

# 3 Future Conditions

## 3.1 Introduction

This chapter describes the methodologies and procedures used to forecast the existing 2012 traffic volumes to the Study’s future design year of 2035. Traffic volume projections for the Study account for normal traffic growth anticipated for the region, as well as a limited evaluation of potential secondary growth attributed to the Hackett Hill property resulting from an alternative that relocates Exit 7 with a full interchange. The following describe the traffic volume forecasting procedures used to develop the 2035 traffic volumes for the Study.

## 3.2 2035 Design Hour Volume

As discussed in Section 2.3.2, the SNHPC maintains a regional travel demand model that is based on the 2010 Census and the Commission’s socio-economic database. In addition to this base year condition, the SNHPC uses the model to forecast growth within the region for planning purposes. Forecast year 2035 daily traffic volumes obtained from the model were used to predict a rate at which traffic can be expected to grow. A review of the 2010 and 2035 daily volumes assigned to the roadway links within the SNHPC regional model revealed a projected average annual growth rate of 0.85 percent, which is consistent with historical US Census population growth trends between 1980 and 2010 within the surrounding communities of Manchester, Hooksett, and Goffstown. Therefore, for the purpose of this Study, a slightly higher but still modest 1.0 percent average annual background growth rate was used to project the future year 2035 traffic volume demand. This annual growth rate represents an overall growth rate of 25.7 percent for the 23-year forecast period. **Figures 3.2-1** and **3.2-2** show the projected 2035 No Build weekday morning and evening peak hour volumes along I-293, Exits 6, Exit 7, and at other major intersections servicing the study area.

## 3.3 2035 No Build Traffic Operations

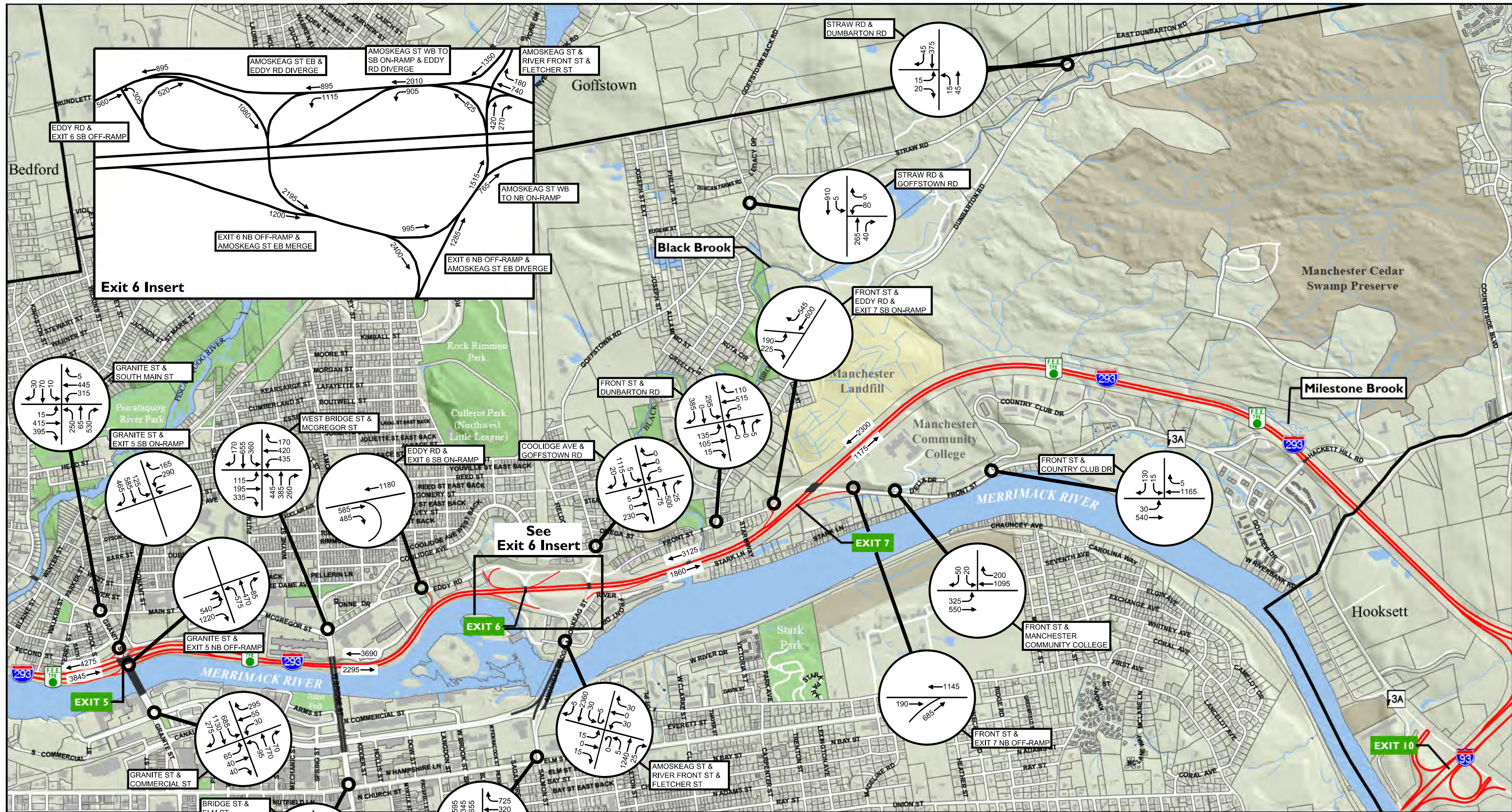
Level of service analyses, similar to those conducted for the existing conditions, were performed for the future 2035 No Build condition. The 2035 No Build condition reflects the continuation and perpetuation of the existing transportation infrastructure within the study area. This section summarizes the results of the 2035 No Build operational analyses for the key freeway, ramp merge, ramp diverge, and ramp weave segments, as well as the signalized and unsignalized intersections.

### 3.3.1 Mainline (Freeway and Ramps)

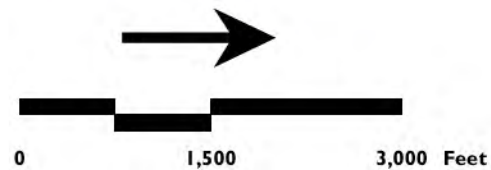
Capacity analyses performed for the existing I-293 freeway segments and ramps under the future year 2035 traffic volume forecast show substantial degradation in traffic operations, even with a modest level of growth from the 2012 traffic levels. By the future year 2035, many of the freeway segments and ramp junctions are expected to degrade to LOS E or F. Consistent with existing commuter patterns on I-293, traffic operations are projected to be most congested in the southbound direction during the morning peak hour and in the northbound direction during the evening peak hour. **Table 3.3-1** summarizes the 2035 freeway and ramp capacity analysis results. The 2012 analysis results have also been provided in the table for comparison purposes.

**Table 3.3-1 2012 & 2035 No Build Freeway and Ramp Analysis**

Location	Facility	Peak Period	Level of Service	
			2012	2035
I-293 Northbound Exit 5 to Exit 6	Freeway	AM	B	C
		PM	D	F
I-293 Northbound Exit 6	Off Ramp (diverge)	AM	B	C
		PM	D	F
I-293 Northbound Exit 6	On Ramp (merge)	AM	B	B
		PM	D	E
I-293 Northbound Exit 6 to Exit 7	Freeway	AM	B	B
		PM	D	E
I-293 Northbound Exit 7	Off Ramp (diverge)	AM	B	B
		PM	D	F
I-293 Northbound Exit 7 to I-93	Freeway	AM	A	B
		PM	C	D
I-293 Southbound I-93 to Exit 7	Freeway	AM	B	C
		PM	B	C
I-293 Southbound Exit 7	On Ramp (merge)	AM	C	D
		PM	B	C
I-293 Southbound Exit 7 to Exit 6	Freeway	AM	C	D
		PM	C	C
I-293 Southbound Exit 6	Weave	AM	E	F
		PM	C	D
I-293 Southbound Exit 6 at Eddy Rd	On Ramp (merge)	AM	D	E
		PM	C	D
I-293 Southbound Exit 6 to Exit 5	Freeway	AM	D	E
		PM	C	D



See Exit 6 Insert



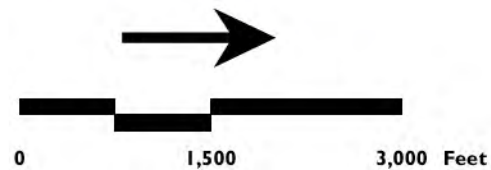
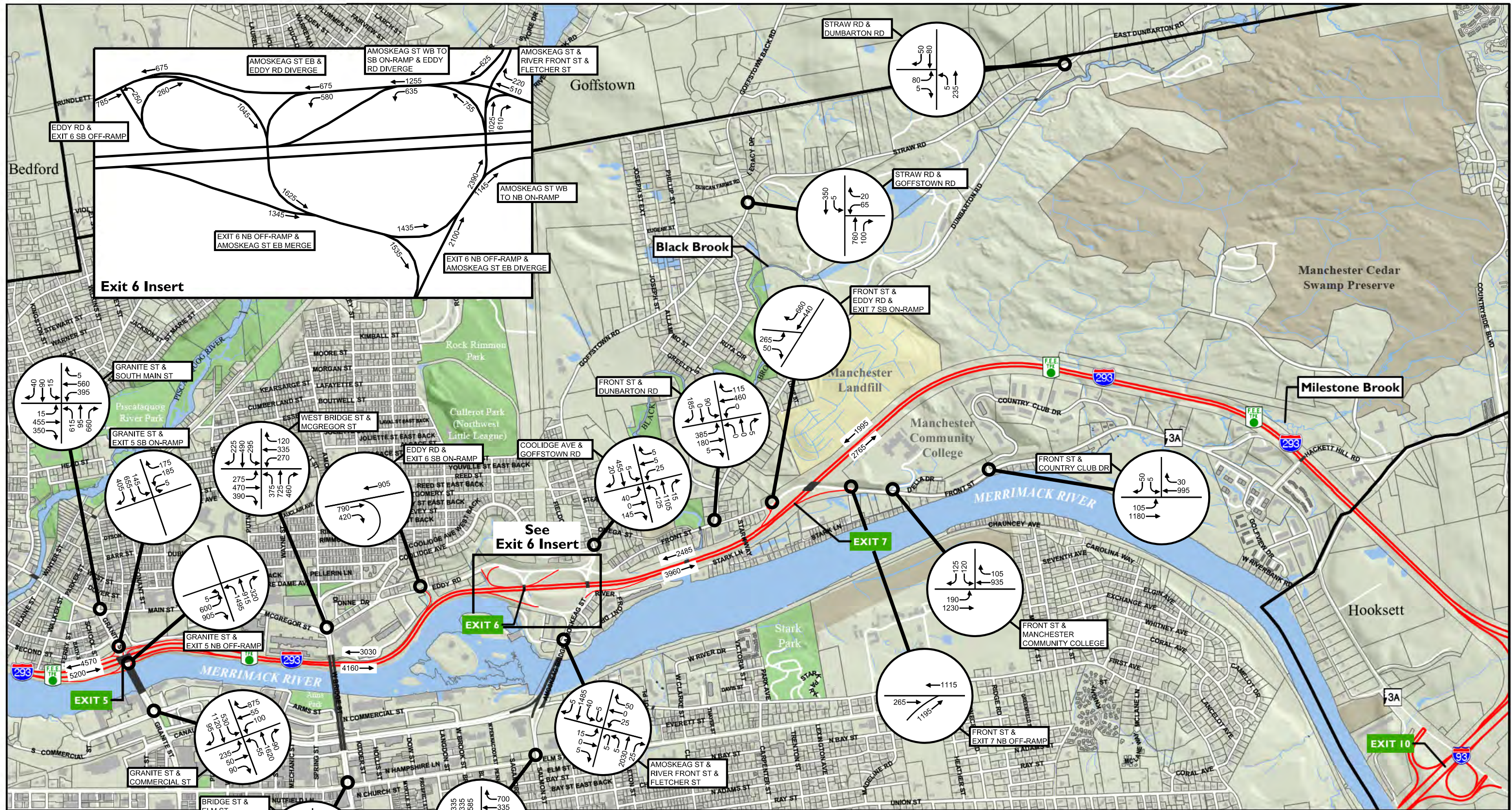
**VHB** Vanasse Hangen Brustlin, Inc.

Manchester 16099  
FEET/I-293, Exit 6-7 Planning Study

Figure 3.2-1  
2035 No Build Weekday Morning  
Peak Hour Traffic Volumes

Manchester, NH





**VHB** Vanasse Hangen Brustlin, Inc.

Manchester 16099  
FEET/I-293, Exit 6-7 Planning Study

Figure 3.2-2  
2035 No Build Weekday Evening  
Peak Hour Traffic Volumes

Manchester, NH  
New Hampshire  
**DOT**  
Department of Transportation

### 3.3.2 Signalized Intersections

By the forecast year of 2035, all but two of the nine signalized intersections (Amoskeag Street at Goffstown Road/Front Street and Amoskeag Street at River Road/Fletcher Street) are expected to operate at a LOS D or worse. As shown in **Table 3.3-2**, several study area intersections are expected to degrade to a LOS F and/or have a v/c greater than 1.00 indicating that the volume exceeds capacity.

**Table 3.3-2 2035 No Build Signalized Intersection Analysis**

Location	Peak Period	v/c*	2035 No Build	
			Delay**	LOS***
Granite Street at Main Street	AM	0.92	51	D
	PM	1.08	89	F
Granite Street at I-293 Exit 5	AM	0.96	41	D
	PM	1.04	50	D
Granite Street at Commercial Street	AM	0.86	88	F
	PM	1.05	128	F
McGregor Street at Bridge Street/Amory St	AM	1.09	97	F
	PM	1.00	60	E
Bridge Street at Elm Street	AM	0.67	32	C
	PM	0.87	44	D
Amoskeag Street at Goffstown Rd/Front St	AM	0.77	8	A
	PM	0.86	16	B
Amoskeag Street Traffic Circle (I-293 Northbound Approach)	AM	0.77	19	B
	PM	1.16	102	F
Amoskeag Street at River Front Dr/Fletcher St	AM	0.83	13	B
	PM	0.79	11	B
Salmon Street at Elm Street	AM	0.91	38	D
	PM	1.07	67	E

\* Volume to capacity ratio.

\*\* Delay in seconds per vehicle.

\*\*\* Level of service.

### 3.3.3 Unsignalized Intersections

Similar to the freeway facilities and the signalized intersections, traffic operations at the unsignalized intersections will continue to deteriorate as traffic volumes increase. Under the 2035 No Build condition, delays are expected to be predominantly in the LOS E and F range for vehicles exiting from the unsignalized side streets onto the primary roadways servicing I-293 including Eddy Road, Amoskeag Road, Goffstown Road, and Front Street. **Table 3.3-3** summarizes the 2035 No Build unsignalized intersection capacity analysis results.

**Table 3.3-3 2035 No Build Unsignalized Intersection Analysis**

Location / Movement	2035 No Build AM			2035 No Build PM		
	Demand*	Delay**	LOS***	Demand	Delay	LOS
Exit 6 Southbound Off-Ramp at Eddy Road						
Exit 6 Southbound Off-Left	305	#	F	250	#	F
Exit 6 Southbound Off-Right	520	88	F	260	37	E
Exit 6 Northbound Off-Ramp at Amoskeag						
Exit 6 Northbound Off Ramp	1200	#	F	1345	#	F
Amoskeag Westbound Slip Lane at Eddy Road						
Amoskeag Westbound Slip Lane	825	#	F	755	#	F
Goffstown Road at Coolidge Ave						
Goffstown Road Eastbound	1140	0	A	480	1	A
Goffstown Road Westbound	600	2	A	1245	5	A
Coolidge Ave Northbound	235	120	F	185	#	F
Business Drive Southbound	5	#	F	35	#	F
Front Street at Dunbarton Rd						
Dunbarton Road Eastbound	680	#	F	275	#	F
Retail Drive Westbound	10	109	F	5	10	A
Front Street Northbound	265	6	A	570	9	A
Front Street at Exit 7 SB On-Ramp						
Front Street Northbound	415	#	F	315	68	F
Front Street at Exit 7 NB Off-Ramp						
I-293 Exit 7 NB Off-Ramp Approach	685	29	D	1195	#	F
Front Street at Manchester Community College						
Community College Exit	70	#	F	245	#	F
Front Street at Country Club Drive						
Country Club Dr Exit	145	48	E	55	36	E
Front Street Northbound	570	2	A	1285	8	A
Goffstown Road at Straw Road						
Straw Road Southbound	85	37	E	85	33	D
Dunbarton Road at Straw Road						
Straw Road Northbound	35	12	B	85	12	B

\* Demand in vehicles per hour.

\*\* Delay in seconds per vehicle. # Delay greater than 3 minutes.

\*\*\* Level of service.

### 3.4 Other Area Growth Potential

In addition to the anticipated local and regional traffic growth that is projected for the year 2035 by the regional travel demand model (described in Section 3.2), there are opportunities within the study area for specific land development that if developed, could generate concentrated traffic demand in the vicinity of that development. One of these potential development areas is the Hackett Hill property (**Exhibit 3.4-1**).

The City of Manchester acquired the Hackett Hill property in 1988 from the University of New Hampshire. The property, which consists of approximately 833 acres, is located on the north end of the study area west of I-293 and extends from Dunbarton Road to Hackett Hill Road. The Hackett Hill Master Plan, which the City prepared in 2000, describes a plan with the potential for approximately 1,290,000 square feet of office space in a corporate campus environment. More recently, and based on market demand, city officials anticipate more of an office/light industrial build-out scenario.

Applying trip-generation rates published by the Institute of Transportation Engineers (ITE) in *Trip Generation*<sup>7</sup> (ITE Industrial Park - Land Use Code 130), it is estimated that the full build-out of the Hackett Hill property could generate approximately 1,085 (890 entering and 195 exiting) vehicle-trips during a weekday morning peak hour and approximately 1,110 (235 entering and 875 exiting) vehicle-trips during a weekday evening peak hour.

The Hackett Hill Master Plan states that the development of the property would require improved access, which would ultimately involve the relocation of the existing Exit 7 interchange. As some of the alternatives that are under consideration for this study involve the relocation of Exit 7, a key question to consider in the NEPA phase of the project is how or if the development potential of the Hackett Hill property is driving the transportation decision to relocate the interchange.

The Town of Goffstown also has land that could benefit from improved connectivity. Several years ago the Town of Goffstown established an industrial zone (**Exhibit 3.4-2**) in the northeast section of town bordering the City of Manchester. However, the industrial zoned land remains undeveloped because Goffstown Road, within the City of Manchester and the primary connection to I-293 restricts truck activity. The Town of Goffstown is hopeful that improved connectivity between the industrial zoned land and I-293 will accelerate development of this land.

**Exhibit 3.4-1**  
City of Manchester's Hackett Hill Master Plan



**Exhibit 3.4-2**  
Town of Goffstown's Industrial Zone



<sup>7</sup>Trip Generation, Eighth Edition, ITE, Washington, DC, 2008.