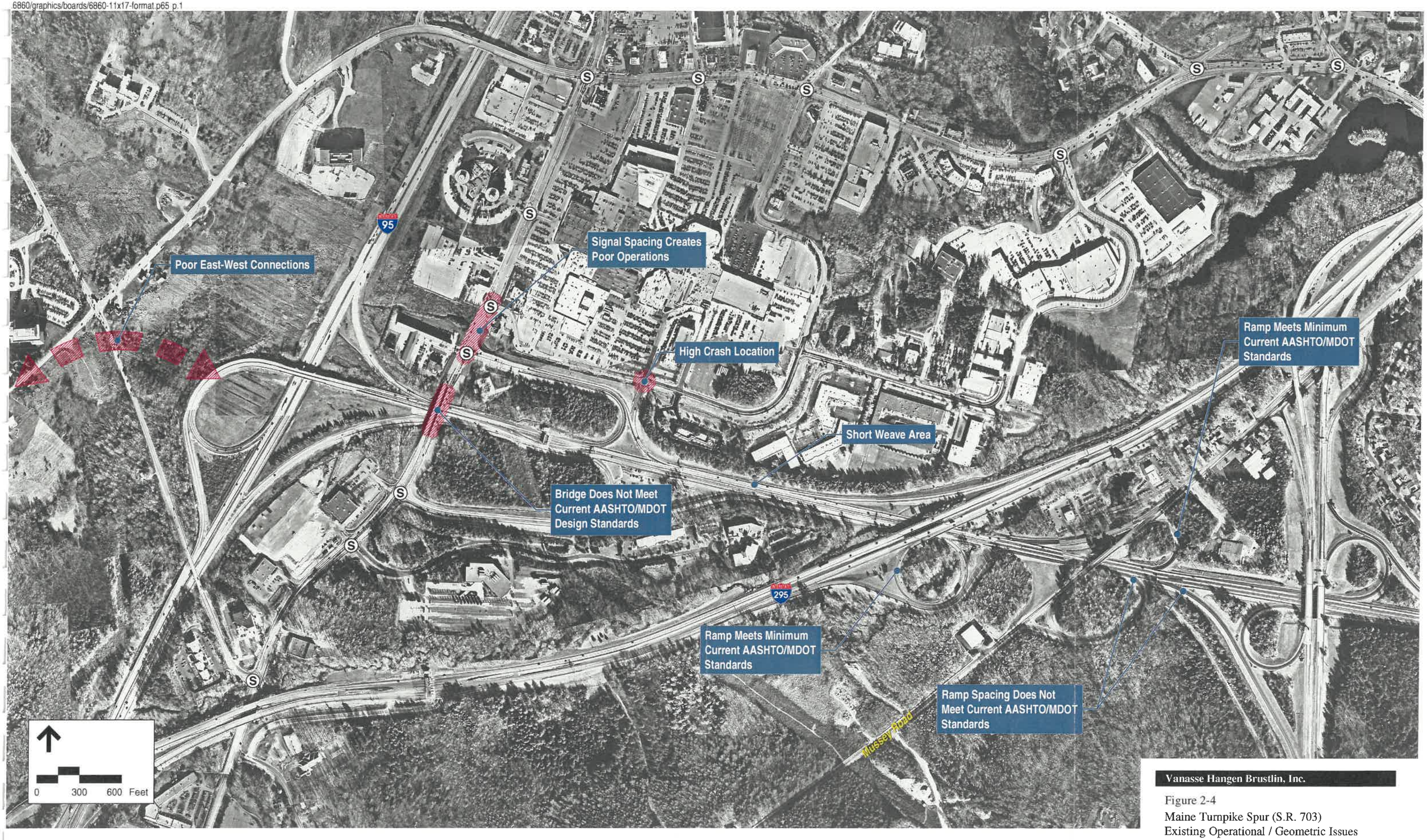


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Figure 2-4
Maine Turnpike Spur (S.R. 703)
Existing Operational / Geometric Issues Summary

Maine Mall Area Transportation Plan

As reflected by the level of service analysis, the SR 703 corridor and ramps currently operate at a very high level of service (in the A to B range). Not reflected in this analysis is the often-cited motorist's confusion over directional signage, number of exits, and lack of egress options from the mall complex.

Table 2-6
Existing State Route 703 Freeway Segment Level-of-Service Summary

Location	1994 Design Hour			2000 Design Hour		
	Volume	Density	LOS	Volume	Density	LOS
Eastbound						
Maine Mall Road/I-295	439	7.98	A	363	6.60	A
I-295/Mussey Road	388	7.05	A	464	8.44	A
Mussey Road/Scarborough Connector	311	5.65	A	378	6.87	A
Scarborough Connector/Route 1	360	6.55	A	372	6.76	A
Westbound						
Route 1/Scarborough Connector	487	8.85	A	486	8.84	A
Scarborough Connector/Mussey Road	462	8.40	A	421	7.65	A
Mussey Road/I-295	363	6.60	A	507	9.22	A
I-295/Maine Mall Road	420	7.64	A	665	12.09	B

* Volume expressed in Vehicles per hour
** Density expressed in passenger car equivalents per mile per lane
*** LOS – Level of Service

Table 2-7
Existing State Route 703 Ramp Junction Level-of-Service Summary

Location	1994 Design Hour			2000 Design Hour		
	Speed	Density	LOS	Speed	Density	LOS
Eastbound						
Maine Mall Road On-ramp	51	13	B	51	12	B
I-295 NB Off-ramp	50	14	B	51	14	B
I-295 NB On-ramp	51	10	B	50	12	B
Mussey Road Off-ramp	51	10	B	51	11	B
Scarborough Conn. Off-ramp	51	9	A	51	11	B
Scarborough Conn. On-ramp	51	11	B	51	10	A
Westbound						
Scarborough Conn. Off-ramp	51	11	B	51	12	B
Scarborough Conn. On-ramp	51	11	B	51	13	B
Mussey Road EB On-ramp	51	11	B	51	12	B
Mussey Road WB On-ramp	51	13	B	51	13	B
I-295 SB On-ramp	51	15	B	51	19	B
Maine Mall Road Off-ramp	50	15	B	49	20	B

2.4 Existing Safety Analysis

A safety evaluation was conducted to identify study area locations that may be unsafe to motorists and pedestrians. This evaluation consisted of compiling and analyzing crash data, provided by the MDOT, reviewing the existing roadway geometry for design deficiencies, and providing a qualitative assessment of pedestrian needs based on observations.

2.4.1 Methodology

The safety analysis was based on an examination of crash rates on the study area roadway and a comparison to statewide averages for similar type facilities. The source of the data is the MDOT Traffic Accident System. The Traffic Accident database analyzes statewide crash data on a three-year basis. The database calculates actual crash rates for every highway link and intersection on state numbered highways. Also calculated is an expected "crash rate" for each location based upon the type of highway or intersection, the traffic volume, and the vehicle miles of travel on the highway. The ratio of the actual crash rate to the expected crash rate is then calculated and referred to as the critical rate factor (CRF). If this ratio is higher than 1.0, then the rate of crash occurrence at that location is said to be "higher than expected." As a first level screening, if a location has a CRF greater than 1.0 ("higher than expected") and 8 or more crashes have occurred at the location over the three-year period, the location meets the criteria to be placed on

MDOT's List of High Crash Locations (HCL). Locations with a CRF greater than 2.0 on the HCL List, that have a correctable crash pattern, are prioritized for further investigation and funding of future safety improvement projects.

Based on the first level screening, a total of 26 locations (15 intersections and 11 roadway links) within the study area meet the criteria for placement on MDOT's list of High Crash Locations. Figure 2-5 presents a summary of each of the 26 HCL locations with the number of crashes experienced and their CRF's noted. Table 2-8 highlights the eight locations with CRFs greater than 2.0. Improvements at two of these locations (Mussey Road/Route 114 and Mussey Road/Spring Street) were completed in 2000. The remaining six locations may qualify for the prioritized investigation and funding for safety improvements. Study participants focused on improving these locations.

The two HCL links noted in Table 2-8 could be described as roadways with a number of unsignalized curb-openings and closely spaced signalized intersections. The accident data indicates a high number of angle collisions (80 percent) at these locations due to the volume of turning traffic.

Table 2-8
Maine Mall Area
Highest Crash Locations (1996, 1997, and 1998)

High Crash Locations	Critical Rate Factor	Number of Crashes
Roadway Links		
Maine Mall Road, south of Mall Entrance Drive	2.09	28
Philbrook Road, east of Maine Mall Road	4.18	12
Intersections		
Route 114 (Gorham Road) / Running Hill Road (unsignalized intersection)	2.73	22
Philbrook Road/John Roberts Road (unsignalized intersection)	2.67	10
Philbrook Road/Maine Turnpike Spur Ramp (unsignalized intersection)	3.14	11
Westbrook Street/On-ramp to I-295 NB (unsignalized intersection)	2.10	20
Mussey Road/Route 114 (unsignalized intersection)	5.14	24
Mussey Road/Spring Street (unsignalized intersection)	10.62	46 *

Source: Maine Department of Transportation Crash Statistics for the three-year period from 1996-1998
* Identifies Specific Accident Trends in crash occurrence at the location in question

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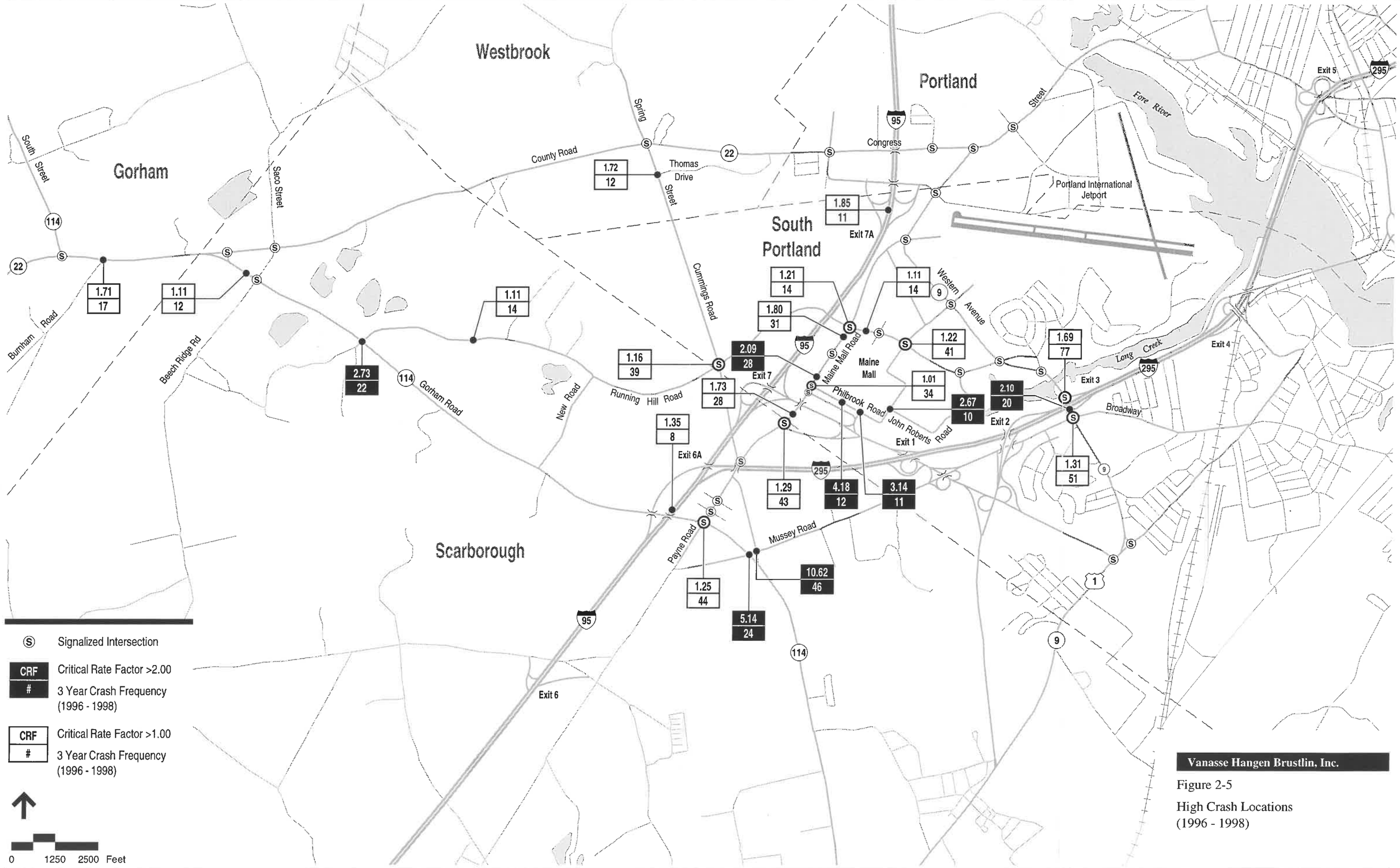

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Figure 2-5

High Crash Locations
(1996 - 1998)

The four remaining HCL intersections are all unsignalized intersections. As noted previously in the unsignalized analysis, two of the locations (Philbrook Road at John Roberts Road, and Westbrook Street at I-295 on-ramp) are operating above current theoretical capacity resulting in a forced-flow operation. These intersections may be HCLs because drivers are trying to 'squeeze' through the intersection by accepting gaps in the traffic stream that are less than normally acceptable. Generally, these 'forced-flow' conditions result in drivers taking unsafe chances and tend to result in higher than average traffic accident conditions. These improvements are being performed, in part, to correct safety deficiencies at this intersection.

The remaining location, Philbrook Road and the Maine Turnpike Spur, is a major access point to the Maine Mall. The intersection currently operates as a three-way STOP condition. At this location drivers appear to be unsure of who has the right-of-way at the STOP signs and tend to get into low-speed collisions. This is highlighted by the low personal injury rates experienced at these intersections.

2.5 Bicycle and Pedestrian Infrastructure

Wilbur Smith Associates has prepared a companion study for PACTS on bicycle and pedestrian conditions within the Maine Mall area. The following findings highlight existing conditions of the study area's bicycle and pedestrian infrastructure:

- Sidewalk conditions vary widely from poor (no sidewalks) to excellent with conditions generally fair to poor;
- Most signalized intersections do not provide for the safe crossing of pedestrians, lacking pedestrian signals and crosswalks;
- Many opportunities exist for expanding the pathway and trail system in the study area with linkages to municipal and regional trails;
- Supporting pedestrian infrastructure for transit users is generally poor; and,
- The urban design of the area is highly oriented to automobiles.

The deficiencies noted in the Pedestrian Study and identified improvement plans were considered as part of this study as the recommendations were developed.

Contact the PACTS office (207-774-9891) for a copy of the final report for this study.

2.6 Existing Conditions Summary

The evaluation of existing traffic operations has provided an overview of the operational characteristics for the general Maine Mall area intersections and roadways. The analysis has shown that there are a number of specific locations where traffic operations do not meet the desired standards (LOS D or better).

Figure 2-6 summarizes the overall operational conditions in the study area.

Traffic Operations

This study analyzed the traffic level of service for various locations of the Maine Mall area. Level-of-service (LOS) is the qualitative measurement denoting the different operating conditions that occur under various traffic volume loadings. Similar to a report card, LOS designations are letter based, ranging from A to F, with LOS A representing the best operating condition under relatively free flowing traffic conditions and LOS F representing the worst operating condition, or locations that are at or approaching capacity.

- **Signalized Intersections.** This study analyzed 31 different signalized intersections within the Maine Mall study area. During the evening design hour, seven locations currently operate at LOS E or LOS F.

- **Unsignalized Intersections.** This study evaluated a total of six unsignalized locations as part of this project. These locations were selected based on consultation with PACTS, and observed traffic exiting and entering the side streets. In the evening design hour, traffic movements at four of the intersections included in this study are currently operating at or over-capacity.

- **Vehicle Queues.** In addition to the standard LOS analysis at each intersection, peak observations were also conducted as part of this study to confirm the results of the analysis. Specifically, vehicle queuing was noted at many of the congested intersections within the study area. Figure 2-6 identifies the approximate length of these observed vehicle queues for reference purposes.

- **Segments.** Ten roadway segments within the study area were evaluated based on their ability to carry the current traffic volume loads. Two of these 10 segments operate at a condition close to capacity (v/c ratio greater than 0.90). The remaining segments appear to have some additional capacity for future growth.

Safety

Traffic safety data for the Maine Mall area for the most recent three-year period available indicated that there are several locations within the project limits, which are exhibiting a "higher than expected", crash rate. Specifically, there were 20 locations where the CRF was greater than 1.0 and six locations where the CRF was greater than 2.00. These include several locations in and around the Maine Mall, along Westbrook Street near the I-295 interchange, and along the Route 114/22-overlap area (as previously shown in Figure 2-5).

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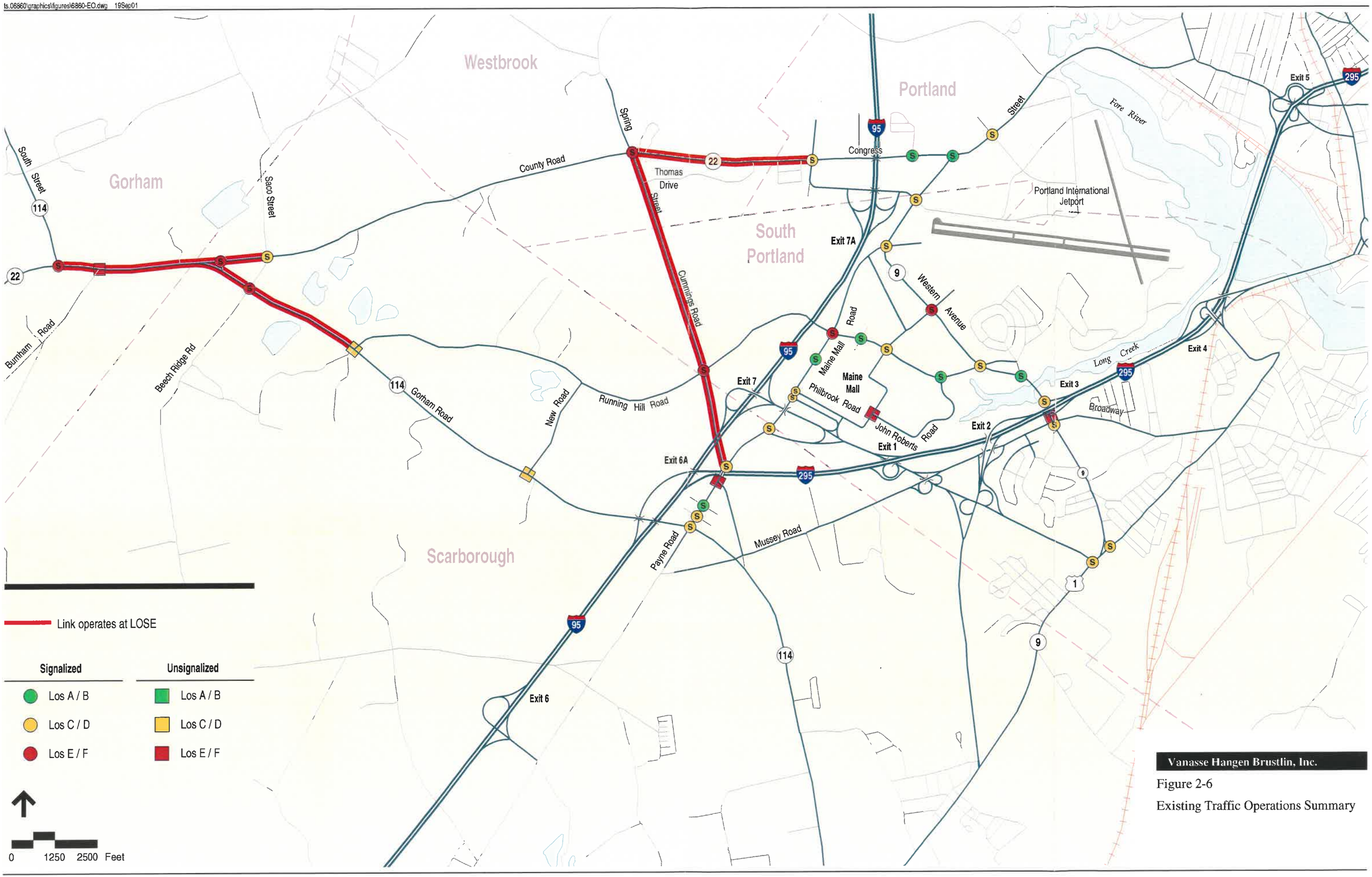

Link operates at LOSE

Signalized	Unsignalized
Los A / B	Los A / B
Los C / D	Los C / D
Los E / F	Los E / F

0 1250 2500 Feet

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Figure 2-6

Existing Traffic Operations Summary

3

Future Conditions Analysis

The second phase of the Maine Mall Area Transportation Plan involved developing an understanding of the anticipated future transportation conditions throughout the study area. This chapter summarizes the results of the future conditions traffic assessment. Data collected and assembled during the earlier tasks of this study were used in conjunction with the PACTS area-wide traffic-forecasting model to estimate future design year travel demands. These projected traffic volumes were used to assess future traffic conditions on roadway links and at key intersections within the study area.

3.1 Planned Roadway Improvements

The 2025 No-Build alternative assumes that no major improvements of any type are implemented within the time-period of the study other than those projects that are presently planned and/or programmed. Within the 30-year time frame for this project (forecast year 2025), the projects summarized in Figure 3-1 and described below are assumed to be included in the No-Build scenario for the purposes of modeling future conditions:

- **Route 22/114 Overlap Area Improvements** – PACTS has been studying a variety of alternative improvements to the overlap area. At this time, consensus is toward a southern by-pass of the corridor. To represent this or a similar improvement in the model, the Route 22/114 Overlap area was assumed to be widened to provide four lanes of capacity.

- **Widen Western Avenue to Four Lanes from Foden Road to Gorham Road** – The City of South Portland will be widening the Western Avenue corridor from Foden Road to Gorham Road from two-lanes to a consistent four-lane cross-section. Associated with this improvement will be signal improvements to the intersection of Foden Road and Western Avenue as well as the intersection of Western Avenue and Gorham Road.

- **Create new interchange ("Exit 7B") at Rand Road** – The Maine Turnpike Authority (MTA) is building a new interchange between Exits 7A (the Jetport Interchange) and Exit 8 (Riverside Street). This new interchange will provide improved connections to the Rand Road area and Route 302 corridor. It is also expected to reduce the volume of traffic utilizing Exit 7A and Exit 8.

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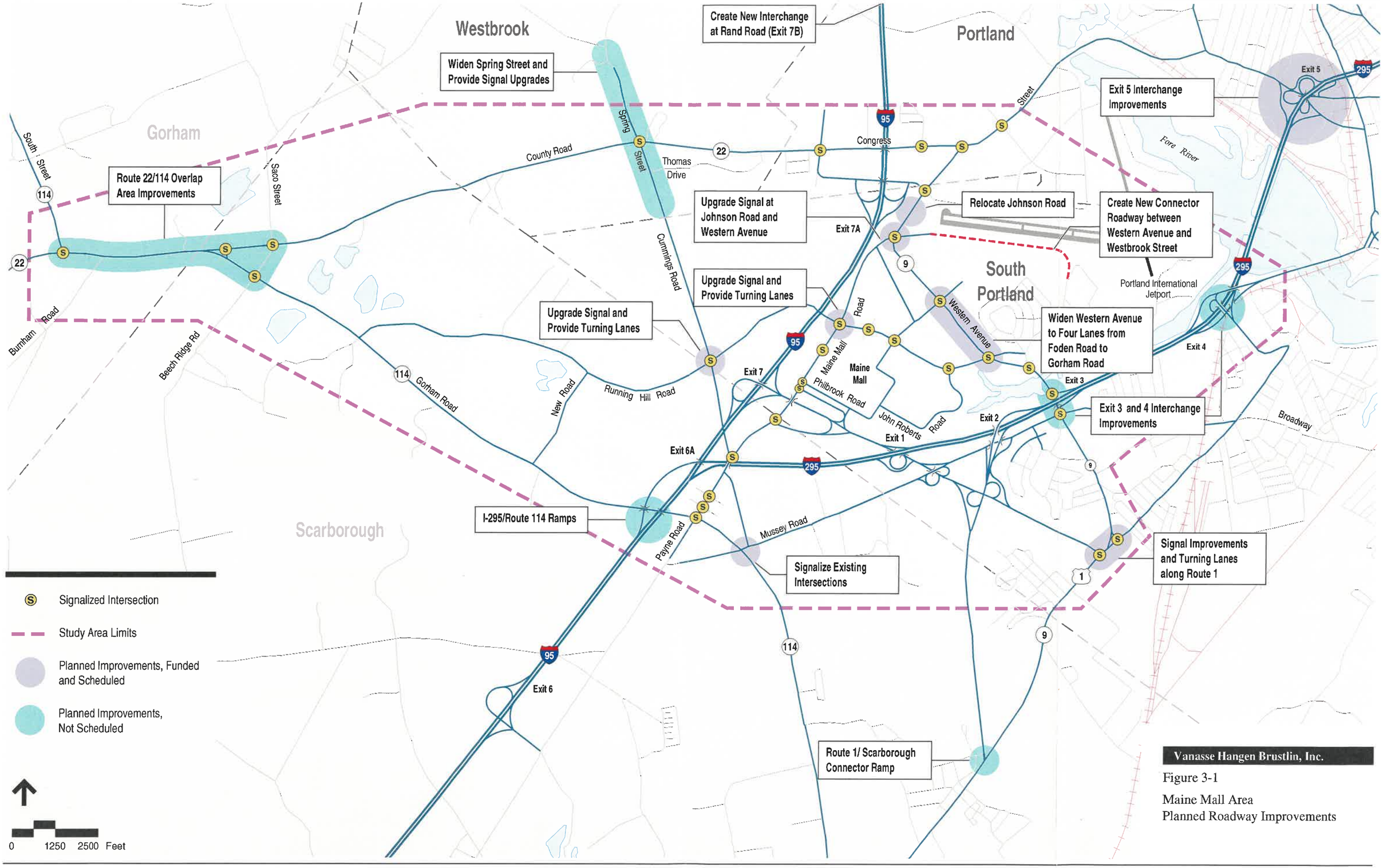

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Figure 3-1

Maine Mall Area
Planned Roadway Improvements

- **Widen Spring Street to Four Lanes** – MDOT and the Town of Westbrook will be widening Spring Street to provide a four-lane cross-section. These improvements are being completed as part of the recommendations from the Spring Street corridor study prepared by Gorrill-Palmer Consulting Engineers, Inc. (GPCEI).

- **Signalize the intersections of Mussey Road and Spring Street/Route 114** – As part of a safety improvement project, MDOT recently completed a project at the "Eight Corners" intersections to provide signalization of Mussey Road and Spring Street as well as Mussey Road and Route 114 (Gorham Road). Minor geometric improvements will also be included in this signal project.

- **Running Hill Road and Spring Street/Cummings Road** – As part of the Packard Development (the Lowe's and Target retail stores), several off-site roadway improvements will be instituted along the Running Hill Road/Spring Street/ Cummings Road corridor. While the proponent is still negotiating specific final improvements with MDOT, the proponent will provide, at a minimum, a new traffic signal and right-turn lanes along Running Hill Road. Furthermore, a new signal will be installed at the main entrance to the site located approximately 500 feet to the east of this intersection along Running Hill Road.

- **Maine Mall Road and Gorham Road/Running Hill Road** – MDOT will be upgrading the signal at this intersection and will be providing additional right-turn lanes on all approaches to meet the current traffic demands.

- **Relocate Johnson Road** – As part of the Exit 7A improvements and in order to meet current Federal Aviation Administration (FAA) guidelines, Johnson Road will be relocated to the west. This improvement will permit the Jetport to extend a runway to meet the current FAA regulations. Minor geometric improvements to the Exit 7A/Johnson Road intersection will also be considered as part of the improvement package.

- **Create Jetport Connector Road** – The City of South Portland will be creating a new access road to Western Avenue from the Johnson Road/Maine Mall Road intersection, running parallel to the Jetport runway. This roadway will connect the intersection to the rear of Western Avenue and provide an alternate route for traffic originating from or destined to the National Semiconductor plant and/or other employers on the east side of Western Avenue.

- **Upgrade the signals at Johnson Road and Western Avenue** – As part of the above noted projects, the signals and geometry at the intersection of Johnson Road and Western Avenue will be upgraded.

It should also be noted that no change in the Turnpike toll structure was included in the 2025 No-Build forecasts presented here.

3.2 Design Hour Traffic Volumes

Design hour traffic volume forecasts for the Maine Mall Area Transportation Study were developed using the regional PACTS travel demand model, as updated by Kevin Hooper Associates. The volume output from the PACTS model was for the weekday evening (design) peak hour condition. Traffic projections from the model assume a 1995 base year condition (which was assumed to approximate the existing 1999 existing conditions – with minor alterations) and projects traffic to the 2025 horizon year. In general, the PACTS model shows moderate growth in the study area along the lines of 1.0 to 1.5 percent per year. Specifically, in the Maine Mall area, growth projections over the 30-year period indicate that the local roadway system will be increasing by approximately 25 to 40 percent.

To forecast future traffic conditions, VHB compared the projected growth on area corridors and adjusted the 1999 Existing Design Hour traffic volumes to account for the higher (or lower) traffic growth. Where appropriate, turning movements were adjusted to account for the percentage changes on adjacent roadways. In certain instances, the model output was more carefully examined to look for areas where the model may not be consistent with anticipated growth patterns, or where the traffic volumes may be inappropriately assigned to the network. Hand adjustments were made to the model output in these areas, accordingly.

The construction of the Exit 7A interchange on the Maine Turnpike resulted in some adjustments to the traffic network in the vicinity of the interchange and along the Western Avenue, Maine Mall Road, and Gorham Road corridors. The 1995 model output did not include the new interchange in the traffic volume networks, whereas the 2025 model output did account for the presence of the interchange. Since the 1999 traffic volume networks presented in the prior Existing Conditions chapter of this study did include the active use of the interchange, minor adjustments were necessary to account for the model projections on the local roadway system. In this particular case, adjustments to the model diversions were made to account for the trips already using the new interchange.

It is also important to note that the 2025 model assumed two significant infrastructure improvements when projecting future traffic volumes. First, the Route 22/114 Overlap area was assumed to be widened to a four-lane cross-section. This was performed to simulate the traffic volume demands for the western portion of the study area and did not limit the capacity of these roadways to their current levels. Secondly, the model assumed the opening of the so-called "Exit 7B" along the Maine Turnpike. While this does not significantly affect traffic patterns in the Maine Mall study area, it does somewhat limit the increase of traffic to and from the north along the Maine Turnpike and along the northern roadway corridors such as Spring Street.

A review of the model output at other locations indicated that volumes were fairly consistent with the general growth patterns in the region. As a result, only minor 'balancing' adjustments were made to the model output. Figure 3-2 shows the 2025 Design Hour traffic volume networks for the study area roadways. Additional data from the travel demand model are provided in a separate Technical Appendix to this report.

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Gorham
South Street
Saco Street
Inset A
Country Road
Spring Street
Portland
Congress
Fore River
Portland International Jetport
Exit 7A
South Portland
Cummings Road
Inset B
Maine Mall Road
Maine Mall
Exit 7
Inset C
Long Creek
Western
Exit 3
Broadway
Exit 2
Exit 1
Exit 6A
Inset D
Mussey Street
Avenue
Burnham Road
Beech Ridge Rd
Scarborough
Gorham Road
New Road
Running Hill Road
Gorham Rd
Foden Rd
Philbrook Rd
Motel
Circuit City
Turnpike Ramp
Westbrook St
Payne Rd
Spring St
Sam's
Walmart

0 1050 2100 Feet

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Figure 3-2

2025 Design Hour
(Weekday Evening)
Traffic Volumes

3.3 No-Build Capacity Analysis Results

Future intersection and roadway link analyses were prepared using the procedures documented in the Highway Capacity Manual. The traffic analyses were conducted using 2025 design hour traffic volumes and the geometric design conditions noted to exist under the 2025 conditions. The results are presented graphically in Figure 3-3 and are discussed in greater detail in the following segments.

As with existing conditions, the traffic operations analysis allows a level of service (LOS) rating to be assigned to the roadway. Level of service is a qualitative measurement of the operating conditions of a roadway facility. The measurement represents the driver's perception of operating conditions including such indicators as travel time, speed, maneuverability, comfort, and safety. LOS C or better is defined as the generally acceptable condition by which these facilities should operate with LOS D, the minimum acceptable condition in the more urbanized areas. LOS E or F generally represents the conditions where a roadway is operating at capacity or failing.

3.3.1 Roadway Level of Service

Traffic operating conditions along various segments of study area roadways were evaluated based on anticipated future traffic conditions. In areas of closely spaced traffic signals, such as near the Mall, roadway segment LOS is defined by the operations of the traffic signals and not by the actual capacity of the roadway. With traffic being released by the signals in platoons, the roadway segment LOS would not be indicative of the actual operations of the segment. For this reason, no segment analysis was performed in certain areas where multiple signals are present. The future roadway segment LOS results for the specific links within the overall study area are shown in Table 3-1.

Table 3-1
Roadway Segment Capacity Analysis- Future Design Hour Conditions (2025)

Roadway Segment (non-access controlled roadways)	Volume	V/C[1]	LOS[2]
County Road, at the Route 22/114 Overlap	3,760	1.02	F
County Road, east of Saco Street	1,350	0.59	E
Route 114 (Gorham Road), north of Running Hill Road	2,390	1.04	F
Running Hill Road, east of Route 114 (Gorham Road)	1,005	0.44	D
Route 114 (Gorham Road), north of Payne Road	1,180	0.49	D
Spring Street, south of Running Hill Road (Scarborough)	1,705	0.72	E
Running Hill Road, west of Maine Mall Road	1,765	0.73	E
Spring Street, south of County Road (Westbrook)	1,735	0.69	E
Congress Street, east of Spring Street	2,460	1.02	F

1 V/C - Volume-to-capacity ratio.
2 LOS - Level-of-service.

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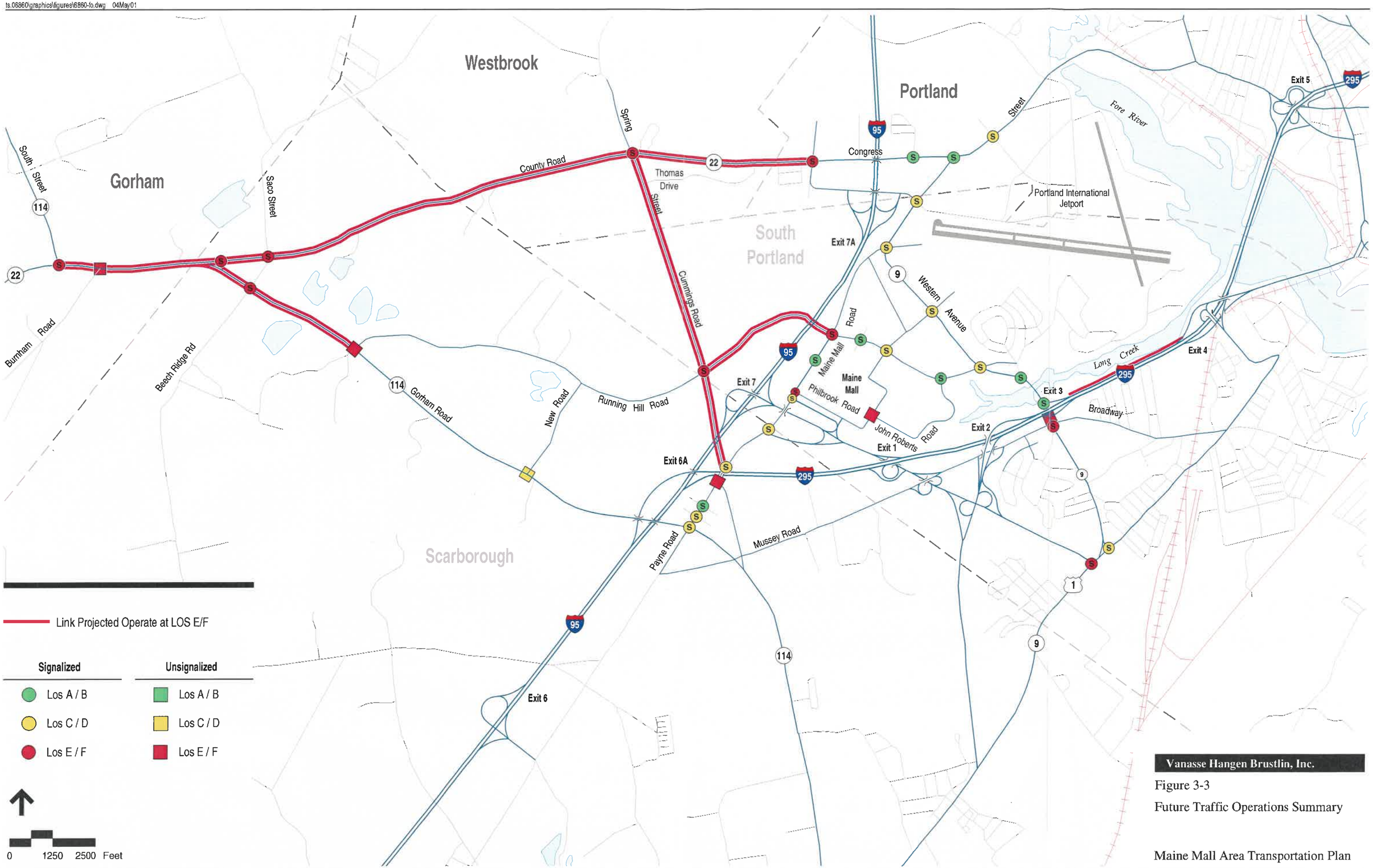

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Figure 3-3

Future Traffic Operations Summary

Maine Mall Area Transportation Plan

As Table 3-1 indicates, there are a number of roadway links that are projected to operate at LOS E or worse during the 2025 peak period conditions. This is particularly true of the Route 22/114 "overlap" area in the western portion of the study area, on the outer Congress Street link between Spring Street and the new I-95 interchange (exit 7A ramps), and the Route 114 corridor north of Running Hill Road. While some other sections currently operate at LOS E, the volume-to-capacity ratios are still projected to be well below capacity by 2025.

■

3.3.2 Signalized Intersection Operations

Capacity analysis was also conducted at the 31 signalized intersections within the study area. The results of the intersection analysis under 2025 future design hour conditions are summarized in Table 3-2.

The table shows that there are 11 intersections expected to fall below acceptable operating conditions during the 2025 design hour condition. Observations of future conditions include:

- **Route 22/114 Overlap Area** – Even with the assumed widening of the Route 22/114 overlap area from 2 lanes to 4 lanes, the three signalized intersections along Route 22 are projected to deteriorate to LOS F under 2025 design hour conditions. This is due to the traffic volume growth anticipated along this corridor under 2025 design conditions. Furthermore, the intersection of Saco Street/Beech Ridge Road with Route 114 is also projected to operate at LOS F under future design conditions.

- **Spring Street Corridor (Westbrook section)** – The intersection of Spring Street and County Road is projected to benefit from the widening of Spring Street to a four-lane cross-section and associated turning lane improvements. Traffic operations are projected to improve from current LOS E conditions to LOS C operations under future traffic projections.

- **Westbrook Street Interchange/Gorham Road corridor** – A benefit resulting in the larger utilization of Exit 7A is that there are several locations along Gorham Road and Westbrook Street in South Portland that actually improve as traffic shifts from using the Westbrook Street interchange and begins to use the Exit 7A interchange. In particular, the intersection of Western Avenue and Gorham Road is projected to operate at a slightly improved operating condition as well as the intersection of Gorham Road and Clarks Pond Road. Other intersections along these corridors do not see significant increases in traffic volume delay.

- **Payne Road Corridor** -- Moderate traffic volume increases along Payne Road will reduce the available capacity at the intersections along the corridor, however, the intersections are expected to remain at acceptable operations.

Table 3-2
Signalized Intersection Capacity Analysis- Future Design Hour Conditions

Signalized Intersections	1999 Existing Conditions V/C[1]	Delay[2]	LOS[3]	2025 Future Weekday Evening Peak Design Hour V/C[1]	Delay[2]	LOS[3]
County Road (Route 22) at South Street (Route 114)++	> 1.2	> 60	F	> 1.2	> 60	F
County Road (Route 22) at Route 114 (Gorham Road)++	>1.2	>60	F	> 1.2	> 60	F
County Road (Route 22) at Saco Street++	0.70	21.6	C	> 1.2	> 60	F
Route 114 (Gorham Road) at Saco Street/Beech Ridge Road	0.90	25.3	D	> 1.2	> 60	F
Route 114 (Gorham Road) at Payne Road	0.71	18.5	C	0.86	23.3	C
County Road (Route 22) at Spring Street++	0.96	22.9	E	> 1.2	> 60	F
Congress Street at Hutchins Drive	0.76	17.9	C	> 1.2	> 60	F
Congress Street at Unum Access Driveway	0.66	8.5	B	0.72	9.4	B
Congress Street at Johnson Road	0.51	8.1	B	0.49	6.6	B
Payne Road at Sam's Club	0.62	20.7	C	0.69	15.8	C
Payne Road at Wal-Mart Entrance	0.72	13.0	B	0.78	14.1	B
Payne Road at Spring Street	0.83	15.6	C	0.94	18.4	C
Johnson Road at Jetport Access Road (north)	0.88	21.8	C	0.97	27.4	D
Johnson Road at Jetport Access Road (south) ++	0.86	29.4	D	0.95	22.6	C
Western Avenue at Maine Mall Road/Johnson Road++	0.96	27.7	D	0.83	21.2	C
Western Avenue at Foden Road++	0.99	41.4	E	0.92	28.2	D
Western Avenue at Gorham Road++	0.78	21.2	C	0.91	27.4	D
Gorham Road at Clarks Pond Parkway	0.50	6.2	B	0.44	5.8	B
Gorham Road at Philbrook Road/Foden Road	0.67	22.1	C	0.56	27.4	D
Maine Mall Road at Gorham Road/Running Hill Road++	>1.2	>60	F	>1.2	>60	F
Maine Mall Road at Philbrook Road	1.00	46.2	D	1.08	78.2	E
Maine Mall Road at Maine Mall Entrance/Sheraton	0.56	7.4	A	0.84	11.8	B
Gorham Road at Maine Mall Entrance	0.55	10.3	B	0.63	11.3	B
Maine Mall Rd at the SR 703 eastbound ramps	1.00	33.3	C	1.08	30.1	C
Maine Mall Rd at the SR 703 westbound ramps	0.85	16.1	C	0.91	18.8	C
Running Hill Road at Cummings Road	> 1.2	> 60	F	>1.2	>60	F
Western Avenue at Westbrook Street	0.72	6.8	B	0.59	6.6	B
Westbrook Street at I-295 Off Ramp	0.88	17.1	C	0.80	10.5	B
Westbrook Street at Broadway	1.00	25.9	D	> 1.2	> 60	F
Westbrook Street at Main Street (Route 1)++	0.59	15.6	C	0.75	26.2	D
Main Street at Maine Turnpike Spur ++	0.90	26.4	D	> 1.2	> 60	F

1 Volume-to-capacity ratio
2 Delay is expressed in seconds per vehicle.
3 Level-of-service
+ Delay is too high to accurately estimate.
++ 2025 Analysis includes roadway improvements identified in the previous section.

➤ **Maine Mall Area** -- Finally, intersections surrounding the Maine Mall will see moderate traffic growth over the design period. While there are expected to be some traffic shifts occurring around the Mall area due to the previously mentioned roadway improvement projects, there will still be a moderate traffic growth on most area roadways. Specifically, the intersections of Maine Mall Road and Philbrook Road/the State Route 703 westbound ramps are projected to deteriorate to LOS E and LOS C, respectively, under future conditions. More telling, is the increase in intersection volume-to-capacity ratios at these two locations to over 1.0 conditions indicating that, while the intersections themselves are handling the majority of the traffic entering the intersection, there are certain approaches that are operating above the theoretical capacity. This is partly due to the traffic growth projected along Maine Mall Road (approximately 15 percent) and partly due to higher traffic volumes being generated by the Maine Mall.

■

3.3.3 Unsignalized Intersection Operations

The results of the future design hour unsignalized intersection analysis are shown in Table 3-3. Analyses were conducted for all six unsignalized intersections. Unsignalized intersection analysis presents operating conditions for the critical side street movements. Analysis assumes that traffic along the major roadway is not affected by the delays occurring on the side street.

Table 3-3
Unsignalized Intersection Capacity Analysis- Future Conditions

	2025 Future Weekday Evening Peak Design Hour			
Unsignalized Intersections	Movement[1]	Demand	Delay[2]	LOS[3]
Route 114 (Gorham Road) at Running Hill Road	WB R	725	+	F
County Road (Route 22/114) at Burnham Road	NB L	30	+	F
Philbrook Road at John Roberts Road	WB LT	200	+	F
Running Hill Road at New Road	SB LR	20	22.6	D
Payne Road at Spring Street	WB L	15	+	F
Westbrook Street at I-295 On Ramp	SB L	435	37.4	E

1. Of the critical movements from the minor street and the left-turn movement from the major street are reported.
2. Approach delay, expressed in seconds per vehicle.
3. LOS: Level-of-service.

\+ Delay is too high to accurately estimate.

There are five key unsignalized intersections that will operate at or over capacity based on the project criteria in 2025. It should be noted that there is a slight improvement in the LOS at the Westbrook Street/I-295 On-ramp due to the opening of Exit 7A on the Maine Turnpike; however, the reduction in traffic volume is not enough to bring the traffic volume back to acceptable operating conditions at this intersection.

3.3.3 Maine Turnpike Spur (SR 703)

Traffic operating conditions along State Route 703 were reassessed based on projected future demands. The results of this analysis are summarized in Tables 3-4 and 3-5.

Table 3-4
Future State Route 703 Freeway Segment Level-of-Service Summary

Location	2025 Design Hour		
	Volume	Density	LOS
Eastbound			
Maine Mall Road/I-295	390	7.09	A
I-295/Mussey Road	466	8.47	A
Mussey Road/Scarborough Connector	345	6.27	A
Scarborough Connector/Route 1	336	6.11	A
Westbound			
Route 1/Scarborough Connector	921	16.75	C
Scarborough Connector/Mussey Road	844	15.35	B
Mussey Road/I-295	965	17.55	C
I-295/Maine Mall Road	1062	19.31	C

Table 3-5
Future State Route 703 Ramp Junction Level-of-Service Summary

Location	2025 Design Hour		
	Volume	Density	LOS
Eastbound			
Maine Mall Road On-ramp	51	12	B
I-295 NB Off-ramp	51	15	B
I-295 NB On-ramp	50	13	B
Mussey Road Off-ramp	51	11	B
Scarborough Connector Off-ramp	51	11	B
Scarborough Connector On-ramp	51	9	A
Westbound			
Scarborough Connector Off-ramp	51	12	B
Scarborough Connector On-ramp	51	20	C
Mussey Road EB On-ramp	51	19	B
Mussey Road WB On-ramp	50	20	C
I-295 SB On-ramp	50	28	D
Maine Mall Road Off-ramp	49	30	D

As noted by the level of service analysis, the SR 703 corridor is expected to have ample reserve capacity and good operating conditions well into the future. This condition opens up the possibility of using the SR 703 corridor to relieve other more taxed arterials in the area and to improve access to and from the Maine Mall complex. These options are discussed in more detail in Chapters 5 and 6 of this report.

4 Existing Environmental Conditions

This chapter discusses the environmental and cultural resource constraints (both natural and manmade) within the study area that could affect the feasibility of proposed alternatives. Constraints studied include wetlands and surface water resources; public drinking water supplies; 100-year floodplains; threatened and endangered species; historic and archaeological resources; Section 4(f) and Section 6(f) lands; land uses (including neighborhoods, commercial and industrial development) and areas of possible hazardous materials contamination. These constraints are discussed in the following sections, including an explanation of why they are studied, *i.e.*, how they could potentially limit alternatives, and a description of their presence and extent within the study area.

4.1 Constraint Mapping Process

Preliminary constraint mapping has been done based upon a review of available information from a variety of sources. Wetlands and surface water resources have been mapped based on review of USGS topographic and National Wetland Inventory (NWI) maps. Wetland boundaries have been field verified on a limited basis. Locations of public drinking water supplies were identified using information from the Maine Drinking Water Program. Floodplain information was obtained from available Federal Emergency Management Agency Flood Insurance Rate Maps. Information regarding the presence of rare, threatened, and endangered species was gathered from the U.S. Fish and Wildlife Service, the Maine Department of Inland Fisheries and Wildlife, and the Maine Natural Areas Program (MNAP, an office of the Maine Department of Conservation). Information on the presence of historic resources within the project area was obtained from the Maine Historic Preservation Commission (MHPC). Potential Section 4(f) and 6(f) properties within the study area were identified through consultation with the planning and parks and recreation staff from each of the study area's municipalities.

In fairly well developed locations like the Maine Mall area, oftentimes the most significant constraint facing a transportation alternative is the existing land use. Through aerial photography and field inspection, the existing land uses were also inventoried and taken into consideration as the transportation alternatives were identified and evaluated.

4.2 Constraints

This section describes each of the environmental constraints studied for this report.

4.2.1 Wetland and Surface Water Resources

Because they provide important ecological functions such as flood retention, wildlife habitat, and nutrient production, wetlands in the study area are protected by state and federal laws. Wetlands and surface waters are regulated at the federal level by the U.S. Army Corps of Engineers under the Section 10/404 Program. The State of Maine Natural Resources Protection Act (38 M.R.S.A., sections 480-A to 480-Z) (NRPA) establishes regulations to protect Maine's natural resources, including rivers, streams, great ponds, and freshwater wetlands. Because these regulations stress avoidance of wetland resources as the first step in the permitting process, an alternative's potential impact to wetlands and surface waters is generally the environmental constraint that most greatly affects the selection process.

The project study area is almost entirely within the Fore River Watershed; just a small portion in the northwestern part of the study area drains to the Stroudwater River and a small part of the southern portion of the study area drains into the Nonesuch River. Figure 4-1 shows the perennial streams within the project area, there are six streams crossed by roadways at twenty locations that would likely be affected by roadway improvements. The most notable are Long Creek and Red Brook, which are both tributaries to the Fore River. Table 4-1, lists all of the streams that are crossed by roadways within the study area and gives their general location.

Wetlands occur throughout the study area, and most are hydrologically connected with the streams and rivers listed in Table 4-1. Some, however, occur as isolated depressions having no inlet or outlet. Wetland locations are shown on Figure 4-1.

Based upon a review of the National Wetlands Inventory maps, approximately 15 percent of the study area is freshwater or estuarine wetland. Most of the wetlands are freshwater, forested evergreen and deciduous palustrine wetlands associated with streams. The balance of the freshwater wetlands are shrub-dominated wetlands, emergent dominated wetlands, or open water. There are subtidal and intertidal estuarine wetlands associated with Long Creek and the Fore River in the eastern portion of the study area.

The major project area wetlands are associated with Red Brook and the Nonesuch River and occur in the south central portion of the study area. Much of the land immediately adjacent to Interstates 95 and 295 (I-95 and I-295), Route 114, Payne Road, Maine Mall Road, and Mussey Road is wetland associated with Red Brook or the Nonesuch River. Other major project area wetlands are those associated with the headwaters of Long Creek in the north central portion of the study area, west of Cummings Road, and with Red Brook in Gorham, north of Route 22.

Table 4-1
Stream Crossings in Maine Mall Study Area

†Stream	Crossing Number	Municipality	Road	General Location	†† 100-year Floodplain Overtops Roadway
Stroudwater River	-	Gorham	Route 114	1,000 feet north of the intersection with County Road	yes
Unnamed Tributary to the Stroudwater River	-	Portland	Congress Street	600 feet east of the intersection of Congress Street and Johnson Road	no
Red Brook	1	Scarborough	County Road	3,000 feet east of the intersection with Beech Ridge Road	no
	2	Scarborough	Running Hill Road	3,000 feet east of the intersection with Route 114	no
	3	Scarborough	New Road	180 feet northeast of the intersection with Route 114	yes
	4	Scarborough	I-95	1,800 feet northeast of the intersection with Route 114	yes
	5	Scarborough	Cummings Road	just north of I-295	yes
	6	South Portland	I-295	1,000 feet east of the Scarborough town line	no
	7	South Portland	I-295	five crossings in the vicinity of Exit 1	yes
Long Creek	1	South Portland	Cummings Road	800 feet north of the intersection with Running Hill Road	No
	2	South Portland	Cummings Road	275 feet south of Westbrook town line	No
	3	South Portland	I-95	2,000 feet north of the intersection with Running Hill Road	Yes
	4	South Portland	Maine Mall Road	2,000 feet north of the intersection with Running Hill Road	Yes
	5	South Portland	Foden Road	1,400 feet southwest of the intersection with Western Avenue	Yes
	6	South Portland	Gorham Road	500 feet west of Western Avenue	Yes
	7	South Portland	Westbrook Street	700 feet north of the intersection with I-295	Yes
Unnamed Tributary to Long Creek	-	Westbrook	Spring Street	1,000 feet south of County Road	no
Unnamed Tributary to Long Creek	1	South Portland	Western Avenue	950 feet southeast of the intersection with the Maine Mall Road	no
	2	South Portland	Foden Road	800 feet west of the intersection with Western Avenue	no
Nonesuch River	-	Scarborough	Route 114	2,000 feet south of the intersection with Mussey Road	yes
Unnamed Tributary to the Nonesuch River	-	South Portland	Route 1/ I-95 Connector	2,000 feet northwest of the intersection with Route 1	no

† Streams listed are those that occur on the 1:25000 USGS topographic maps.
†† Based on FEMA floodplain mapping.

4.2.2 Floodplains

Floodplains are low-lying areas that are adjacent to streams, rivers, or coastline. These areas store water during periods of flooding. Flood storage capacity provided by floodplain reduces flooding impact on land downstream by reducing peak flows. Development in floodplain can decrease the amount of flood storage, which can increase flooding threat to downstream areas.

According to Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps for the five municipalities in the study area, the Stroudwater River, Red Brook, Long Creek, and the Nonesuch River have 100-year flood plain within the study area. The 100-year flood plain approaches or overtops the roadway in the study area in eleven locations (see Table 4-1 for approximate locations and the Appendix for copies of the FEMA maps);

- Long Creek's floodplain overtops five roadways in South Portland; Westbrook Street, Running Hill Road, Foden Road, Maine Mall Road, and I-95;
- Red Brook's floodplain overtops New Road, I-95, and Cummings Road in Scarborough and I-295 in South Portland;
- The Stroudwater River's floodplain overtops Route 114 in Gorham; and
- The Nonesuch River's floodplain overtops Route 114 in Scarborough.

Any work proposed in these areas would need to comply with the South Portland, Scarborough, and Gorham Floodplain Ordinances. Roadway improvements would need to be designed so as not to reduce flood storage capacity in these areas.

4.2.3 Public Drinking Water Supply

The Federal Safe Drinking Water Act (42 USC 300f) (SDWA) is the primary law regulating drinking water quality in the United States. The Maine Drinking Water Program (DWP) administers the SDWA in the State of Maine under the Maine Drinking Water Rules. The DWP Source Water Assessment Program (SWAP) helps identify areas important to the protection of water supplies. The source waters and their protection zones are locations that may be sensitive to non-point source pollution generated from highway development.

Public Water Supply Wells

The SWAP includes the Maine Wellhead Protection Program, which is a voluntary program aimed at reducing potential sources of contamination in the vicinity of wellheads. The program provides guidelines for the establishment of Wellhead Protection Areas (WPAs).

Two Public Water Supply Wells were identified in the project area from MDWP data. Their locations are also shown on Figure 4-1. One is a 275-foot well at the Smiling Hill Farmland Co., LLC in Westbrook and the other is a 23-foot deep gravel well at the First Stop County Road Store in Scarborough. Based on the populations served by the wells, they both have 300-foot WPAs. The WPA for the Smiling Hill Farmland well overlies Route 22.

Aquifers

The Maine Natural Resource Information and Mapping Center has mapped significant sand and gravel aquifer areas and sand and gravel aquifer areas. Significant sand and gravel aquifers are those capable of yielding more that 10 gallons per minute to a properly installed well (areas where the course grained material is deeper than 10 feet below the water table). The mapped aquifer areas not designated significant usually does not meet the 10-gallon per minute requirement. A significant sand and gravel aquifer is present in much of the western and south central portion of the study area in Scarborough, Gorham, and Westbrook (Figure 4-1).

■

4.2.4 Rare, Threatened, and Endangered Species

Rare and Endangered Species are protected at both the federal and state levels. Rare species are protected because they are part of ecological communities that are important natural resources. The Federal Endangered Species Act (16 U.S.C.A. section 1531-43) requires federal agencies to conserve listed species. Maine regulations protect rare animal species by prohibiting the "misuse" of any individuals of the species and the habits that contain physical or biological features critical to the species' survival. Actions that may significantly affect essential habitat must take all reasonable measures to mitigate any adverse impacts.

The United States Fish and Wildlife Service (USFWS) was consulted regarding the presence of federally listed or proposed threatened or endangered species. According to their Maine Field Office, there are no documented occurrences of federally threatened or endangered species within the study area, with the exception of the occasional, transient bald eagle (*Haliaeetus leucocephalus*). (See consultation letters in the Appendix of this report).

Rare plants and botanical communities are not protected under state regulations unless they are identified as essential to providing state-listed wildlife species with physical or biological features that are critical to the species' survival, or are within another protected natural resource. However, the Commissioner has mandated the MNAP to develop and maintain an Official List of Endangered and Threatened Plants (E & T List) in Maine, which is used as an informational planning tool. The E & T List contains native vascular plant species which are vulnerable to loss. The Department of Conservation also recognizes a "Special Concern" category of rare plant, which is described as rare based on available information, but not sufficiently rare to be considered threatened or endangered.

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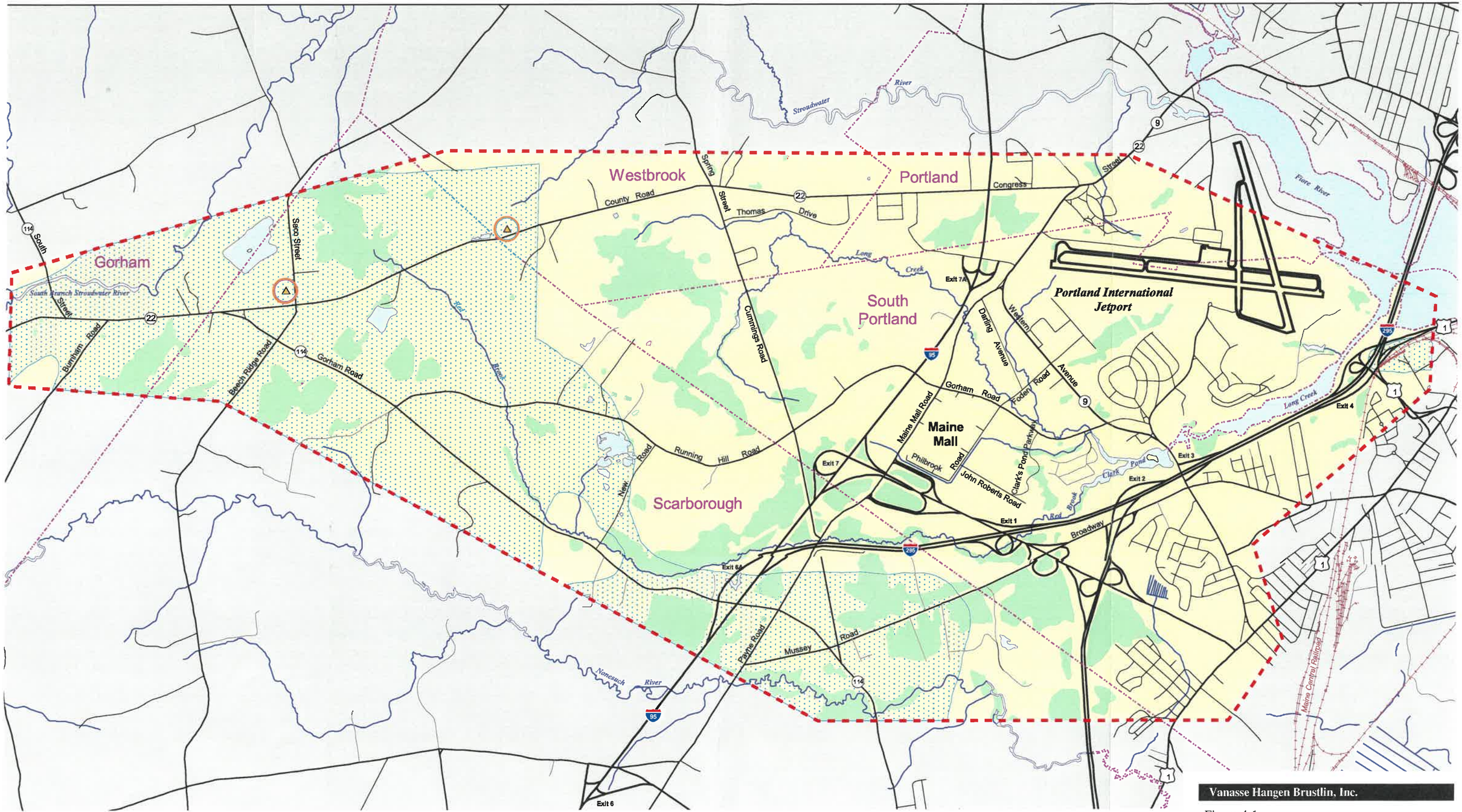

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Figure 4-1

Water Resources

Maine Mall Area Transportation Plan

The Maine Department of Inland Fisheries and Wildlife (IF&W) was contacted regarding state listed rare fish and wildlife species and the Natural Areas Program was consulted regarding rare plant populations. IF&W indicated that their records show no threatened or endangered fish species within the project area, but that Red Brook supports a small, wild population of brook trout that could be significantly impacted by future development. IF&W also indicates that there are no Significant Wildlife Habitats within the study area (see map in Appendix). The Maine Department of Conservation Natural Resources Information and Mapping Center reviewed the Natural Areas Program's Biological and Conservation Data System and other records of the area and found no rare botanical features documented within the study area.

■

4.2.5 Historic and Cultural Resources

Section 106 of the National Historic Preservation Act of 1966, as amended, requires federal agencies to take into account the effect of an undertaking on historic properties listed, or eligible for listing in the National Register of Historic Places. Section 106 would apply to any roadway improvement projects funded wholly or in part by the Federal Highway Administration. The regulations call for application of the criteria of "effect," "no adverse effect," and "adverse effect," (36 CFR 800.3) to assess project impacts on historic properties listed or eligible for listing in the National Register. The National Register includes several types of historic resources. These are archaeological sites, historic sites, and traditional cultural properties.

To meet the Section 106 requirements for this study, information on the presence of historic resources within the project area was requested from the Maine Historic Preservation Commission (MHPC), in February 2000. (See enclosed letter in the Appendix to this report).

The MHPC found that there was insufficient information to completely identify historic properties within the area of potential effects of the project. MHPC did, however, provide a list of state properties that could potentially be eligible for listing on the National Register of Historic Places, as described in Table 4-2. If proposed improvements were to affect these properties, their historical significance would need to be researched further. The locations are also shown on Figure 4-2.

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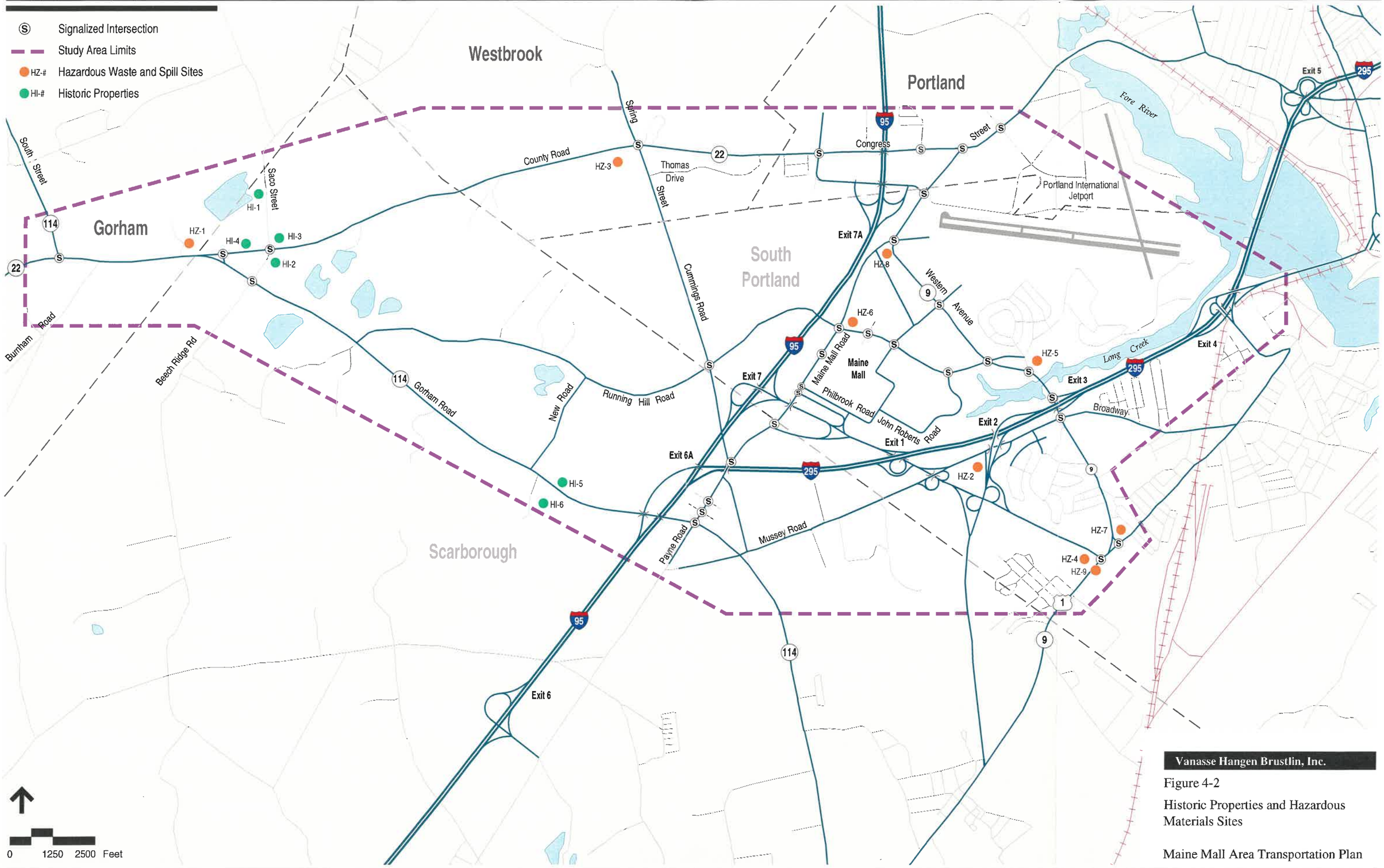

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Figure 4-2

Historic Properties and Hazardous Materials Sites

Maine Mall Area Transportation Plan

Table 4-2
Historic Properties Potentially Eligible for the NRHP
In Maine Mall Study Area

Map Number	Name	Town	Location	Description	MHPC Inventory Number
HI-1	John B. Hillock	Scarborough	52 Saco Street	Single Family Home	383-1066
HI-2	North Scarborough Grange	Scarborough	80 County Road	Agriculture	383-1056
HI-3	Ralph E. Temm	Scarborough	79 County Road	Single Family Home	383-1054
HI-4	Robert & Elanor Kennedy	Scarborough	97 County Road	Single Family Home	383-1049
HI-5	Geoffrey Maclean	Scarborough	311 Gorham Road	Single Family Home	383-1040
HI-6	Spring Valley Associates	Scarborough	304 Gorham Road	Recreation/Culture	383-1090

Source: Maine Historic Preservation Commission

■

4.2.6 Section 4(f) and Section 6(f) Resources

Section 4(f) of the Department of Transportation Act of 1966 requires that prior to the approval of use of land from a publicly owned park, recreational area, or wildlife or waterfowl refuge, or from an historic or archaeological resource listed on or eligible for the National Register of Historic Places (NRHP), for a federally funded transportation project, the proponent must determine that there is no prudent and feasible alternative which avoids such use. Additionally, the proponent must demonstrate that the proposed study includes all possible planning to minimize harm to these valuable public resources. Potential 4(f) resources are defined as *public* parks, recreation areas and wildlife refuges as well as both *publicly and privately* owned historical properties. This section discusses only public parks, recreation areas, and wildlife areas, since historical properties were discussed in the preceding section.

Section 6(f) lands are those that have been purchased with funds under the Land and Water Conservation Fund Act. Section 6(f) of the Land and Water Conservation Act (LWCA) states that any lands that were purchased with LWCA funds may not be "converted" to another use for purposes inconsistent with the Act without being replaced with other land that is of equal use and value to the land proposed for conversion.

Potential 4(f) and 6(f) properties within the study area were identified through consultation with the planning and parks and recreation staff from each of the study area's municipalities. Town staff was asked to identify any public parks, recreational areas, wildlife refuges, or dedicated open space parcels along the study area's roadway corridors. The Maine Historic Preservation Commission was contacted to identify historic or archaeological resources listed on or eligible for

the National Register of Historic Places.

Only one area of publicly owned recreation land was identified within the study area. None were found within the study area in the City of South Portland, the City of Portland, City of Westbrook or the Town of Scarborough. The only publicly owned wildlife refuge identified during the data collection effort is the state owned Narragansett Game Sanctuary in Gorham at the northwestern limit of the study area. The entire sanctuary is approximately 3,600 acres and is bounded to the south by the Stroudwater River. Only a small portion of the southern limit of the sanctuary falls within the study area.

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4.2.7 Oil and Hazardous Materials

As part of this study, VHB conducted a federal and state environmental database search to help identify properties within the study area that have had a release or pose a threat of release of oil and/or hazardous materials. VHB reviewed federal and state environmental databases using New England Datamap's Environmental FirstSearch Database. A list and description of the databases searched is included in the Appendix along with a copy of the FirstSearch report.

Identified Sites

The database search identified 346 sites in the study area: two CERCLIS sites, 36 RCRA sites, three ERNS sites, five state sites, 168 spill sites, and 132 Registered UST/AST's. Based on a review of the information provided in the database report, VHB has identified nine sites that could pose potential environmental concerns for roadway improvements. Each of these sites are described below in Table 4-3 and their general locations are shown on Figure 4-2.

These sites pose potential liability if acquired as part of a right of way taking, and could pose a hazard to workers during construction. For these reasons, if work is proposed in these areas, further investigation into the specific site hazards will need to be investigated. All of the other sites identified in the database search are not considered to pose environmental concerns based on the information provided in the database detail sheets such as regulatory status; amount, type, and age of release.

Table 4-3
Hazardous Materials Sites in Maine Mall Study Area

Map Number	Name	Address	Municipality	Description
HZ-1	Maine Metal Finishing	Route 22, RFD 1	Gorham	This site is currently listed as a state hazardous waste site. EPA had conducted a preliminary assessment and site investigation, however, the Maine DEP is now overseeing the site as a hazardous materials site. Metal and solvents were identified in the subsurface.
HZ-2	Broadway Industries	2066 Broadway	South Portland	Listed for two spills: aboveground storage tank release of 50 gallons of #2 fuel oil, and unknown amount of waste oil.
HZ-3	County Road Business Park	Lot 16 County Road	Westbrook	Release of 100 gallons of unspecified oil from a transportation truck.
HZ-4	Exit 7 Irving	690 Main Street	South Portland	Listed for two spills: release of unleaded gasoline from an underground storage tank, and 40 gallons of diesel from a tank overfill.
HZ-5	N/A	N/A	South Portland	Release of 1,100 gallons of unspecified chemicals from a service station; 500 gallons were recovered during excavation procedures.
HZ-6	N/A	N/A	South Portland	Unknown quantity of gasoline released from an underground storage tank at a service station.
HZ-7	N/A	N/A	South Portland	Unknown quantity of motor fuel released from a tank and/or piping removal of an UST at a service station.
HZ-8	Spillane Car Rental	60 Darling Avenue	South Portland	Release of 26 gallons of #2 fuel oil from a UST removal.
HZ-9	Truck Accident	Route 1, Exit 7	South Portland	Release of 300 gallons of non-hazardous chemical in a traffic accident.

Sources: New England Map Data, Environmental First Search Database.

5

Identification and Screening of Alternatives

As documented by the existing conditions analysis, congestion is prevalent along many local arterials in the Maine Mall area and at several intersections in the area. In addition, there are 26 identified high crash locations. Many of the operational problems identified under existing conditions will only be exacerbated in the future. Despite an on-going program of planned improvements, there are many locations within the Maine Mall area that are projected to operate at or over capacity by 2025.

Once the existing and projected deficiencies were defined, a series of ideas aimed at addressing the area's problems were developed. Through a series of outreach meetings and discussions with the local officials, approximately 50 ideas were presented for consideration. Of those 50 ideas, some were outside the initial scope of this project, some were not expected to address the core goals of this project, and some were similar in nature to other ideas presented. After reviewing them all, the list of 50 alternatives were condensed into 32 alternatives for consideration. The 32 alternatives were further broken down as short-term and long-term actions, evaluated and screened. For any of the ideas to be considered viable, they had to be consistent with one or more of the objectives originally set forth in this project. This chapter discusses the development of strategies aimed at meeting the core goals outlined at the outset of this project:

- Reduce traffic congestion
- Preserve arterial capacity
- Improve safety
- Facilitate the safe movement of people and goods
- Improve access to the Maine Mall area
- Improve regional east-west access
- Improve access to the Interstate system

The strategies are divided into two classifications: short-term actions and long-term actions. Most of the short-term (0 to 5 years) action items are aimed at addressing immediate safety, operational, and other minor issues highlighted in Chapter 2 (Existing Conditions) of this study. The long-term actions are larger scale items aimed at meeting the long-term (5 to 20+ years) transportation needs within the study area.

5.1 Short-Term Alternatives Development

The short-term action items are intended to address the immediate needs of the Maine Mall area transportation system. Most of these actions can be qualified as Transportation System Management (TSM) items and other strategies that are (relatively) lower in cost than the large-scale ideas, do not require major environmental documentation, and can be scheduled quickly for implementation. These specifically include improvements to locations where safety deficiencies currently exist, operational issues are present, or where simple improvements may lead to an overall improved transportation environment. A full alternative screening process was not required or undertaken for the short-term actions (as was done for the long-term improvement alternatives). Instead, these options were presented to the PACTS Technical Committee for discussion and agreement. Figure 5-1 illustrates the candidate short-term improvement options identified through the public outreach effort. A brief discussion of the candidate short-term actions considered and recommended is provided below.

5.1.1 Safety Improvements/Access Management Strategies

There were 26 individual intersections or roadway links identified in Chapter 2 (Existing Conditions) that are classified as High Crash Locations (HCLs) by the Maine DOT Traffic Accident System (see Figure 2-5 for their locations). Of these locations, there are 6 remaining locations that are qualified as priority locations for investigation (where the CRF's are greater than 2.0). Where possible, safety improvement strategies aimed at reducing the potential for accidents were included in the short-term action items.

Table 5-1 provides a summary of the high crash locations and action items that could be instituted to alleviate the safety deficiencies.

5.1.2 Capacity-related Improvements

In addition to the safety improvements, there are a number of intersections that are operating at or over capacity under the existing environment. As noted in Chapter 2, there are 4 unsignalized and 5 signalized locations that are currently operating at or over capacity. Some of these locations already are planned for improvements as described below.

The five signalized intersections that are currently operating at or close to capacity include:

- County Road (Route 22) at South Street (Route 114)
- County Road (Route 22) at Congress Street/Spring Street
- Western Avenue at Foden Road
- Maine Mall Road/Running Hill Road/Gorham Road
- Running Hill Road/Cummings Road

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Improve Signal Operations and make Geometric Improvements

Review Lane Assignments and Signal Timings

Continue Development of Jetport Plaza Road

Remove Median Along Gorham Road

Signalize Gannett Drive

Extend Turnpike Spur

Improve Exit 3 Operations

Make Turnpike Spur Connection 2-Way to Philbrook Road

Westbrook

Portland

Gorham

Scarborough

South Portland

Exit 5

Exit 7A

Exit 7

Exit 6A

Exit 6

Exit 4

Exit 3

Exit 2

Exit 1

Fore River

Long Creek

Portland International Jetport

Maine Mall

Congress Street

Spring Street

South Street

Saco Street

County Road

Thomas Drive

Cummings Road

Burnham Road

Beech Ridge Rd

Gorham Road

Running Hill Road

New Road

Philbrook Road

John Roberts Road

Western Avenue

Payne Road

Mussey Road

Other Actions

- Address Existing Safety Deficiencies (See Figure 2-5)
- Improve Directional Signage
- Improve Signal Coordination
- Shuttle Bus / Park'n Ride Service
- Encourage Use of the Turnpike Spur
- Improve Access Management

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Figure 5-1

Candidate Short-Term Improvements

Maine Mall Transportation Plan

Table 5-1
Maine Mall Area
High Crash Locations (1996 to 1998) and Short Term Strategies

High Crash Location	Key Issues	Short-Term Strategy
Roadway Links		
Maine Mall Road, south of Mall Entrance Drive	➤ Closely spaced signals ➤ Confusing lane description/signage ➤ Heavy turning movements	Consolidate the Philbrook Road and SR 703 Ramp intersection as the first phase of the long-term improvements (see later discussion)
Philbrook Road, east of Maine Mall Road	➤ Poor roadway geometry ➤ Poor access management ➤ Heavy turning movements	Consolidate and realign the Philbrook Road and SR 703 Ramp intersection as the first phase of the long-term improvements (see later discussion) Consolidate Mall parking access points (by others)
Intersections		
Route 114 (Gorham Road)/Running Hill Road	➤ Unsignalized intersection ➤ Operations approaching capacity	Signalize as first phase of Route 114/22 overlap area improvements
Philbrook Road/John Roberts Road	➤ Unsignalized, 4-way STOP intersection ➤ Heavy turning movements	Further evaluate the effectiveness of flashing beacon installation. Monitor for possible future signalization
Philbrook Road/Maine Turnpike Spur Ramp	➤ Unsignalized intersection ➤ Abrupt transition from high speed facility ➤ Confusing motorist right-of-way	Signalize as part of the first phase of the long-term improvements at Philbrook Road and SR 703 (see later discussion)
Westbrook Street/On-ramp to I-295 NB	➤ Unsignalized intersection ➤ Operating at or near capacity ➤ Heavy left-turn demands and queues	Monitor for improvement since opening of Exit 7A along Maine Turnpike (I-95) Refer to long-term improvements

Three of these locations (Western Avenue/Foden Road, Maine Mall Road/Running Hill Road/Gorham Road, and Running Hill Road/Cummings Road) have defined and programmed improvements to address these deficiencies (see Figure 3-1). Needed improvements at the County Road/Spring Street intersection were defined in the Spring Street Corridor Study but are not yet funded. These improvements have been received and incorporated into this master plan as part of the short-term improvements. The final signalized location, County Road (Route 22) at South Street (Route 114), has been the subject of several studies. Resolution of the capacity issues at this location is dependent upon the long-term solution for the overlap area (see later discussion under long-term alternatives).

The four key unsignalized intersections that are operating at or near capacity are:

- Routes 22 and 114/Burnham Road
- Philbrook Road/John Roberts Road
- Payne Road/Spring Street
- Westbrook Street/On-ramp to I-295 Northbound

Two of these four locations—Philbrook Road/John Roberts Road, and Westbrook Street/On-ramp to I-295 Northbound) —have been previously discussed as part of

the safety improvement discussion in the prior section. Resolution of capacity problems at the Routes 22 and 114 /Burnham Road intersection is dependent upon the long-term solution of the overlap area, however, the MDOT made interim improvements (including minor widening of Routes 22/114) a couple of years ago to help alleviate the congestion. Finally, no further improvements are recommended at the Payne Road/Spring Street intersection, although better coordination of the signals along Payne Road will likely alleviate the congestion that develops at this location, as well. The Westbrook Street/On-ramp to I-295 Northbound has traditionally been operating near capacity. Issues at the location are largely due to heavy turning movements and closely spaced intersections. The recently opened Exit 7A on I-95 has relieved some of the demands at Westbrook Street. Whether or not these improvements relieve the number of turning movement crashes at this location and improve operations should be monitored.

■

5.1.3 Other Actions

In addition to individual improvements aimed at addressing specific safety or capacity concerns, there are some locations grouped together that exhibit similar trends. For example, there are corridors in and around the Maine Mall area that have a high number of curb openings on to the local arterials that may be able to be addressed by broad controls of access. These access management strategies are intended to provide the municipalities with a short-term goal of consolidating curb openings along these congested corridors, placing turn restrictions at certain locations, and promoting cross-connection of adjoining parking areas.

An example of this is along Cummings Road, in the vicinity of Gannett Drive. At this location two access drives to an adjacent commercial development are experiencing delays and a fair number of turning movement crashes (although not yet defined as a high crash location by the MDOT). The consolidation of these driveways by making them one-way entering and one-way exiting, respectively and/or signalizing one of the driveways will improve access management to this area and is, therefore, recommended as part of the short-term recommendations. Other locations for improvement to arterial access management are defined later under the long-term improvement program and itemized in the Recommendations Chapter. Many of these improvements could be implemented at any time to improve local arterial operations.

There were several other candidate short-term actions (as suggested through public input) that were deferred to longer-term consideration, or discarded all together. Short-term strategies deferred to longer-term (see later discussion):

- Extend State Route (SR) 703 (Turnpike Spur) to Running Hill Road
- Make SR 703 connection to Philbrook Road two-way
- Encourage increased use of the SR 703 corridor

Short-term strategies eliminated as part of this study after review included:

- Removal of the median along Gorham Road (further deteriorates access controls)

- Implement new shuttle bus services to Maine Mall area (see companion study prepared by GPCOG for further discussion about transit options).

With any short-term or long-term improvements, especially with proposed changes to the SR 703 (Turnpike Spur), opportunities to improve and/or simplify signage in the study area should be investigated. The need for improved signage was suggested on several occasions through the public input process. (Much of the confusion over poor signage is attributable to the difficulties getting to/from the Mall and returning to the interstate system).

Finally, there were other short-term actions that could be applied aimed at improving the general overall Maine Mall area transportation environment. These actions range from providing better pedestrian connections, improved transit service to and through the region, provision of park'n ride facilities, provision of better signal coordination along specific corridors, and adjusting municipal policies toward future transportation and land use development.

Specifically, there were three companion studies prepared at the time of this report that address pedestrian, transit, and signal coordination through the Maine Mall area. The results and recommendations that are developed through these studies should be considered as a means of providing additional improvements to the transportation infrastructure for the region. These studies include:

- **For signal improvements**: *"Maine Mall Signal Systems Study,"* prepared for PACTS by Gorrill Palmer Consulting Engineers, Inc;

- **For pedestrian-related improvements**: *"Maine Mall Area Pedestrian Master Plan,"* prepared for PACTS by Wilbur Smith Associates; and

- **For transit improvements**: *"Maine Mall Area Transit Plan,"* prepared for PACTS by the Greater Portland Council of Governments (GPCOG).

Furthermore, the local municipalities should consider more inclusive policies for future land use proposals and transportation improvement actions, while respecting the rights of landowners. Seeking opportunities to promote internal driveway connections and sharing of parking areas are means for limiting the number of curb openings along congested corridors. Other actions may include instituting new policies towards driveway spacing along corridors, setting turn restrictions along certain high-volume corridors, and improvement to existing directional signage (both regionally and locally) aimed at promoting arterial capacity.

5.2 Long-term Alternatives Screening Methodology

The long-term actions include a range of alternatives developed through the study process to address the defined future deficiencies and needs in the study area. These alternatives were developed through collaborative working sessions with the PACTS Technical Committee, including members of the local municipalities, Maine

Department of Transportation, the consultant (VHB), and the general public. The alternatives were conceptually developed, evaluated, screened, refined, and further screened to determine the most appropriate strategies for each location. The alternatives screening process and methodology are described in this section of the report. Later sections summarize the alternative development and screening process and refinement of alternatives considered. Chapter 6 outlines the resulting set of recommendations and action plan for the Maine Mall area.

■

5.2.1 Evaluation/Screening of Alternatives

The alternative screening process was based on a set of criteria that included anticipated transportation benefits (in terms of traffic demand for each action, local and regional benefit, safety effects), environmental impact "fatal flaw" analysis, physical/design feasibility review, and an order of magnitude cost estimate. VHB utilized the 2025 PACTS Travel Demand Model for this study to determine the appropriate level of future traffic demand shifts under the various alternatives considered. The general evaluation criteria used to assess each of the preliminary alternatives identified included:

Transportation

- Anticipated traffic demand projections (especially where new roadway links or additional travel lanes were suggested)
- Transportation benefits/drawbacks (including improvement to regional and local accessibility though the Maine Mall area, and reduced delays/congestion)
- Improved safety for motorists
- Order-of-magnitude construction costs

Environmental

As this is a planning level assessment, VHB conducted an evaluation of critical environmental constraints that include:

- Water/wetland resources
- Floodplains
- Public Drinking Water Supply
- Rare, Threatened, and Endangered Species
- Historic/cultural resources
- Section 4(f) and Section 6(f)
- Oil and Hazardous contaminated risk

Geometric/Design

- Physical impacts of alternative
- Compatibility with standard AASHTO design criteria
- Consistency with FHWA and MDOT design guidelines and policy criteria

Land Use Issues

- General impacts to both private and public land owners (particularly where land takings may be required and/or specific locations where access is improved or restricted)
- Impacts to major utilities

The potential overall effectiveness of each of the proposed long-term transportation strategies for the alternatives were evaluated and compared with the expected impacts to determine the feasibility of implementation and the potential to achieve the goals and objectives of the project. In total, 32 major alternatives or combination of alternatives were formally reviewed as part of the first level screening effort. A summary matrix evaluation was used for the screening evaluation for each of the 32 alternatives reviewed.

The results of the first level screening were presented to the PACTS Technical and Policy Committees for input, discussion, and concurrence on the results. The analysis completed under the preliminary screening process led to a refined list of alternatives for further consideration and more detailed evaluation. In general, this list included design options that appeared to offer some form of transportation benefit and did not indicate any major "fatal flaws" in the design and/or environmental consequences. It also included combinations of alternatives not originally screened as part of the first level analysis, but offered potential benefits above and beyond the results presented in the initial screening.

■

5.2.2 Refinement of Transportation Alternatives

The next step in the alternative evaluation/screening process was to further develop the alternatives that appeared to offer the most potential benefit after completion of the first level screening. Additional engineering, transportation, and environmental review of the alternatives were completed and documented through this portion of the study.

Conceptual Engineering

The improvement strategies that "survived" the first level screening were developed into more detailed conceptual plans. Intersection and interchange lane configurations were reviewed, in conjunction with the traffic data provided by the PACTS Travel Demand Model for the 2025 design year, to ensure operational and safety objectives were met. Several additional on-site studies were conducted to field review and identify physical and environmental design constraints. The preliminary order of magnitude construction cost estimate was also refined for each alternative. Construction costs were based on the geometric detail available at this stage, and estimated from historical MDOT unit cost data.

Transportation Evaluation

Using the results of the traffic forecasts for the study area previously provided by the PACTS Travel Demand Model (and new model output for the various alternatives), the

impacts of the transportation strategies under consideration for affected locations were identified and analyzed. Updated intersection, arterial, freeway, ramp, and weave analyses were conducted for each relevant strategy for the design year. Using the 2025 design peak hour network, local streets and intersections expected to be significantly impacted by each preliminary strategy were identified and re-analyzed using HCS or Synchro software. The specific criteria referred to through this process included:

- Reduce congestion throughout the Maine Mall area
- Preserve arterial capacity
- Improve connections to the regional highway system
- Improve driver safety
- Facilitate the safe movement of goods and people
- Provide for pedestrian safety
- Improve access to the Maine Mall area

In general, the study participants agreed that, in conducting the first-level screening assessment all viable options must:

- Have a significant and positive effect on safety and travel demands;
- Have acceptable levels of environmental impacts (including land use impacts); and,
- Be reasonably cost effective.

Environmental Review

As part of this more detailed refinement of the alternatives, additional review was completed to evaluate and compare potential environmental impacts for each alternative. The environmental constraints identified and mapped in earlier tasks were overlaid with the proposed alternatives to determine impacts in each of the environmental review categories. In this way, each alternative's relative impacts could be compared.

■

5.2.3 Summary of First-Level Screening Evaluation

The process of screening the potential transportation improvement ideas was completed by VHB and presented to the PACTS Technical Committee in several working sessions. Figure 5-2 illustrates the general concepts and location for each long-term action evaluated. Tables 5-2 and 5-3 provide a summary matrix of the 32 different first-level screening options consisting of 22 individual options and 10 variations of the original ideas. The major issues related to each of the alternatives are discussed in this section along with the decision whether to pursue or discard this option from future consideration. The individual evaluation matrices, which are presented in the separate Technical Appendix to this report, show a more detailed evaluation of each of the options. These matrices are based on a technical analysis completed to aid the PACTS Technical Committee in the first-level screening.

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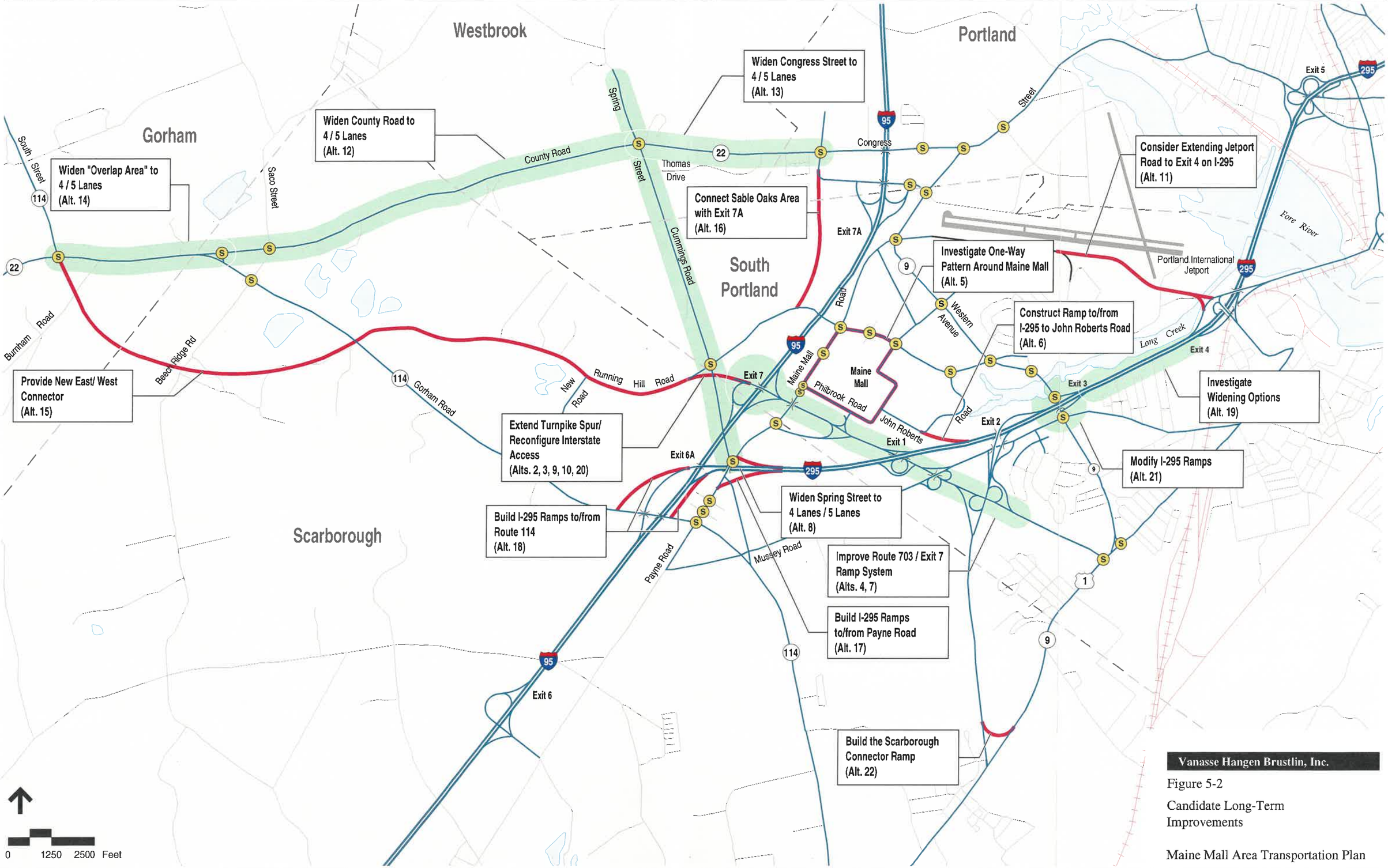

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Figure 5-2

Candidate Long-Term Improvements

Maine Mall Area Transportation Plan

The two summary matrices have divided the alternatives into four criteria for evaluation. These criteria are generally consistent with the project goals and the Purpose and Needs Statement originally developed for the Maine Mall Area Transportation project:

- Improving regional east/west access through the Maine Mall area,
- Improving access to/from the immediate Maine Mall area,
- Improving arterial access and capacity, and
- Improving interstate highway access and capacity

Within these specific goals, each alternative was evaluated for its transportation and implementation issues. The following defines the terminology used in the matrix evaluation summaries.

Traffic Impacts (Table 5-2)

This table provides a summary of the transportation impacts associated with the implementation of a specific improvement. It is important to remember that all traffic impacts are based on an Evening Design Hour condition:

Traffic Projections – Lists the amount of new traffic projected to use a certain new ramp connection, the increase in volume on a certain widened roadway, and/or a summary of the benefit of implementing the alternative.

Regional Traffic Impacts – Lists the impact on a regional basis for implementing the alternative. This essentially focuses on reductions or increases at certain interstate or regional highway links and/or at interchanges. In certain cases, the impact of an alternative is to shift traffic from its current route of travel to a new route. In these cases, the shift is defined as minor (less than 50 vehicle trips) per hour, moderate (between 50-150 vehicle trips), or major (over 150 vehicle trips).

Local Traffic Impacts – Lists the impact on a localized basis for implementing the alternative. This essentially focuses on reductions or increases at certain individual intersections or on local roadway corridors. In certain cases, the impact of an alternative is to shift traffic from its current route of travel to a new route. In these cases, the shift is defined as minor (less than 50 vehicle trips per hour), moderate (between 50-150 vehicle trips), or major (over 150 vehicle trips).

Implementation Issues (Table 5-3)

In addition to the transportation issues associated with each alternative, implementation issues associated with each option under consideration were identified:

Environmental Issues – Lists the environmental issues associated with implementing the proposed alternative. The terms minor, moderate, and major are intended to serve as a guide as to the complexity of permitting the proposed alternative. If an alternative were to be further advanced, additional evaluation of the environmental constraints would be required.

Table 5-2
Alternative Screening Analysis: Transportation Impacts

Purpose/ Alternative Description	Evening Peak Hour Traffic Impacts		
	Projections	Regional	Local
Improve Regional Access to/from Immediate Maine Mall Area			
Alternative 2A -- One-way ramp connection from Turnpike Exit 7 to Cummings Road	Ramp demand: 155 trips	Minor shifts from Payne Road near SR 703 to new ramp	Minor volume increase along Spring Street
Alternative 2B -- Two-way ramp connection to/from Turnpike Exit 7 to Cummings Road	Combined ramps demand: 290 trips	Minor shifts from Payne Road near SR 703 to new ramp	Minor volume increase along Spring Street
Alternative 3A -- One-way ramp connection from Turnpike Exit 7 to Running Hill Road	Ramp demand: 250 trips	Minor shifts from Route 22 & 114 to RHR	Minor volume increase along Running Hill Road
Alternative 3B -- Two-way ramp connection to/from Turnpike Exit 7 to Running Hill Road	Combined ramps demand: 400 trips	Minor shifts from Route 22 & 114 to RHR	Minor volume increase along Running Hill Road
Alternative 4 -- Develop at-grade intersection at the Maine Mall Road/SR 703 intersection (replace Maine Mall bridge)	Entering intersection volume: 2500+ vehicles	Minor shift from Exit 7A to Exit 7 on I-95	Reduces number of signals along Maine Mall Road by 2
Alternative 5A -- Create one-way loop around the Maine Mall (clockwise)	n/a	Minor shift from SR 703 to Westbrook St (Exit 3)	Diversion of S-to-N and E-to-W traffic
Alternative 5B -- Create one-way loop around the Maine Mall (counter-clockwise)	n/a	Minor shift from Westbrook St. (Exit 3) to SR 703	Diversion of N-to-S and W-to-E traffic
Alternative 5C -- Create one-way loop along Philbrook Avenue (clockwise)	n/a	Minor shift from SR 703 to Westbrook St (Exit 3)	Minor volume increase along Maine Mall Road near Philbrook Road
Alternative 5D -- Create one-way loop along Philbrook Avenue (counter-clockwise)	n/a	Minor shift from Westbrook St. (Exit 3) to SR 703	Minor volume increase along Gorham Road near Foden Road
Alternative 6A -- Develop one-way slip ramp from I-295 southbound to John Roberts Road	Ramp demand: 500 trips	Major decrease along SR 703 at Maine Mall Rd. and at Westbrook St. (Exit 3)	Major volume increase along John Roberts Road and Philbrook Road
Alternative 6B -- Develop two-way ramp between I-295 and John Roberts Road	Combined ramps demand: 850 trips	Major decrease along SR 703 at Maine Mall Rd. and at Westbrook Street (Exit 3)	Major volume increase along John Roberts Road and Philbrook Road
Alternative 7A -- Reconfigure interchanges along SR 703 to provide better access to Maine Mall (at-grade scheme)	Reduction on SR 703: 500 trips	Full interstate access provided between I-295/I-95 Major shift from SR 703 to I-295 SB	Minor volume increase along Maine Mall Road Slower speeds along SR 703 with signals
Alternative 7B -- Reconfigure interchanges along SR 703 to provide better access to Maine Mall (controlled access scheme)	Reduction on SR 703: 200 trips	Minor shift from Exit 7A to Exit 7 on I-95	Minor increase along Maine Mall Road Slower speeds along SR 703 with signals
Alternative 7C -- Reconfigure SR 703 to provide access to I-295 and provide better access to Maine Mall from SR 703	Reduction on SR 703: 200 trips	No regional impact	Minor volume decrease along Maine Mall Rd.
Alternative 7D -- Reconfigure Exit 7 to diamond interchange, Maine Mall Road/SR 703 at-grade, SR 703 to Running Hill Rd	Connection to West: 400 trips	Moderate volume shift from Exit 7A to Exit 7 on I-95	Major reduction along Maine Mall Rd./Payne Rd.
Alternative 8 -- Widen Spring Street corridor to 4/5 lanes	Increase in corridor demand: 400 trips	Minor shrift from Johnson Road to Spring St.	Increase in NB through traffic at Spring/County Rd decreased at exit 7A from Johnson Road
Improve Regional East/West Access through the Maine Mall Area			
Alternative 9A -- Extend SR 703 through to Running Hill Road and combine with Alternative 7A	Reduction on SR 703: 500 trips Connection to West: 450 trips	Full access provided between I-295/I-95 Moderate shifts from Route 22 and Route 114	Reduced demands along Payne Road
Alternative 9B -- Extend SR 703 through to Running Hill Road and combine with Alternative 7B	Reduction on SR 703 to I-95: 200 trips Connection to West: 450 trips	Moderate volume shift from Exit 7A to Exit 7 on I-95 Moderate shifts from Route 22 and Route 114	Reduced demands along Payne Road
Alternative 10 -- Widen Running Hill Road to 4 Lanes and combine with Alt 9 and widened "Overlap" area	Connection to West: 2100 trips	Major reductions on Payne Rd. and Routes 22/114	Major improvements to Payne Rd./Maine Mall Rd. corridors
Alternative 11 -- Extend Jetport Plaza Road to Exit 4 on I-295 and connect to the Interstate highway system	Increase in corridor demand: 310 trips	Minor reduction at Westbrook Street (Exit 3)	Minor increase along Johnson Road/Western Avenue
Improve Regional Arterial Access			
Alternative 12 -- Widen County Road (Route 22) from Saco Road to Spring Street to 4/5 lanes	Increase in corridor demand: 200 trips	Majority of trips drawn from the north of the study area	Minimal study area impacts
Alternative 13 -- Widen Congress Street from Exit 7A to Spring Street to 4/5 lanes	Increase in corridor demand: 400 trips	Minor reduction along Johnson/Maine Mall Roads	Improved operations on congested corridors
Alternative 14 -- Widen the "Overlap" area (Routes 22/114) to 4/5 lanes	Increase in corridor demand: 1000 trips	Volume increase is limited by capacity of corridor	Creates additional demand along Routes 22.114
Alternative 15 -- Construct southern by-pass of the "Overlap" area	By-pass demand: 1200 trips	Major shift from "overlap" area to new by-pass	Improves "overlap" area operations
Improve Regional Interstate Access			
Alternative 16 -- Provide two-way connector road between Sable Oaks area and Exit 7A	Corridor demand: 750 trips	Moderate shift from Johnson Road	Increase traffic along Sable Oaks Drive Increase traffic along Running Hill Road
Alternative 17A -- Connect I-295 to Payne Road by developing new SB off-ramp	SB Ramp demand: 550 trips	Moderate reduction along Main mall Road/SR 703	Reduction along Maine Mall Road
Alternative 17B -- Connect I-295 to Payne Road by developing new NB on-ramp	NB Ramp demand: 600 trips	Major shifts from Payne Road Corridor	Increase on Spring and Payne corridors
Alternative 18 -- Connect the Route 114 corridor to Exit 6A along the Turnpike via new NB on-ramp and SB off-ramp	On-Ramp demand: 500 trips Off-Ramp demand: 600 trips	Minor shift from SR 703	Increase along Rte. 114 Reductions along Payne Road
Alternative 19 -- Widen section of I-295 between Exits 3 and 4	Corridor demand: 400 trips	Minor reduction along Congress Street	Minor reduction along SR 703
Alternative 20 -- Provide full access interchange at Exit 6A	Ramp demand: 650 trips	None	No local benefits
Alternative 21 -- Modify I-295 Exit 3 Interchange configuration	Increase in ramp demand: 25	Minor reduction along SR 703	Address HCL on Westbrook Street at (Exit 3)
Alternative 22 -- Build Scarborough Connector ramp	Ramp demand: 60 - 100 trips	Minor reduction along SR 703	Reduce heavy vehicle trips along congested Rte. 1

Table 5-3
Alternative Screeening Analysis: Implementation Issues

Purpose/ Alternative Description	Implementation Issues				
	Environmental	Geometric	Land Use Impacts	Turnpike Operations	Retain Concept for Additional Analysis?
Improve Regional Access to/from Immediate Maine Mall Area					
Alternative 2A -- One-way ramp connection from Turnpike Exit 7 to Cummings Road	Major Wetland Impacts	None	Requires land takings Impacts private driveways / buildings	Yes	No, limited transportation benefits, major environmental impacts
Alternative 2B -- Two-way ramp connection to/from Turnpike Exit 7 to Cummings Road	Major Wetland Impacts	I-95 SB Ramp Modifications at Exit 7	Requires land takings Impacts private driveways / buildings	Yes	No, limited transportation benefits, major environmental impacts
Alternative 3A -- One-way ramp connection from Turnpike Exit 7 to Running Hill Road	Major Wetland Impacts	None	Requires land takings	Yes	No, limited transportation benefits, major environmental impacts
Alternative 3B -- Two-way ramp connection to/from Turnpike Exit 7 to Running Hill Road	Major Wetland Impacts	I-95 SB Ramp Modifications at Exit 7	Requires land takings	Yes	Yes
Alternative 4 -- Develop at-grade intersection at the Maine Mall Road/SR 703 intersection (replace Maine Mall bridge)	None	Signal proximity to I-95 NB off-ramp Seven lane cross-section on all approaches	Potential impact to CMP station	Yes	Yes
Alternative 5A -- Create one-way loop around the Maine Mall (clockwise)	None	Major modification to Maine Mall Road / Gorham Road corridors	Limits access to certain properties	No	No, minimal benefit
Alternative 5B -- Create one-way loop around the Maine Mall (counter-clockwise)	None	Major modification to Maine Mall Road / Gorham Road corridors	Limits access to certain properties	No	No, minimal benefit
Alternative 5C -- Create one-way loop along Philbrook Avenue (clockwise)	None	Minor modifications to Philbrook Rd corridor	Limits access to certain properties	No	No, minimal benefit
Alternative 5D -- Create one-way loop along Philbrook Avenue (counter-clockwise)	None	Minor modifications to Philbrook Rd corridor	Limits access to certain properties	No	No, minimal benefit
Alternative 6A -- Develop one-way slip ramp from I-295 southbound to John Roberts Road	Minor stream crossing Moderate wetland Impacts	Ramp spacing along I-295	Requires land takings	No	Yes
Alternative 6B -- Develop two-way ramp between I-295 and John Roberts Road	Minor stream crossing Moderate wetland impacts	Ramp spacing along I-295	Requires land takings	No	No, requires major infrastructure improvements to connect to I-295 northbound
Alternative 7A -- Reconfigure interchanges along SR 703 to provide better access to Maine Mall (at-grade scheme)	Minor wetland impacts	New interchange at Exit 6A	Discontinue Spring St near Payne Rd	Yes	Yes
Alternative 7B -- Reconfigure interchanges along SR 703 to provide better access to Maine Mall (controlled access scheme)	Minor wetland Impacts	I-95 SB Ramp Modifications at Exit 7	Requires land takings Impacts private driveways / buildings	Yes	Yes
Alternative 7C -- Reconfigure SR 703 to provide access to I-295 and provide better access to Maine Mall from SR 703	Moderate wetland impacts Moderate stream crossing	On-ramp clearance over SR 703	Requires land takings Impacts private driveways	No	Yes
Alternative 7D -- Reconfigure Exit 7 to diamond interchange, Maine Mall Road/SR 703 at-grade, SR 703 to Running Hill Rd	Major Wetland Impacts	Queuing between signals on SR 703	Requires land takings	Yes	Yes
Improve Regional East/West Access through the Maine Mall Area					
Alternative 8 -- Widen Spring Street corridor to 4/5 lanes	Minor stream crossings Minor wetland impacts	Signalize Gannet Drive (north)	Requires land takings Impacts private driveways	No	Yes
Alternative 9A -- Extend SR 703 through to Running Hill Road and combine with Alternative 7A	Major wetland impacts	I-95 SB Ramp Modifications at Exit 7	Requires land takings Discontinue Spring St at Payne Rd	Yes	Yes
Alternative 9B -- Extend SR 703 through to Running Hill Road and combine with Alternative 7B	Major wetland impacts	I-95 SB Ramp Modifications at Exit 7	Requires land takings Impacts private driveways/parking	Yes	Yes
Alternative 10 -- Widen Running Hill Road to 4 Lanes and combine with Alt 9 and widened "Overlap" area	Major wetland impacts		Requires land takings Impacts private driveways/parking	No	Yes
Alternative 11 -- Extend Jetport Plaza Road to Exit 4 on I-295 and connect to the Interstate highway system	Major wetland / river crossing Tidal area infringement	Construction to occur on poor soils	Potential impacts proposed GA location at Jetport	No	No, minimal projected use. Major envinronmental impacts
Improve Regional Arterial Access					
Alternative 12 -- Widen County Road (Route 22) from Saco Road to Spring Street to 4/5 lanes	Minor wetland impacts Within aquifer area	None	Requires land takings	No	No, limited benefit to the Maine Mall Area roadways
Alternative 13 -- Widen Congress Street from Exit 7A to Spring Street to 4/5 lanes	None	None	Requires land takings Impacts private driveways / parking	No	Yes
Alternative 14 -- Widen the "Overlap" area (Routes 22/114) to 4/5 lanes	Moderate wetland impacts	None	Requires land takings Impacts private driveways / parking	No	Yes
Alternative 15 -- Construct southern by-pass of the "Overlap" area	Major wetland impacts Multiple stream crossings	None	Requires major land takings	No	Yes
Improve Regional Interstate Access					
Alternative 16 -- Provide two-way connector road between Sable Oaks area and Exit 7A	Minor stream crossing Moderate wetland impacts	Connection from Sable Oaks (private road) to Running Hill Road	Requires land takings Sable Oaks Drive not accepted by City	No	Yes
Alternative 17A -- Connect I-295 to Payne Road by developing new SB off-ramp	Major stream impact Moderate wetland impacts	None	Off-ramp requires land takings potential building impacts	Potentially, depending on ramp alignment	No, minimal projected use. Major envinronmental impacts
Alternative 17B -- Connect I-295 to Payne Road by developing new NB on-ramp	None	Utilize existing Turnpike access road	On-ramp requires land takings natural gas pump station to be relocated	Potentially, depending on ramp alignment	No,not without development of Alternative 17A
Alternative 18 -- Connect the Route 114 corridor to Exit 6A along the Turnpike via new NB on-ramp and SB off-ramp	Moderate wetland impacts Within aquifer area	None	Requires land takings	Yes	Yes
Alternative 19 -- Widen section of I-295 between Exits 3 and 4	Potential wetland impacts Potential stream impacts	None	None	No	Yes
Alternative 20 -- Provide full access interchange at Exit 6A	Major wetland impacts Moderate stream crossing	Shift southbound on-ramp west	Requires land takings Discontinue Spring Street at Payne Road	Yes	Yes
Alternative 21 -- Modify I-295 Exit 3 Interchange configuration	Minor wetland impacts	I-295 merge area with Scarborough connector	None	No	Yes
Alternative 22 -- Build Scarborough Connector ramp	Alt 1-none Alt 2-major wetland impacts	None	Alt 1-potential parking impacts to Konica	No	Yes

Geometric Issues – Lists the design issues associated with each alternative. In most cases, these reference the modifications of other roadways not directly associated with the specific improvement or highlight major changes necessary to the existing or proposed infrastructure. In certain instances, potential construction issues are also noted.

Land Use Impacts – Identifies the potential impact to properties and buildings as a result of implementing certain alternatives. In many cases, the alternative will require some form of land takings from private landholders. Where the alternative may impact private parking, access, and/or building structures, notations were made.

Turnpike Operations – Identifies if the proposed alternative has a physical or operational impact to the Maine Turnpike operations. In most cases the alternative will require the modification or relocation of an existing toll plaza.

Comments – Provides a "miscellaneous" column for other issues that should be considered when determining if an alternative is a potential candidate for implementation.

Action – Provides an indication as to whether or not the alternative was advanced to the next level of screening. Commentary is also provided to lend insight as to why the alternative was discarded or advanced.

In addition to the summary matrix, individual evaluation sheets for each of the alternatives under consideration are provided in the Appendix to this report.

The results of the first level screening were presented to the PACTS Technical Committee for input and concurrence on the results. The analysis presented under the first level screening process led to a refined list of alternatives for further consideration and more detailed analysis, as discussed below.

■

5.2.4 Refinement of Long-term Transportation Alternatives

The next step in the alternatives screening/evaluation process was to further develop the alternatives that appeared to offer the most potential after completion of the first level screening. Additional engineering, transportation, and environmental review of these alternatives were completed for each option remaining under consideration.

Because of the numerous options considered for the State Route 703 corridor, it was determined that a separate evaluation of the SR 703 corridor was warranted to address the numerous issues being considered. For that reason, a category was added to address the State Route 703 corridor options under consideration.

Table 5-4 and the following sections provide a more detailed description and discussion of the refined alternatives.

Table 5-4
Second Level Screening
Evaluation of Long Term Action Options

	Alternative Description	Estimated Costs*	Address Capacity Problem?	Address Geometry/ Safety Problem?	Projects Goals: Improve East-West Access Goal?	Improve Access To Mall Area?	Improve Access to Interstate System?	Improve Arterial Access / Capacity?	Comments
Improve Regional Access to/from the Immediate Maine Mall Area									
3B	Develop two way ramp connection to/from Turnpike (Exit 7) and Running Hill Road	$9.3 Million	No	No	Yes - provides new east/west connection from SR 703	Yes -- provides new connection to/from west into Mall area	Yes -- provides direct access from Turnpike to west	Indirectly -- through removal of traffic on arterial street system	Consider in conjunction with other SR 703 and Running Hill Road options.
6A	Develop one-way slip ramp from I-295 Southbound to John Roberts Road	$1.65 Million	Indirectly -- Ramp would draw traffic away from the congested Exit 3 interchange along I-295	No	No	Yes -- provides new connection from interstate system directly into Mall area	Yes -- provides new access point from interstate highway to local road system	Indirectly -- through removal of traffic on arterial street system	Discard alternative for further consideration
Improve Regional East-West Access through the Maine Mall Area									
8	Widen Spring Street to 4/5 Lanes	$1.45 Million	Yes	No	No	No	No	Yes -- provides additional capacity to projected congested corridor	Consider as a stand alone option. Possible complement to other alternatives.
10	Widen Running Hill Road to 4/5 Lanes	$3.60 Million	No	No	No -- not directly	No	No -- not directly	No	Discard as a stand alone option. Possible complement to other SR 703alternatives.
14	Widen the Route 22/114 "Overlap" area	$1.3 Million	Yes	Yes	Yes	No -- not directly	No	Yes -- provides additional capacity to congested corridor	Consider as a stand alone option. Possible complement to other alternatives.
15	Develop the "Southerly" By-Pass of the Route 22/114 Overlap Area	$3.5 Million	Yes	Yes	Yes	No - not directly	No	Yes -- provides a by-pass of a congested corridor	Consider as a stand alone option. Possible complement to other alternatives.
Improve Regional Arterial Access and Capacity									
ST	Widen Western Avenue between Foden Road and Johnson Road	$750,000	Yes	No	No	No	No	No	Consider as a stand alone option. Possible complement to other alternatives.
13	Widen Congress Street between the Turnpike (Exit 7A) and Spring Street	$2.4 Million	Yes	No	Yes -- indirectly provides additional east-west capacity	No -- not directly	No -- not directly	Yes -- provides additional capacity to projected congested corridor	Consider as a stand alone option. Possible complement to other alternatives.
Improve Interstate Highway Capacity and Access									
19	Widen I-295 between Exit 3 and Exit 4 by an Additional Lane	$1.5 Million	Yes	No	No	No	Yes	Yes	Consider as a stand alone option. Possible complement to other alternatives.
20	Provide a Full-Service Interchange at Exit 6A on the Turnpike	$12.5 Million	No	No	No	No -- Not directly	Yes	No	Consider as a possible complement to other alternatives. Discard as a stand alone option.
21	Reconstruct the I-295/Westbrook Street (Exit 3) interchange	$1.5 Million	Yes	Yes	No	No	Yes	No	Consider as a stand alone option. Possible complement to other alternatives.
22	Provide a Connection between Route 1 and the Scarborough Connector	$900,000	Indirectly	No	No	No	No -- Not directly	Indirectly	Consider as a stand alone option. Possible complement to other alternatives.

* Costs do not include traffic management, permitting, design, and/or environmental/ROW costs. $3.5 Million assumed for toll plaza relocations.

Improve Regional Access to/from the Immediate Maine Mall Area

The alternatives described in this section are aimed specifically at improving access to and from the immediate Maine Mall area. As noted in the purpose and need statement for this project, there is a concern about traffic congestion in and around the Maine Mall area. The perception of this congestion, particularly present during the holiday seasons, is that future development is being hindered. While there are limited options for adding new connections into the Maine Mall area from the north and south, there are potential opportunities to connect to and from the east and west. These specific actions provide new connections into the Maine Mall area and provide additional choices for drivers to use to access the Mall area. The specific improvements identified and their benefits/drawbacks are discussed in the following sections.

Provide a two-way Connection from Turnpike (Exit 7) to Running Hill Road (Alternative 3B)

Figure 5-3 presents this alternative at Exit 7. This improvement essentially provides a more direct connection between SR 703 and Running Hill Road to the west by reconstructing the Exit 7 interchange into a modified trumpet-style layout.

Transportation Benefits – The transportation-related benefits expected to be gained from this alternative is to reduce the amount of traffic along the Maine Mall Road and Payne Road corridors by providing a more direct route for drivers destined to the Mall heading from the west. The model results indicate that this new connection would carry close to 400 design hour trips. However, the majority of these trips would be drawn predominantly from the Payne Road area (south of the Maine Mall Road bridge) and there would only be limited trip reductions along the congested Gorham Road and Maine Mall Road corridors. There were some reductions of trips along Route 22 and Routes 114 as this may serve as a more direct route from the west to the I-295 corridor. Based on the model results, the majority of these trips do not appear to be accessing the Maine Mall area, but travelling into the Portland area along SR 703 and I-295.

Engineering/Construction Issues – As part of the alternative screening analysis, the following engineering/construction issues were identified for the improvement option:

- The ramp connection from Exit 7 to Running Hill Road will travel over two privately owned properties. Land takings will be required on both these properties.
- A major wetland resource exists on the property immediately west of the Exit 7 interchange. This would need to be addressed as part of the permitting of this improvement.
- In order to connect into Running Hill Road, it will be necessary to realign the Spring Street/Cummings Road corridor. This realignment will require property takings on the southwest quadrant (commonly referred to as the 'Neptune Property") of the Running Hill Road/Cummings Road intersection.

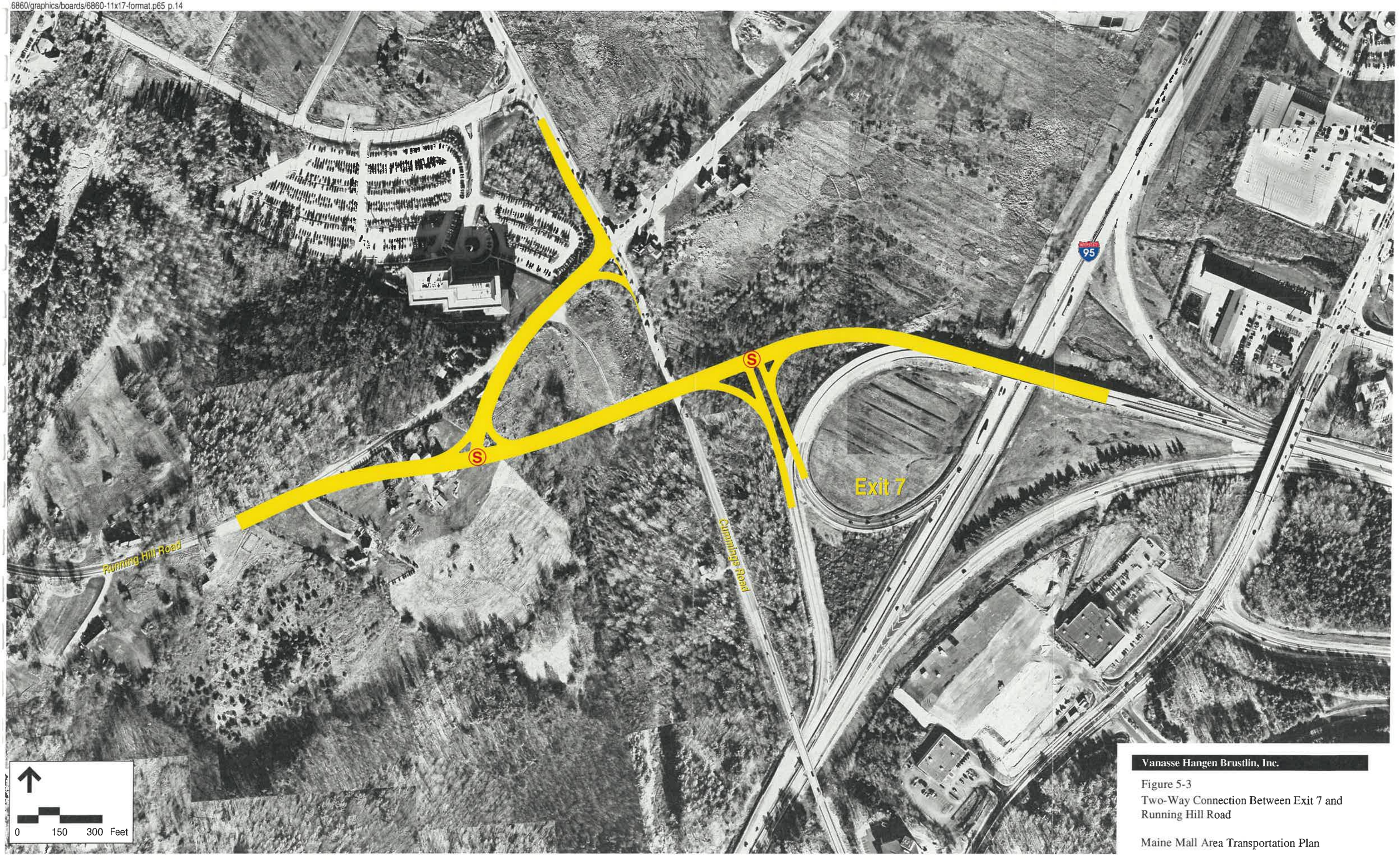

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Figure 5-3
Two-Way Connection Between Exit 7 and Running Hill Road

Maine Mall Area Transportation Plan

Results – This alternative should be considered in conjunction with other SR 703 and Running Hill Road options (see later discussions).

Create a Slip-Ramp from I-295 directly into John Roberts Road (Alternative 6A)

Figure 5-4 presents this alternative between Exit 2 and Exit 1 on I-295. This improvement essentially provides a more direct connection between I-295 and John Roberts Road to the east of the Mall and office area by providing a direct slip-ramp into the 'rear' of the Maine Mall area.

Transportation Benefits – The transportation-related benefits expected to be gained from this alternative is to reduce the amount of traffic destined to the Maine Mall that are currently using the congested Westbrook Street interchange off of I-295. This connection would essentially provide a more direct route for drivers destined to the Mall heading from the Portland area to the east. The model results indicate that this new connection would carry close to 500 design hour trips. The majority of these trips would be drawn predominantly from both the Westbrook Street interchange and from traffic currently using the SR 703 access road to the Maine Mall. There were some reductions of trips along the Congress Street/Johnson Road corridors as this may serve as a more direct route from the Portland area to the John Roberts Road/ Clarks Pond commercial area.

Engineering/Construction Issues – As part of the alternative screening analysis, the following engineering/construction issues were identified for the improvement option:

- The spacing of ramps along I-295 does not meet AASHTO guidelines for ramp spacing (less than one mile between successive off-ramps).
- When developing new interchanges along interstate highway, current FHWA policy discourages the creation of partial interchanges (as proposed) because of the need for increased signage and the potential for driver confusion.
- The ramp connection from I-295 to John Roberts Road will travel over a privately owned property. Land takings will be required to complete this connection.
- A wetland resource and stream exists on the property immediately west of the proposed off-ramp. This slip ramp would need to span the wetland area and the environmental issues would need to be addressed as part of the permitting of this improvement.
- In order to connect into John Roberts Road, the intersection of the ramp, John Roberts Road, and Clarks Pond Road would need to be signalized.
- The John Roberts Road corridor between the ramp and Philbrook Road would also need to be widened to provide the necessary capacity and appropriate shoulders for this connection. This would have minor land impacts to the commercial properties located along the corridor.

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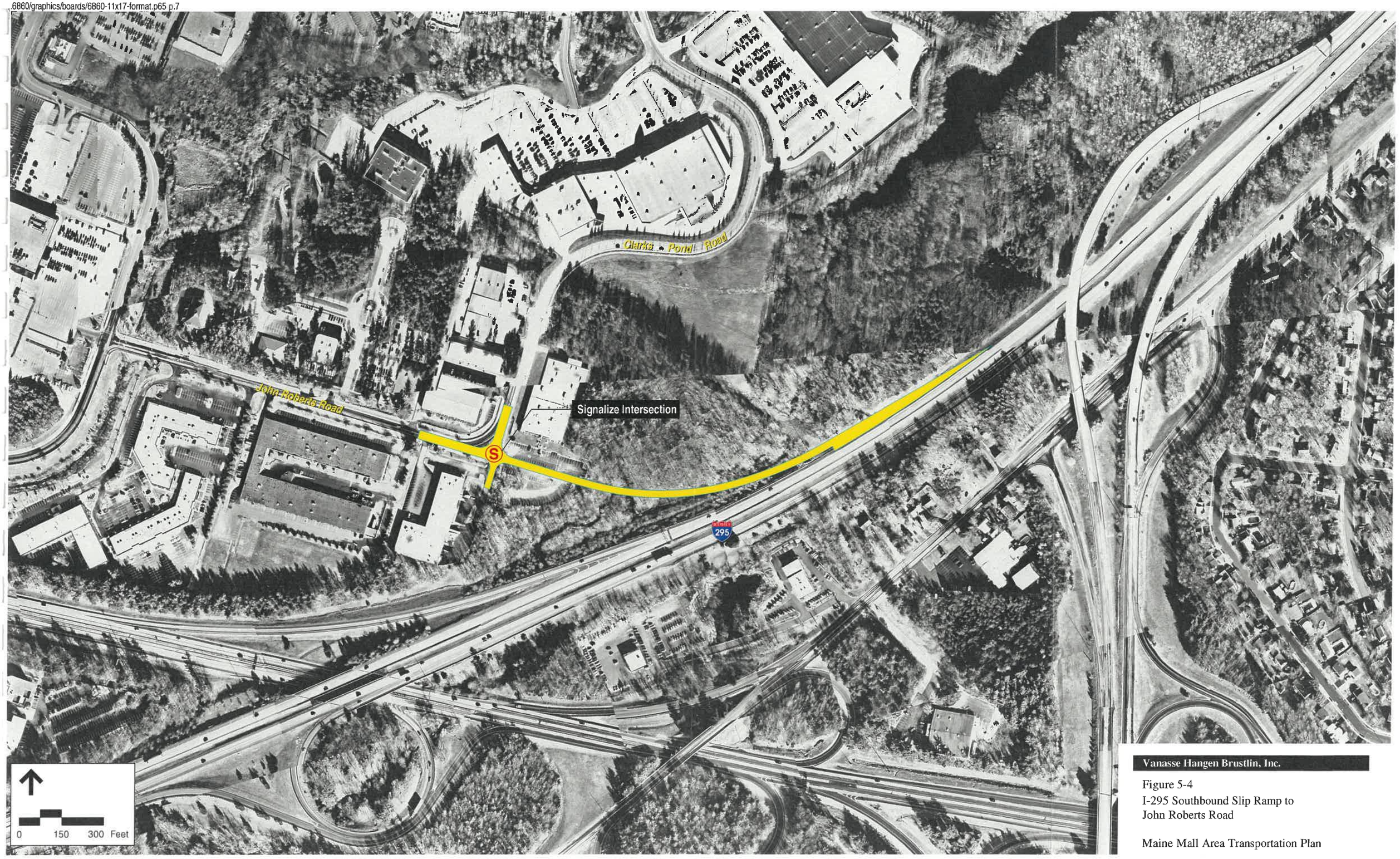

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Figure 5-4
I-295 Southbound Slip Ramp to
John Roberts Road

Maine Mall Area Transportation Plan

- The Philbrook Road/John Roberts Road/Maine Mall driveway would need to be signalized.

Results – Due to the policy and implementation issues associated with this alternative, it is recommended to be dropped from further consideration.

Improve Regional East-West Access through the Maine Mall Area

These actions have been considered to promote the movement of goods and people through the Maine Mall area. One of the long-standing goals of the Portland region has been to provide a new corridor to connect the growing western suburbs with the region's urban core. There are currently limited connections provided that serve that purpose. The alternatives discussed in detail below focus on providing new opportunities to facilitate east and west travel through this region. The intent of these alternatives is not to provide improved access directly to the Mall area, although, there are certain benefits that may arise out of these options that may actually improve access to the Maine Mall area.

Widen Spring Street/Cummings Road to 4 Lanes (Alternative 8)

This alternative includes widening the Spring Street/Cummings Road from its current 2-lane configuration to 4 lanes between Running Hill Road and Payne Road. The Spring Street corridor is currently programmed to be widened near the County Road intersection on the northern portion of the study area. This improvement provides an opportunity to meet the demands of the continued land development in the Spring Street area. (This northern section of the Spring Street/Cummings Road corridor was studied in detail as part of the Spring Street Corridor Study previously completed by PACTS and GPCEI).

Transportation Benefits – The transportation-related benefits expected to be gained from this alternative are to meet the growing demands along this corridor projected to be driven by continued land development in the Spring Street/ Cummings Road area. Based on future projections, this corridor is expected to reach capacity by the 2025 design year. The model results indicate that this new connection would draw an additional 400 design hour trips from surrounding roadways. Based on the model, the majority of these trips would be redirected from using Johnson Road and Maine Mall Road to Congress Street and Spring Street as this may now be a more direct, less congested option. Additionally, there would be some minor shifting of traffic to Spring Street that are currently using Payne Road and Maine Mall Road to travel north through the study area.

Engineering/Construction Issues – As part of the alternative screening analysis, the following engineering/construction issues were identified for the improvement option:

- There will be two stream crossings that will need to be considered as part of the environmental permitting of the project.

- There are several wetland resources that are along the edge of the Spring Street corridor that will also need to be considered.
- As noted in the previous short-term recommendations, the northern intersection of Gannett Drive and Cummings Road is recommended to be signalized based on a high occurrence of correctable vehicle crashes.
- The improvements being negotiated between the Packard Development and MDOT through the Site Location Law process should consider the potential widening of the corridor.
- Several minor "strip" land takings may be required along the frontage of the corridor depending on the alignment of the corridor.

Results – Include the widening of the Spring Street/Cummings Road corridor between Payne Road and Running Hill Road as part of the long-term action plan.

Widen and Realign Running Hill Road to 4/5-Lanes (Alternative 10)

This alternative includes widening Running Hill Road from its current 2-lane configuration to 4/5-lanes from Cummings Road to Route 114. This action would provide an additional major corridor delivering traffic to and from the east/west other than the Route 22 and Route 114 corridors.

Transportation Benefits – The transportation-related benefits expected to be gained from this alternative are minimal as a stand-alone option. Depending on the level of improvement and realignment to the corridor, only minor (150 to 200 peak hour vehicle trips) shifts in traffic are expected to occur as a result of this alternative, (see also later discussions under the SR 703 options). Based on the model, the majority of these trips would be redirected from using the Route 114 and Route 22 corridors into the Maine Mall area. There would be associated minor reductions along Payne Road as well as Spring Street and Johnson Road.

Engineering/Construction Issues – As part of the alternative screening analysis, the following engineering/construction issues were identified for the improvement option:

- There are a number of hills and sharp turns along the Running Hill Road corridor that would need minor realignment to accommodate the four-lane section of Running Hill Road.
- There are a number of driveways to private residences located along the corridor that would need to be modified.
- There is one stream crossing and only minor wetland resource areas that would be impacted along the corridor. These environmental issues will need to be considered as part of the environmental permitting of the project.
- The improvements being negotiated between the Packard Development and MDOT through the Site Location Law process at the Running Hill Road/Spring Street intersection should consider the potential widening of the corridor.

- A 10-18 foot "strip" land taking would be required along the entire frontage of the corridor, depending on the alignment.

Results – The transportation benefits (vs. impacts) do not suggest implementing this action as a stand-alone option. There is additional merit to this improvement should a connection to I-95 at Exit 7 be created (see later discussion).

Widen Route 22/114 "Overlap" (Alternatives 14 and 15)

This area has been the focus of a previous study prepared for PACTS. There are several options under consideration for the widening of the Route 114/22 corridor alignment. Options under consideration include:

- Widen the existing "overlap" area from the current 2-lane configuration to a 4/5-lane corridor.
- Developing a southerly bypass of the overlap area, and
- Developing a northerly by-pass of the overlap area.

In total, the Route 22/114-bypass study investigated seven potential alternatives, of which five were identified for further investigation. Each option has its specific benefits and drawbacks associated with them. These options were all reviewed as potential Maine Mall area improvements.

Specific transportation and construction/engineering issues associated with each of the alternatives are provided in the Route 22/114 study. A summary of the findings is provided in the separate Technical Appendix to this report.

Results – Consider the Southern by-pass alternative or the widening of the overlap area as part of the final recommendations. The Southern by-pass option complements the prior option (Alternative 10).

Improve Regional Arterial Access and Capacity

These options are aimed at improving the capacity along corridors that are projected to operate at or above their theoretical capacity in the future. For the most part, this involves identifying corridors where roadway widenings would benefit the overall Maine Mall area.

Widen Western Avenue (Alternative ST)

This option provides a widened Western Avenue from its current 2-lane configuration to 4/5-lanes from Foden Road to Johnson Road. This action would essentially complete a continuous four-lane corridor from the I-295 Exit 3 interchange in the south to the I-95 Exit 7A interchange along Johnson Road in the north. Currently, the City of South Portland is planning on widening Western Avenue from Gorham Road to Foden Road

and Portland with the MDOT is relocating and widening Johnson Road from the Exit 7A interchange to Maine Mall Road.

Transportation Benefits – This alternative eliminates the long-term potential for the development of a bottleneck between Johnson Road and the widened section east of Foden Road and better serves land uses along the corridor.

Engineering/Construction Issues – As part of the alternative screening analysis, the following engineering/construction issues were identified for the improvement option:

- There are a number of driveways to commercial and private residences located along the corridor that would need to be modified.
- There are some impacts to parking areas for these commercial properties that would need to be accommodated in the design of the corridor.
- Land takings would be required along the entire frontage of the corridor; the extent of the takings depends on the alignment selected for the roadway.

Results – With improvements occurring on both sides of this segment, this alternative should be advanced to the action plan for system continuity.

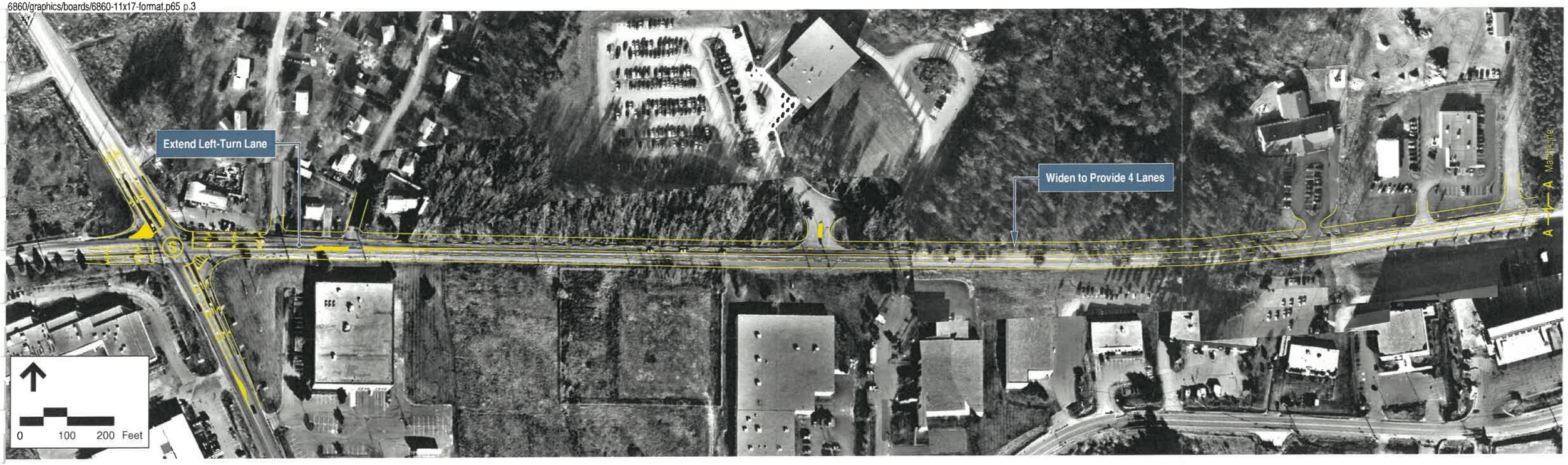
Widen Congress Street (Alternative 13)

Figure 5-5 presents this alternative to widen "outer" Congress Street (County Road in Westbrook) from its current 2-lane configuration to 4/5-lanes. The widening would take place between the Exit 7A interchange with I-95 and Spring Street. The intersection of County Road and Spring Street is currently programmed to be improved on the western portion of the corridor. This action would widen the remainder of the Congress Street corridor.

Transportation Benefits – The transportation-related benefit that is expected to be gained from this alternative is to meet the growing land development demands along this and the Spring Street corridor. Based on future projections, this corridor is expected to reach capacity by the 2025 design year. The model results indicate that this widening would draw an additional 400 design hour trips from surrounding roadways. Based on the model, the majority of these trips would be redirected from using Route 25 and Johnson Road/Maine Mall Road/Running Hill Road as drivers seek to access the "back-door" of the Spring Street corridor via a more direct, less congested option in the future. The provision of this improvement also results in improved operations along the Johnson Road/Maine Mall Road corridors.

Engineering/Construction Issues – As part of the alternative screening analysis, the following engineering/construction issues were identified for the improvement option:

- There do not appear to be any major environmental issues to consider as part of this option.
- Several minor "strip" land takings may be required along the frontage of the corridor depending on the alignment.



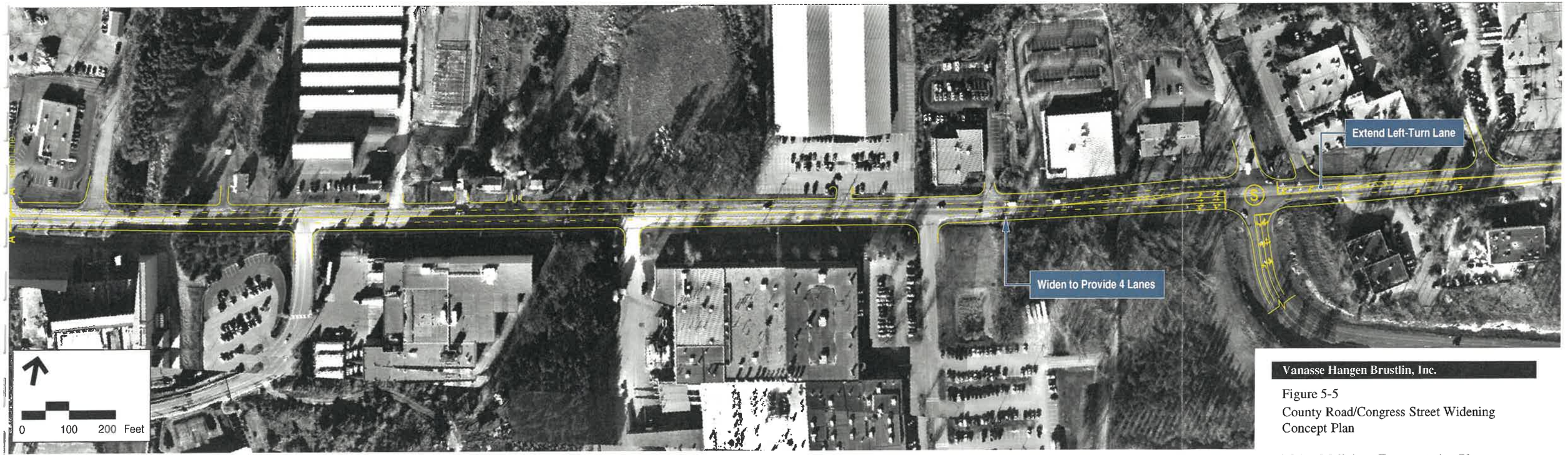


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Figure 5-5
County Road/Congress Street Widening
Concept Plan

Maine Mall Area Transportation Plan

- Several driveways will need to be modified, although none appear to require significant modifications.

Results – The transportation benefits associates with this improvement along with the limited environmental and land use impacts suggest that this should be considered as a stand-alone option in the long-term improvement plan.

Improve Regional Interstate Access and Connections

The interstate system provides the major regional access corridors into and through the Maine Mall region. It is critical that the interstate system be able to efficiently meet the demands placed upon it as the Maine Mall area is a vital component of the Greater Portland economy. The improvements described below are aimed at "streamlining" the delivery of traffic into and through the region.

Widen I-295 between Exit 3 and Exit 4 to 3 lanes (Alternative 19)

This alternative proposes to widen I-295 between Exit 3 (Westbrook Street) and Exit 4 (Route 1/Lincoln Road) from its current 4-lane configuration to a six-lane corridor. The southbound widening would begin as an auxiliary lane at the Exit 4 interchange, and drop off at the Exit 3 off-ramp to Westbrook Street. Similarly, the third lane northbound would pick-up at the Exit 3 on-ramp from Westbrook Street and drop off at the Exit 4 off-ramp to Portland.

Transportation Benefits – The transportation-related benefit that is expected to be gained from this alternative is to meet the ever-increasing demands on this link of I-295. Currently, this link experiences congestion during the peak periods related to the high volumes of merging and diverging traffic at each interchange as well as vehicle queue spill-back on to the interstate highway from Westbrook Street. Based on future projections, this corridor is expected to reach capacity by the 2025 design year. The model results indicate that this widening would provide added capacity and would draw approximately 400 additional design hour trips from surrounding local roadway system. Based on the model, the majority of these trips would be redirected from using the Congress Street corridor from downtown Portland and from using Route 1 through South Portland/Scarborough. The provision of this improvement also results in improved operations along these corridors as the vehicles are shifted to the less-congested interstate system.

Engineering/Construction Issues – As part of the alternative screening analysis, the following engineering/construction issues were identified for the improvement option:

- There is a stream/tidal area that runs adjacent to the I-295 southbound corridor that would need to be handled as part of the environmental permitting of the project,
- The entire widening can take place within the existing interstate right-of-way.

Results – The immediate demand for this improvement along with the limited environmental and land use impacts associated with this action suggest that it be considered as a high priority action.

Provide a Full Service Interchange at Exit 6A (Alternative 20)

Figure 5-6 presents the alternative of providing a full service interchange (with connections to all directions between I-95 and I-295). This would provide a new connection ramp from I-295 southbound to I-95 northbound and a new ramp from I-95 southbound to I-295 northbound.

Transportation Benefits – The transportation-related benefit that is expected to be gained from this alternative is to keep interstate traffic (trucks and passenger vehicles) on the interstate regional highway system. Currently, motorists must use the SR 703 connection to travel between these two points. Based on traffic projections, these ramp connections would carry a combined total of about 650 design hour trips with the majority of them being drawn off of the SR 703 corridor. The provision of this improvement results in improved operations along the SR 703 corridors as the vehicles are shifted to the less-congested interstate system. However, there does not appear to be much local benefit from this alternative based on the model results.

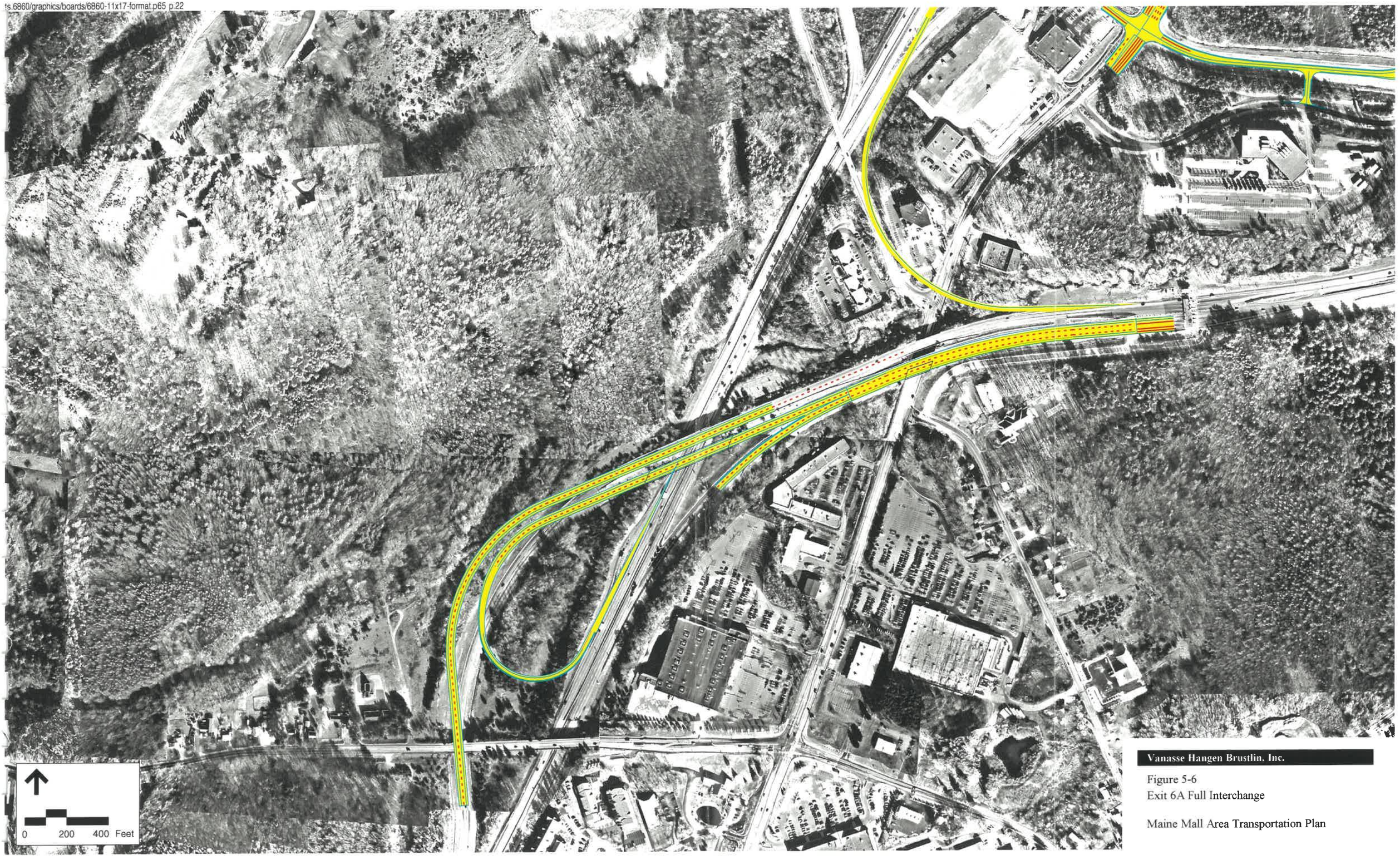
Engineering/Construction Issues – As part of the alternative screening analysis, the following engineering/construction issues were identified for the improvement option:

- There is a stream that runs adjacent to I-295 that would need to be addressed as part of the environmental permitting of the project.
- There are moderate wetland resources that would also need to be addressed.
- The existing I-295 southbound ramp to I-95 southbound would need to be shifted west to accommodate the proposed loop ramp from I-95 SB to I-295 NB; this would require a new bridge section under Route 114.
- The ramp from I-295 SB to I-95 NB would need to cross Payne Road and would likely impact either private land ownership or could be constructed along the Spring Street layout (requiring the discontinuance of Spring Street at Payne Road).

Results – While the demand is moderate for this improvement, it would be more beneficial in concert with modifications to the character of the SR 703 corridor (discussed later).

Reconstruct the I-295/Westbrook Street (Exit 3) Interchange (Alternative 21)

The alternative of eliminating the existing I-295 northbound on-ramp from Westbrook Street and shifting it to a location along Broadway was presented previously in prior studies of the area. This proposal would require widening the I-295 bridge over Westbrook Street.



Vanasse Hangen Brustlin, Inc.

Figure 5-6
Exit 6A Full Interchange

Maine Mall Area Transportation Plan

Transportation Benefits – The transportation-related benefit that is expected to be gained from this alternative is to improve safety by eliminating the heavy left-turn demand (and a high-crash location) on Westbrook Street to the I-295 on-ramp. The traffic changes as a result of this modification are essentially negligible from a volume perspective, however, the operational benefits to the whole Exit 3 interchange are significant (by eliminating an existing queue that develops under the I-295 overpass and keeping traffic moving along Westbrook Street).

Engineering/Construction Issues – As part of the alternative screening analysis, the following engineering/construction issues were identified for the improvement option:

- The location of the proposed on-ramp would have minor impacts to wetland resources (previously defined as "wet meadows"). These would need to be addressed in any environmental documentation prepared for the project.
- The new on-ramp would need to accommodate the existing on-ramp from the Scarborough Connector located upstream from the proposed ramp location by separating the high-speed merging traffic on I-295 over the Westbrook Street corridor.
- The lane geometry along Westbrook Street would need to be re-evaluated to accommodate the change in lane usage along the corridor.
- There are moderate wetland resources that would also need to be addressed.

Results – This improvement project should be considered as a stand-alone option for addressing the safety and operational issues identified at this location. This interchange improvement has been studied in a number of previous transportation reports with this improvement option continuing to emerge as the preferred alternative at this location.

■

5.2.5 Refinement of SR 703 Alternatives

After the initial review of the State Route 703 corridor in the first-level screening, a range of potential alternatives was developed to address the defined needs of the corridor and the intersecting roadways serving the corridor. From this development of ideas came the theory of redefining the use of the corridor entirely. For example, instead of using SR 703 as a limited access arterial connecting I-95 with I-295, the idea of creating a slower-speed arterial providing full access at intersections to the various cross-streets was considered. These ideas and resulting alternatives were developed, again, through collaborative working sessions with PACTS, Maine DOT, and various stakeholders. Due to the breadth of alternatives generated for the SR 703 corridor, a separate evaluation and screening process was developed to identify long-term strategies at individual locations, as well as the entire corridor. This section discusses the alternatives developed, their issues, and benefits to the system as a whole. Table 5-5 presents the matrix evaluations for the 15 alternatives and combination of alternatives developed for the SR 703 corridor.

Maine Mall Road Bridges

Much of the impetus for the development of the Maine Mall Area Transportation Plan update was the need to reconstruct/rehabilitate the Maine Mall Road bridges over

Table 5-5
Evaluation of SR 703 Improvement Options

	Alternative Description		Estimated Costs*	Address Capacity Problem?	Address Geometry/ Safety Problem?	Projects Goals: Improve East-West Access Goal?	Improve Access To Mall Area	Improve Access to Interstate System?	Improve Arterial Access/ Capacity?	Comments
Maine Mall Road/Local Access Improvements										
A	Rehabilitate existing Maine Mall Road bridges	Perform maintenance on the Maine Mall Road bridges. Retain existing cross-section.	~ $3.0 Million	No -- signal spacing remains a problem along Maine Mall Road	No	No	No	No	No	Discard alternative as a stand-alone option.
B	Rehabilitate existing Maine Mall Road bridges (redesign to standards)	Reconstruct Maine Mall Road bridges to meet current design standards. Provide 4-lane cross-section.	~ $4.5 Million	No -- signal spacing remains a problem along Maine Mall Road	Yes -- upgrades deficient bridges to meet current design standards	No	No	No	No	Discard alternative as a stand-alone option. Consider in conjunction with other options.
C	Widen Maine Mall Road bridges to provide 6-lane cross-section	Reconstruct the Maine Mall Road bridges to meet current design standards. Provide 6-lane cross-section.	~ $6.4 Million	Partially -- improves capacity of Maine Mall Road/SR 703 intersection, however, queues are still a problem on Maine Mall Road	Yes -- upgrades deficient bridges to meet current design standards	No	No	No	Yes -- provides capacity increase along Maine Mall Road	Discard alternative as a stand-alone option. Consider in conjunction with other options.
D	Eliminate Maine Mall Road bridges and create Maine Mall Road and SR 703 signalized, at-grade intersection	Eliminate the Maine Mall Road bridges and replace with a signalized intersection at SR 703. Requires elimination of Exit 7 (I-95) NB off-ramp to SR 703	~ $7.3 Million ($10.8 Million with Toll Plaza relocation)	No -- addition of new signal along Maine Mall Road without addressing broader corridor capacity issues	No	No	Yes -- provides more direct access to Mall from interstate	No -- eliminates I-95 NB ramp to SR 703	No -- concentrates turning movements on Maine Mall Road	Discard alternative as a stand-alone option. Consider in conjunction with other options.
E	Retain Maine Mall Road overpass, create new signalized intersection east of bridge	Retain the existing Maine Mall Road bridges, realign Maine Mall Road, and construct a signalized intersection at the current ramps at SR 703.	$8.6 Million	No	No -- would exacerbate merge/weave area between I-295 and Mall entrance	No	Yes -- provides direct access to/from SR 703 to Maine Mall area	No	Yes -- eliminates demand over Maine Mall Road bridge	New signal at Maine Mall access with SR 703 would necessitate other improvements.
F	Consolidate SR 703 WB Ramps with Philbrook Road	Consolidate the intersections of Maine Mall Road at Philbrook Road and at SR 703 WB Ramps into one signal. Upgrade Philbrook Road to a four lane cross-section.	$1.0 Million	Yes -- addresses queuing issue between Philbrook Road and SR 703 WB Ramp along Maine Mall Road	Yes -- addresses existing HCL at Maine Mall Road and Philbrook Road	No	Yes -- improves access to Maine Mall/ Philbrook Road area from Maine Mall Road	No	Yes -- provides capacity increase along Maine Mall Road	Discard alternative as a stand-alone option as it necessitates other improvements at Maine Mall Road / SR 703
G	Provide two-way access from Maine Mall/Philbrook Road to SR 703.	Signalize the intersection of Philbrook Road, the Maine Mall driveway, and the SR 703 WB Ramp intersection to provide a connection from the Mall to SR 703.	$715,000	Yes -- eliminates need for vehicles leaving the Mall area to use Maine Mall Road to access SR 703	Yes -- signalizes an existing HCL at Philbrook Road and Maine Mall driveway	No	Yes -- provides direct access to and from Mall to regional highway system	No	Yes -- provides capacity increase along Maine Mall Road	Discard alternative as a stand-alone option as it necessitates other improvements along SR 703 (see options below)

* Costs do not include traffic management, permitting, design, and/or environmental/ROW costs. $3.5 Million assumed for toll plaza relocations.

Table 5-5
Evaluation of SR 703 Improvement Options

	Alternative Description		Estimated Costs*	Address Capacity Problem?	Address Geometry/ Safety Problem?	Projects Goals: Improve East-West Access Goal?	Improve Access To Mall Area	Improve Access to Interstate System?	Improve Arterial Access/ Capacity?	Comments
SR 703 "Arterial Options"										
H	Create signalized ramps from I-295 to SR 703.	Reconfigure interchange at SR 703 and I-295 to provide half-diamond design. Signalize ramp intersection at SR 703.	$1.6 Million	No	Yes -- replaces existing substandard inner loop ramp from SR 703 to I-295 NB	No	No	No -- unless in conjunction with Alternative A	No	Could work as a stand alone option or in conjunction with other alternatives.
I	Eliminate ramp from I-295 SB to SR 703 and create new ramp to SR 703 from Scarborough Connector	Eliminate the ramp from I-295 to SR 703 and replace it with a new ramp from the Scarborough Connector to SR 703 to the east.	$1.0 Million	No	Yes -- addresses merge/weave area between I-295 and Mall entrance	No	No -- not directly	No	No	Should be included with alternatives to provide full access to Maine Mall from SR 703.
J	Signalize intersection of Mussey Road/Broadway and SR 703	Eliminate the existing interchange at Mussey Road/Broadway and SR 703 and replace with a signalized, at-grade intersection.	$2.1 Million	No	Yes -- eliminates substandard ramp spacing from SR 703 EB	No	No	No	Yes -- provides full access to Mussey Road/Broadway corridor	Eliminates bridge structure and improves access to Broadway/Mussey development area.
SR 703 "Limited Access" Options										
K	Modify SR 703 and I-295 NB connections	Eliminate the SR 703 connection to I-295 NB and replace with new loop ramp at Scarborough Connector. Reconfigure I-295 NB off-ramp to SR 703 to provide more direct ramp connection.	$1.3 Million	No	Yes -- replaces existing substandard inner loop ramp from SR 703 to I-295 NB	No	No	No	No	Alone does not address project goals.
L	Consolidate Ramps at Mussey Road	Combine ramps from Mussey Road to SR 703 Westbound.	> $500,000	No	Yes -- eliminates ramp connection to SR 703	No	No	No	No	Consider as potential alternative in conjunction with other alternatives.
SR 703 "Regional (East/West) Access Options										
M	Develop one-way (westbound) connection to Running Hill Road from Exit 7. Retain current trumpet interchange layout.	Extend westbound SR 703 to Running Hill Road (grade separated over Cummings Road).	$2.3 Million ($5.8 Million with Toll Plaza relocation)	Partially -- provides alternative route for traffic currently using Maine Mall Road and Payne Road to travel west.	No	Partially -- provides new connection to west	No	No	Partially - removes traffic from Maine Mall Road and Payne Road	Discard -- alternative has limited value within overall transportation system as a stand-alone option.
N	Create two-way connection to Running Hill Road from Exit 7. Modify current trumpet interchange layout.	Extend SR 703 through to Running Hill Road (grade separated over Cummings Road). Signalize existing I-95 SB ramps at extended ST 703.	$9.3 Million ($12.8 Million with Toll Plaza relocation)	Yes -- provides alternative route for traffic currently using Maine Mall Road and Payne Road and Payne Road to travel east-and-west.	No	Partially -- provides new connection to/from west	Yes -- provides additional route to/from the west accessing the Mall area	Yes -- improves access to Exit 7 to/from the west	Yes -- removes traffic from Maine Mall Road and Payne Road by providing alternative route	Consider alternative as stand-alone option or in conjunction with other options.

* Costs do not include traffic management, permitting, design, and/or environmental/ROW costs. $3.5 Million assumed for toll plaza relocations.

Table 5-5
Evaluation of SR 703 Improvement Options

	Alternative Description		Estimated Costs*	Projects Goals: Address Capacity Problem?	Address Geometry/ Safety Problem?	Improve East-West Access Goal?	Improve Access To Mall Area	Improve Access to Interstate System?	Improve Arterial Access/ Capacity?	Comments
O	Create diamond interchange layout at Exit 7 with connection to Running Hill Road.	Reconfigure the existing Exit 7 interchange to provide a diamond configuration. Signalize the NB and SB ramps and extend SR 703 to Running Hill Road.	$14.5 Million ($18.0 Million with Toll Plaza relocation)	Yes -- provides alternative route for traffic currently using Maine Mall Road and Payne Road east-and-west.	Yes -- replaces existing I-95 SB loop ramp to SR 703	Partially -- provides new connection to/from west	Yes -- provides additional route to/from the west accessing the Mall area	Yes -- improves access to Exit 7 to/from the west	Yes -- removes traffic from Maine Mall Road and Payne Road by providing alternative route	Discard -- costs considerably more than Alt. N with no added benefits.

* Costs do not include traffic mangement, permitting, design, and/or environmental/ROW costs. $3.5 Million assumed for toll plaza relocations.

* Costs do not include traffic management, permitting, design, and/or environmental/ROW costs. $3.5 Million assumed for toll plaza relocations.

SR 703. Funding for these bridges has been on the Transportation Improvement Plan (TIP) for the past six years. Over that time, the traffic volumes in the region have continued to grow to the point where there was concern that the reconstruction of the existing twin two-lane bridges may not meet the long-term needs of the region. In fact, traffic projections indicate that the three intersections to either side of the bridge (Philbrook Road, the SR 703 westbound ramps, and the SR 703 eastbound ramps) will operate over capacity in the 2025 design year. For this reason, three options were considered to evaluate the long-term viability of the bridge. These three options include:

- **Alternative A** – Rehabilitation and performance of major maintenance of the existing bridges.
- **Alternative B** – Reconstruction of the bridges to provide a four-lane cross-section designed to current MDOT standards with full shoulders and pedestrian accommodations.
- **Alternative C** – Reconstruction of the bridge to provide a six-lane cross-section designed to current MDOT standards with full shoulders and pedestrian accommodations.

The following section discusses the issues associated with each of these options.

Rehabilitate Maine Mall Road Bridges (Alternative A)

This option essentially would call for MDOT to perform a major maintenance program on the bridge to assure its long-term viability. The bridge would not be widened or altered in any way beyond the "shoring up" of the structural stability of the bridge. Based on conversations with MDOT, this option would likely cost close to $3.0 million, but is not considered a viable option because it doesn't meet state / federal design guidelines or address projected volumes.

Results: Discard alternative

Reconstruct Maine Mall Road Bridges to 4 Lanes with Shoulders (Alternative B)

This option would completely reconstruct the bridges to provide a new four-lane cross-section with adequate shoulders and pedestrian amenities. The new bridge would need to be redesigned to meet current MDOT design standards. Based on conversations with MDOT, this option would cost approximately $4.5 million.

Benefits: This option would not specifically improve capacity through the Maine Mall area because of the close spacing of signalized intersections, but would bring the bridge up to meet current design standards as well as provide pedestrian amenities.

Drawbacks: The widening of the bridge would not address long-term capacity issues at the signals located to either side of the bridge. Essentially, the bridge would serve as it currently does supporting the queues that form at the signals on either side of the bridge.

Results: Discard alternative as a stand-alone option. Consider option in conjunction with upgrades/redesign of signals along Maine Mall Road.

Reconstruct Bridge to 6 lanes (Alternative C)

This option would provide a new six-lane cross-section bridge with adequate shoulders and pedestrian amenities. The bridge would need to be redesigned to meet current MDOT design standards. Based on conversations with MDOT, this option would cost approximately $6.0 million.

Benefits: This option would add an additional lane of capacity along the Maine Mall Road/Payne Road corridor. Additionally, the redesign of the bridge would bring the bridge up to meet current design standards as well as provide pedestrian amenities.

Drawbacks: The widening of the bridge would not address long-term capacity issues at the signals located to either side of the bridge. While moderately improved from the four-lane cross-section, this option would serve the queues that form at the signals on either side of the bridge. The corridor would remain congested as its overall carrying capacity is governed by the numerous signalized intersection locations.

Results: Discard alternative as a stand-alone option. Consider option in conjunction with upgrades/redesign of signals along Maine Mall Road.

Maine Mall Road At-grade Signal Options

In addition to the investigation of options to rehabilitate or reconstruct the Maine Mall Bridges, consideration was given to the potential elimination of the bridges and/or re-routing of the Maine Mall Road corridor. Improved access potential to SR 703 and the Maine Mall created support for this concept. Toll plaza issues exist with both options. It was noted that the provision of a signal along SR 703 would alter the character of the high-speed, limited-access highway. Two options were considered to evaluate the viability of these alignments. These options include:

- Eliminate the Maine Mall Road bridges and replace with an at-grade signalized intersection. *(Alternative D).*
- Retain the Maine Mall Road bridges, but realign Maine Mall Road and Payne Road to the east of the bridge and provide a signalized intersection along SR 703 *(Alternative E).*

The following section discusses the issues associated with each of these two options.

Eliminate Maine Mall Road Bridges, Provide At-grade Intersection Along SR 703 (Alternative D)

Several design variations of this option were developed as part of this study. Essentially, they all include the removal of the Maine Mall Road bridges and replacement of the crossing with an at-grade, signalized intersection of the SR 703 and Maine Mall Road. Some options to this project include providing an additional signal

located along SR 703 to the south providing direct access into the Maine Mall shopping area via Philbrook Road.

Benefits: This option would eliminate the need to reconstruct the Maine Mall Road bridges and would improve traffic operations along the Maine Mall Road/Payne Road corridor through removal of the numerous on- and off-ramps to and from SR 703. This intersection would serve as a means of providing a more direct access for many motorists to the Maine Mall area (especially with the introduction of a second signal providing access directly to the Maine Mall). This could change the nature of the SR703 corridor from a high-speed corridor to a slower regional arterial roadway connecting I-95, I-295 and Route 1, while providing improved land use access.

Drawbacks: Changes the pattern for vehicles traveling northbound on I-95 to access the Maine Mall area to a more circuitous route (without other improvements along SR703). The I-95 northbound (Exit 7) off ramp to SR 703 would need to be removed to eliminate the chance of high speed weaving movements occurring as I-95 northbound off-ramp motorists wanting to turn left at Maine Mall Road weave across I-95 southbound off-ramp movements travelling through onto SR 703. This option also begins to change the nature of the SR703 corridor from a high-speed corridor to a slower regional arterial roadway connecting I-95, I-295 and Route 1, while providing improved land use access. Additionally, this action would concentrate a volume of north-south and east-west through traffic into a single intersection where currently a bridge exists.

Results: Discussed as a stand-alone option. Consideration should be given to this option in conjunction with other SR 703 corridor improvement options. While this option provides some promise for local area traffic benefit, a number of regional access issues would need to be considered before recommending this as a full alternative.

Retain Maine Mall Road Bridges (Alternative B or C above) Realign Maine Mall Road/Payne Road Provide an At-grade Intersection along SR 703 (Alternative E)

This option would upgrade the Maine Mall Road bridges through either Alternative B (a four-lane bridge) or Alternative C (a six-lane bridge) and would also realign the Maine Mall Road/Payne Road corridor to provide a large signalized intersection to the east of the replaced bridge.

Benefits: This option would serve to improve the current ramp system in place connecting Maine Mall Road and the SR 703 corridor by concentrating all turning movements at one central location.

Drawbacks: This option alone would not improve operations along Maine Mall Road and would introduce a signal on a current high-speed facility. Consideration would also need to be given to the close proximity of the I-295 southbound off-ramp to SR 703 and the potential for safety issues.

Results : While this option should be discarded as a specific stand-alone option, there is some promise in refining the design to serve as a potential short-term solution with other concepts along Philbrook Road (discussed later).

Philbrook Road Consolidation Plan

Consolidate signals at SR 703 Eastbound Ramps and Philbrook Road along Maine Mall Road (Alternative F)

This improvement would upgrade the existing intersections of Maine Mall Road, Philbrook Road and the SR 703 ramps through combining and realigning Philbrook Road and the ramps into one signalized intersection

Benefits: The action would improve the currently problematic operation of these two intersections by concentrating all traffic into one location. This would also serve to eliminate the number of conflicting turning movements at the intersection, which could improve the safety of motorist travelling through this location.

Drawbacks: This improvement likely requires land takings (the gas station located between the ramps and Philbrook Road). In order to retain the ramps and the Philbrook Road corridor, as they currently are, the intersection that would be formed at Maine Mall Road could result in a confusing, high-volume intersection.

Results: While this option should be discarded as a stand-alone option due to the problems associated with the alignments of the roadways at the intersection, the idea of combining the two signals into one could serve as a potential immediate solution to a number of operational and safety problems in this area. Larger-scale improvements in concert with this action would further increase the effectiveness of the improvement.

Provide two-way access from Philbrook Road and SR 703 (Alternative G)

This option would provide a southbound connection from Philbrook Road to SR 703, as opposed to the current requirement of vehicles on Philbrook Road needing to travel through Maine Mall Road to reach the Maine Turnpike. The intersection would need to be signalized to handle the conflicting traffic flows and some modifications to the SR 703 ramps would also be required to accommodate the merging traffic along the corridor.

Benefits: The provision of this connection would improve traffic operations at the intersections along Maine Mall Road significantly and would reduce delay along the entire Philbrook Road corridor.

Drawbacks: This action would require two new signals in close proximity to each other. There would also need to be some modifications to the Maine Mall internal parking and circulation aisles. The improvement would introduce a difficult merge/weaving condition with the existing SR 703 on-ramp from Maine Mall Road.

Results: Due to the creation of the difficult weaving section along the SR 703 ramps and the need for two new signals, this option was discarded as a specific stand-along consideration. However, this option, in conjunction with minor modifications to Alternative F (above) could serve as a significant improvement to this corridor.

Increased Access along the SR 703 Corridor

Create a new half-diamond interchange at I-295 northbound and SR 703 (Alternative H)

This option would bring traffic from I-295 travelling northbound directly to SR 703 at a signalized intersection. It would also create a new ramp connection from SR 703 to I-295 northbound.

Benefits: This connection would serve as a more direct route for travelers heading from the Maine Mall area to the north along I-295. It would also reduce the heavy left-turns at Exit 3 (Westbrook Street).

Drawbacks: This option by itself would not improve operations significantly at many locations and would introduce a new signal onto a high-speed facility. Consideration would need to be given to the placement of the signal along SR 703 given the proximity of the I-295 overpass to this location.

Results: Consideration should be given to this option if the I-95 northbound off-ramp is eliminated as it would provide northbound motorists traveling from the Maine Turnpike access to the Maine Mall area.

Eliminate I-295 Southbound Ramp to SR 703 (Alternative I)

This option would eliminate the existing high-speed ramp from I-295 southbound to SR 703 westbound and replace it with a new ramp from the Scarborough Connector to SR 703 westbound.

Benefits: This option would eliminate the concerns with placement of a new signal along SR 703 at the Maine Mall's Philbrook Road access driveway. The high-speed ramp traffic would be diverted further to the east and away from the signal.

Drawbacks: The relocation of this ramp might increase travel time between I-295 and the Maine Mall area and result in more motorists using the already congested Westbrook Street interchange, although this scenario is difficult to quantify.

Results: Discard this alternative as an option. Consideration instead should be given to altering the design of the I-295 southbound off-ramp to lower the operating speed of ramp traffic by realigning the angle of merge with SR 703 and potentially signalizing the ramp/SR 703 intersection.

Replace Mussey Road/Broadway interchange with signalized intersection (Alternative J)

This option would eliminate the existing Mussey Road/Broadway bridge and interchange along SR 703 and replace it with a large at-grade signalized intersection along SR 703.

Benefits: This alternative would provide access to all directions at the intersection of these roadways (currently, access is limited to certain directions only). With the United States Postal Service facility being located to the south along Mussey Road, full access could serve to limit the impacts to other local area roadways.

Drawbacks: This option would introduce a new traffic signal on a current high-speed facility. Consideration should also be given to the close proximity of this intersection to the surrounding interchanges to the east (I-295) and west (Scarborough Connector).

Results: This option could serve as a stand-alone option if the above noted considerations were taken into account. The decision to alter the character of the SR 703 corridor by placing a signalized intersection along the corridor must be considered as well.

Consolidate Ramps along SR 703 to Promote Limited Access Options

Modify SR 703 and I-295 ramp system (Alternative K)

This action would eliminate the tight SR 703 loop-ramp connection to I-295 northbound and replace it with a new, higher speed loop ramp at the Scarborough Connector interchange. In concert with this option, the I-295 northbound off-ramp to SR 703 could be altered to provide a more direct ramp connection.

Benefits: These new ramp connections would improve the minimum-level designs on the existing ramps between SR 703 and I-295.

Drawbacks: The new connection to the Scarborough Connector would introduce a new weaving segment along the Connector. This improvement does not necessarily address the project goals.

Results – This option should be discarded, as it does not address any project goals. Furthermore, the connection would actually appear to create greater burdens on certain local roadway connections such as at Exit 3 (Westbrook Street).

Modify ramp system at Mussey Road/ Broadway with SR 703 (Alternative L)

As opposed to Alternative J, where the interchange was eliminated and replaced with a signalized intersection, this option focuses on improving the existing interchange ramps to provide full access connections to the SR 703.

Benefits: This option eliminates the redundant connections to SR 703 westbound by combining ramps at a signalized intersection on Broadway. This would permit other alternatives being considered along SR 703 to be enhanced.

Drawbacks: The alternative only provides minimal benefits to the corridor from an operational perspective as a stand-alone option. Does not address eastbound SR 703 connections.

Results – This alternative should be discarded as a stand-alone option, but should be considered as part of a comprehensive SR 703 improvement scenario.

Promote SR 703 as Regional East/West Access Corridor

Create one-way connection to Running Hill Road from SR 703 (Alternative M)

This option extends SR 703 to the west from the existing Exit 7 interchange off of the Maine Turnpike. The connection would serve as a one-way connection to Running Hill Road.

Benefits: This connection provides a more direct option for connecting the Greater Portland area with the suburbs to the west. The connection is projected to draw a moderate amount of vehicles off local roadways (Payne Road and Maine Mall Road) during the weekday evening peak period.

Drawbacks: Does not improve eastbound traffic into the Greater Portland area, particularly during the morning peak commuter periods.

Results – This option has some limited benefits for regional traffic patterns, but the idea of providing a connection to the west could be improved beyond this concept (see Alternatives N and O). To realize the full benefit of these options, the Running Hill Road widening (Alternative 10) should also be considered.

Create two-way connection to Running Hill Road from SR 703 – Modified Trumpet Interchange (Alternative N)

This alternative would create a two-way connection between Running Hill Road and SR 703 at the Exit 7 interchange at the Maine Turnpike. This would require a grade separation over Cummings Road to tie into Running Hill Road along with modifications to the Running Hill Road/Cummings Road intersection. This option will cost approximately $9.3 million – not including the potential need to relocate the existing tollbooth structures located on SR 703.

Benefits: This option offers the potential for a major transportation benefit to the region if designed in concert with other supporting improvements (such as the widening of Running Hill Road and addressing of the capacity issues at the Route 114/22 "Overlap Area"). This option also improves the access to the Maine Turnpike and the Maine Mall area to and from the west by providing a direct connection to the interstate and Mall area. Because much of the infrastructure is already in place, this option does not appear to require major changes to the layout of the roadway systems.

Drawbacks: This option must address environmental issues associated with a large wetland area located to the west of the Exit 7 interchange. The option also requires some land acquisition from private land owners and avoidance of the current Packard Development located to the west of the interchange as well. Toll issues will need to be addressed.

Results – Retain this alternative for further refinement and development. The benefits of this option are projected to be significant to the local roadway (Maine Mall Road, Payne Road, and Gorham Road) networks. Consider with other area roadway capacity enhancements to maximize the benefits of this option.

Create two-way connection to Running Hill Road from SR 703 – Diamond Interchange (Alternative O)

Similar to Alternative N above, this option provides a connection to the western portion of the Greater Portland area. This alternative would require a grade separation over Cummings Road to tie into Running Hill Road along with modifications to the Running Hill Road/Cummings Road intersection. This option will cost approximately $14.5 million – not including the potential need to relocate the existing tollbooth structures located on SR 703.

Benefits: This option offers the potential for a major transportation benefit to the region if designed in concert with other supporting improvements (such as the widening of Running Hill Road and addressing of the capacity issues at the Route 114/22 "Overlap Area"). This option also improves the access to the Maine Turnpike and the Maine Mall area to and from the west by providing a direct connection to the interstate and Mall area.

Drawbacks: This option would require major alterations to the existing layout of the Exit 7 interchange along the Maine Turnpike. The option also requires some land acquisition

from private land owners and avoidance of the current Packard Development located to the west of the interchange as well. Toll issues will need to be addressed.

Results: Discard this option as a long-term consideration. The benefits are similar in nature to those noted in Alternative N previously; however, the costs associated with this action are more that $5.0 million in excess of Alternative N.

6 Corridor Recommendations and Action Plan

The previous sections of this report reviewed in detail the range of alternatives considered to address the deficiencies and needs identified in the Maine Mall study area. These analyses, combined with input from the municipalities, MDOT, and other interested stakeholders, led to the list of recommended improvements for the study area. This chapter summarizes the recommendations for implementation of the improvement program for the Maine Mall area.

6.1 Overview

PACTS and the Maine Department of Transportation undertook this study to evaluate the transportation deficiencies and define the long-term transportation improvements needed within the Maine Mall area in the communities of South Portland, Scarborough, Portland, Westbrook, and Gorham. The study was intended to serve as a blueprint for the area to assist MDOT, PACTS, and the municipalities in their programming of future transportation investments in the region. The key objectives of this study were:

- Reduce traffic congestion
- Preserve arterial capacity
- Improve safety
- Improve access to the Maine Mall area
- Improve regional east – west access
- Improve access to the Interstate system

6.2 Summary of Needs/Prioritization of Recommended Actions

Growth within the Maine Mall area and among the communities served by the roadway systems that travel through the area is expected to continue as a result of population and economic growth in the region. Projected traffic volumes indicate that a number of roadways and intersections within the study area will reach or exceed capacity within the next twenty-five years. By 2025, absent any action, growth in the Maine Mall area will begin to be limited by the roadway infrastructure's ability to deliver the traffic into the area.

The transportation improvement options identified were screened through the process of evaluating each on the basis of its technical merits and by seeking public

input to assess its implementation feasibility and need. The latter is especially important to gauge those strategies that are the most pressing and those that require a longer lead time to implement. Improving public safety and traffic-operational issues within the study area were given highest consideration as part of the screening evaluation criteria.

The process of screening the initial set of potential transportation improvement ideas was completed by the consultant team with the input of the MDOT and staff members of South Portland, and the PACTS Technical Committee in several working sessions. The resulting recommendations are identified as short-term action items (those that could be instituted relatively quickly) and long-term action items (those that could trigger several levels of environmental review and would require additional funding sources, long design times, and significant project coordination).

6.3 Summary of Recommended Maine Mall Area Transportation Plan

Certain transportation deficiencies throughout the study area were identified during the transportation study process. The final phase of the study involved the development of an integrated series of roadway improvement actions aimed at meeting existing and future roadway demands. The screening criteria considered in the development of a recommended improvement plan were highlighted in the previous section.

The roadway improvement plan concentrates on the four goals of improving east-west access through the region, improving access to the Mall area, improving accessibility to the regional roadway system, and improving the overall capacity of the arterial roadway system as a whole. Summaries of the recommended short-term and long-term roadway improvements are outlined in the following section and on Figures 6-1 and 6-2. It should be noted that some of the roadway improvement plans are conditioned on other projects currently programmed by MDOT, MDEP, and the local municipalities in which the roadways are located. These specific projects were previously identified in the "Planned Roadway Improvement Projects" section in Chapter 3 and shown in Figure 3-1. All improvements that fall into this category have been clearly identified in the recommended plan description. Tables 6-1 through 6-4 provide a detailed summary of the recommended improvements, their benefits to the existing and future transportation environment, and the corresponding costs.

6.4 SR 703 Options

As noted in previous sections, the concept of modifying the character of the SR 703 corridor could have certain regional transportation benefits. Through this study, several options were presented and discussed at length about potential layouts and concepts for the corridor. Each concept had perceived benefits and drawbacks associated with it. Collectively, these concepts represent the consideration of a wide spectrum of options and combination of options. Figures 6-3 through 6-5 present the three concept plans that received the most attention during this process. Tables 6-5 through 6-7 provide a

Table 6-1

Recommended Plan Summary

Location / Improvement Description	Reference Figure Number	Existing Safety	Existing Intersection Capacity	Existing Arterial Capacity	2025 Intersection Capacity	2025 Arterial Capacity	High (Short-Term)	Medium (Long-Term)	Low (Long-Range)	COST (1999 Dollars)*	REMARKS
MAINE MALL ROAD	N/A	♦	♦		♦						
MAINE MALL ROAD ACCESS MANAGEMENT STRATEGIES											
-- Consolidate Toys' R Us driveways		♦						♦		$50,000	Requires internal reconfiguration of parking layout
MAINE MALL ROAD / GORHAM ROAD INTERSECTION											
-- Add right-turn lanes on both Gorham Road approaches			♦		♦		♦			$70,000	Project Underway by MDOT
-- Add right-turn lanes on NB Maine Mall Road approach			♦		♦		♦			$40,000	Project Underway by MDOT
-- Extend SB left-turn lane on Maine Mall Road			♦		♦		♦			$10,000	Queues currently exceed storage capacity
-- Restrict LT from Auto dealership							♦			n/a	Required to accommodate extended LT lane
MAINE MALL ROAD / BED BATH & BEYOND DRIVEWAY											
-- Extend NB/SB left-turn lanes (restripe)			♦		♦		♦			n/a	Provide better definition for center left-turn lane
SIGNAL COORDINATION											
-- Provide better coordination between signals on corridor			♦		♦		♦			n/a	Refer to GPCEI Signal System study
WESTBROOK STREET / WESTERN AVENUE	N/A	♦	♦		♦						
GORHAM ROAD / WESTERN AVENUE INTERSECTION											
-- Discontinue NE portion of Western Avenue							♦			$10,000	Consolidate movements at congested intersection
-- Extend median along WB approach of Western Avenue								♦		$20,000	Eliminate uncontrolled left-turns on congested corridor
-- Restrict LT from retail developments		♦						♦		n/a	Required with extension of median
WESTBROOK STREET / WESTERN AVENUE INTERSECTION											
-- Add left-turn lanes on EB/WB Westbrook Street			♦		♦			♦		$30,000	Would require widening Westbrook Street to south
-- Upgrade/Replace signal at intersection								♦		$60,000	Required as part of additional LT lanes
SIGNAL COORDINATION											
-- Provide better coordination between signals on corridor			♦		♦		♦			n/a	Refer to GPCEI Signal System study

* Costs rounded to nearest $10,000. Do not include costs associated with traffic management, permitting, design, environmental/ROW issues, and/or contingencies.

Table 6-2

Recommended Plan Summary

Location / Improvement Description	Reference Figure Number	Existing Safety	Existing Intersection Capacity	Existing Arterial Capacity	2025 Intersection Capacity	2025 Arterial Capacity	High (Short-Term)	Medium (Long-Range)	Low (Long-Range)	COST (1999 Dollars)*	REMARKS
CONGRESS STREET	Fig 5-5		♦	♦	♦	♦				$2.4 Million+	
CONGRESS STREET CORRIDOR											
-- Widen Congress Street to 4 lanes per direction				♦		♦		♦		$2.2 Million	Corridor projected to operate over-capacity
CONGRESS STREET / EXIT 7A INTERSECTION											
-- Extend WB Congress Street left-turn lane			♦		♦		♦			$10,000	Queues currently exceed storage capacity
-- Add EB right-turn lane					♦			♦		$40,000	Long-term growth warrants right-turn lane
CONGRESS STREET / SPRING STREET INTERSECTION											
-- Add additional thru lane on EB / WB Congress Street			♦		♦		♦			n/a	Refer to GPCEI Spring Street Corridor Study
-- Add additional SB thru lane on Spring Street			♦		♦		♦			n/a	Refer to GPCEI Spring Street Corridor Study
-- Redesignate NB RT lane as Thru/RT lane			♦		♦	♦	♦			n/a	Refer to GPCEI Spring Street Corridor Study
SPRING STREET		♦	♦		♦						Refer to GPCEI Spring Street Corridor Study
SPRING STREET / CONGRESS STREET INTERSECTION	[Fig 5-5]										
-- Add additional thru lane on EB / WB Congress Street			♦		♦		♦			n/a	
-- Add additional SB thru lane on Spring Street			♦		♦		♦			n/a	
-- Redesignate NB RT lane as Thru/RT lane			♦		♦		♦			n/a	
SPRING STREET / THOMAS DRIVE INTERSECTION											
-- Signalize intersection		♦	♦		♦		♦			$140,000	
SPRING STREET / GANNETT DRIVE (North) INTERSECTION											
-- Signalize intersection		♦					♦			$140,000	Signalization suggested due to high number of crashes at two driveways
WESTERN AVENUE						♦					
WESTERN AVENUE CORRIDOR											
-- Widen corridor to provide 4 lane cross-section						♦		♦		$300,000	Provide consistent lane continuity along Western Avenue

* Costs rounded to nearest $10,000. Does not include costs associated with traffic management, permitting, design, envrionmental/ROW issues, and/or contingencies.

Recommended Plan Summary

Location / Improvement Description	Reference Figure Number	Existing Safety	Existing Intersection Capacity	Existing Arterial Capacity	2025 Intersection Capacity	2025 Arterial Capacity	High (Short-Term)	Medium (Long-Range)	Low (Long-Range)	COST (1999 Dollars)*	REMARKS
WESTBROOK STREET / I-295 INTERCHANGE	N/A	◆	◆		◆						
INTERCHANGE IMPROVEMENTS											
-- Eliminate existing I-295 NB on-ramp and construct loop ramp from Broadway to I-295 NB		♦	♦		♦			♦		$2,400,000	Refer to I-295 Ramps Safety & Capacity Study
PHILBROOK ROAD	N/A	◆									
PHILBROOK ROAD CORRIDOR											
-- Consolidate driveway openings along Philbrook Road from Mall		♦					♦			$10,000	Requires parking layout modifications within Maine Mall parking area
I-295	N/A			◆		◆					
I-295 CORRIDOR BETWEEN EXITS 3 AND 4											
-- Widen I-295 to 3 lanes per direction				♦		♦		♦		$560,000	
SYSTEM-WIDE CONSIDERATIONS	N/A										
SIGNAL COORDINATION											
-- Provide signal coordination at Maine Mall area intersections		♦	♦	♦	♦	♦	♦			n/a	Refer to GPCEI Signal Study for additional information
TRANSIT / PARK'N RIDE FACILITIES											
-- Pursue improved transit options through Maine Mall area			♦	♦	♦	♦	♦			n/a	Refer to GPCOG Transit study for additional information
-- Increase number of Park'n Ride lots			♦	♦	♦	♦	♦			n/a	Refer to GPCOG Transit study for additional information
PEDESTRIAN FACILITIES											
-- Provide improved pedestrian connections throughout the Maine Mall Area		♦					♦			n/a	Refer to Wilbur-Smith Pedestrian study for additional information

* Costs rounded to nearest $10,000. Does not include costs associated with traffic management, permitting, design, environmental/ROW issues, and/or contingencies.

Table 6-5

Recommended Plan Summary

Location / Improvement Description	Reference Figure Number	Existing Safety	Existing Intersection Capacity	Existing Arterial Capacity	2025 Intersection Capacity	2025 Arterial Capacity	High (Short-Term)	Medium (Long-Range)	Low (Long-Range)	COST (1999 Dollars)	REMARKS
SR 703 ARTERIAL CORRIDOR (OPTION A)	Fig 6-3	♦	♦	♦	♦	♦				$16,245,000	
WIDEN SR 703 CORRIDOR TO SIX LANES			♦	♦	♦	♦		♦		$2,400,000	Does not include costs associated with turning lanes at individual intersections (noted below)
MAINE MALL ROAD / SR 703 INTERSECTION											
-- Eliminate Maine Mall Road bridges			♦		♦			♦		$370,000	
-- Replace bridge with 'at-grade' signalized intersection					♦			♦		$150,000	
-- Widen Maine Mall Road and SR 703						♦		♦		$1,390,000	
-- Consolidate Philbrook Road and SR 703 WB ramps & signalize intersection with Maine Mall Road			♦		♦			♦		$1,250,000	Required as part of the signalization of SR 703 and Maine Mall entrance/SR 703 ramps
-- Modify I-95 Ramp System & I-95 overpass		♦						♦		$2,250,000	Minor widening of I-95 overpass and ramps, demolition of I-95 NB off-ramp to SR 703 WB
SR 703 / MAINE MALL ENTRANCE/RAMP SYSTEM INTERSECTION											
-- Widen SR 703 and construct signalized intersection						♦		♦		$350,000	
-- Construct connector ramp to Philbrook Road					♦			♦		$110,000	
-- Modify SR 703 ramp system		♦			♦			♦		$550,000	
SR 703 / I-295 NB INTERSECTION											Replaces movements eliminated through the removal of the I-95 northbound ramps at Exit 7
-- Construct Ramps from I-295 NB to SR 703 and from SR 703 to I-295 NB									♦	$1,110,000	
-- Widen SR 703 and signalize intersection with I-295 NB Ramps					♦			♦		$350,000	
I-295 SB TO SR 703 WB RAMPS											
-- Remove existing ramp from I-295 SB to SR 703 WB		♦						♦		$350,000	Only required when signalized intersection constructed at SR 703 and Maine Mall driveway
-- Construct ramp from Scarborough Connector to SR 703 WB						♦		♦		$750,000	
SR 703 / MUSSEY ROAD INTERSECTION											Option for consideration
-- Remove Mussey Road bridge		♦							♦	$465,000	
-- Widen SR 703 and Mussey Road.						♦			♦	$750,000	
-- Signalize intersection of SR 703 and Mussey Road					♦	♦			♦	$150,000	
TOLL BOOTH OPERATIONS											
-- Relocate existing Toll Plaza to split operations								♦		$3,500,000	Assumed price for toll booth operations

* Costs rounded to nearest $10,000. Does not include costs associated with traffic management, permitting, design, environmental/ROW issues, and/or contingencies.

Table 6-6

Recommended Plan Summary

Location / Improvement Description	Reference Figure Number	Existing Safety	Existing Intersection Capacity	Existing Arterial Capacity	2025 Intersection Capacity	2025 Arterial Capacity	High (Short-Term)	Medium (Long-Range)	Low (Long-Range)	COST (1999 Dollars)	REMARKS
SR 703 ARTERIAL CORRIDOR (OPTION B)	Fig 6-4	♦	♦		♦	♦				$13,565,000	
WIDEN SR 703 CORRIDOR TO SIX LANES			♦	♦	♦	♦		♦		$2,400,000	Does not include costs associated with turning lanes at individual intersections (noted below)
MAINE MALL ROAD BRIDGE/CORRIDOR											
-- Retain and Rehabilitate Maine Mall Road bridge		♦						♦		$4,500,000	
-- Adjust Philbrook Road and SR 703 WB ramps & signalize intersection with Maine Mall Road			♦		♦			♦		$1,200,000	
-- Modify Maine Mall Road signals			♦		♦			♦		$200,000	
SR 703 / MAINE MALL ENTRANCE/RAMP SYSTEM INTERSECTION											
-- Widen SR 703 and construct signalized intersection						♦		♦		$1,190,000	
-- Construct connector ramp to Philbrook Road					♦			♦		$890,000	
-- Modify SR 703 ramp system		♦			♦			♦		$720,000	
I-295 SB TO SR 703 WB RAMPS											
-- Remove existing ramp from I-295 SB to SR 703 WB		♦						♦		$350,000	Only required when signalized intersection constructed at
-- Construct ramp from Scarborough Connector to SR 703 WB						♦		♦		$750,000	SR 703 and Maine Mall driveway
SR 703 / MUSSEY ROAD INTERSECTION											Option for consideration
-- Remove Mussey Road bridge		♦							♦	$465,000	
-- Widen SR 703 and Mussey Road.						♦			♦	$750,000	
-- Signalize intersection of SR 703 and Mussey Road					♦	♦			♦	$150,000	

* Costs rounded to nearest $10,000. Does not include costs associated with traffic management, permitting, design, environmental/ROW issues, and/or contingencies.

Table 6-7

Recommended Plan Summary

Location / Improvement Description	Reference Figure Number	Existing Safety	Existing Intersection Capacity	Existing Arterial Capacity	2025 Intersection Capacity	2025 Arterial Capacity	High (Short-Term)	Medium (Long-Range)	Low (Long-Range)	COST (1999 Dollars)	REMARKS
SR 703 ARTERIAL CORRIDOR (OPTION C)	Fig 6-5	♦	♦	♦	♦	♦				$15,680,000	
WIDEN SR 703 CORRIDOR TO SIX LANES			♦	♦	♦	♦		♦		$2,400,000	Does not include costs associated with turning lanes at individual intersections (noted below)
MAINE MALL ROAD / SR 703 INTERSECTION											
-- Eliminate Maine Mall Road bridges			♦		♦			♦		$370,000	
-- Replace bridge with 'at-grade' signalized intersection					♦			♦		$150,000	
-- Widen Maine Mall Road and SR 703						♦		♦		$1,390,000	
-- Consolidate Philbrook Road and SR 703 WB ramps & signalize intersection with Maine Mall Road			♦		♦			♦		$1,250,000	Required as part of the signalization of SR 703 and Maine Mall entrance/SR 703 ramps
-- Modify I-95 Ramp System & I-95 overpass		♦						♦		$2,250,000	Minor widening of I-95 overpass and ramps, demolition of I-95 NB off-ramp to SR 703 WB
SR 703 / MAINE MALL ENTRANCE/RAMP SYSTEM INTERSECTION											
-- Widen SR 703 and construct signalized intersection						♦		♦		$350,000	
-- Construct connector ramp to Philbrook Road					♦			♦		$110,000	
-- Modify SR 703 ramp system		♦			♦			♦		$700,000	
SR 703 / I-295 NB INTERSECTION											Replaces movements eliminated through the removal of the I-95 northbound ramps at Exit 7
-- Construct new ramp from SR 703 to I-295 NB									♦	$1,110,000	
-- Modify ramps from I-295 NB to SR 704								♦		$350,000	
-- Widen SR 703 and signalize intersection with I-295 NB Ramps					♦			♦		$350,000	
I-295 SB / SR 703 RAMPS											
-- Reconfigure existing ramp from I-295 SB to SR 703		♦							♦	$350,000	
-- Construct new ramp from SR 703 to I-295 SB						♦			♦	$700,000	
-- Signalize and widen intersection at SR 703 and I-295 SB ramps		♦				♦			♦	$350,000	
TOLL BOOTH OPERATIONS											
-- Relocate existing Toll Plaza to split operations								♦		$3,500,000	Assumed price for toll booth operations

* Costs rounded to nearest $10,000. Does not include costs associated with traffic management, permitting, design, environmental/ROW issues, and/or contingencies.

Table 6-4

Recommended Plan Summary

Location / Improvement Description	Reference Figure Number	Existing Safety	Existing Intersection Capacity	Existing Arterial Capacity	2025 Intersection Capacity	2025 Arterial Capacity	High (Short-Term)	Medium (Long-Range)	Low (Long-Range)	COST (1999 Dollars)*	REMARKS
WESTERN EXTENSION OPTION	N/A									$17,895,000	
EXTEND SR 703 TO RUNNING HILL ROAD											
-- Widen I-95 Overpass to 4-lane cross-section									♦	$2,800,000	
-- Reconfigure I-95 SB Ramps & Signalize									♦	$1,210,000	
-- Construct bridge over Spring Street									♦	$2,450,000	
-- Relocate Spring St/Running Hill Road intersection alignment and signalize									♦	$2,535,000	
RUNNING HILL ROAD											
-- Widen Running Hill Road to 4-lanes from relocated SR 703 to Gorham Road					♦	♦			♦	$3,000,000	Only construct in conjunction with SR 703 connection to Running Hill Road
OVERLAP AREA											
-- Construct southern by-pass of the Route 22/114 Overlap area					♦	♦		♦	♦	$2,400,000	Refer to Route 22/114 study for alignment options
TOLL BOOTH OPERATIONS											
-- Relocate existing Toll Plaza to split operations								♦		$3,500,000	Assumed cost for toll booth operations (only if not previously relocated)

* Costs rounded to nearest $10,000. Does not include costs associated with traffic management, permitting, design, environmental/ROW issues, and/or contingencies.

detailed summary of the different improvements associated with the three alternatives and provide a breakdown of the costs.

Consensus among all stakeholders was not reached as to which option was the "preferred option", however, there was general agreement as to what needed to be addressed in the short term. Figure 6-6 presents an immediate action aimed at improving the intersections of Philbrook Road and the SR 703 ramp with the Maine Mall Road. This action will realign and combine the two intersections into a single intersection along Maine Mall Road. This action will address existing capacity and safety issues noted in Chapter 2. The design of this improvement, which has been funded, is expected to begin in 2002.

Figure 6-7 presents Phase 1 and a potential second phase of this improvement, which is still being studied. This concept is to build a four-way signalized intersection on SR 703, which would increase accessibility to and from the Maine Mall and SR 703.

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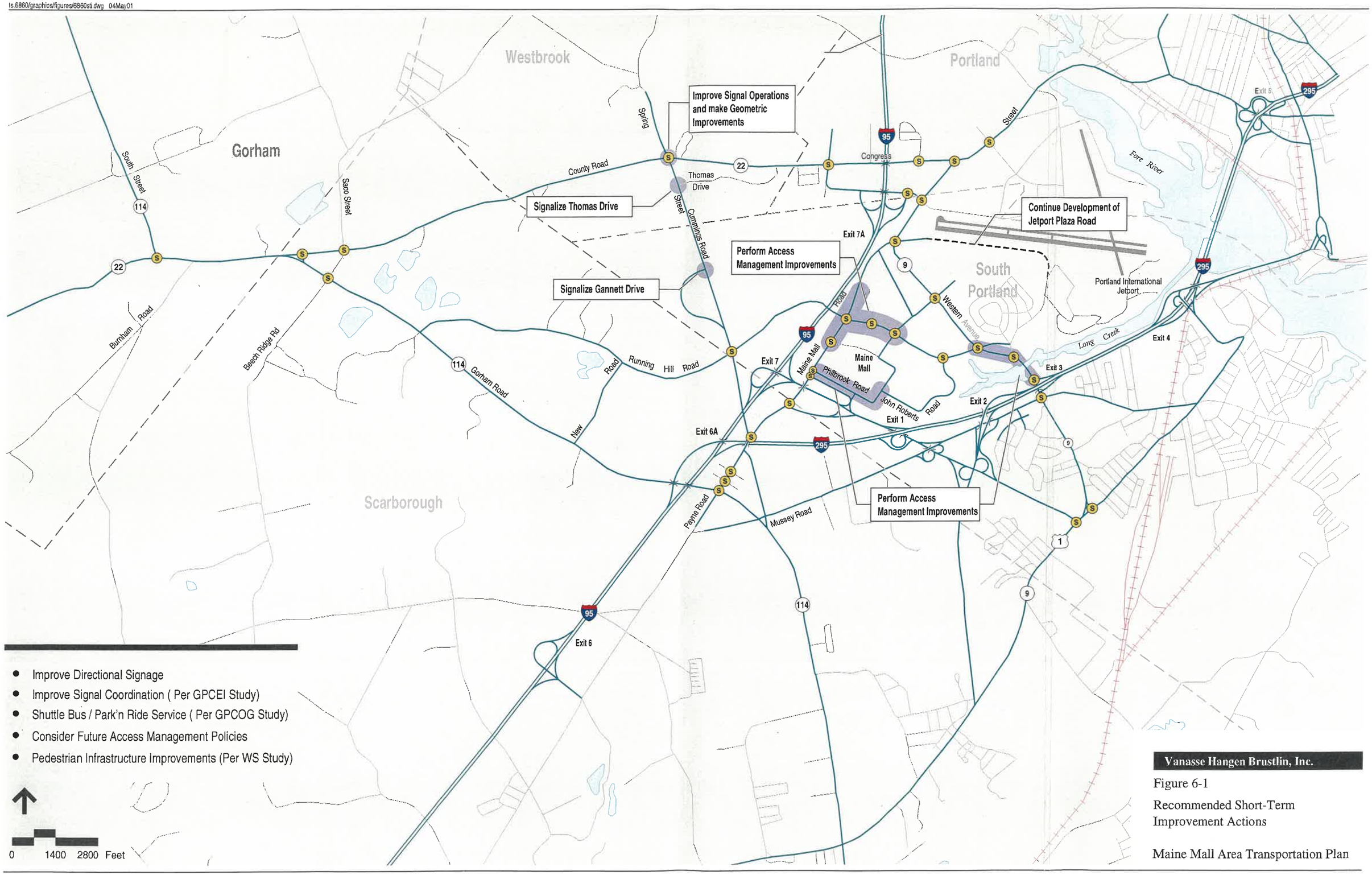

- Improve Directional Signage
- Improve Signal Coordination (Per GPCEI Study)
- Shuttle Bus / Park'n Ride Service (Per GPCOG Study)
- Consider Future Access Management Policies
- Pedestrian Infrastructure Improvements (Per WS Study)

0 1400 2800 Feet

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Figure 6-1

Recommended Short-Term Improvement Actions

Maine Mall Area Transportation Plan

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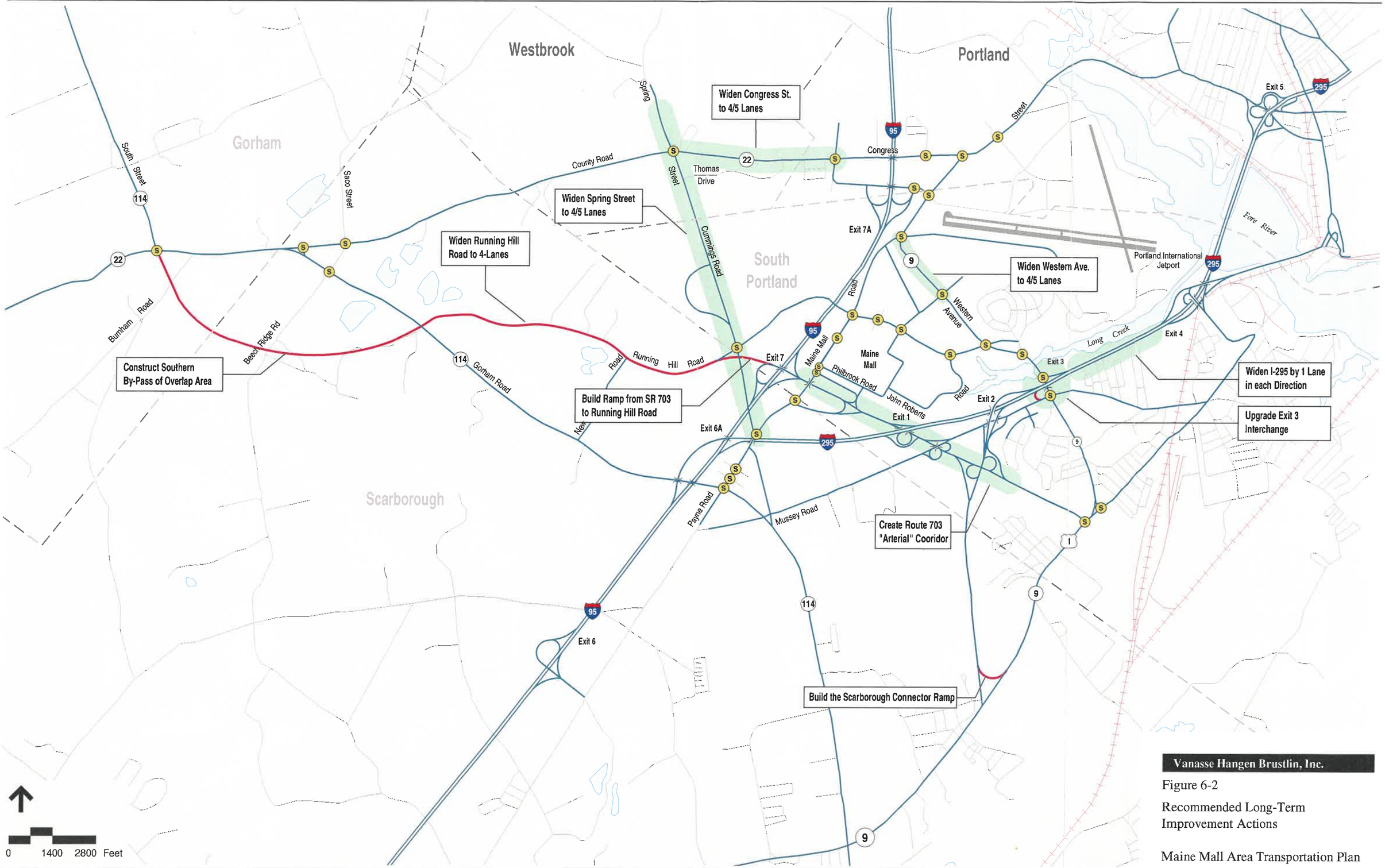

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Figure 6-2

Recommended Long-Term Improvement Actions

Maine Mall Area Transportation Plan

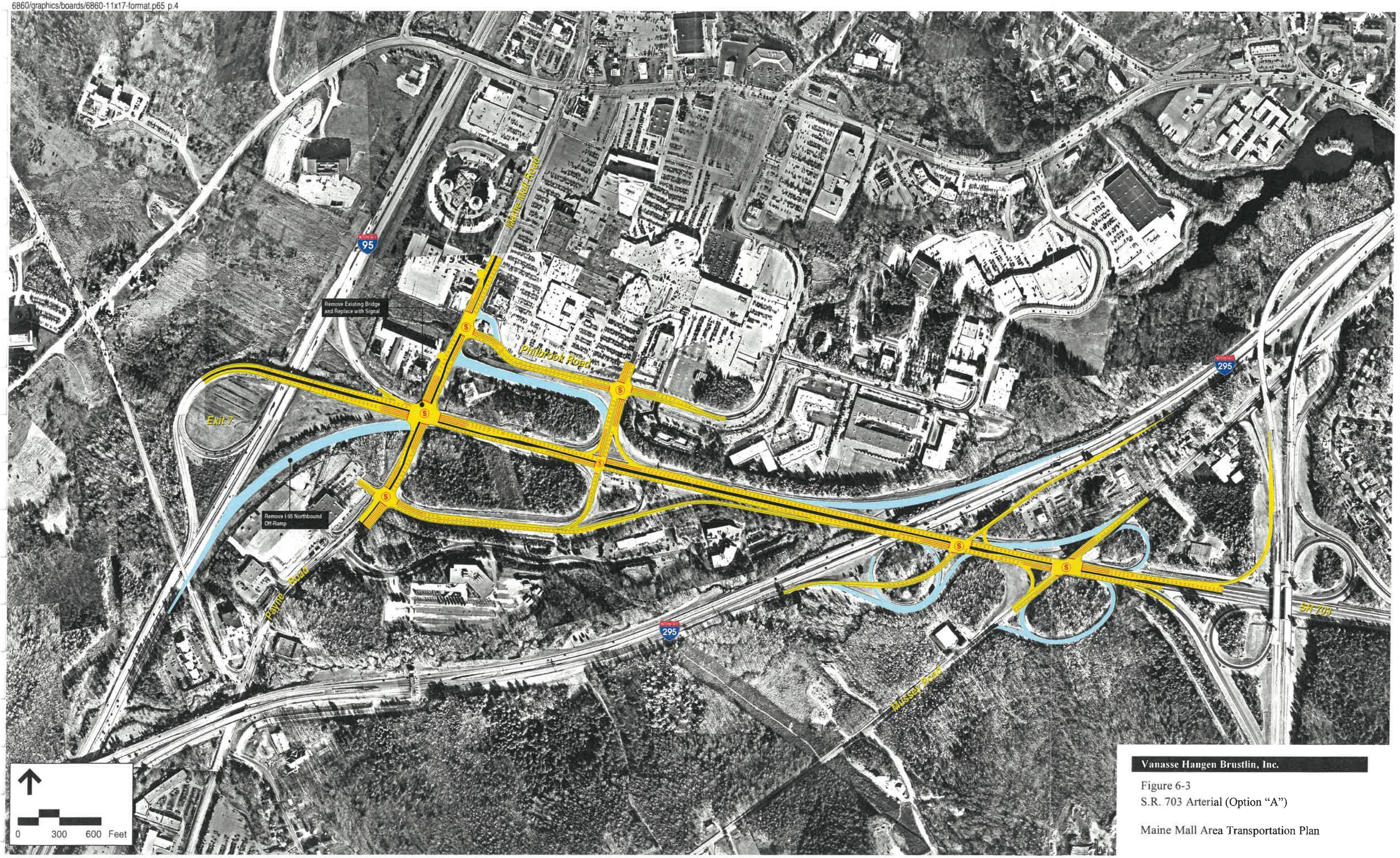

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Figure 6-3
S.R. 703 Arterial (Option "A")

Maine Mall Area Transportation Plan

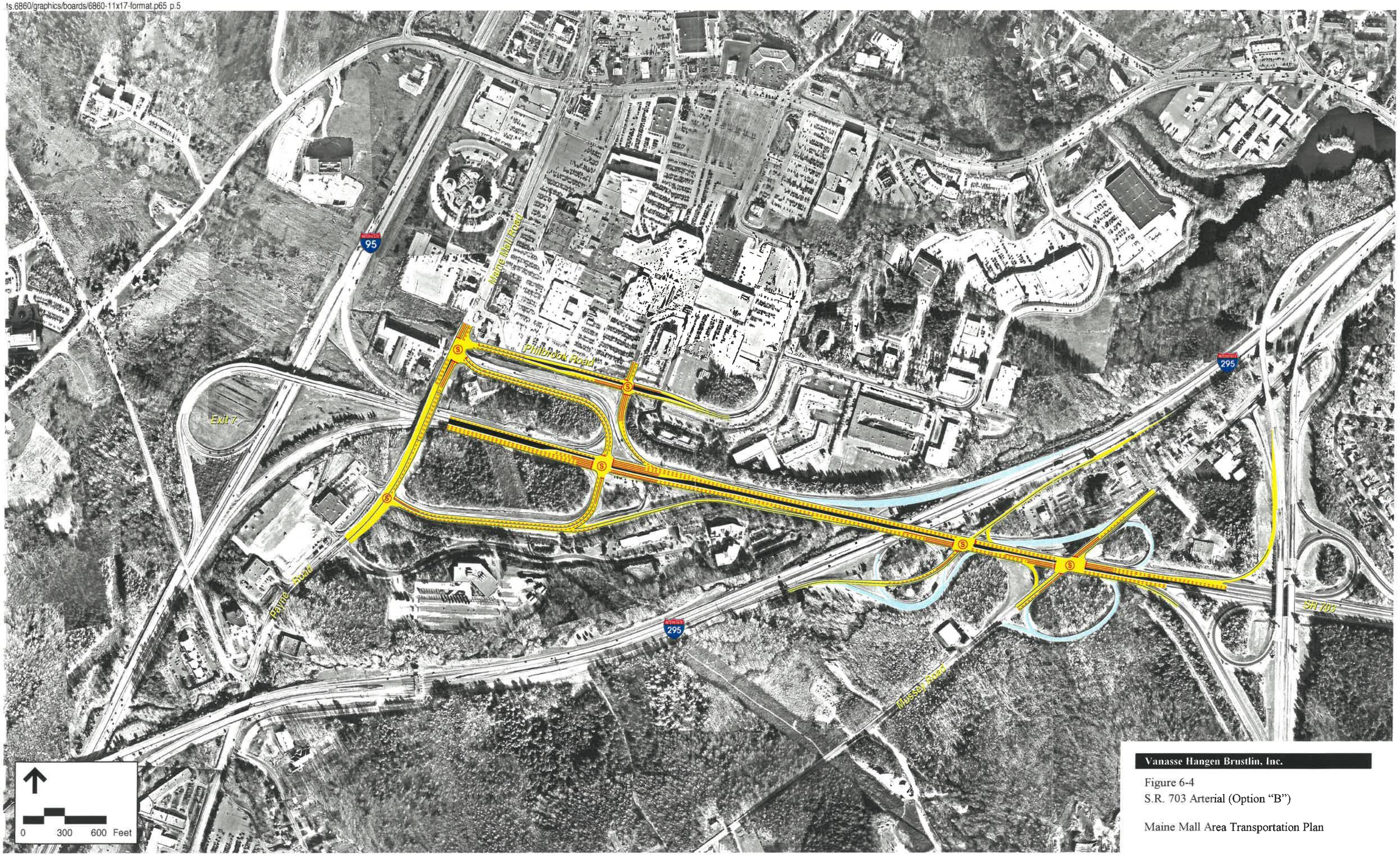

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Figure 6-4
S.R. 703 Arterial (Option "B")

Maine Mall Area Transportation Plan

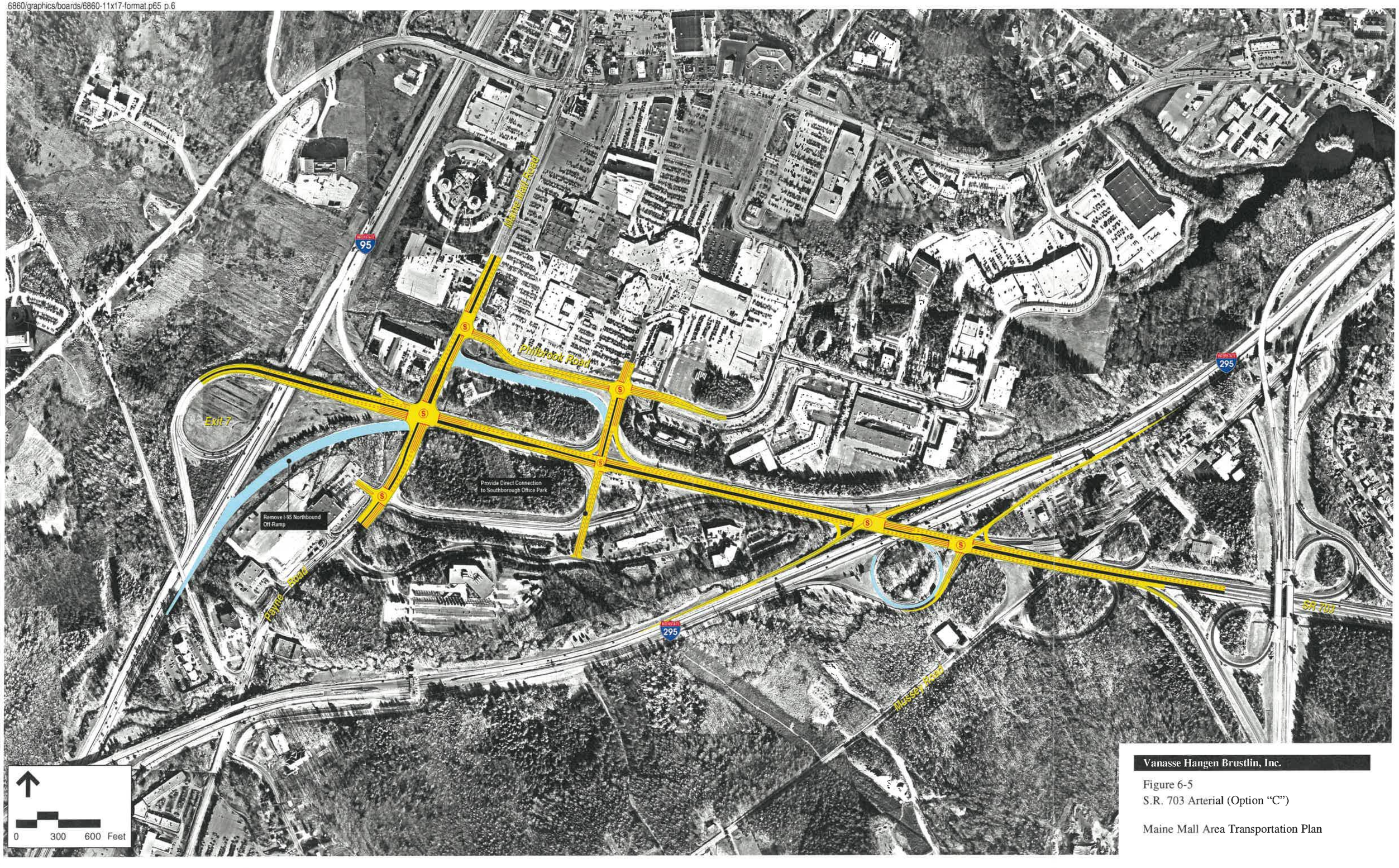

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Figure 6-5
S.R. 703 Arterial (Option "C")

Maine Mall Area Transportation Plan

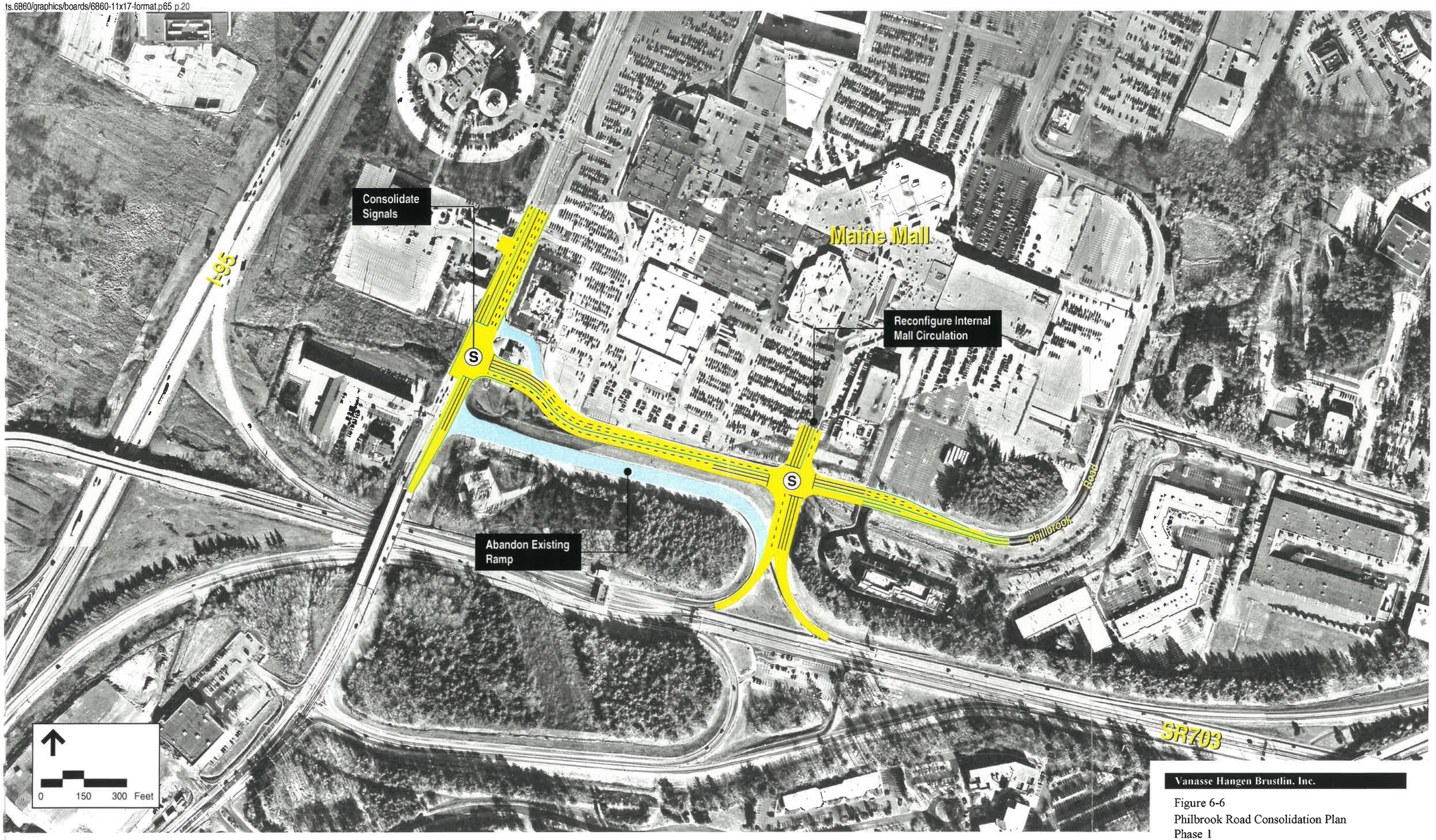

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Figure 6-6
Philbrook Road Consolidation Plan
Phase 1

Maine Mall Area Transportation Plan

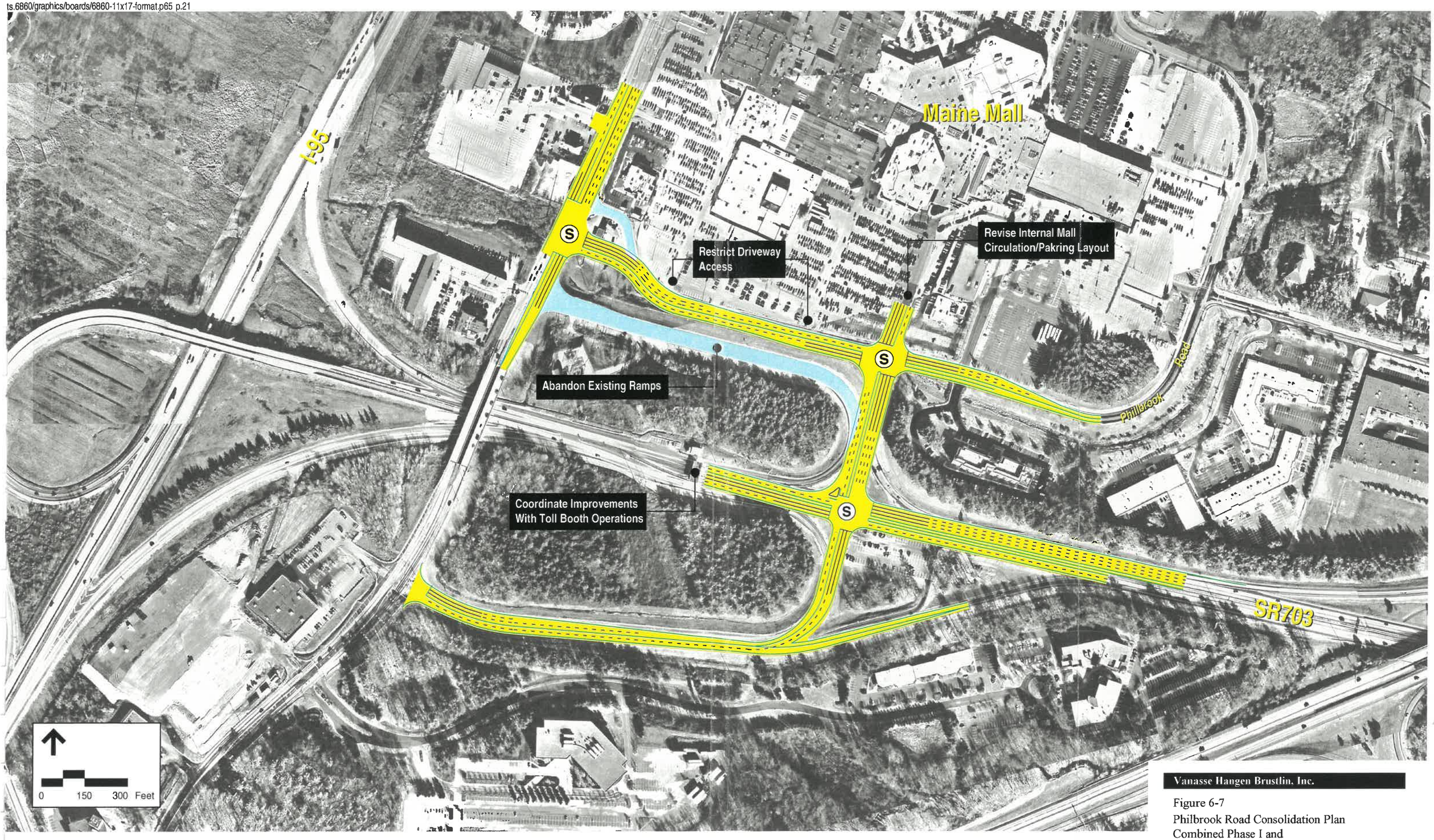

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Figure 6-7
Philbrook Road Consolidation Plan
Combined Phase I and
Phase 2 Improvements

Maine Mall Area Transportation Plan