I-295/I-76/Route 42 Direct Connection

Camden County

Air Quality
Technical Environmental Study

October 2007

US Department of Transportation
Federal Highway Administration
New Jersey Department of Transportation

TABLE OF CONTENTS

EXECUTIVE SUMMARY i
1.0 INTRODUCTION 1-1
2.0 PROJECT DESCRIPTION 2-1
2.1 Project Area Overview 2-1
2.2 Description of Existing Facilities 2-1
2.2.1 Ramps 2-1
2.2.2 I-295, I-76, Route 42 from the Southern Project Limit 2-4
2.2.3 I-295, I-76, Route 42 from the Northern Project Limit 2-4
2.3 Purpose and Need 2-5
2.3.1 Purpose 2-5
2.3.2 Need 2-5
2.3.3 Goals and Objectives 2-7
2.4 Description of Alternatives 2-8
2.4.1 Alternative D 2-8
2.4.2 Alternative D1 2-10
2.4.3 Alternative G2 2-12
2.4.4 Alternative H1 2-14
2.4.5 Alternative K 2-14
2.4.6 No-Build Alternative 2-17
3.0 CRITERIA FOR DETERMINING IMPACTS 3-1
4.0 MODELING METHODOLOGY 4-1
4.1 Carbon Monoxide (CO) 4-1
4.1.1 MOBILE6.2 4-1
4.1.2 CAL3QHC 4-1
4.1.3 ISC3 4-2
4.1.4 Receptor Locations 4-2
4.2 $PM_{2.5}$ 4-7
4.3 MOBILE SOURCE AIR TOXICS 4-10
5.0 SUMMARY OF FINDINGS 5-1
5.1 2030 "No-Build" Alternative 5-1
5.2 2030 "Build" Alternatives 5-3
5.2.1 Alternative D 5-3
5.2.2 Alternative D1 5-5
5.2.3 Alternative G2 5-7
5.2.4 Alternative H1 5-9
5.2.5 Alternative K 5-11
6.0 CONCLUSION 6-1
6.1 CO 6-1
6.2 $PM_{2.5}$ 6-3
6.3 Mobile Source Air Toxics 6-3
6.4 Conformity Determination 6-3
7.0 CONSTRUCTION-RELATED MSAT IMPACTS 7-1
8.0 COORDINATION WITH PUBLIC AGENCIES 8-1
9.0 LIST OF PREPARERS 9-1
10.0 REFERENCES 10-1
11.0 GLOSSARY 11-1

TABLE OF CONTENTS (CONTINUED)

LIST OF FIGURES

Figure 1 Project Location Map 2-2
Figure 2 Ramp Diagram 2-3
Figure 3 Alternative D 2-9
Figure 4 Alternative D1 2-11
Figure 5 Alternative G2 2-13
Figure 6 Alternative H1 2-15
Figure 7 Alternative K 2-16
Figure 8 Project Study Area and Receptor Location 4-3
Figure 9 2030 "No-Build" CO Concentrations 5-2
Figure 10 2030 "Alternative D" CO Concentrations 5-4
Figure 11 2030 "Alternative D1" CO Concentrations 5-6
Figure 12 2030 "Alternative G2" CO Concentrations 5-8
Figure 13 2030 "Alternative H1" CO Concentrations 5-10
Figure 14 2030 "Alternative K" CO Concentrations 5-12

LIST OF TABLES

Table 1 Existing Level of Service 2-7
Table 2 Unites States Environmental Protection Agency
National Ambient Air Quality Standards 3-2
Table 3 $PM_{2.5}$ Monitoring Data (Camden 2003-2005) 4-8
Table 4 Predicted Speed Comparison
2030 "No-Build" to 2030 "Build" Alternatives (D, D1, G2, H1, K) 4-9
Table 5 2030 "No-Build" Peak 1 & 8 Hour Carbon Monoxide Concentrations 5-1
Table 6 2030 "Alternative D" Peak 1 & 8 Hour Carbon Monoxide Concentrations 5-3
Table 7 2030 "Alternative D1" Peak 1 & 8 Hour Carbon Monoxide Concentrations 5-5
Table 8 2030 "Alternative G2" Peak 1 & 8 Hour Carbon Monoxide Concentrations 5-7
Table 9 2030 "Alternative H1" Peak 1 & 8 Hour Carbon Monoxide Concentrations 5-9
Table 10 2030 "Alternative K" Peak 1 & 8 Hour Carbon Monoxide Concentrations 5-11
Table 11 1-Hour CO Concentrations
2030 "No-Build" and 2030 "Build" Alternatives (D, D1, G2, H1, K) 6-1
Table 12 8-Hour CO Concentrations
2030 "No-Build" and 2030 "Build" Alternatives (D, D1, G2, H1, K) 6-2

LIST OF APPENDICES

Appendix A – Traffic Analysis (Volumes and Speeds)
Appendix B – FY 2007-2010 Statewide Transportation Improvement Program (STIP)
Project Listing

EXECUTIVE SUMMARY

Substandard operating intersections (worse than LOS C) produce delays, congestion and result in excessive idle emissions. The New Jersey Department of Environmental Protection (NJDEP) and the New Jersey Department of Transportation (NJDOT) require carbon monoxide (CO) assessments performed at "critical" intersections within the project study area to comply with the National Ambient Air Quality Standards (NAAQS). Since no intersections are associated with the I-295/I-76/Route 42 Direct Connection project, a free-flow CO analysis was performed at sensitive receptors within project limits.

Throughout the study area, carbon monoxide concentrations were predicted at locations where the public may have access. To accurately predict concentrations, all roadway links within 1600 feet of project improvements were modeled. Appropriate modeling techniques were utilized to predict one-hour concentrations, and eight-hour concentrations were generated through application of an approved persistence factor. Ambient background CO concentrations were added to the modeled results and compared to the NAAQS. Peak CO concentrations were relatively similar (-0.1 to +0.2 ppm) throughout all alternatives, with or without construction of the NJDOT Missing Moves project.

Peak **2030 "No-Build"** CO concentrations were predicted along I-76 southbound near Chestnut Avenue (Receptor #6). A one-hour concentration of 8.6 parts per million (ppm) and an eight-hour concentration of 6.0 ppm were predicted. All CO concentrations modeled under 2030 "No-Build" peak traffic conditions were below the one- (35 ppm), and eight-hour (9 ppm) NAAQS set forth for CO.

Peak **2030 "Build" Alternative D** CO concentrations were predicted along I-295 northbound near Snyder Avenue (Receptor #25). At this receptor, a one-hour concentration of 7.6 ppm and an eight-hour concentration of 5.3 ppm were predicted. All CO concentrations modeled under 2030 "Build" Alternative D peak traffic conditions were below CO standards set forth within the NAAQS.

Predicted CO concentrations peaked within the Bellmawr Park Mutual Housing Development near Willow Place (Receptor # 10) under **2030 "Build" Alternatives D1, G2 and H1** conditions. Alternatives D1 and G2 resulted in one-hour CO concentrations of 7.9 ppm and eight-hour concentrations of 5.5 ppm at this receptor. Peak CO concentrations of 8.5 ppm (one-hour) and 6.0 ppm (eight-hour) were predicted under 2030 "Build" Alternative H1. All concentrations modeled under 2030 "Build" Alternatives D1, G2 and H1 were below the NAAQS for CO.

CO concentrations as a result of roadway and tunnel contributions were predicted for the **2030 "Build" Alternative K** condition. Peak concentrations were predicted within the Bellmawr Park Mutual Housing Development, near Fir Place (Receptor #20). Peak CO concentrations without the NJDOT Missing Moves project of 7.9 ppm (one-hour) and 5.5 ppm (eight-hour) and with the NJDOT Missing Moves project of 7.7 (one-hour) and 5.4 ppm (eight-hour) were predicted at this receptor. All CO concentrations modeled under 2030 "Build" Alternative K peak traffic conditions were below CO standards set forth within the NAAQS.

Addressing inhalable particulate matter smaller than 2.5 micrometers; 2.5 x 10^{-6} meters ($PM_{2.5}$), mobile-source air toxics (MSATs) as well as the CO analysis performed for the I-295/I-76/Route 42 Direct Connection project provides validation of State Implementation Plan (SIP) conformity. As stated in Part D, Section 176 (Limitation on certain federal assistance) of The Clean Air Act Amendments of 1990, a specific project cannot "cause or contribute any new violation of any standard in any area, increase the frequency or severity of any existing violation of any standard in any area, or delay the timely

attainment of any standard or any required interim emission reduction or other milestone in any area"[1]. As shown within this document, all 2030 "Build" alternatives adhere to these regulations.

[1] United States Environmental Protection Agency, Clean Air Act Amendments of 1990. Part D, Section 176, page 160.

1.0 INTRODUCTION

The I-295/I-76/Route 42 Direct Connection project study area is located within the Boroughs of Bellmawr and Mount Ephraim, and Gloucester City; Camden County. Five design alternatives, which are intended to improve traffic flow throughout the interchange, were advanced through the Environmental Impact Statement (EIS) process. An air quality analysis was performed to evaluate the impact of each alternative (D, D1, G2, H1, K), including the "No-Build" scenario.

This analysis is one of several environmental studies, which together weigh the costs, benefits and consequences of the proposed project. It was prepared pursuant to requirements set forth by the Federal Highway Administration (FHWA) in Title 23, Code of Federal Regulations (CFR) Part 771, Title 40 CFR Part 51, Subpart T and in accordance with the New Jersey Department of Transportation (NJDOT), New Jersey Department of Environmental Protection (NJDEP) and the United States Environmental Protection Agency (USEPA).

Acquisition of federal funds for a highway project necessitates certification that the project is in conformance with an approved Statewide Transportation Improvement Plan (STIP). The purpose of the STIP is to provide a plan for the attainment, maintenance, and enforcement of National Ambient Air Quality Standards (NAAQS) for each state. The Metropolitan Planning Organization's yearly approval of the annual Transportation Improvement Plan (TIP; includes a list of federally supported highway projects) certifies that any project on the plan is in conformance with New Jersey's STIP. A conformity determination for the I-295/I-76/Route 42 Direct Connection project has also been provided. The findings are presented in the following sections of this report, prepared by Paul Carpenter Associates, Inc., in association with Dewberry-Goodkind, Inc. on behalf of the NJDOT.

2.0 PROJECT DESCRIPTION

2.1 Project Area Overview

The I-295/I-76/Route 42 Direct Connection project involves the reconstruction of Interstate 295 (I-295), Interstate 76 (I-76), and New Jersey State Route 42 (Route 42) and affected roadway segments traversing the Boroughs of Bellmawr and Mount Ephraim, and Gloucester City, Camden County. The existing interchange, which was constructed between 1958 and 1961, is insufficient to accommodate current traffic volumes and travel speeds safely, resulting in an accident rate that is more than seven times the statewide average. Additionally, failing levels of service on the interchange ramps, combined with the congestion of local streets, adversely affects the quality of life in the surrounding communities.

A Project Location Map is provided in Figure 1. The study area for the I-295/I-76/Route 42 Direct Connection project includes several residential, commercial, industrial, and public/recreational areas in Bellmawr, Mount Ephraim, and Gloucester City. The project limits for the I-295/I-76/Route 42 Direct Connection are as follows:

Along the Route 42/I-76 corridor, the study area extends from the southerly limit of Route 42 at Leaf Avenue, Mile Post (M.P.) 13.82, north to where Route 42 ends at M.P. 14.28 and merges with I-295 at M.P. 26.79. The I-295 corridor includes only a short section of I-295 roadway from M.P. 26.79 to M.P. 26.96 before I-295 continues north following Ramp A. Additionally, the I-76 section of the project begins at M.P. 0.00 and continues to the northerly limit just south of Crescent Boulevard (Route 130) over I-76 at M.P. 1.15. Along I-295, the study area extends from the southerly limit of Creek Road (CR 753) over I-295 (M.P. 26.03), to the merge with Route 42 (M.P. 26.79), and continues north to M.P. 28.16, where Black Horse Pike (Route 168) crosses over I-295.

2.2 Description of Existing Facilities

The following is a description of the existing roadways. Figure 2 is an excerpt from the NJDOT Straight Line Diagram which provides an overview of the interchange configuration.

2.2.1 Ramps

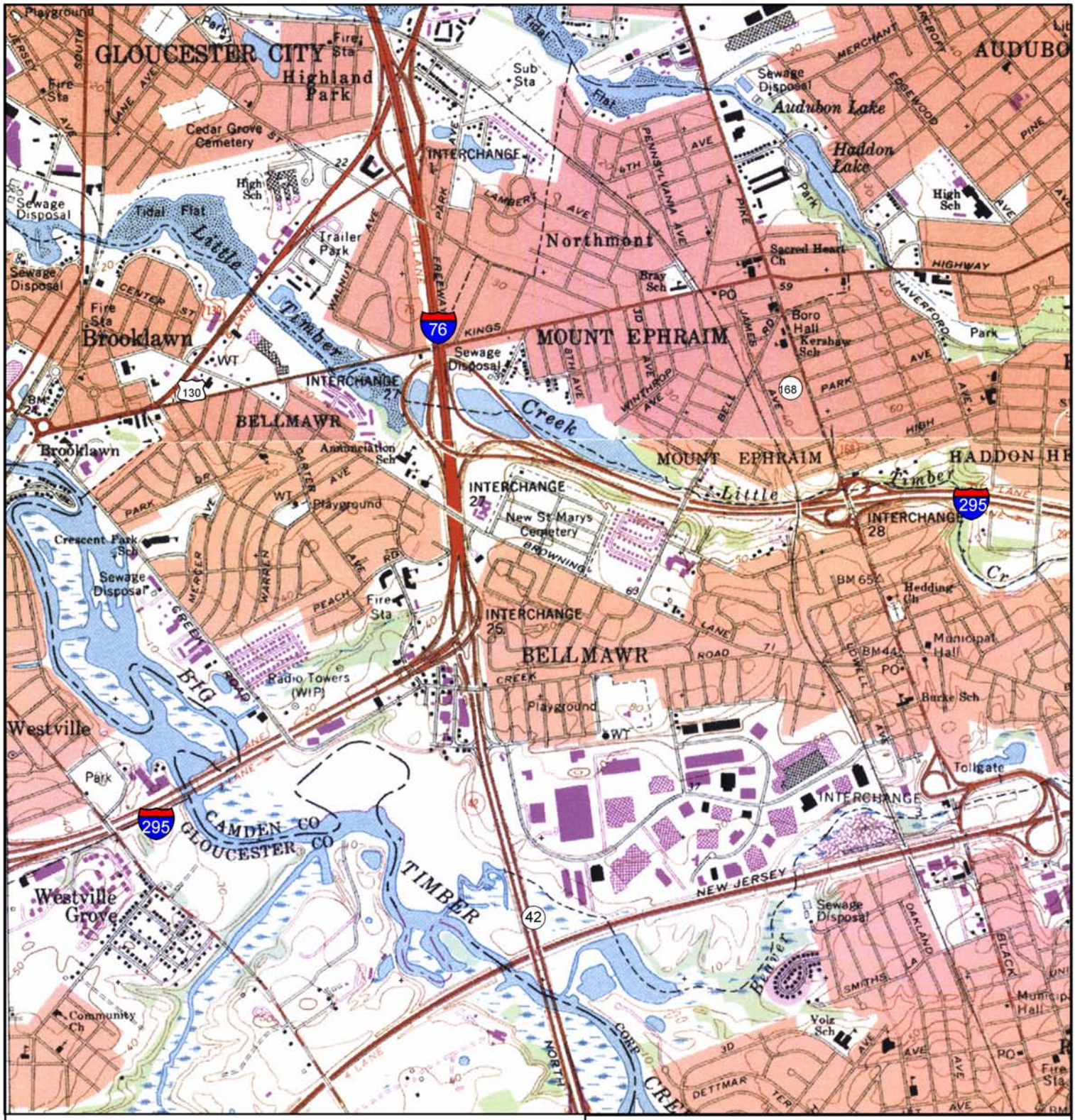
Ramp A
Ramp A connects northbound Route 42 with northbound I-295.

Ramp B
Ramp B connects southbound I-295 with northbound I-76.

Ramp C
Ramp C connects southbound I-295 with southbound Route 42.

Ramp D
Ramp D connects southbound I-76 with northbound I-295.

Ramp E
Ramp E connects northbound I-295 with northbound I-76.



SOURCE:

- Camden, NJ-PA
  USGS 7.5 Minute Quadrangle
  1967, Revised 1994
- Runnemede, NJ
  USGS 7.5 Minute Quadrangle
  1964, Revised 1994

0 1,000 2,000 4,000 Feet

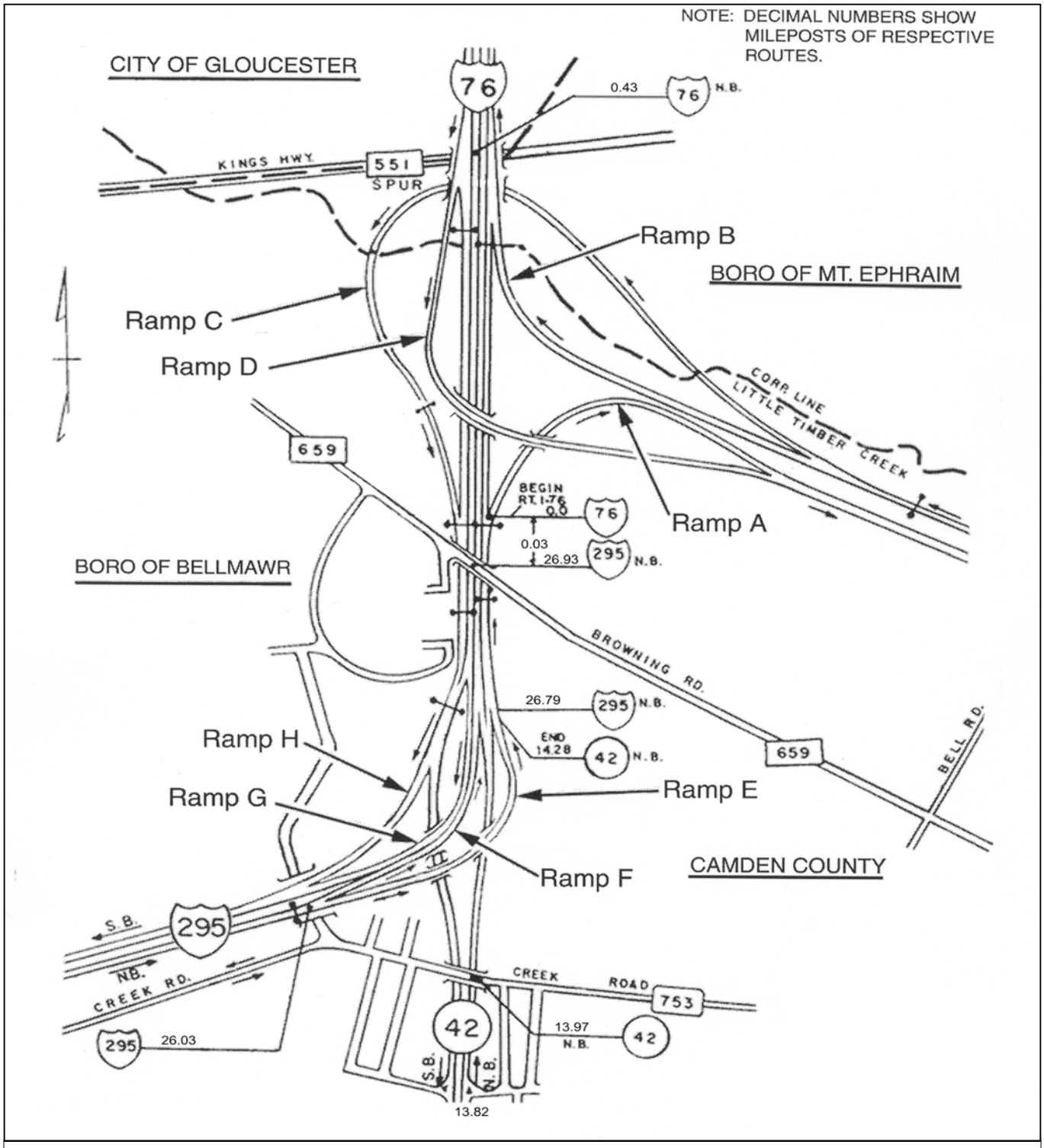
N

Q:\2652\technical\GIS\Alternatives-2005\PROJECT LOCATION MAP

NEW JERSEY DEPARTMENT OF TRANSPORTATION

I-295 / I-76/ ROUTE 42
Direct Connection
Camden County

Figure 1
Project Location Map



NEW JERSEY DEPARTMENT OF TRANSPORTATION

I-295 / I-76 / ROUTE 42
Direct Connection
Camden County
Figure 2
Overview of Existing Interchange Configuration

Ramp F
Ramp F connects northbound I-295 with the I-76 northbound express lanes.

Ramp G
Ramp G connects the I-76 southbound express traffic with southbound I-295.

Ramp H
Ramp H connects southbound I-76 with southbound I-295.

2.2.2 I-295, I-76, Route 42 from the Southern Project Limit

I-295 northbound consists of three 12' lanes with a 12' right shoulder. There is a 50' wide grass median separating the northbound and southbound lanes. The three lane section terminates in the vicinity of the bridge over Essex Avenue in Bellmawr, and forms Ramps E and F, which lead traffic to I-76 northbound local and express lanes, respectively. Ramp E becomes Ramp A, which is considered a continuation of I-295 northbound, and carries I-295 through-traffic northbound. Ramp A merges with Ramp D, carrying I-76 northbound traffic onto I-295, and together re-form the three lane section of I-295 northbound.

Route 42 northbound consists of four 12' lanes with a 12' right shoulder and a concrete median barrier curb. Route 42 ends at the merge of Ramp E carrying traffic from I-295 northbound. At this point, Route 42 becomes I-295 northbound which continues to the Ramp A gore. At the gore, I-76 northbound begins for through-traffic while traffic heading to I-295 must exit onto Ramp A. Traffic traveling from Route 42 northbound to I-295 northbound must merge across the lanes created by Ramp E to exit onto Ramp A to continue onto I-295, as the lanes of Ramp E form part of the express and local lanes of I-76 northbound.

2.2.3 I-295, I-76, Route 42 from the Northern Project Limit

I-295 southbound consists of three 12' lanes with a 12' right shoulder. Approximately 1,000' south of the Bell Road overpass in Mt. Ephraim, the travel lanes diverge into Ramps B and C. Ramp B carries traffic to I-76 northbound lanes. Ramp C, also known as "Al-Jo's Curve," carries I-295 southbound through-traffic via Ramp H, while traffic to Route 42 exits from the left lane. Ramp G, carrying I-76 and Route 42 southbound traffic merges with Ramp H, re-forming the 3-lane southbound section of I-295.

I-76 southbound consists of four 12' lanes with a 12' shoulder. Ramp D carries traffic from I-76 to I-295 northbound. At the Ramp C merge, I-76 ends, becoming I-295 southbound. Traffic continuing on I-295 southbound exits at Ramp G, while through-traffic continues onto Route 42 southbound past the Ramp G exit. Traffic traveling on I-76 to Route 42 must stay in the right lane after the Ramp C merge, then move to the left lane across merging traffic from I-295 southbound to continue onto Route 42. Traffic continuing to I-295 southbound exits right onto Ramp H.

2.3 Purpose and Need

2.3.1 Purpose

The purpose of this project is to improve traffic safety, reduce traffic congestion and meet driver's expectations by improving the direct connection of the I-295 mainline and the interchange of I-295/I-76/Route 42.

2.3.2 Need

There is a significant accident history at the interchange. The interchange's existing roadways include a number of geometric deficiencies that can be considered contributing factors to the high number of accidents. The deficiencies were identified from NJDOT record construction drawings and Structural Inventory and Appraisal (SI&A) Sheets.

Improve Safety
Accident data for the years 1995 through 2000 were reviewed. Since statewide accident rates were available for 1995, 1996, and 1999, a comparison of the accident rates on I-295, I-76 and Route 42 for these years was made with the statewide average.

During the 1995 to 1999 period, the I-295 roadway segments from M.P. 26.4 to M.P. 28.2 had accident rates over seven times the statewide average. Of these segments, M.P. 26.4 and 27.6 and M.P. 28 to 28.2, lengths that encompass the area of the interchange with Route 42 and I-76, had a substantially higher number of accidents than sections of I-295 immediately north and south of the interchange. For example, in 1995, M.P. 26.4 to 27.0 had almost seven times more accidents than the statewide average, while M.P. 26.8 to M.P 27.1 had the most accidents in each of the analyzed years.

All six segments of Route 42 (from M.P. 13.2 to M.P. 14.28) had accident rates in excess of the statewide average. In 1996, four segments (from M.P. 13.45 to M.P. 14.28) had accident rates, per million vehicle miles, greater than the statewide average. In 1999, four segments (from M.P. 13.44 to M.P. 14.28) had accident rates, per million vehicle miles, greater than the statewide average. In the years 1995, 1996 and 1999, one segment had an accident rate four times the statewide average.

I-76 accident rates were similar to those of I-295 and Route 42 in the 1995-1999 time frame. For 1995, four segments (from M.P. 0.0 to M.P. 0.8) had accident rates which exceeded the statewide average. One segment had an accident rate twice the statewide average. In 1996 five segments (from M.P. 0.0 to M.P. 0.8) had accident rates greater than the statewide average, with one segment being three times the statewide average. On I-76 in 1999, three segments (from M.P. 0.0 to M.P. 0.53) had accident rates in excess of the statewide average. In 1999, one segment had an accident history four times greater than the statewide average. Segments that were over-represented, in all three years that were compared with statewide averages, were M.P. 0.0 to 0.3 and 0.3 to 0.5. These segments mainly encompass the area in which I-76 is combined with I-295.

Geometric and Structural Deficiencies
The existing interchange has numerous substandard geometric design elements. These include horizontal curvature, stopping sight distance, superelevation, shoulder widths and acceleration and deceleration lane lengths. These are present along I-295, I-76, Route 42 and ramps at various locations. Since a majority of the improvements will be on new alignments, these substandard features will be addressed as part of the project.

In addition to the geometric deficiencies noted above, several bridges within the interchange have been identified as structurally deficient or functionally obsolete due to substandard vertical and horizontal clearances. Once again, since a majority of the improvements will be on new alignments, these structures will be replaced as part of the project.

Driver Expectations

While there is a definite need to correct the geometric deficiencies in existing ramps and structures, driver expectations also play a large role in the high accident rates at the interchange and necessitate improved safety. The posted speed limits on the existing ramps that serve the through-traffic on I-295 are inconsistent with typical operating speeds on an interstate highway. The posted speed limit on all of the highway approaches to the interchange is 55 miles per hour (MPH). The 20 MPH discrepancy between the posted speed limits (and higher operating speeds) on the approach highways and the 35 MPH speed on the ramps can be considered as a contributing factor in the interchange's overall poor accident record.

Operational Deficiencies

The lack of a direct connection for through movement on I-295, significant weaving problems, deficient connecting ramps, and high volumes of traffic all result in operational deficiencies (or congestion) within and near the interchange. The operational deficiencies on I-295, I-76 and Route 42, particularly the queuing of traffic and poor Levels of Service (LOS) that cause excessive delays, impact not only regional traffic and commuters using the highways, but local arterials and neighborhood streets as well. Excessive delays at the interchange result in highway traffic exiting onto surrounding local arterials, thereby further adding to congestion in the region. The diverted traffic, in turn, causes congestion on local roads, compromises traffic and pedestrian safety, increases noise levels, and lowers air quality in the community, which disproportionately tax the capacity and life of local roadways.

The effective operation of any roadway network, be it highway, local arterial or street intersection, is measured by the LOS categories ranging from A to F. LOS A represents the most favorable operating conditions with little or no delay. LOS F is the worst operating condition occurring when demand volume exceeds the capacity of the roadway resulting in severe congestion. Specific sections of the interchange that experience a poor LOS (LOS E or F) are highlighted in Table 1. Of the eight ramps studied in detail, five operate at a LOS E or worse for at least one of the two peak hours (AM and PM).

In addition, a weaving condition exists on I-76/Route 42 between Ramp E and Ramp A. Traffic on Ramp E wishing to proceed north on I-76 must weave with traffic from northbound Route 42 proceeding north on I-295. Due to the volumes of traffic involved in this section of the interchange (specifically the high volume of traffic from Ramp E proceeding to Ramp A) this section of the roadway experiences failure. It should be noted that the traffic exiting Ramp E and proceeding on Ramp A is “through” traffic that could be expected to stay on mainline I-295 if a mainline section of the highway were available.

TABLE 1
EXISTING LEVEL OF SERVICE

Roadway/Ramp	Peak Hour Level of Service	
	AM	PM
I-295 - Northbound		
South of Interchange	D	C
North of Interchange	D	**E**
I-295 - Southbound		
South of Interchange	**E**	**E**
North of Interchange	C	C
I-76 - Northbound		
South of Interchange	n/a[1]	n/a[1]
North of Interchange	**E**	C
Express Lanes	D	B
I-76 - Southbound		
South of Interchange	n/a[1]	n/a[1]
North of Interchange	C	**E**
Route 42 - Northbound		
South of Interchange	D	C
North of Interchange	n/a[1]	n/a[1]
Route 42 - Southbound		
South of Interchange	B	D
North of Interchange	n/a[1]	n/a[1]
Ramp A	**F**	**F**
Ramp B	**E**	B
Ramp C	**F**	**F**
Ramp D	B	C
Ramp E	**E**	**E**
Ramp F	**E**	**E**
Ramp G	B	C
Ramp H	C	B

[1]Section of roadway does not exist (see Figure 1).

2.3.3 Goals and Objectives

A set of project goals and objectives has been developed based on the project's purpose and needs described above, findings from previous studies, and goals developed during the partnering meetings on December 11-12, 2001. The goals and objectives are a compendium of statements made by the NJDOT, Federal Highway Administration (FHWA), agencies, local elected officials, residents, and other stakeholders in the project. As such, the goals and objectives are wide-ranging and represent different levels of priority for each stakeholder.

While the project may not be able to satisfy all goals and objectives listed herein, the preferred alternative seeks to address as many as possible. The project's goals and objectives are as follows:

- Improve safety by constructing a roadway system that meets interstate standards for geometric design.
- Provide a direct connection for through-traffic on I-295 with a design speed consistent with that of the interchange's approach roadways.
- Reduce congestion on local arterials such as Route 168 and US 130 and decrease commuter traffic on neighborhood streets, thereby improving local traffic mobility, pedestrian safety, and the level of service on I-295. In addition, noise levels would decrease and air quality would improve.
- Enhance regional economic development by increasing overall mobility. In addition, the improved roadway network conforms to State and local development plans.
- Reduce the financial burden on State and local police and emergency services by decreasing the number of vehicle accidents.
- Avoid, minimize or mitigate environmental and cultural resource impacts.
- Preserve the quality of life of communities by minimizing relocations and acquisitions of private and public property.
- Enhance opportunities for other modes of transportation, including bicycle and pedestrian, within the project area.
- Provide opportunities for intermodal use within the project area.

2.4 Description of Alternatives

The following section provides a description of the alternatives selected for further study. The alternatives were developed through a collaborative effort between stakeholder groups and were based on the objectives set forth in the project Purpose and Need statement. Graphics illustrating each alternative follow the narrative.

2.4.1 Alternative D

Alternative D, shown in Figure 3, begins in the vicinity of the Grenloch Secondary Railroad Bridge over I-295. Mainline I-295 shifts slightly south and elevates to a third level viaduct over Browning Road and Route 42 and a second level viaduct over Ramp C The roadway meets existing I-295 pavement north of the Creek Road overpass. The I-295 Alternative D alignment crosses I-76/Route 42 at a skew through an unused area of New St. Mary's Cemetery.

Vehicles on northbound Route 42, whose destination is I-295 northbound, exit on Ramp A. This ramp configuration, in conjunction with the new I-295 mainline alignment, eliminates the current substandard weaving condition with Ramp E at this location. Ramp A crosses under Ramp E and then crosses over Route 42 northbound before joining the elevated I-295 northbound alignment just north of Browning Road.

Ramp B provides the movement from southbound I-295 to northbound I-76. Ramp C provides the movement from southbound I-295 to southbound I-76/Route 42. Ramp B and Ramp C exit I-295 from the right. Ramp B follows a similar alignment to its existing one to meet I-76 northbound. Ramp C splits from Ramp B and crosses under Ramp D, I-76, Browning Road, and I-295 to connect with Route 42 north of the Creek Road Bridge.

A - Ramp Designation

- Roadway
- Bridge
- Ramps for Missing Moves
- Roadway to be Removed

N

0 750 1,500 3,000 Feet

Q:\2652\technical\GIS\Alternatives 2006\AlternativeD

NEW JERSEY DEPARTMENT OF TRANSPORTATION

I-295 / I-76/ ROUTE 42
Direct Connection
Camden County

Figure 3

Alternative D

Ramp D is the move from I-76 southbound to I-295 northbound. Ramp D exits I-76 in much the same way that it does now. The Ramp D alignment crosses over I-76, over Ramp C, and under I-295 before merging with I-295 northbound south of Bell Road.

Northbound I-295 traffic heading north to I-76 utilizes Ramp E which follows essentially the same alignment as it does now.

Southbound I-76 traffic heading to I-295 southbound utilizes Ramp F. Ramp F diverts from I-76 from the right (existing exit is from the left), and then passes under Browning Road. Ramp F first runs parallel to Ramp C and then runs adjacent to I-295 southbound. Ramp F rises from a depressed section at Browning Road to an elevated section as it ties into I-295 southbound prior to Essex Avenue.

A summary of design features of this alternative are:

- Northbound and Southbound I-295 are side-by-side
- I-295 crosses over Route 42/I-76 on a viaduct on a skew
- I-295 on viaduct over Ramp C and Browning Road
- Ramp D on viaduct over I-76/Route 42, Ramp C and under I-295
- Two lane ramps except for Ramp F
- Removes express/local lanes on I-76 Westbound
- I-295 Posted Speed Limit: 55 mph (Design Speed: 60 mph)
- Ramp Speed Limits: 40 mph (Design Speed: 45 mph)

2.4.2 Alternative D1

Alternative D1, shown in Figure 4, is almost identical to Alternative D. The primary difference is the configuration of Ramps B and C. Ramp C exits I-295 southbound from the tangent section of I-295 southbound. Ramp B exits from the right approximately 1,000' later. Ramp B is on a new alignment south of its present location, but ties into I-76 at a similar location. Ramp C generally follows (within 150'±) the existing Ramp C alignment (Al Jo's curve) and passes under I-76 and Ramp F before merging with Route 42 southbound. The substandard radius on the existing Ramp C is replaced with a larger radius. Ramp D follows the same alignment as in Alternative D.

A summary of design features of this alternative are:

- Northbound and Southbound I-295 are side-by-side
- I-295 crosses over Route 42/I-76 on a viaduct on a skew
- I-295 on viaduct over Ramp C and Browning Road
- Ramp D on viaduct over I-76/Route 42 and under I-295
- Two lane ramps except for Ramp F
- Removes express/local lanes on I-76 Westbound
- I-295 Posted Speed Limit: 55 mph (Design Speed: 60 mph)
- Ramp Speed Limits: 40 mph (Design Speed: 45 mph)

A - Ramp Designation

- Roadway
- Bridge
- Ramps for Missing Moves
- Roadway to be Removed

N

0 750 1,500 3,000 Feet

Q:\2652\technical\GIS\Alternatives 2006\AlternativeD1

NEW JERSEY DEPARTMENT OF TRANSPORTATION

I-295 / I-76/ ROUTE 42
Direct Connection
Camden County

Figure 4
Alternative D1

2.4.3 Alternative G2

Alternative G2, shown in Figure 5, also begins in the vicinity of the Grenloch Secondary Railroad Bridge over I-295. The southbound and northbound lanes of I-295 align over top of each other as an over–and-under viaduct and shift south. The I-295 viaduct alignment is elevated to cross over all of the ramps as well as I-76 and Browning Road. I-295 crosses over I-76 on a skewed alignment and then diverges and lowers in elevation to meet the existing I-295 pavement following the same alignment as in Alternative D to a point just north of the Creek Road Bridge. I-295 southbound is a fourth level viaduct and northbound is a third level viaduct at the Route 42 and Browning Road crossings. I-295 southbound passes over Bell Road, whereas, I-295 northbound passes under Bell Road.

Vehicles on Route 42 whose destination is I-295 northbound, exit on Ramp A. Ramp A crosses under Ramp E and then crosses over Route 42 northbound before joining the elevated I-295 northbound alignment just north of Browning Road, similar to Alternative D.

Ramp B provides the movement from southbound I-295 to northbound I-76. Ramp C provides the movement from southbound I-295 to southbound Route 42. Ramps B and C exit I-295 from the right. Ramp B follows a similar alignment to its existing alignment to meet I-76 northbound. Ramp C crosses under Ramp D, I-76, Browning Road, and I-295 to connect with Route 42 north of the Creek Road Bridge.

Ramp D is the move from I-76 southbound to I-295 northbound. Ramp D exits I-76 in much the same way that it does now. The Ramp D alignment crosses over I-76, over Ramp C, and under I-295 before merging with I-295 northbound south of Bell Road.

Northbound I-295 traffic heading north on I-76 utilizes Ramp E which follows essentially the same alignment as it does now.

Southbound I-76 traffic heading to I-295 southbound utilizes Ramp F. Ramp F diverts from I-76 from the right (existing exit is from the left), and then passes under Browning Road. Ramp F first runs parallel to Ramp C and then runs adjacent to I-295 southbound. Ramp F rises from a depressed section at Browning Road to an elevated structure as it ties into I-295 southbound prior to Essex Avenue.

A summary of design features of this alternative are:

- Southbound I-295 placed above Northbound I-295 using a double-decker configuration
- I-295 crosses over Route 42/I-76 on a viaduct on a skew
- I-295 on viaduct over Ramp C and Browning Road
- I-295 on viaduct over Ramp D
- Ramp D on viaduct over I-76/Route 42 and Ramp C
- Two lane ramps except for Ramp F
- Removes express/local lanes on I-76 Westbound
- I-295 Posted Speed Limit: 55 mph (Design Speed: 60 mph)
- Ramp Speed Limits: 40 mph (Design Speed: 45 mph)

A - Ramp Designation

- Roadway
- Bridge
- Ramps for Missing Moves
- Roadway to be Removed

N

0 750 1,500 3,000 Feet

Q:\2652\technical\GIS\Alternatives 2006\AlternativeG2

NEW JERSEY DEPARTMENT OF TRANSPORTATION

I-295 / I-76/ ROUTE 42
Direct Connection
Camden County

Figure 5
Alternative G2

2.4.4 Alternative H1

Alternative H1, shown in Figure 6, is almost identical to Alternative G2. The primary difference is the configuration of Ramps B and C. Ramps B and C exit from I-295 from the right. Ramp C generally follows (within 150'±) the existing Ramp C alignment (Al Jo's curve) and passes under I-76 and Ramp F before merging with Route 42 southbound. The substandard radius on the existing Ramp C is replaced with a larger radius. Ramp B splits from Ramp C to meet I-76 northbound.

A summary of design features of this alternative are:

- Southbound I-295 placed above Northbound I-295 using a double-decker configuration
- I-295 crosses over Route 42/I-76 on a viaduct on a skew
- I-295 on viaduct over Ramp C and Browning Road
- I -295 on viaduct over Ramp D
- Ramp D on viaduct over I-76/Route 42
- Two lane ramps except for Ramp F
- Removes express/local lanes on I-76 Westbound
- I-295 Posted Speed Limit: 55 mph (Design Speed: 60 mph)
- Ramp Speed Limits: 40 mph (Design Speed: 45 mph)

2.4.5 Alternative K

Alternative K makes I-295 a continuous direct-through alignment in the form of a tunnel beneath I-76/Route 42, as shown in Figure 7. Alternative K begins in the vicinity of the Grenloch Secondary Railroad Bridge over I-295. Mainline I-295 shifts slightly south and begins to descend at a 3.5%± grade close to New St. Mary's Cemetery. The road reaches a depth of 60' in the northwestern corner of New St. Mary's Cemetery, and a depth of 35' below the I-76/Route 42 pavement. The roadway begins to ascend at a 4% grade beside the baseball fields and is at grade to meet the I-295 pavement north of the Creek Road overpass.

Vehicles on northbound Route 42 whose destination is I-295 northbound, exit on Ramp A, which would be separated from, but parallel with, Route 42. This ramp configuration, in conjunction with the new I-295 mainline alignment, eliminates the current substandard weaving condition with Ramp E at this location. Ramp A then crosses under Ramp E before joining the depressed I-295 alignment north of Browning Road.

Ramp B provides the movement from southbound I-295 to northbound I-76. Ramp C provides the movement from southbound I-295 to southbound Route 42. Ramp C exits I-295 from the right and Ramp B exits from the right approximately 1,000' further. Ramp B follows a similar path but to the south of its existing location to meet I-76 northbound. Ramp C crosses over Ramps B and D, and I-76. Then Ramp C passes over Browning Road and I-295 to connect with Route 42 north of the Creek Road Bridge.

Ramp D is the move from I-76 southbound to I-295 northbound. Ramp D exits I-76 in much the same way that it does now. The Ramp D alignment crosses over I-76, under Ramp C, and over I-295 before merging with I-295 northbound south of Bell Road.

A - Ramp Designation

- Roadway
- Bridge
- Ramps for Missing Moves
- Roadway to be Removed

N

0 750 1,500 3,000 Feet

Q:\2652\technical\GIS\Alternatives 2006\AlternativeH1

NEW JERSEY DEPARTMENT OF TRANSPORTATION

I-295 / I-76/ ROUTE 42
Direct Connection
Camden County

Figure 6
Alternative H1

A - Ramp Designation

- Roadway
- Bridge
- Ramps for Missing Moves
- Roadway to be Removed

N

0 750 1,500 3,000 Feet

Q:\2652\technical\GIS\Alternatives 2006\AlternativeK

NEW JERSEY DEPARTMENT OF TRANSPORTATION

I-295 / I-76/ ROUTE 42
Direct Connection
Camden County

Figure 7
Alternative K

Northbound I-295 traffic heading north on I-76 utilizes Ramp E which follows essentially the same alignment as it does now.

Southbound I-76 traffic heading to I-295 southbound utilizes Ramp F. Ramp F diverts from I-76 from the right (existing exit is from the left) and then passes under Browning Road. Ramp F first runs parallel to Ramp C and then runs adjacent to I-295 southbound. Ramp F rises from a depressed section at Browning Road to tie into I-295 southbound prior to Essex Avenue.

A summary of design features of this alternative are:

- Northbound and Southbound I-295 are side-by-side
- Mainline I-295 is a tunnel under I-76/Route 42 on a skew
- Ramp C on viaduct over Ramps B and D and I-76/Route 42
- Two lane ramps except for Ramp F
- Removes express/local lanes on I-76 Westbound
- I-295 Posted Speed Limit: 55 mph, (Design Speed: 60 mph)
- Ramp Speed Limits: 40 mph, (Design Speed: 45 mph)

Three local bridges are impacted by each of the alternatives. The Bell Road, Browning Road, and Creek Road bridges will be raised to provide proper vertical clearance and lengthened to accommodate the wider typical section of I-295 or I-76/Route 42. In addition, King's Highway will be lowered by approximately one foot under each alternative and Alternative K may require Essex Avenue to be lowered by approximately two feet.

2.4.6 No-Build Alternative

This alternative proposes no changes to the existing interchange. Impacts to the project area will be evaluated in the same way as the other proposed alternatives, with the assessment of current conditions projected to the design year serving as the impact assessment for the no-build alternative. The no-build alternative serves as the benchmark to measure the costs and benefits of each build alternative evaluated.

3.0 CRITERIA FOR DETERMINING IMPACTS

Since it was originally passed in 1955, the Clean Air Act (CAA) had been the primary basis for regulating air pollutant emissions. The amendments to the Clean Air Act were passed in 1970, and allowed USEPA to delegate responsibility to state and local governing bodies. This allowed each state/local government the opportunity to prevent and control air pollution at the source. The 1970 amendments (Clean Air Act Amendments; CAAA) mandated that the USEPA establish ceilings for certain pollutants based upon the identifiable effects each pollutant may have on public health and welfare. Subsequently, the USEPA promulgated the revised regulations which set National Ambient Air Quality Standards (NAAQS) for carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), lead (Pb), sulfur dioxide (SO_2), total suspended particulates (TSP), inhalable particle matter smaller that 10 micrometers (PM_{10}), and in 1997, a new particulate standard; inhalable particulate matter smaller than 2.5 micrometers; 2.5 x 10^{-6} meters ($PM_{2.5}$). These pollutants are collectively referred to as "criteria pollutants", shown in Table 2.

The Clean Air Act established two types of air quality standards. The primary standards define air quality levels intended to protect the public health with an adequate margin of safety. The secondary standards define levels of air quality intended to protect the public welfare from any known or anticipated adverse effects of a pollutant (e.g. soiling, vegetation damage, material corrosion).

Each criteria pollutant is monitored, on a continuous basis, throughout the State of New Jersey by the NJDEP. The major objective of monitoring air quality is to provide an early warning system for pollutant concentrations, assess air quality in light of public health and welfare standards, and also track trends or changes in these pollutant levels.

Section 107 of the 1970 Clean Air Act Amendments requires the USEPA and states throughout the country to identify those areas not meeting the NAAQS. An area, which does not meet a standard, is referred to as in "non-attainment". For non-attainment areas, states are required to revise their State Implementation Plan (SIP) to detail measures whereby the NAAQS can be met as expeditiously as practical, within certain time limits.

The I-295/I-76/Route 42 Direct Connection project study area is located in the Boroughs of Bellmawr and Mount Ephraim, and Gloucester City; Camden County. This county is in attainment for carbon monoxide, nitrogen dioxide, lead, sulfur dioxide, total suspended particulates and PM_{10} but in non-attainment for ozone and $PM_{2.5}$. New federal regulations for transportation projects require $PM_{2.5}$ addressed since Camden County is in non-attainment.

The incomplete combustion of fossil fuel creates a spectrum of pollutant by-products. CO by volume is the most prominent, when compared to other mobile-source pollutants. CO is a colorless/odorless poisonous gas that is generally found adjacent to intersections or congested roadways. Accelerating/decelerating and idling vehicles emit higher emissions than steady-state speed vehicles. Substandard operating intersections produce significant delays, congestion and result in excessive idle emissions. Accordingly, it is appropriate to evaluate the impact of a project through assessing carbon monoxide levels at project-affected intersections. Since the I-295/I-76/Route 42 Direct Connection project does not include project-affected intersections, a free-flow air quality analysis was performed at critical receptor locations throughout the project study area. The federal/state carbon monoxide primary and secondary standard of 35 ppm (parts per million) for a one-hour period, and 9 ppm for a continuous eight-hour period, have been set forth.

The entire state of New Jersey is in non-attainment for O_3. Naturally occurring ozone, in the upper atmosphere, protects the population from harmful ultraviolet rays. Ground-level ozone is created when nitrogen oxides (NO_x) and volatile organic compounds (VOC) react in the presence of sunlight and heat. Ground-level ozone can cause serious adverse health effects by damaging cells that line our airways. Therefore, ozone can aggravate respiratory disease and cause people to be more susceptible to respiratory infections. The incomplete combustion of fossil fuel, power plants and other sources of combustion emit the primary source of NO_x. In recent years documented O_3 levels had been decreasing. In 2004, the USEPA created a new, more stringent O_3 standard and therefore precursors (NO_x and VOCs) are monitored very carefully.

Particle matter includes very small liquid and solid particles suspended within the lower atmosphere. The USEPA is concerned with inhalable particulate matter which is not filtered by the nose and throat like the larger particulates, and can reach deep in the lungs causing lung disease, emphysema or lung cancer. Particulate matter irritates the membranes of the respiratory system and therefore may affect sensitive groups such as the elderly, individuals with cardiopulmonary disease such as asthma, and children. Inhalable course particulates (PM_{10}) are larger than 2.5 micrometers but smaller than 10 micrometers in diameter and are caused by agriculture, grinding or crushing operations and become wind blown dust that can also affect visibility. Fine particulate matter ($PM_{2.5}$) are smaller than 2.5 micrometers in diameter and is created from chemical reactions in the atmosphere and through fuel combustion by sources such as motor vehicles and power generation. The NAAQS was revised on December 17, 2006 to reflect exclusion of the annual PM_{10} standard as well as a more stringent twenty-four hour $PM_{2.5}$ standard (35 ug/m^3).

TABLE 2
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS)

Pollutant	Averaging Period	New Jersey Primary	New Jersey Secondary	National Primary	National Secondary
Carbon Monoxide	1 hour	40 mg/m3 (35.0 ppm)	40 mg/m3 (35.0 ppm)	40 mg/m3 (35.0 ppm)	- -
	8 hour	10 mg/m3 (9.0 ppm)	10 mg/m3 (9.0 ppm)	10 mg/m3 (9.0 ppm)	- -
Ozone	1 hour	0.12 ppm	0.08 ppm	0.12 ppm	0.12 ppm
	8 hour	-	-	.08 ppm	.08 ppm
Nitrogen Dioxide	1 year	0.05 ppm (100.0 ug/m3)	0.05 ppm (100.0 ug/m3)	0.053 ppm (100.0 ug/m3)	0.053 ppm (100.0 ug/m3)
Lead	3 months	1.5 ug/m3	1.5 ug/m3	1.5 ug/m3	1.5 ug/m3
Sulfur Dioxide	3 hour	- -	0.50 ppm (1300.0 ug/m3)	- -	0.50 ppm (1300.0 ug/m3)
	24 hour	0.14 ppm (365.0 ug/m3)	0.10 ppm (260.0 ug/m3)	0.14 ppm (365.0 ug/m3)	- -
	1 year	0.03 ppm (80.0 ug/m3)	0.02 ppm (60.0 ug/m3)	0.03 ppm (80.0 ug/m3)	- -
Total Suspended Particulates	24 hour	260.0 ug/m3	150.0 ug/m3	-	-
	1 year	75.0 ug/m3	60.0 ug/m3	-	-
Inhalable Particulates (PM_{10})	24 hour	-	-	150 ug/m3	-
	1 year	-	-	-	-
Fine Particulates ($PM_{2.5}$)	24 hour	-	-	35 ug/m3	-
	1 year	-	-	15 ug/m3	15 ug/m3

- *denotes no applicable standard is established*

Source: New Jersey Department of Environmental Protection and United States Environmental Protection Agency

Toxic air pollutants (air toxics), are not considered criteria pollutants but are linked to cancer and other serious health effects, such as reproductive problems or birth defects. Air toxics are mainly caused by man-made sources, including mobile sources (cars, trucks, construction equipment) and stationary sources (factories refineries, power plants) as well as indoor sources (certain building materials and cleaning solvents). Natural source air toxics are caused by volcanic eruptions and forest fires. USEPA is tracking 188 toxic air pollutants regulated under the Clean Air Act. USEPA separates air toxics into four emission types; major industrial sources, area and natural sources, on-road mobile sources, and non-road mobile sources. Of the 188 air toxics, USEPA further identified 21 mobile-source air toxics (MSAT), and further designated six as priority MSATs having the greatest influence on health. These priority MSATs include acetaldehyde, acrolein, benzene, 1, 3-butadiene, formaldehyde, and combined diesel particulate matter and diesel exhaust organic gases.

As stated in the Clean Air Act Amendments of 1990, proposed projects must adhere and insure conformity of the governing SIP. Projects will not gain approval if they:

(1) - cause or contribute any new violation of any standard in any area;
(2) - increase the frequency or severity of any existing violation of any standard in any area; or
(3) - delay the timely attainment of any standard or any required interim emission reduction or other milestones in any area.

4.0 MODELING METHODOLOGY

4.1 Carbon Monoxide (CO)

CO modeling is required by the NJDEP and the NJDOT at "critical" project-affected intersections. Since no intersections are associated with the I-295/I-76/Route 42 Direct Connection project, a free-flow analysis was performed at sensitive receptor locations throughout the study area. Traffic analyses, representing 2030 "No-Build" and 2030 "Build" (Alternative D, D1, G2, H1, K) peak AM and PM conditions were reviewed. Traffic data was obtained from the "Final Traffic Report I-295/I-76/Route 42 Direct Connection" document, dated June 2006. Traffic volumes and speeds utilized for microscale CO modeling are included within Appendix A.

NJDEP and NJDOT require specific methodology to estimate carbon monoxide concentrations and are outlined in the "Air Quality Analysis for Intersections" document released by the Bureau of Air Quality Evaluation, dated November 2001. Three (3) models were utilized; **MOBILE6.2** to calculate emission factors for input to the air dispersion model, **CAL3QHC** as well as the USEPA **ISC3** model, to calculate emissions due to the tunnel in Alternative K. All computer model input/output files are included within the "I-295/I-76/Rt. 42 Direct Connection Air Quality Computer Support Document, Volumes 1 & 2".

4.1.1 MOBILE6.2

The newly released USEPA MOBILE6.2 model calculates carbon monoxide emission factors based on New Jersey-specific vehicular mixes of gasoline and diesel-fueled motor vehicles. This model calculates mobile emission factors for a specific project year based on the range of database years specified by the user. The model takes the age of the vehicles as well as the speeds and drive cycles of the user-specified roadway (freeway, arterial, local or ramp) as factors in the calculation. Databases specific for New Jersey Inspection Maintenance and Anti-Tampering Programs are also utilized.

4.1.2 CAL3QHC

The USEPA CAL3QHC air dispersion model is capable of predicting carbon monoxide concentrations due to free-flow roadway segments and intersections, simultaneously. Cartesian coordinates are utilized to allow the computer model to understand and evaluate the specific roadway configuration within the project study area. For accurate modeling results, more than 1600 feet of roadway links from each receptor site are required. All cruise speed link inputs include coordinates, traffic volume, emission factor and lane width (including an additional 3 meters on each side for an adequate mixing zone).

Air quality concentrations generated by vehicular-related sources are also influenced by such factors as wind direction, wind speed and atmospheric stability. The pollutant concentration predicted at any given location, due to pollutant mixing, is inversely related to wind speeds. Therefore, lower wind speeds result in higher estimated CO concentrations. A worst-case wind speed of one meter per second (1 m/s), and an atmospheric mixing height of 1000 meters were assumed. NJDEP requires a conservative atmospheric stability class, therefore for this project, "D" was assumed. In addition, the project study area was modeled utilizing a surface roughness of 108 centimeters (residential).

Due to the wind angle, separate receptors may be influenced by different roadway links. Therefore, the wind angle was varied in five-degree increments, from 0 to 360^{o}, to determine the worst-case wind direction resulting in maximum one-hour concentrations. NJDEP-approved ambient background levels are then added to each one-hour concentration to yield the total carbon monoxide concentration at each receptor site. A one-hour background concentration of 3.0 ppm was utilized. Resultant one-hour carbon monoxide concentrations are then compared to the standard of 35 ppm.

To evaluate an eight-hour air quality impact, each one-hour computer modeled concentration was multiplied by a 0.7 persistence factor. This value represents the role traffic and meteorological conditions may have on an overall eight-hour period. The NJDEP-approved eight-hour ambient background CO concentration of 2.1 ppm was applied, and then compared to the 9 ppm standard.

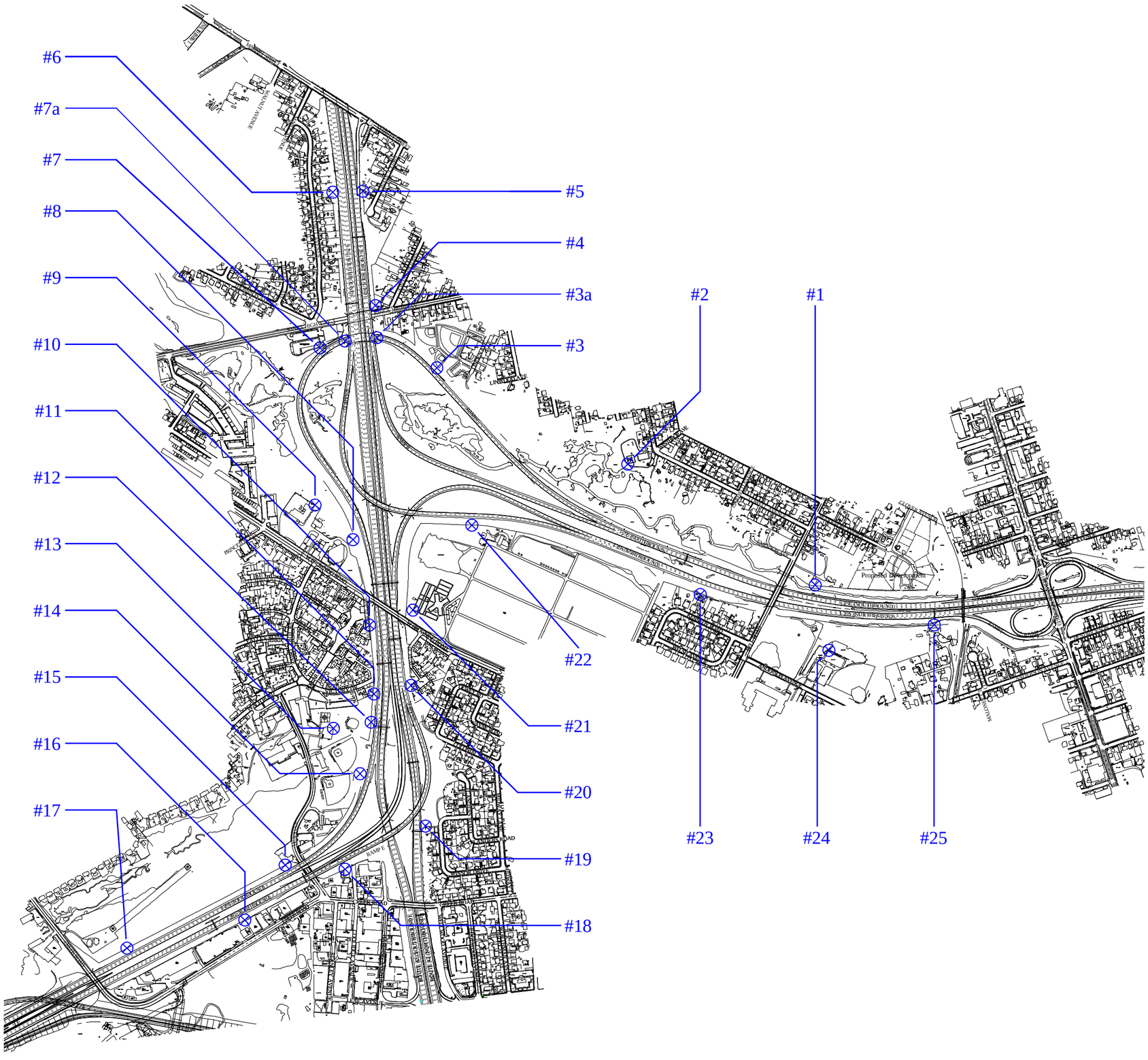
4.1.3 ISC3

The USEPA ISC3 (Industrial Source Complex Version 3) model was utilized to calculate supplemental emissions as a result of the tunnel in Alternative K. The air from within the tunnel will be mechanically ventilated out the tunnel portals. The short-term (ISCST3) model calculates hourly peak emissions at each receptor based on emission rates and meteorological conditions (Philadelphia-Metro area meteorological data provided by NJDEP). Conservatively, the emission rate was calculated based on a speed of 2.7 mph through the tunnel and a maximum volume of vehicles within the tunnel at all times. Due to this conservative approach, CO contributions at each receptor are identical during both AM and PM peak travel periods.

4.1.4 Receptor Locations

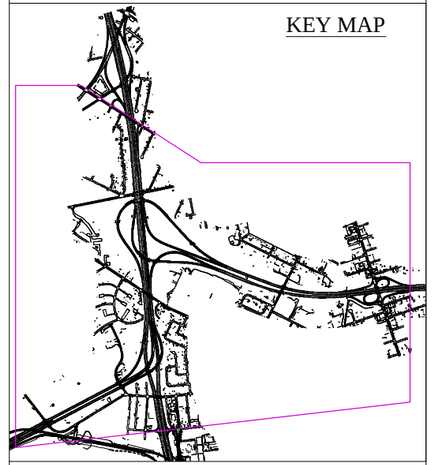
NJDEP requires air quality receptors modeled at "reasonable" locations. Receptors were placed along the right-of-way line adjacent to communities throughout the entire study area. Additional receptors were placed along the perimeter of special-use facilities including recreational areas, baseball fields, schools, churches and cemeteries. Each receptor was placed in a location that represents the closest access the public may have to the roadways. A total of 27 receptor locations were chosen, and are detailed within Figure 8 (Project Study Area and Receptor Locations). Conservatively, some receptor locations are placed in areas that are protected by existing and proposed noise walls. The air quality analysis performed for this project assumed no physical barriers existed between the roadway sources and receptor locations.

Although many of the chosen receptor locations remain the same between all alternatives ("No-Build", D, D1, G2, H1 and K), some require displacement due to the proposed alignment. In order to illustrate the "Build" alternative impact on receptor locations, the project study area was separated into four key sections: **I-295, East of the Interchange; I-76, North of the Interchange; I-295 Within the Interchange; I-295, Southwest of the Interchange.** Following Figure 8 is a detailed description of chosen receptor locations within each section.



PROJECT NORTH

KEY MAP



LEGEND

⊗ Carbon Monoxide Receptor Location

0 425 850 1700

Feet

New Jersey Department of Transportation

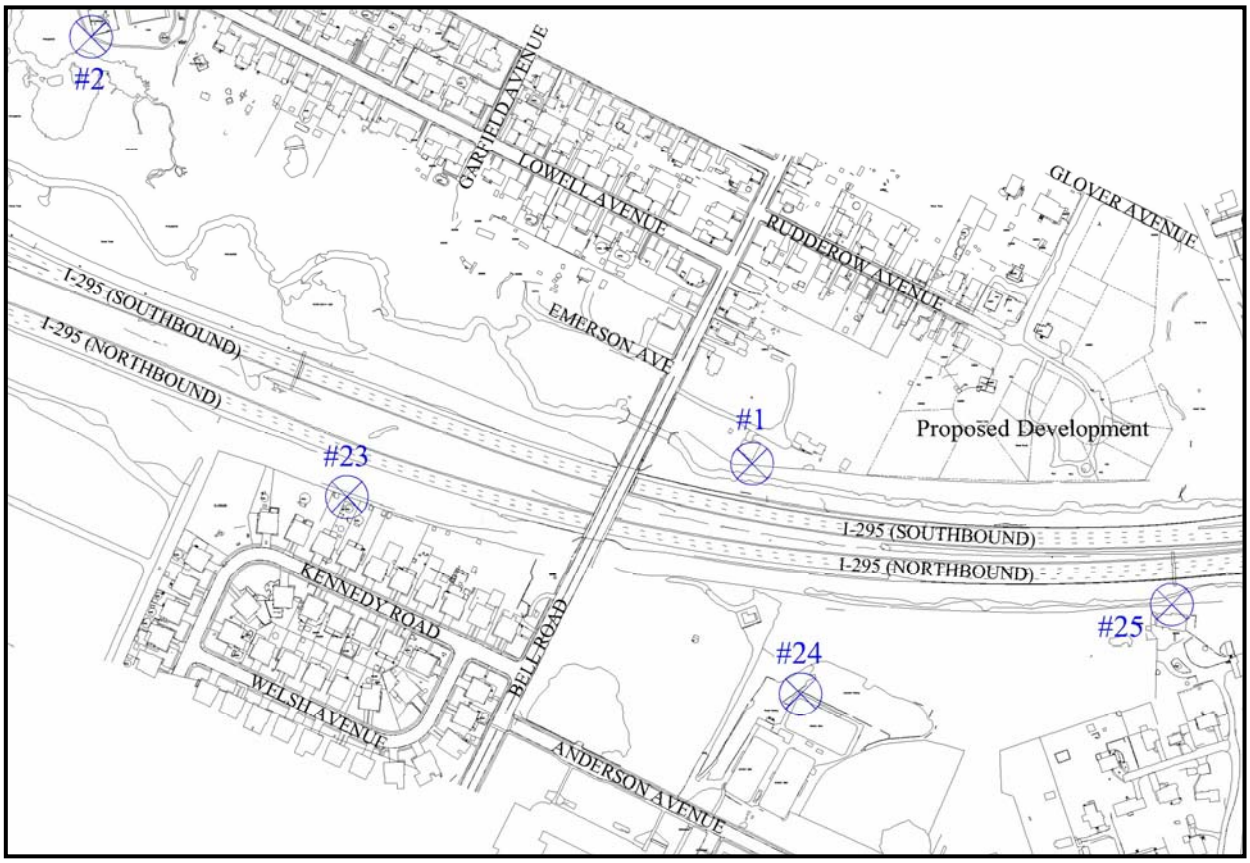
I-295 / I-76 / Route 42 Direct Connection Camden County

Figure 8

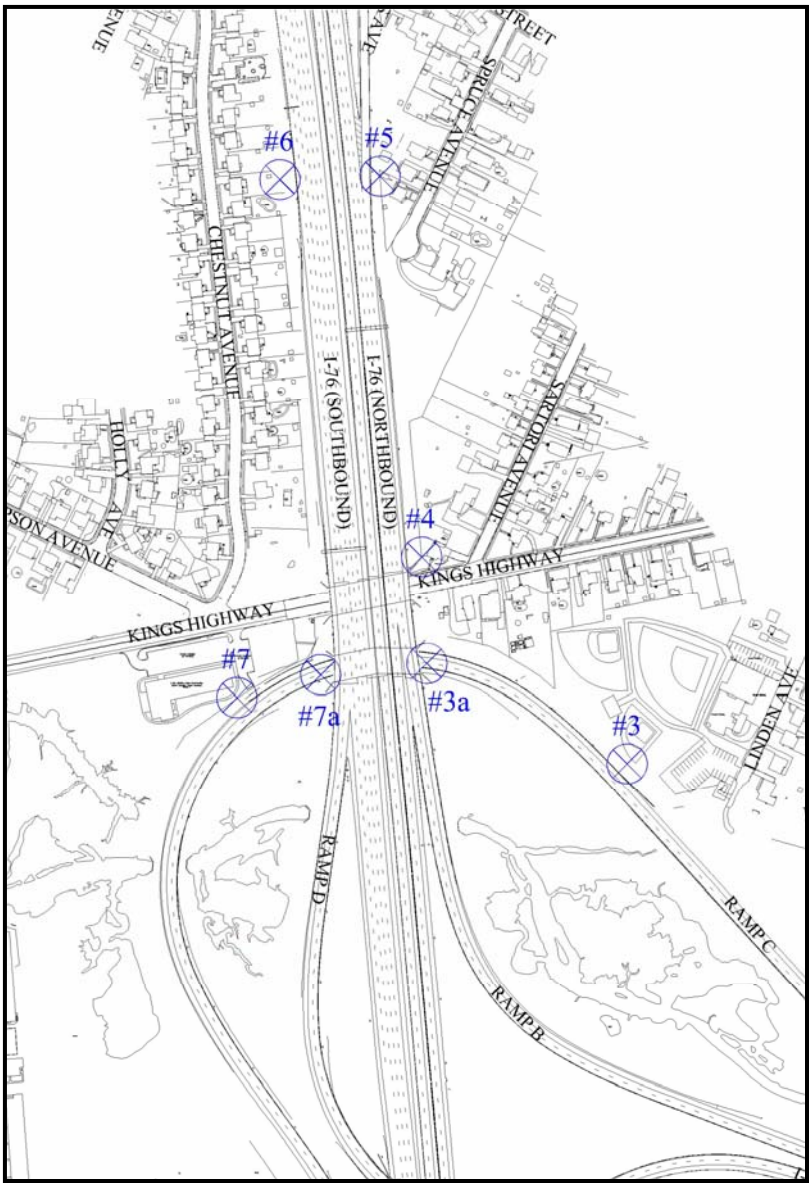
Project Study Area and Receptor Locations

Date	May 4, 2007	Page 4-3

I-295, East of the Interchange – Within this section of the study area, the number of lanes along I-295 northbound and southbound are proposed to increase in each alternative from three ("No-Build") to four ("Build" alternatives). Widening in this area will occur within the NJDOT right-of-way, therefore receptors remain in exact locations under "No-Build" and all "Build" alternatives. This area consists of five key receptor locations; three representing neighborhoods (#1, #23 and #25) and two representing recreational areas (#2 and #24).



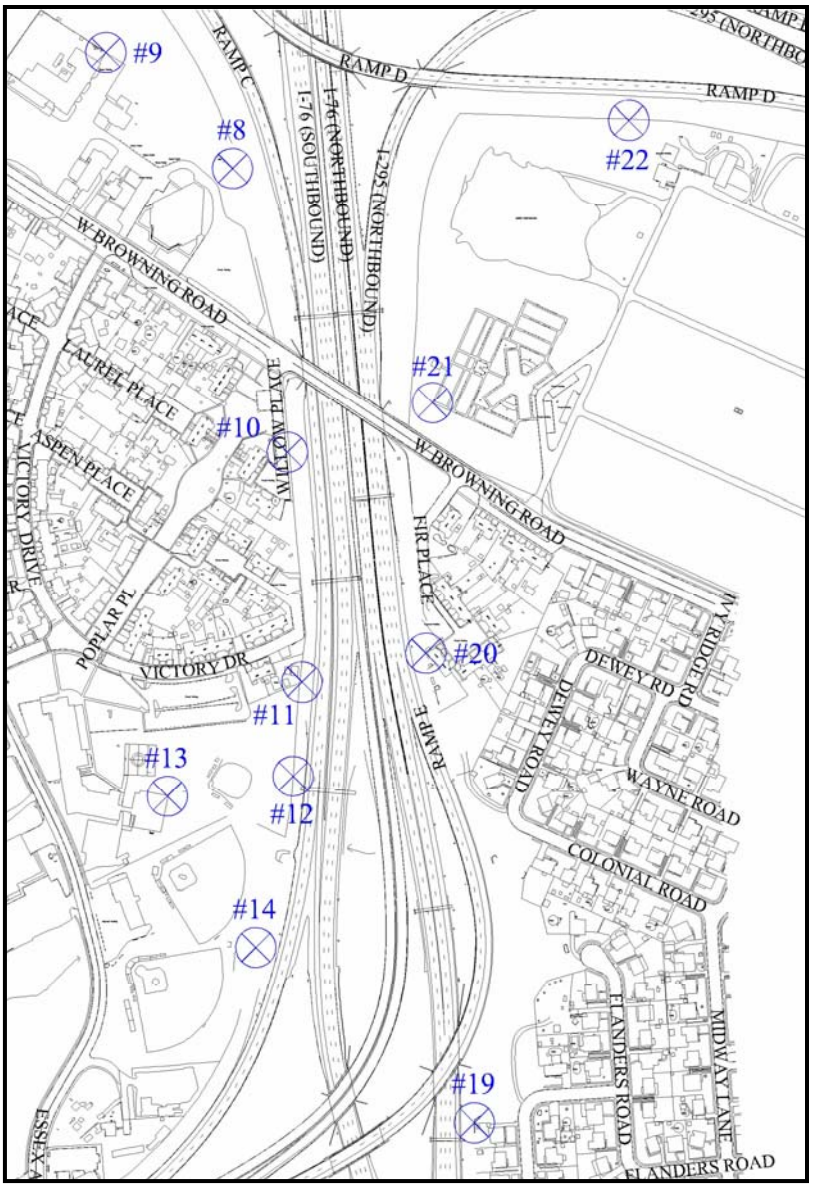
Receptor #1 is located along the I-295 southbound right-of-way line, representing the neighborhoods near Bell Road as well as Lowell, Emerson and Rudderow Avenues. Receptor #23 and Receptor #25 are located along the I-295 northbound right-of-way line, representing the neighborhoods near Bell Road, Kennedy Road and Anderson Avenue. Receptor #2 represents the Shining Star Park**,** while Receptor #24 represents the Scott E. Mueller Park.



I-76, North of the Interchange – Within this section of the study area, I-76 northbound and southbound remain six lanes each, however the separation of I-76 northbound express and local is eliminated. Ramps B and D follow curves similar to "No-Build" conditions. Ramp C is converted from *mainline* I-295 southbound to a *ramp* that carries vehicles from I-295 southbound to Route 42 southbound. Under Alternatives D1 and H1, the proposed Ramp C would follow an alignment similar to the existing Al-Jo's curve. Under Alternatives D, G2 and K, Al-Jo's curve would be removed and the proposed Ramp C would be relocated.

This area consists of seven sensitive receptor locations; four representing neighborhoods (#4, #5, #6 and #7), one representing a recreational area (#3) and two representing a proposed waterfront access path (#3a and #7a). Since the right-of-way line does not change with each alternative, the receptor locations remain the same throughout.

Receptor #4 and Receptor #5 are located along the I-76 northbound right-of-way line, representing neighborhoods near Kings Highway, Sartori Avenue and Spruce Avenue. Receptor #6 is located along the I-76 southbound right-of-way line, representing neighborhoods near Kings Highway and Chestnut Avenue. Receptor #3 is located along the right-of-way line near the Mount Ephraim Girl's Softball League fields, directly adjacent to a proposed playing field. Receptor #7 represents the Mount Ephraim Senior Housing building, and is located along the right-of-line. Under the alternatives which remove Al-Jo's curve (D, G2 and K), a waterfront access path connecting Linden Avenue and the Mount Ephraim Senior Housing Building is proposed. Receptor #3a is located along this path, east of I-76, while Receptor #7a is located along this path, west of I-76. Concentrations were predicted at these receptors under Alternatives D, G2 and K.



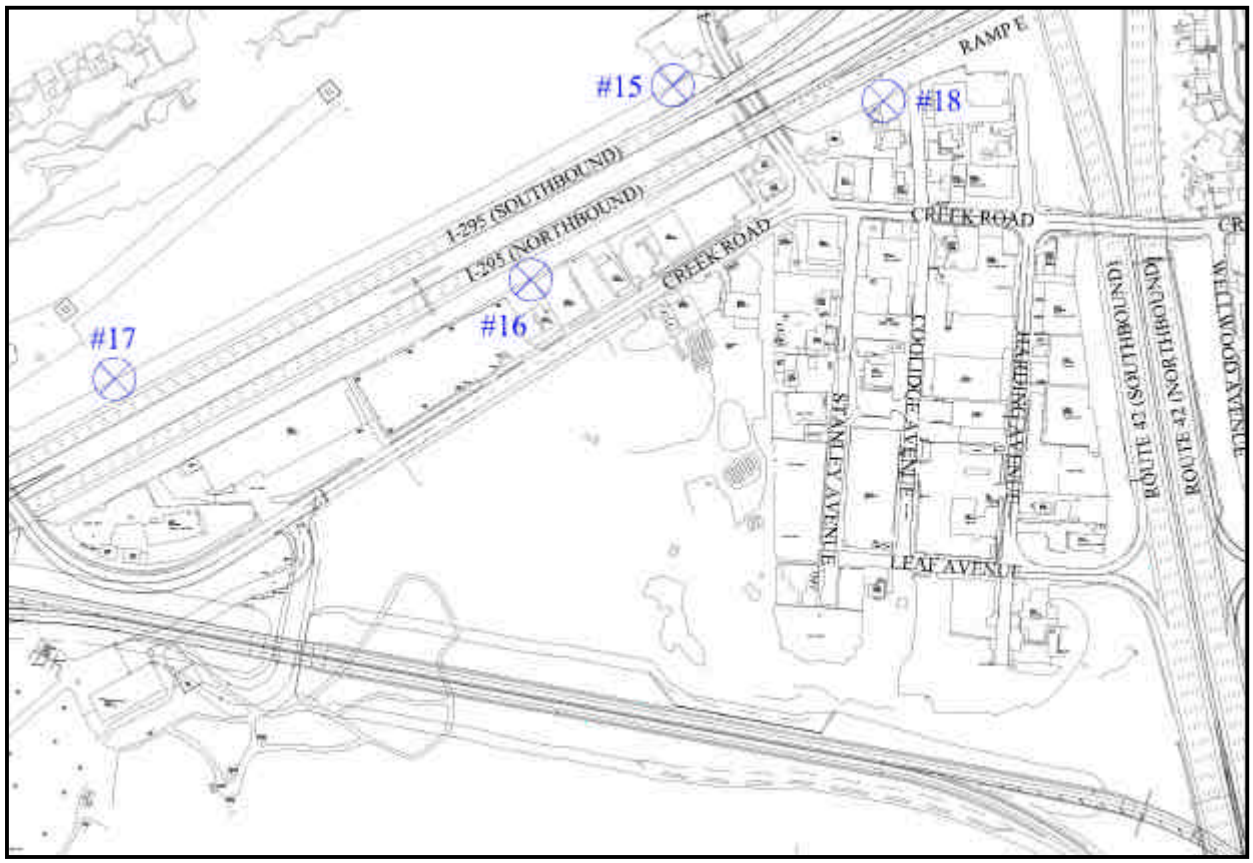
I-295, Within the Interchange-
Although this section of the study area experiences diverse changes between alternatives, the main alignment change is that I-295 is separated from Route 42/I-76. In addition, ramps are realigned and utilized only to carry vehicles from one mainline to another. Therefore, ramps are not utilized as mainline movements as with the "No-Build" alternative.

This area consists of eleven sensitive receptor locations; four representing neighborhoods (#10, #11, #19 and #20), one representing a church (#8), two representing schools (#9 and #13), two representing recreational areas (#12 and #13) and two representing a cemetery (#21 and #22).

Under all "Build" alternatives (D, D1, G2, H1, K), the right-of-way line is shifted toward the Bellmawr Park Mutual Housing Development (to the west) and toward New St. Mary's Cemetery (to the east). Therefore, under all "Build" alternatives, Receptors #10, #11, #12, #14 and #22 are relocated to the proposed right-of-way lines.

The Bellmawr Park Mutual Housing Development is represented by Receptor #10 (Willow Place), Receptor #11 (Victory Drive) and Receptor #20 (Fir Place). Receptor #19 is located along Route 42 northbound near Ramp E, and represents the Windsor Drive and Flanders Road neighborhoods. Receptor #8 is located along the Annunciation B.V.M. Church property line, while Receptor #9 is located adjacent to the Annunciation Regional School playground. Receptor #12 is located along the right-of-way line near the Bellmawr Park Elementary School baseball field. Receptor #13 is located at the corner of the Bellmawr Park Elementary School closest to the Interchange. Receptor #14 is located along the right-of-way line near the Bellmawr Baseball League Fields. New St. Mary's Cemetery is represented by Receptor #21 (located along the mausoleum walkway) and Receptor #22 (located along the right-of-way line).

I-295, Southwest of the Interchange - Within this section of the study area, I-295 northbound and southbound remain three lanes in both directions, however the curvature is slightly modified. Route 42 northbound and southbound remain five lanes in each direction, however the movements do not split north of Creek Road, as within the "No-Build" alternative. Air quality modeling incorporated the I-295/I-76/Route 42 Direct Connection both with, and without construction of the NJDOT Missing Moves project. This area consists of four sensitive receptor locations, all representing residential areas.



Receptor #15 and Receptor #17 are located along the I-295 southbound right-of-way line, representing the neighborhoods near Essex Avenue, Creek Road and Booth Drive. Receptor #16 and Receptor #18 are located along the I-295 northbound right-of-way line, representing the neighborhoods near Creek Road, south of the Interchange.

4.2 $PM_{2.5}$

In 40 CFR Part 93, the USEPA amended the Transportation Conformity Rule (TCR) to include new 8-hour O_3 and $PM_{2.5}$ NAAQS. In March 2006, USEPA established project-level conformity determinations in $PM_{2.5}$ non-attainment and maintenance areas and revised the project-level determinations in PM_{10} areas. This rule requires $PM_{2.5}$ hot-spot analyses included in project-level conformity determinations when new transportation projects of air quality concern are proposed in $PM_{2.5}$ non-attainment or maintenance areas.

Camden County is designated as a non-attainment area for $PM_{2.5}$ and began monitoring for this pollutant in 1999. The Camden lab trailer is located within a residential neighborhood, specifically at 1667 Davis Street (corner of Copewood Street). To determine 24-hour $PM_{2.5}$ attainment, an average is calculated based on the 98th percentile 24-hour concentration (ug/m3) for three past years. $PM_{2.5}$ monitoring data (24-hr and Annual Mean), 3-year averages and respective standards are included within Table 3. The 3-

year average of 24-hour (45.3 ug/m^3) and annual mean (15.3 ug/m^3) $PM_{2.5}$ concentrations exceed standards set forth.

TABLE 3
$PM_{2.5}$ MONITORING DATA (CAMDEN 2003-2005)

Year	24-Hour Concentration[3] (ug/m^3)	Annual Mean Concentration (ug/m^3)
2003	61.0	16.6
2004	35.0	13.3
2005	40.0	16.1
3-Year Average	45.3	15.3
Standard	35.0	15.0

3 – 98th percentile concentration

The *Transportation Conformity Guidance for Qualitative Hot-spot Analysis in $PM_{2.5}$ and PM_{10} Non-Attainment and Maintenance Areas* (EPA 420-B-06-902) document has been released to assist with determining projects of air quality concern. Under 40 CFR 93.123(b)(i) and (ii), the I-295/I-76/Route 42 Direction Connection project would not be considered a project of air quality concern since this interchange configuration project proposes physically separated movements. As stated within the EPA guidance document, these types of projects are intended to improve freeway operations by smoothing traffic flow and vehicle speeds with improved weave and merge operations. Projects that propose physically separated movements are not expected to create or worsen $PM_{2.5}$ or PM_{10} violations. The I-295/I-76/Route 42 Direct Connection project proposes physically separating I-295 from I-76/Route 42 throughout the interchange.

The *I-295/I-76/Route 42 Direct Connection Traffic Report* dated June 2006 details many traffic improvements due to the project. Under 2030 "Build" conditions, regardless of which alternative is chosen, the project is estimated to reduce vehicle-hours traveled by 4,570 vehicles during the 2-hour AM peak period, and by 7,120 vehicles during the 3-hour PM peak period. During PM peak periods, the reduction in vehicle-hours traveled would be 8,530 if the Missing Moves project is not built. These savings would be realized on local roadways, within the towns of Mt. Ephraim and Bellmawr, along with the adjacent towns such as Brooklawn and Runnemede. Due to current and proposed "No-Build" conditions, vehicles avoid the interchange and travel throughout the local roadway network to evade congestion.

As stated within the Traffic Report, traffic operations would improve in all "Build" alternatives as compared to "No-Build" since all alternatives are proposed to separate through traffic on I-295 from those on I-76/Route 42. Improved operating conditions translate into higher speeds. Since congestion yields higher emissions, the goal for improved air quality is to decrease congestion and increase travel speeds. The overall interchange average speed predicted under 2030 "No-Build" condition is 25/26 mph (AM/PM peak), as compared to a 32 mph (AM/PM peak) average speed predicted under all 2030 "Build" conditions. The speed differences with, and without the NJDOT Missing Moves project is negligible.

Under 2030 "No-Build" condition, I-295 NB and Route 42/I-76 NB Local merge for approximately 800 feet, causing excessive delays and congestion. The mainline speeds within this area range from 10-20 mph. Under each of the design alternatives, these movements are completely separated, resulting in mainline speeds of 49 mph (I-295 NB) and 44 mph (Route 42/I-76 NB). Table 4 illustrates how each of

the mainline-to-mainline movements improve under the 2030 "Build" alternatives, when compared to the "No-Build" alternative.

TABLE 4
PREDICTED SPEED COMPARISON
2030 "NO-BUILD" to 2030 "BUILD" ALTERNATIVES (D, D1, G2, H1, K)

Movement	2030 AM "No-Build"/ "Build" Speed	2030 PM "No-Build" / "Build" Speed
I-295 NB to I-76 NB	26-43 mph / 40-41 mph	23-45 mph / 44-45 mph
I-295 NB to Route 42 SB (Missing Moves Project)	36-40 mph / 37-41 mph	38-49 mph / 36-48 mph
I-295 SB to I-76 NB		
("No-Build" / Alternative D/G2)	21-26 mph / 41 mph	17-51 mph / 38-41 mph
("No-Build" / Alternative D1/K)	21-26 mph / 41-48 mph	17-51 mph / 41-50 mph
("No-Build" / Alternative H1)	21-26 mph / 36-41 mph	17-51 mph / 38-41 mph
I-295 SB to Route 42 SB		
("No-Build" / Alternative D/G2)	28-42 mph / 34-41 mph	32-33 mph / 30-40 mph
("No-Build" / Alternative D1/K)	28-42 mph / 34-36 mph	32-33 mph / 30-40 mph
("No-Build" / Alternative H1)	28-42 mph / 34-36 mph	32-33 mph / 30-40 mph
Route 42 NB to I-295 NB	23-33 mph / 34-38 mph	15-27 mph / 27-35 mph
Route 42 NB to I-295 SB (Missing Moves Project)		
("No-Build" / Alternative D/G2)	33-43 mph / 26-37 mph	31-37 mph / 31-38 mph
("No-Build" / Alternative D1/K)	33-43 mph / 26-37 mph	31-37 mph / 31-38 mph
("No-Build" / Alternative H1)	33-43 mph / 26-32 mph	31-37 mph / 31-38 mph
I-76 SB to I-295 NB	26-34 mph / 38-47 mph	27-39 mph / 34-35 mph
I-76 SB to I-295 SB		
("No-Build" / Alternative D/G2)	33-42 mph / 42-48 mph	39-42 mph / 37-45 mph
("No-Build" / Alternative D1/K)	33-42 mph / 40-48 mph	39-42 mph / 37-45 mph
("No-Build" / Alternative H1)	33-42 mph / 40-48 mph	39-42 mph / 37-45 mph

4.3 MOBILE SOURCE AIR TOXICS

USEPA has recognized the need to evaluate mobile source air toxics (MSATs) however at this time there is incomplete or unavailable information. Existing studies are currently under review by USEPA as well as on-going research to better characterize health impacts. An established procedure to quantify MSAT emissions has not yet been developed. In addition, mitigation evaluations need to be determined. The relevance of unavailable or incomplete information is that it is not possible to make a quantitative determination of whether any of the alternatives would have "significant adverse impacts on the human environment". Although reliable methods to accurately estimate MSAT health impacts do not exist at this time, MSATs can be qualitatively addressed.

A non-profit organization funded by EPA, FHWA and industry, performed a major series of studies to address MSAT health impacts in proximity to roadways. The results of health implications of near-roadway MSAT hot spots will not be available for several years.

The FHWA performed a preliminary study comparing hypothetical emission impacts for a sample highway widening project. The study was based on the product of a composite MSAT emission factor produced by USEPA's MOBILE6.2 mobile emission model per roadway link and the vehicle miles of travel (VMT). Based on the study results, MSATs were predicted to decrease substantially over the next 25 years due to implementation of the USEPA's new programs for fuel and mobile source vehicle engine emission standards. It is important to note that the emission reductions were shown to offset the additional vehicle miles of travel predicted with an improved highway.

The FHWA's *Interim Guidance on Air Toxic Analysis in NEPA Documents* provides direction on MSAT evaluation based on projected impact. The I-295/I-76/Route 42 Direct Connection project can be considered a Category 2 project since the project serves to improve operations of the interchange without adding substantial new capacity. As stated within Section 4.2 ($PM_{2.5}$), the project proposes physically separated movements that improve freeway operations and increase vehicle speeds as well as a reduction in vehicle-hours traveled. Therefore, this project type would not meaningfully increase emissions.

The estimated VMTs were calculated for the I-295/I-76/Route 42 Direct Connection project and result in 722,595 VMTs for the 2030 "No-Build" condition and 885,465 VMTs for each 2030 "Build" alternative. Therefore, VMTs are predicted to increase 22.5% from 2030 "No-Build" to "Build". For projects on an existing alignment, such as the I-295/I-76/Route 42 Direct Connection, it is expected that MSATs will decline. As stated within the guidance document, MSATs are expected to decline unless VMTs more than doubles by 2020. Due to the project-specific increase in VMTs (22.5%) for each 2030 "Build" alternative combined with new EPA engine and fuel standards, MSATs related to this project are expected to decline.

Specific improvements proposed for each alternative include locations of widening that will bring some traffic lanes closer to sensitive receptors. Therefore, there may be localized areas of higher MSAT concentrations under each 2030 "Build" alternative. At this time, MSAT concentrations cannot be accurately quantified due to this emerging state of the science. However, it is expected that all 2030 "Build" alternatives will possess substantially lower MSATs than present levels due to the implementation of EPA's vehicle and fuel regulations.

5.0 SUMMARY OF FINDINGS

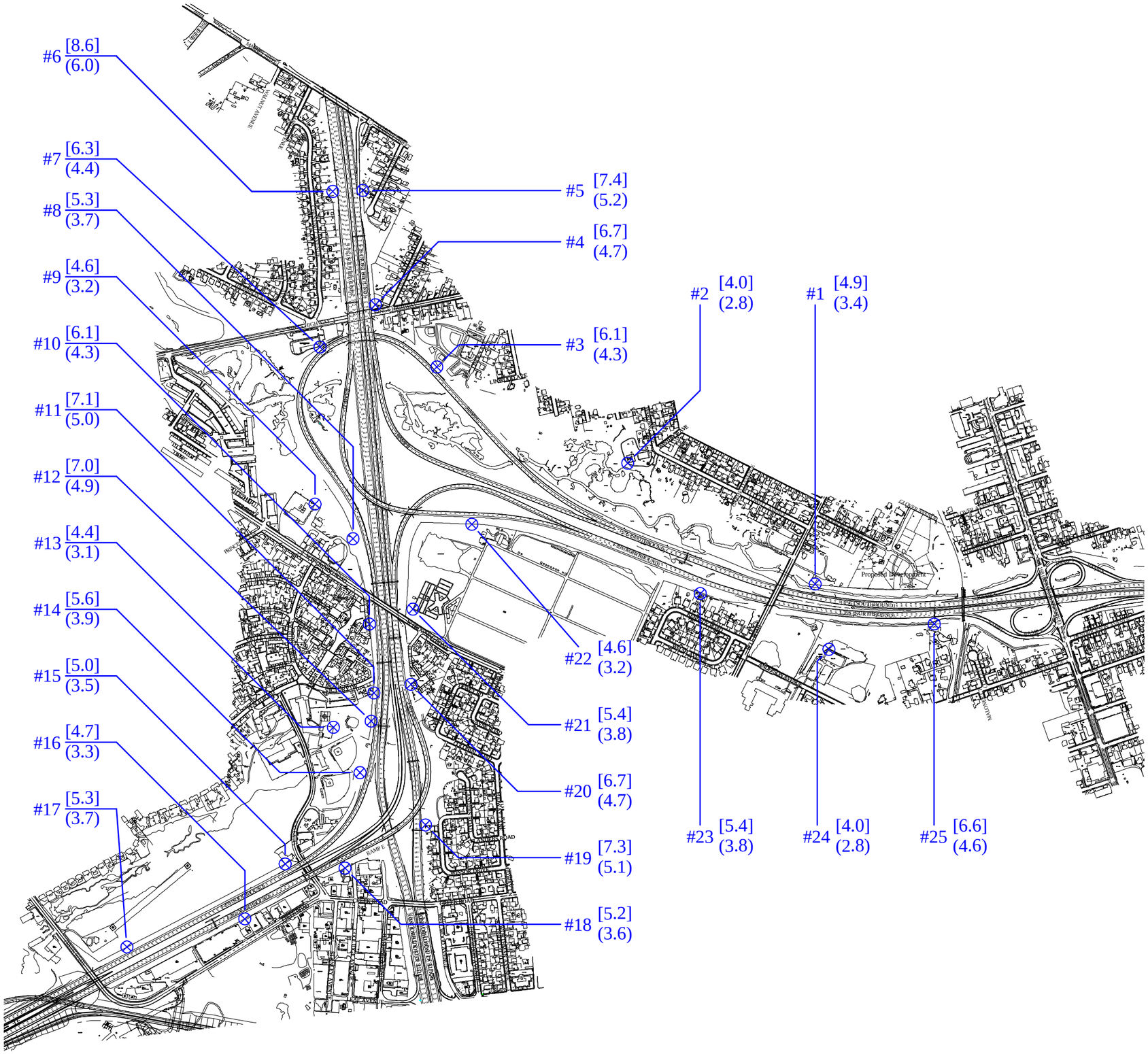
5.1 2030 "No-Build" Alternative

Under the 2030 "No-Build" alternative, peak concentrations were predicted at Receptor #6, which is located along the I-76 southbound right-of-way line and represents the Chestnut Avenue neighborhood. The highest concentration of 8.6 ppm over a one-hour period and 6.0 ppm over an eight-hour period was predicted with and without construction of the NJDOT Missing Moves project. Table 5 and Figure 9 detail the maximum concentrations, which includes background levels, at each receptor. Under the 2030 "No-Build" peak traffic conditions, receptors are not predicted to exceed the one, or eight-hour NAAQS set forth.

TABLE 5 - 2030 "NO-BUILD"
PEAK 1 & 8-HOUR CARBON MONOXIDE (CO) CONCENTRATIONS (ppm)

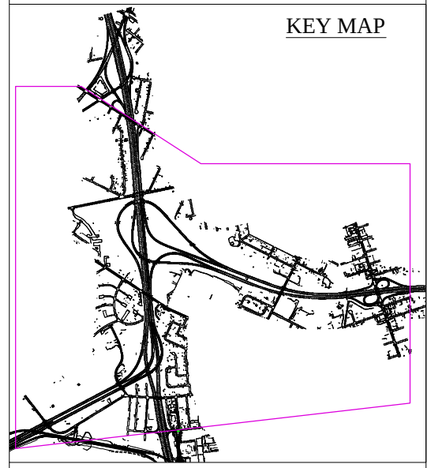
Receptor Number	Receptor Location	Peak Concentration With Missing Moves (1hr/8hr)	Peak Concentration Without Missing Moves (1hr/8hr)
1	I-295 SB ROW (Bell Road)	4.9 / 3.4	4.9 / 3.4
2	Shining Star Park	4.0 / 2.8	4.0 / 2.8
3	Mount Ephraim Girl's Softball Fields ROW	6.1 / 4.3	6.1 / 4.3
4	I-76 NB ROW (King's Highway)	6.7 / 4.7	6.7 / 4.7
5	I-76 NB ROW (Spruce Avenue)	7.4 / 5.2	7.6 / 5.3
6	I-76 SB ROW (Chestnut Avenue)	**8.6 / 6.0**	**8.6 / 6.0**
7	Mount Ephraim Senior Housing ROW	6.3 / 4.4	6.3 / 4.4
8	Annunciation B.V.M. Church ROW	5.3 / 3.7	5.3 / 3.7
9	Annunciation Regional School Playground	4.6 / 3.2	4.6 / 3.2
10	Bellmawr Park Mutual Housing ROW (Willow Place)	6.1 / 4.3	6.1 / 4.3
11	Bellmawr Park Mutual Housing ROW (Victory Drive)	7.1 / 5.0	7.2 / 5.0
12	Bellmawr Park Elementary School BB Field ROW	7.0 / 4.9	7.1 / 5.0
13	Bellmawr Park Elementary School	4.4 / 3.1	4.4 / 3.1
14	Bellmawr Baseball League Fields ROW	5.6 / 3.9	5.7 / 4.0
15	I-295 SB ROW (Essex Avenue)	5.0 / 3.5	5.1 / 3.6
16	I-295 SB ROW (Creek Road)	4.7 / 3.3	4.7 / 3.3
17	I-295 NB ROW (Creek Road)	5.3 / 3.7	5.3 / 3.7
18	I-295 NB ROW (Ramp E)	5.2 / 3.6	5.2 / 3.6
19	Route 42 NB ROW (Ramp E)	7.3 / 5.1	7.3 / 5.1
20	Bellmawr Park Mutual Housing ROW (Fir Place)	6.7 / 4.7	6.7 / 4.7
21	New St. Mary's Cemetery Mausoleum Walkway	5.4 / 3.8	5.5 / 3.9
22	New St. Mary's Cemetery ROW	4.6 / 3.2	4.6 / 3.2
23	I-295 NB ROW (Kennedy Road)	5.4 / 3.8	5.4 / 3.8
24	Scott E. Mueller Park	4.0 / 2.8	4.0 / 2.8
25	I-295 NB ROW (Snyder Avenue)	6.6 / 4.6	6.7 / 4.7

ROW: existing right-of-way line
Bold values represent maximum predicted CO concentrations



PROJECT NORTH

KEY MAP



LEGEND

Figure generated utilizing peak AM and PM concentrations, in units of ppm (parts per million)

⊗ Carbon Monoxide Receptor Location

[ ] Peak 1-hour CO Concentration

( ) Peak 8-hour CO Concentration

0 425 850 1700 Feet

New Jersey Department of Transportation

I-295 / I-76 / Route 42 Direct Connection Camden County

Figure 9

2030 "No-Build" CO Concentrations

5.2 2030 "Build" Alternatives

5.2.1 Alternative D

Under the 2030 "Alternative D" condition, peak concentrations were documented at Receptor #25, which is located along the I-295 northbound right-of-way line and represents the Snyder Avenue neighborhood. Peak concentrations of 7.6 ppm (one-hour) and 5.3 ppm (eight-hour) were predicted, assuming construction of the NJDOT Missing Moves project. Peak concentrations of 7.5 ppm (one-hour) and 5.3 ppm (eight-hour) were predicted without construction of the NJDOT Missing Moves project. Table 6 and Figure 10 detail the maximum concentrations, which includes background levels, at each receptor. Under the 2030 "Alternative D" AM and PM peak traffic conditions, receptors are not predicted to exceed the one, or eight-hour NAAQS set forth.

TABLE 6 – 2030 "ALTERNATIVE D"
PEAK 1 & 8-HOUR CARBON MONOXIDE (CO) CONCENTRATIONS (ppm)

Receptor Number	Receptor Location	Peak Concentration With Missing Moves (1hr/8hr)	Peak Concentration Without Missing Moves (1hr/8hr)
1	I-295 SB ROW (Bell Road)	4.5 / 3.2	4.5 / 3.2
2	Shining Star Park	4.4 / 3.1	4.4 / 3.1
3	Mount Ephraim Girl's Softball Fields ROW	4.0 / 2.8	4.0 / 2.8
3a	Waterfront Access Path, East	6.6 / 4.6	6.7 / 4.7
4	I-76 NB ROW (King's Highway)	6.7 / 4.7	6.9 / 4.8
5	I-76 NB ROW (Spruce Avenue)	7.5 / 5.3	7.5 / 5.3
6	I-76 SB ROW (Chestnut Avenue)	7.1 / 5.0	7.1 / 5.0
7	Mount Ephraim Senior Housing ROW	4.3 / 3.0	4.3 / 3.0
7a	Waterfront Access Path, West	6.0 / 5.2	6.1 / 5.3
8	Annunciation B.V.M. Church ROW	5.7 / 4.0	5.8 / 4.1
9	Annunciation Regional School Playground	4.4 / 3.1	4.4 / 3.1
10	Bellmawr Park Mutual Housing ROW (Willow Place)	7.5 / 5.3	7.5 / 5.3
11	Bellmawr Park Mutual Housing ROW (Victory Drive)	6.6 / 4.6	6.7 / 4.7
12	Bellmawr Park Elementary School BB Field ROW	6.4 / 4.5	6.4 / 4.5
13	Bellmawr Park Elementary School	5.0 / 3.5	5.0 / 3.5
14	Bellmawr Baseball League Fields ROW	6.3 / 4.4	6.3 / 4.4
15	I-295 SB ROW (Essex Avenue)	4.9 / 3.4	5.0 / 3.5
16	I-295 SB ROW (Creek Road)	5.0 / 3.5	4.9 / 3.4
17	I-295 NB ROW (Creek Road)	6.2 / 4.3	6.3 / 4.4
18	I-295 NB ROW (Ramp E)	5.5 / 3.9	5.5 / 3.9
19	Route 42 NB ROW (Ramp E)	6.6 / 4.6	6.7 / 4.7
20	Bellmawr Park Mutual Housing ROW (Fir Place)	7.1 / 5.0	7.3 / 5.1
21	New St. Mary's Cemetery Mausoleum Walkway	6.1 / 4.3	6.2 / 4.3
22	New St. Mary's Cemetery ROW	5.0 / 3.5	5.0 / 3.5
23	I-295 NB ROW (Kennedy Road)	5.7 / 4.0	5.7 / 4.0
24	Scott E. Mueller Park	4.2 / 2.9	4.3 / 3.0
25	I-295 NB ROW (Snyder Avenue)	**7.6 / 5.3**	**7.5 / 5.3**

ROW: proposed right-of-way line
Bold values represent maximum predicted CO concentrations

#6 [7.1][7.1] (5.0)(5.0)

#7a [6.0][6.1] (5.2)(5.3)

#7 [4.3][4.3] (3.0)(3.0)

#8 [5.7][5.8] (4.0)(4.1)

#9 [4.4][4.4] (3.1)(3.1)

#10 [7.5][7.5] (5.3)(5.3)

#11 [6.6][6.7] (4.6)(4.7)

#12 [6.4][6.4] (4.5)(4.5)

#13 [5.0][5.0] (3.5)(3.5)

#14 [6.3][6.3] (4.4)(4.4)

#15 [4.9][5.0] (3.4)(3.5)

#16 [5.0][4.9] (3.5)(3.4)

#17 [6.2][6.3] (4.3)(4.4)

#5 [7.5][7.5] (5.3)(5.3)

#4 [6.7][6.9] (4.7)(4.8)

#3a [6.6][6.7] (4.6)(4.7)

#3 [4.0][4.0] (2.8)(2.8)

#2 [4.4][4.4] (3.1)(3.1)

#1 [4.5][4.5] (3.2)(3.2)

#22 [5.0][5.0] (3.5)(3.5)

#21 [6.1][6.2] (4.3)(4.3)

#20 [7.1][7.3] (5.0)(5.1)

#19 [6.6][6.7] (4.6)(4.7)

#18 [5.5][5.5] (3.9)(3.9)

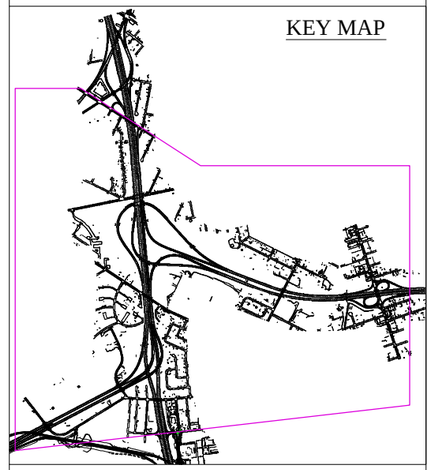
#23 [5.7][5.7] (4.0)(4.0)

#24 [4.2][4.3] (2.9)(3.0)

#25 [7.6][7.5] (5.3)(5.3)

PROJECT NORTH

KEY MAP



LEGEND

Figure generated utilizing peak AM and PM concentrations, in units of ppm (parts per million)

⊗ Carbon Monoxide Receptor Location

[ ] Peak 1-hour CO Concentration With NJDOT Missing Moves Project

( ) Peak 8-hour CO Concentration With NJDOT Missing Moves Project

[ ] Peak 1-hour CO Concentration Without NJDOT Missing Moves Project

( ) Peak 8-hour CO Concentration Without NJDOT Missing Moves Project

Proposed Improvements

Proposed Waterfront Access Path

Structure Limits

0 425 850 1700 Feet

New Jersey Department of Transportation

I-295 / I-76 / Route 42 Direct Connection Camden County

Figure 10

2030 "Aternative D" CO Concentrations

Date	May 4, 2007	Page 5-4

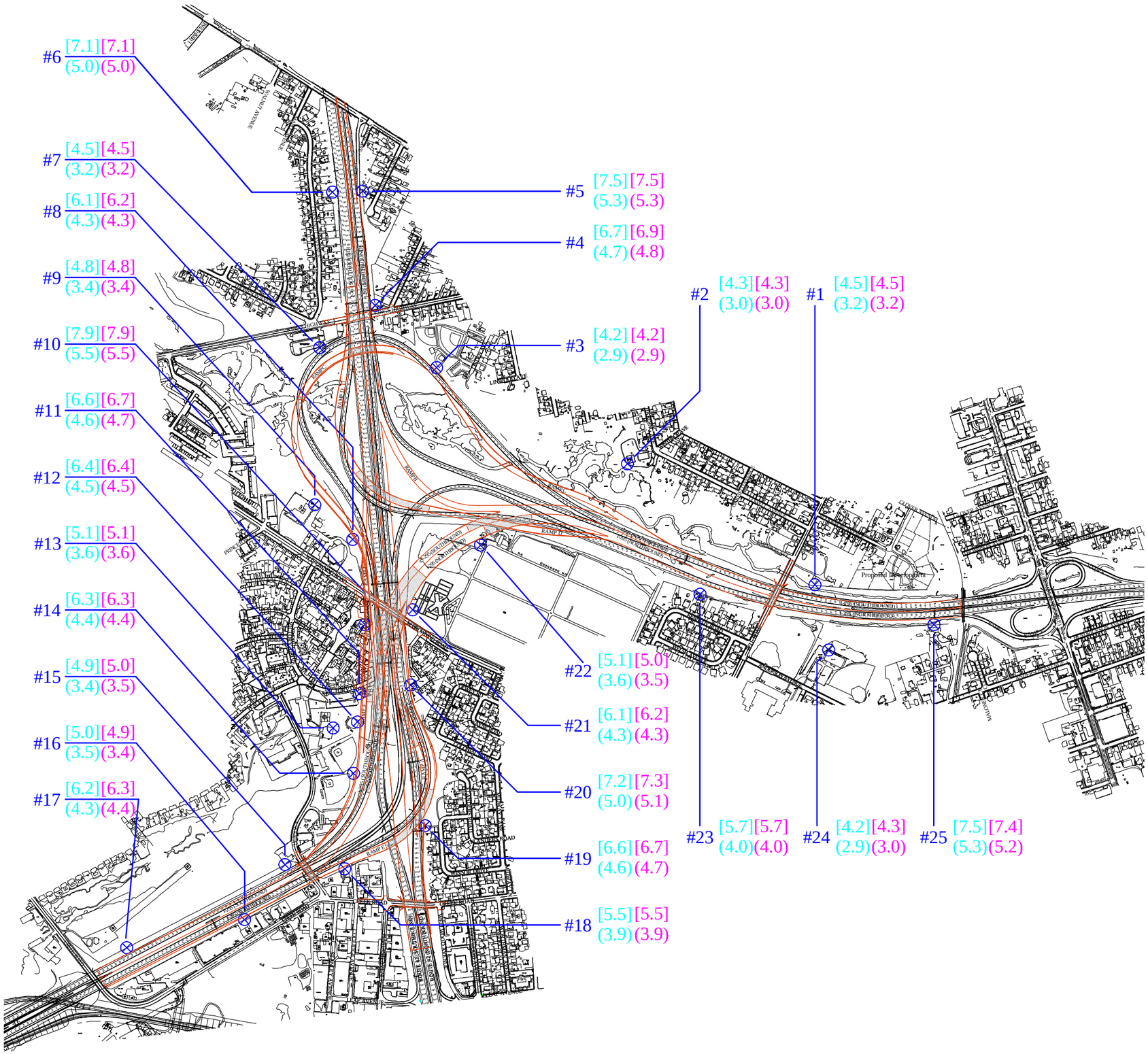
5.2.2 Alternative D1

Under the 2030 "Alternative D1" condition, peak concentrations were documented at Receptor #10, which is located along the I-295 southbound right-of-way line and represents the Bellmawr Park Mutual Housing Development near Willow Place. The highest concentrations of 7.9 ppm (one-hour) and 5.5 ppm (eight hour) were predicted with and without construction of the NJDOT Missing Moves project. Table 7 and Figure 11 detail the maximum concentration, which includes background levels, at each receptor. Under the 2030 "Alternative D1" AM and PM peak traffic conditions, receptors are not predicted to exceed the one, or eight-hour NAAQS set forth.

TABLE 7 – 2030 "ALTERNATIVE D1"
PEAK 1 & 8-HOUR CARBON MONOXIDE (CO) CONCENTRATIONS (ppm)

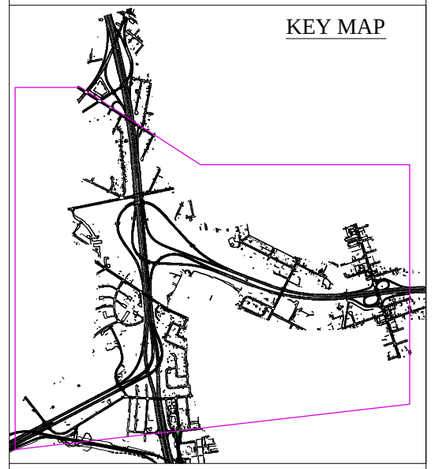
Receptor Number	Receptor Location	Peak Concentration With Missing Moves (1hr/8hr)	Peak Concentration Without Missing Moves (1hr/8hr)
1	I-295 SB ROW (Bell Road)	4.5 / 3.2	4.5 / 3.2
2	Shining Star Park	4.3 / 3.0	4.3 / 3.0
3	Mount Ephraim Girl's Softball Fields ROW	4.2 / 2.9	4.2 / 2.9
4	I-76 NB ROW (King's Highway)	6.7 / 4.7	6.9 / 4.8
5	I-76 NB ROW (Spruce Avenue)	7.5 / 5.3	7.5 / 5.3
6	I-76 SB ROW (Chestnut Avenue)	7.1 / 5.0	7.1 / 5.0
7	Mount Ephraim Senior Housing ROW	4.5 / 3.2	4.5 / 3.2
8	Annunciation B.V.M. Church ROW	6.1 / 4.3	6.2 / 4.3
9	Annunciation Regional School Playground	4.8 / 3.4	4.8 / 3.4
10	Bellmawr Park Mutual Housing ROW (Willow Place)	**7.9 / 5.5**	**7.9 / 5.5**
11	Bellmawr Park Mutual Housing ROW (Victory Drive)	6.6 / 4.6	6.7 / 4.7
12	Bellmawr Park Elementary School BB Field ROW	6.4 / 4.5	6.4 / 4.5
13	Bellmawr Park Elementary School	5.1 / 3.6	5.1 / 3.6
14	Bellmawr Baseball League Fields ROW	6.3 / 4.4	6.3 / 4.4
15	I-295 SB ROW (Essex Avenue)	4.9 / 3.4	5.0 / 3.5
16	I-295 SB ROW (Creek Road)	5.0 / 3.5	4.9 / 3.4
17	I-295 NB ROW (Creek Road)	6.2 / 4.3	6.3 / 4.4
18	I-295 NB ROW (Ramp E)	5.5 / 3.9	5.5 / 3.9
19	Route 42 NB ROW (Ramp E)	6.6 / 4.6	6.7 / 4.7
20	Bellmawr Park Mutual Housing ROW (Fir Place)	7.2 / 5.0	7.3 / 5.1
21	New St. Mary's Cemetery Mausoleum Walkway	6.1 / 4.3	6.2 / 4.3
22	New St. Mary's Cemetery ROW	5.1 / 3.6	5.0 / 3.5
23	I-295 NB ROW (Kennedy Road)	5.7 / 4.0	5.7 / 4.0
24	Scott E. Mueller Park	4.2 / 2.9	4.3 / 3.0
25	I-295 NB ROW (Snyder Avenue)	7.5 / 5.3	7.4 / 5.2

ROW: proposed right-of-way line
Bold values represent maximum predicted CO concentrations



PROJECT NORTH

KEY MAP



LEGEND

Figure generated utilizing peak AM and PM concentrations, in units of ppm (parts per million)

⊗ Carbon Monoxide Receptor Location

[ ] Peak 1-hour CO Concentration With NJDOT Missing Moves Project

( ) Peak 8-hour CO Concentration With NJDOT Missing Moves Project

[ ] Peak 1-hour CO Concentration Without NJDOT Missing Moves Project

( ) Peak 8-hour CO Concentration Without NJDOT Missing Moves Project

Proposed Improvements

Proposed Waterfront Access Path

Structure Limits

0 425 850 1700 Feet

New Jersey Department of Transportation

I-295 / I-76 / Route 42 Direct Connection Camden County

Figure 11

2030 "Aternative D1" CO Concentrations

Date	May 4, 2007	Page 5-6

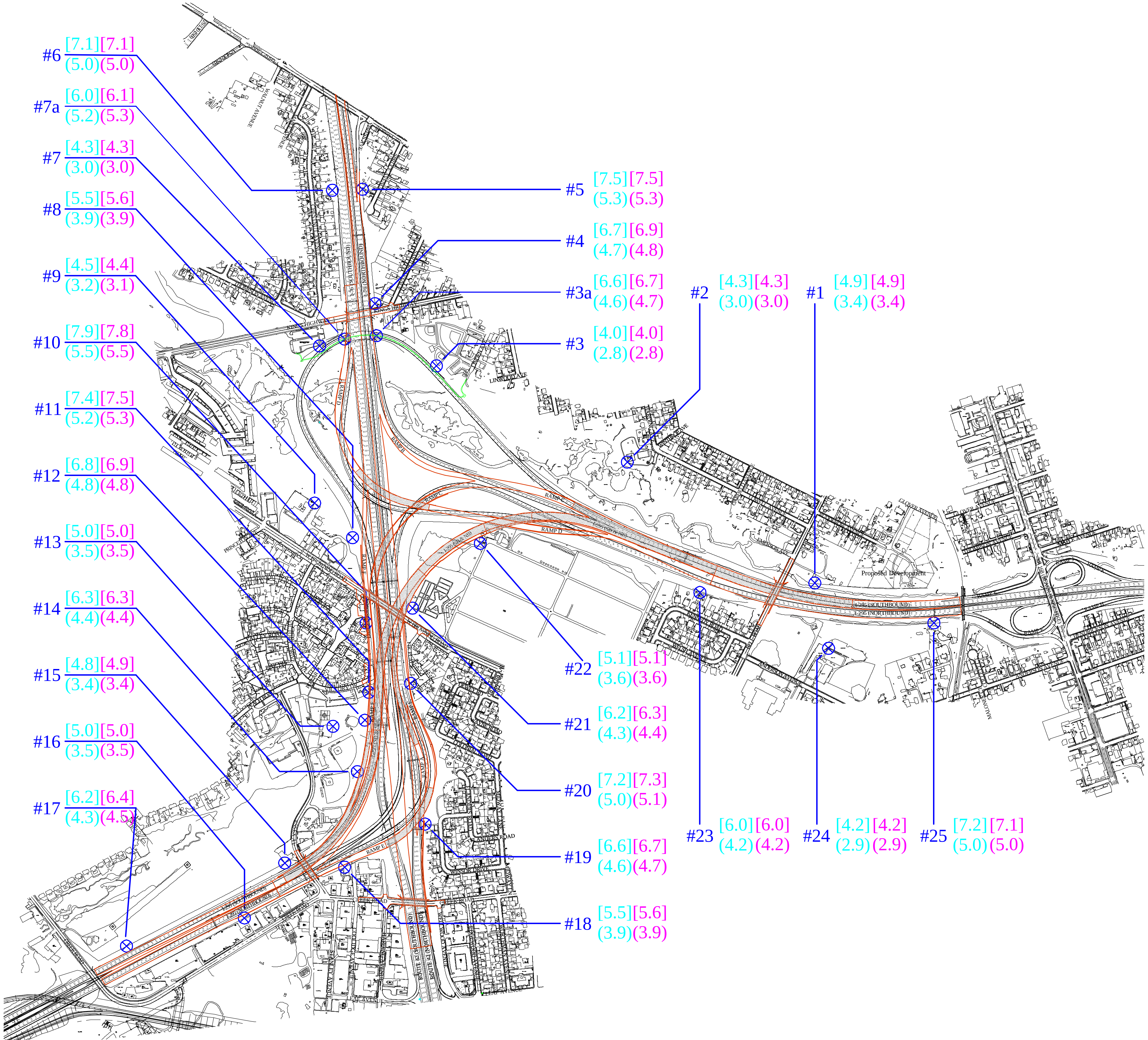
5.2.3 Alternative G2

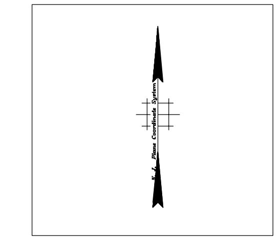
Under the 2030 "Alternative G2" condition, peak concentrations were documented at Receptor #10, which is located along the I-295 southbound right-of-way line and represents the Bellmawr Park Mutual Housing Development near Willow Place. The highest concentration of 7.9 ppm (one-hour) and 5.5 ppm (eight-hour) were predicted with construction of the NJDOT Missing Moves project. Peak concentrations of 7.8 ppm (one-hour) and 5.5 ppm (eight-hour) were predicted without the NJDOT Missing Moves project. Table 8 and Figure 12 detail the maximum concentrations, which includes background levels, at each receptor. Under the 2030 "Alternative G2" AM and PM peak traffic conditions, receptors are not predicted to exceed the one, or eight-hour NAAQS set forth.

TABLE 8 – 2030 "ALTERNATIVE G2"
PEAK 1 & 8-HOUR CARBON MONOXIDE (CO) CONCENTRATIONS (ppm)

Receptor Number	Receptor Location	Peak Concentration With Missing Moves (1hr/8hr)	Peak Concentration Without Missing Moves (1hr/8hr)
1	I-295 SB ROW (Bell Road)	4.9 / 3.4	4.9 / 3.4
2	Shining Star Park	4.3 / 3.0	4.3 / 3.0
3	Mount Ephraim Girl's Softball Fields ROW	4.0 / 2.8	4.0 / 2.8
3a	Waterfront Access Path, East	6.6 / 4.6	6.7 / 4.7
4	I-76 NB ROW (King's Highway)	6.7 / 4.7	6.9 / 4.8
5	I-76 NB ROW (Spruce Avenue)	7.5 / 5.3	7.5 / 5.3
6	I-76 SB ROW (Chestnut Avenue)	7.1 / 5.0	7.1 / 5.0
7	Mount Ephraim Senior Housing ROW	4.3 / 3.0	4.3 / 3.0
7a	Waterfront Access Path, West	6.0 / 5.2	6.1 / 5.3
8	Annunciation B.V.M. Church ROW	5.5 / 3.9	5.6 / 3.9
9	Annunciation Regional School Playground	4.5 / 3.2	4.4 / 3.1
10	Bellmawr Park Mutual Housing ROW (Willow Place)	**7.9 / 5.5**	**7.8 / 5.5**
11	Bellmawr Park Mutual Housing ROW (Victory Drive)	7.4 / 5.2	7.5 / 5.3
12	Bellmawr Park Elementary School BB Field ROW	6.8 / 4.8	6.9 / 4.8
13	Bellmawr Park Elementary School	5.0 / 3.5	5.0 / 3.5
14	Bellmawr Baseball League Fields ROW	6.3 / 4.4	6.3 / 4.4
15	I-295 SB ROW (Essex Avenue)	4.8 / 3.4	4.9 / 3.4
16	I-295 SB ROW (Creek Road)	5.0 / 3.5	5.0 / 3.5
17	I-295 NB ROW (Creek Road)	6.2 / 4.3	6.4 / 4.5
18	I-295 NB ROW (Ramp E)	5.5 / 3.9	5.6 / 3.9
19	Route 42 NB ROW (Ramp E)	6.6 / 4.6	6.7 / 4.7
20	Bellmawr Park Mutual Housing ROW (Fir Place)	7.2 / 5.0	7.3 / 5.1
21	New St. Mary's Cemetery Mausoleum Walkway	6.2 / 4.3	6.3 / 4.4
22	New St. Mary's Cemetery ROW	5.1 / 3.6	5.1 / 3.6
23	I-295 NB ROW (Kennedy Road)	6.0 / 4.2	6.0 / 4.2
24	Scott E. Mueller Park	4.2 / 2.9	4.2 / 2.9
25	I-295 NB ROW (Snyder Avenue)	7.2 / 5.0	7.1 / 5.0

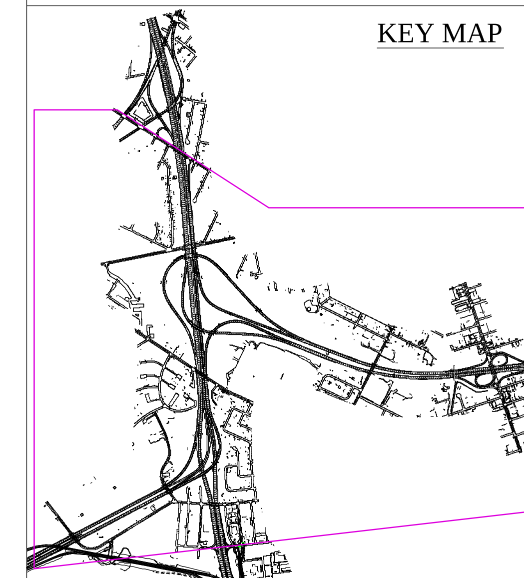
ROW: proposed right-of-way line
Bold values represent maximum predicted CO concentrations





PROJECT NORTH

KEY MAP



LEGEND

Figure generated utilizing peak AM and PM concentrations, in units of ppm (parts per million)

- Carbon Monoxide Receptor Location
- [ ] Peak 1-hour CO Concentration With NJDOT Missing Moves Project
- ( ) Peak 8-hour CO Concentration With NJDOT Missing Moves Project
- [ ] Peak 1-hour CO Concentration Without NJDOT Missing Moves Project
- ( ) Peak 8-hour CO Concentration Without NJDOT Missing Moves Project
- Proposed Improvements
- Proposed Waterfront Access Path
- Structure Limits

0 425 850 1700 Feet

New Jersey Department of Transportation

I-295 / I-76 / Route 42 Direct Connection Camden County

Figure 12

2030 "Aternative G2" CO Concentrations

Date	May 4, 2007	Page 5-8

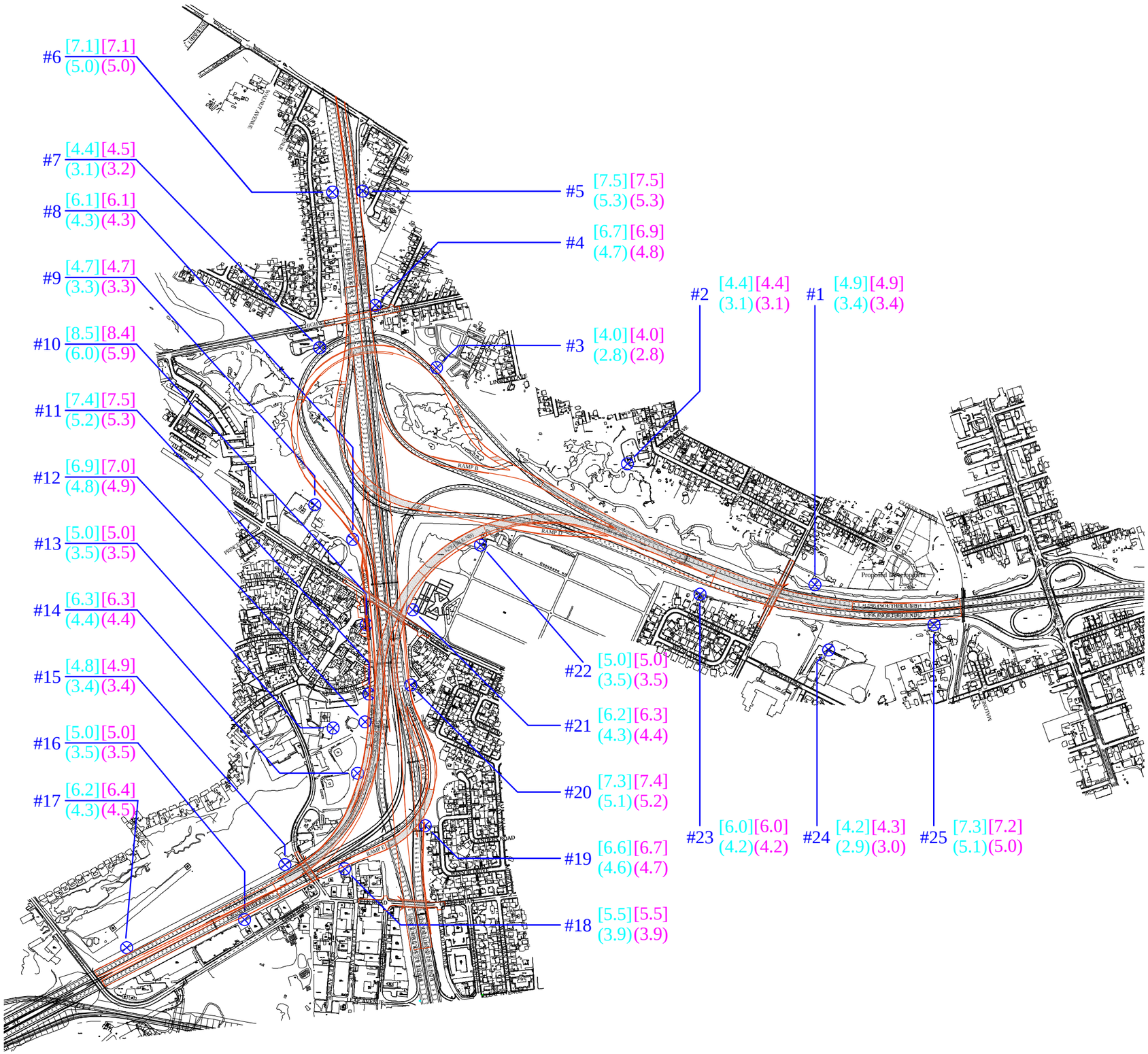
5.2.4 Alternative H1

Under the 2030 "Alternative H1" condition, peak concentrations were documented at Receptor #10, which is located along the I-295 southbound right-of-way line and represents the Bellmawr Park Mutual Housing Development near Willow Place. Peak concentrations of 8.5 ppm (one-hour) and 6.0 ppm (eight-hour) were predicted with construction of the NJDOT Missing Moves project, while peak concentrations of 8.4 ppm (one-hour) and 5.9 ppm (eight-hour) were predicted without construction of the NJDOT Missing Moves project. Table 9 and Figure 13 detail the maximum concentrations, which includes background levels, at each receptor. Under the 2030 "Alternative H1" AM and PM peak traffic conditions, receptors are not predicted to exceed the one, or eight-hour NAAQS set forth.

TABLE 9 – 2030 "ALTERNATIVE H1"
PEAK 1 & 8-HOUR CARBON MONOXIDE (CO) CONCENTRATIONS (ppm)

Receptor Number	Receptor Location	Peak Concentration With Missing Moves (1hr/8hr)	Peak Concentration Without Missing Moves (1hr/8hr)
1	I-295 SB ROW (Bell Road)	4.9 / 3.4	4.9 / 3.4
2	Shining Star Park	4.4 / 3.1	4.4 / 3.1
3	Mount Ephraim Girl's Softball Fields ROW	4.0 / 2.8	4.0 / 2.8
4	I-76 NB ROW (King's Highway)	6.7 / 4.7	6.9 / 4.8
5	I-76 NB ROW (Spruce Avenue)	7.5 / 5.3	7.5 / 5.3
6	I-76 SB ROW (Chestnut Avenue)	7.1 / 5.0	7.1 / 5.0
7	Mount Ephraim Senior Housing ROW	4.4 / 3.1	4.5 / 3.2
8	Annunciation B.V.M. Church ROW	6.1 / 4.3	6.1 / 4.3
9	Annunciation Regional School Playground	4.7 / 3.3	4.7 / 3.3
10	Bellmawr Park Mutual Housing ROW (Willow Place)	**8.5 / 6.0**	**8.4 / 5.9**
11	Bellmawr Park Mutual Housing ROW (Victory Drive)	7.4 / 5.2	7.5 / 5.3
12	Bellmawr Park Elementary School BB Field ROW	6.9 / 4.8	7.0 / 4.9
13	Bellmawr Park Elementary School	5.0 / 3.5	5.0 / 3.5
14	Bellmawr Baseball League Fields ROW	6.3 / 4.4	6.3 / 4.4
15	I-295 SB ROW (Essex Avenue)	4.8 / 3.4	4.9 / 3.4
16	I-295 SB ROW (Creek Road)	5.0 / 3.5	5.0 / 3.5
17	I-295 NB ROW (Creek Road)	6.2 / 4.3	6.4 / 4.5
18	I-295 NB ROW (Ramp E)	5.5 / 3.9	5.5 / 3.9
19	Route 42 NB ROW (Ramp E)	6.6 / 4.6	6.7 / 4.7
20	Bellmawr Park Mutual Housing ROW (Fir Place)	7.3 / 5.1	7.4 / 5.2
21	New St. Mary's Cemetery Mausoleum Walkway	6.2 / 4.3	6.3 / 4.4
22	New St. Mary's Cemetery ROW	5.0 / 3.5	5.0 / 3.5
23	I-295 NB ROW (Kennedy Road)	6.0 / 4.2	6.0 / 4.2
24	Scott E. Mueller Park	4.2 / 2.9	4.3 / 3.0
25	I-295 NB ROW (Snyder Avenue)	7.3 / 5.1	7.2 / 5.0

ROW: proposed right-of-way line
Bold values represent maximum predicted CO concentrations



PROJECT NORTH

KEY MAP

LEGEND

Figure generated utilizing peak AM and PM concentrations, in units of ppm (parts per million)

⊗ Carbon Monoxide Receptor Location

[ ] Peak 1-hour CO Concentration With NJDOT Missing Moves Project

( ) Peak 8-hour CO Concentration With NJDOT Missing Moves Project

[ ] Peak 1-hour CO Concentration Without NJDOT Missing Moves Project

( ) Peak 8-hour CO Concentration Without NJDOT Missing Moves Project

Proposed Improvements

Proposed Waterfront Access Path

Structure Limits

0 425 850 1700 Feet

New Jersey Department of Transportation

I-295 / I-76 / Route 42 Direct Connection Camden County

Figure 13

2030 "Aternative H1" CO Concentrations

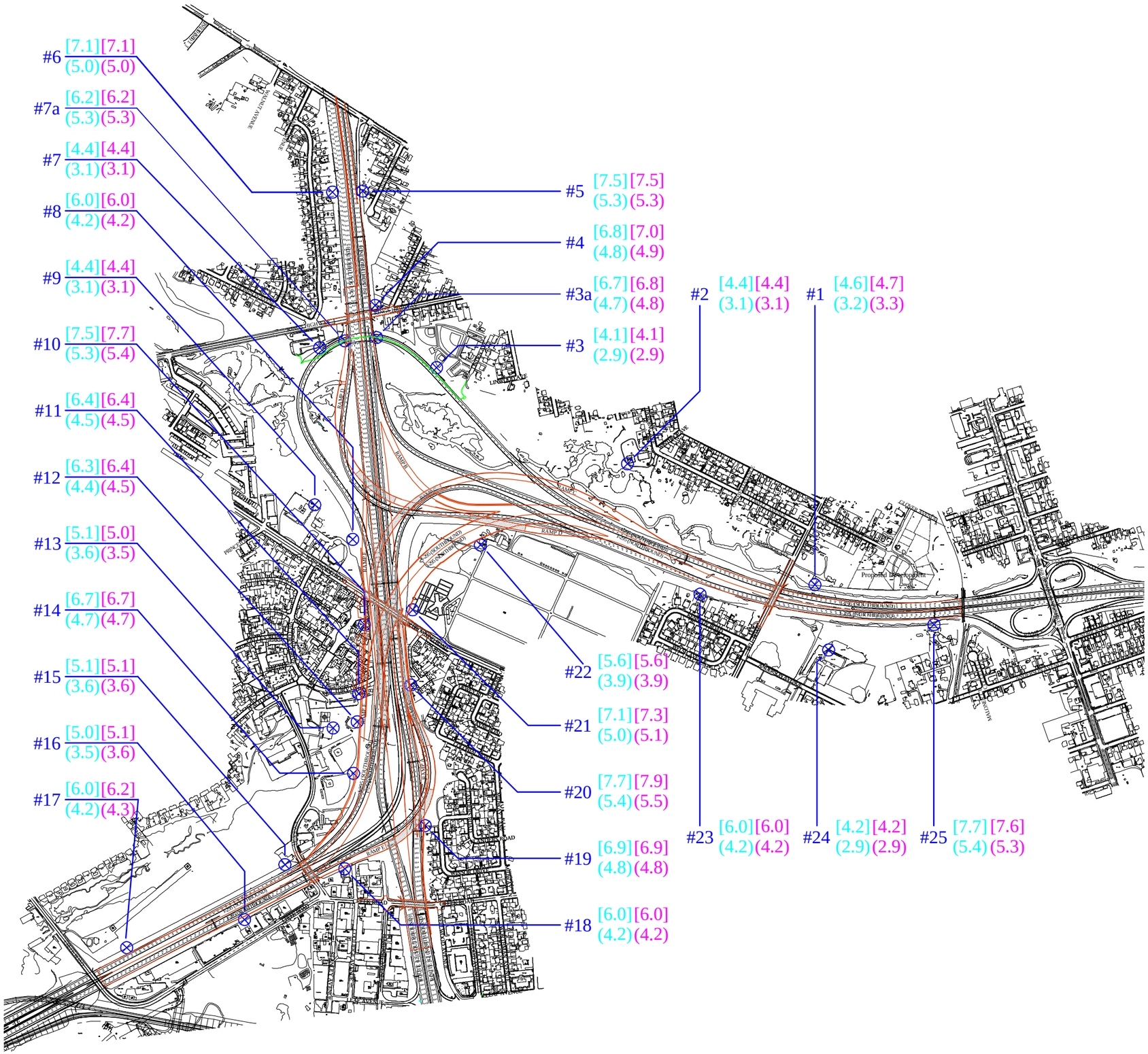
5.2.5 Alternative K

Under the 2030 "Alternative K" condition, peak concentrations were documented at Receptor #20, due to roadway and tunnel contributions. This receptor is located along the I-295 northbound right-of-way line, representing the Bellmawr Park Mutual Housing Development near Fir Place. Peak concentrations of 7.7 ppm (one-hour) and 5.4 ppm (eight-hour) were predicted assuming construction of the NJDOT Missing Moves project. Peak concentrations of 7.9 ppm (one-hour) and 5.5 ppm (eight-hour) were predicted without construction of the NJDOT Missing Moves project. Table 10 and Figure 14 detail the maximum concentrations, which includes background levels, at each receptor. Under the 2030 "Alternative K" AM and PM peak traffic conditions, receptors are not predicted to exceed the one, or eight-hour NAAQS set forth.

TABLE 10 – 2030 "ALTERNATIVE K"
PEAK 1 & 8-HOUR CARBON MONOXIDE (CO) CONCENTRATIONS (ppm)

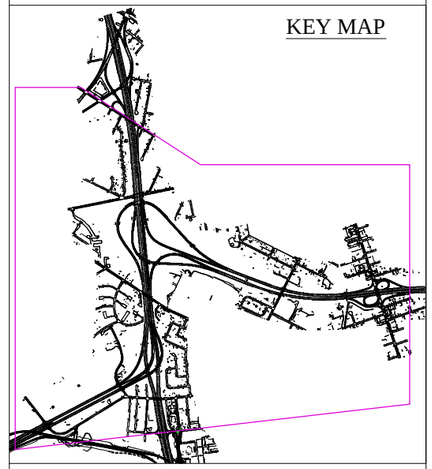
Receptor Number	Receptor Location	Peak Concentration With Missing Moves (1hr/8hr)	Peak Concentration Without Missing Moves (1hr/8hr)
1	I-295 SB ROW (Bell Road)	4.6 / 3.2	4.7 / 3.3
2	Shining Star Park	4.4 / 3.1	4.4 / 3.1
3	Mount Ephraim Girl's Softball Fields ROW	4.1 / 2.9	4.1 / 2.9
3a	Waterfront Access Path, East	6.7 / 4.7	6.8 / 4.8
4	I-76 NB ROW (King's Highway)	6.8 / 4.8	7.0 / 4.9
5	I-76 NB ROW (Spruce Avenue)	7.5 / 5.3	7.5 / 5.3
6	I-76 SB ROW (Chestnut Avenue)	7.1 / 5.0	7.1 / 5.0
7	Mount Ephraim Senior Housing ROW	4.4 / 3.1	4.4 / 3.1
7a	Waterfront Access Path, West	6.2 / 5.3	6.2 / 5.3
8	Annunciation B.V.M. Church ROW	6.0 / 4.2	6.0 / 4.2
9	Annunciation Regional School Playground	4.4 / 3.1	4.4 / 3.1
10	Bellmawr Park Mutual Housing ROW (Willow Place)	7.5 / 5.3	7.7 / 5.4
11	Bellmawr Park Mutual Housing ROW (Victory Drive)	6.4 / 4.5	6.4 / 4.5
12	Bellmawr Park Elementary School BB Field ROW	6.3 / 4.4	6.4 / 4.5
13	Bellmawr Park Elementary School	5.1 / 3.6	5.0 / 3.5
14	Bellmawr Baseball League Fields ROW	6.7 / 4.7	6.7 / 4.7
15	I-295 SB ROW (Essex Avenue)	5.1 / 3.6	5.1 / 3.6
16	I-295 SB ROW (Creek Road)	5.0 / 3.5	5.1 / 3.6
17	I-295 NB ROW (Creek Road)	6.0 / 4.2	6.2 / 4.3
18	I-295 NB ROW (Ramp E)	6.0 / 4.2	6.0 / 42
19	Route 42 NB ROW (Ramp E)	6.9 / 4.8	6.9 / 4.8
20	Bellmawr Park Mutual Housing ROW (Fir Place)	**7.7 / 5.4**	**7.9 / 5.5**
21	New St. Mary's Cemetery Mausoleum Walkway	7.1 / 5.0	7.3 / 5.1
22	New St. Mary's Cemetery ROW	5.6 / 3.9	5.6 / 3.9
23	I-295 NB ROW (Kennedy Road)	6.0 / 4.2	6.0 / 4.2
24	Scott E. Mueller Park	4.2 / 2.9	4.2 / 2.9
25	I-295 NB ROW (Snyder Avenue)	7.7 / 5.4	7.6 / 5.3

ROW: proposed right-of-way line
Bold values represent maximum predicted CO concentrations



PROJECT NORTH

KEY MAP



LEGEND

Figure generated utilizing peak AM and PM concentrations, in units of ppm (parts per million)

⊗ Carbon Monoxide Receptor Location

[ ] Peak 1-hour CO Concentration With NJDOT Missing Moves Project

( ) Peak 8-hour CO Concentration With NJDOT Missing Moves Project

[ ] Peak 1-hour CO Concentration Without NJDOT Missing Moves Project

( ) Peak 8-hour CO Concentration Without NJDOT Missing Moves Project

Proposed Improvements

Proposed Waterfront Access Path

Structure Limits

0 425 850 1700 Feet

New Jersey Department of Transportation

I-295 / I-76 / Route 42 Direct Connection Camden County

Figure 14

2030 "Aternative K" CO Concentrations

6.0 CONCLUSION

6.1 CO

As discussed previously, to assess the impact of this particular project, a carbon monoxide analysis was performed and appropriate background levels were added. Total maximum 2030 "No-Build" and "Build" carbon monoxide concentrations predicted at each receptor for a one-hour period, are shown in Table 11.

TABLE 11
1-HOUR CO CONCENTRATIONS (ppm)
2030 "NO-BUILD" AND 2030 "BUILD" (ALTERNATIVES D, D1, G2, H1, K)

Receptor Location	Peak Concentration With Missing Moves (1 hr)					
	No-Build	Alt. D	Alt. D1	Alt. G2	Alt. H1	Alt. K
1	4.9	4.5	4.5	4.9	4.9	4.6
2	4.0	4.4	4.3	4.3	4.4	4.4
3	6.1	4.0	4.2	4.0	4.0	4.1
3a	-	6.6	-	6.6	-	6.7
4	6.7	6.7	6.7	6.7	6.7	6.8
5	7.4	7.5	7.5	7.5	7.5	7.5
6	**8.6**	7.1	7.1	7.1	7.1	7.1
7	6.3	4.3	4.5	4.3	4.4	4.4
7a	-	6.0	-	6.0	-	6.2
8	5.3	5.7	6.1	5.5	6.1	6.0
9	4.6	4.4	4.8	4.5	4.7	4.4
10	6.1	7.5	**7.9**	**7.9**	**8.5**	7.5
11	7.1	6.6	6.6	7.4	7.4	6.4
12	7.0	6.4	6.4	6.8	6.9	6.3
13	4.4	5.0	5.1	5.0	5.0	5.1
14	5.6	6.3	6.3	6.3	6.3	6.7
15	5.0	4.9	4.9	4.8	4.8	5.1
16	4.7	5.0	5.0	5.0	5.0	5.0
17	5.3	6.2	6.2	6.2	6.2	6.0
18	5.2	5.5	5.5	5.5	5.5	6.0
19	7.3	6.6	6.6	6.6	6.6	6.9
20	6.7	7.1	7.2	7.2	7.3	**7.7**
21	5.4	6.1	6.1	6.2	6.2	7.1
22	4.6	5.0	5.1	5.1	5.0	5.6
23	5.4	5.7	5.7	6.0	6.0	6.0
24	4.0	4.2	4.2	4.2	4.2	4.2
25	6.6	**7.6**	7.5	7.2	7.3	**7.7**

Bold values represent maximum predicted CO concentrations

When comparing the 2030 "No-Build" to the 2030 "Build" Alternatives D, D1, G2, H1 and K, some CO concentrations increase while others decrease. Decreases in predicted CO concentrations under the "Build" alternatives are mainly due to improved roadway operations. On the contrary, an increase in "Build" concentrations over "No-Build" is not caused by a decline of roadway operations, but rather by the fact that the roadway alignment may shift closer to the right-of-way line, and thus the receptor location. Nonetheless, all future 2030 alternatives ("No-Build", D, D1, G2, H1 and K), with and without the NJDOT Missing Moves project document one-hour CO concentrations below the NAAQS, and therefore no mitigation is necessary. Total maximum 2030 "No-Build" and "Build" carbon monoxide concentrations predicted at each receptor for an eight-hour period, are shown in Table 12.

TABLE 12
8-HOUR CO CONCENTRATIONS (ppm)
2030 "NO-BUILD" AND 2030 "BUILD" (ALTERNATIVES D, D1, G2, H1, K)

Receptor Location	Peak Concentration With Missing Moves (8 hr)					
	No-Build	Alt. D	Alt. D1	Alt. G2	Alt. H1	Alt. K
1	3.4	3.2	3.2	3.4	3.4	3.2
2	2.8	3.1	3.0	3.0	3.1	3.1
3	4.3	2.8	2.9	2.8	2.8	2.9
3a	-	4.6	-	4.6	-	4.7
4	4.7	4.7	4.7	4.7	4.7	4.8
5	5.2	**5.3**	5.3	5.3	5.3	5.3
6	**6.0**	5.0	5.0	5.0	5.0	5.0
7	4.4	3.0	3.2	3.0	3.1	3.1
7a	-	5.2	-	5.2	-	5.3
8	3.7	4.0	4.3	3.9	4.3	4.2
9	3.2	3.1	3.4	3.2	3.3	3.1
10	4.3	**5.3**	**5.5**	**5.5**	**6.0**	5.3
11	5.0	4.6	4.6	5.2	5.2	4.5
12	4.9	4.5	4.5	4.8	4.8	4.4
13	3.1	3.5	3.6	3.5	3.5	3.6
14	3.9	4.4	4.4	4.4	4.4	4.7
15	3.5	3.4	3.4	3.4	3.4	3.6
16	3.3	3.5	3.5	3.5	3.5	3.5
17	3.7	4.3	4.3	4.3	4.3	4.2
18	3.6	3.9	3.9	3.9	3.9	4.2
19	5.1	4.6	4.6	4.6	4.6	4.8
20	4.7	5.0	5.0	5.0	5.1	**5.4**
21	3.8	4.3	4.3	4.3	4.3	5.0
22	3.2	3.5	3.6	3.6	3.5	3.9
23	3.8	4.0	4.0	4.2	4.2	4.2
24	2.8	2.9	2.9	2.9	2.9	2.9
25	4.6	**5.3**	5.3	5.0	5.1	**5.4**

Bold values represent maximum predicted CO concentrations

The eight-hour CO concentrations, with and without the NJDOT Missing Moves, predicted for all future 2030 alternatives ("No-Build", D, D1, G2, H1 and K) are below the NAAQS, and therefore no mitigation is necessary.

As discussed in Part D, Section 176 (Limitation on certain federal assistance) of the Clean Air Act Amendments of 1990, a proposed project cannot:

(1) - cause or contribute of any new violation of any standard in any area;
(2) - increase the frequency or severity of any existing violation of any standard in any area; or
(3) - delay the timely attainment of any standard or any required interim emission reductions or other milestones in any area.

As a result of this project, all one-hour concentrations were predicted to be below the 35 ppm standard. In addition, all eight-hour concentrations were predicted to be below the 9 ppm standard. Therefore, this project conforms to the Clean Air Act Amendments.

6.2 $PM_{2.5}$

Based on project improvements, all "Build" alternatives propose a physically separated I-295 through movement from I-76/Route 42 roadway network. As suggested in 40 CFR 93.123(b)(i) and (ii), "Build" alternatives such as D, D1, G2, H1 and K would have no air quality concern with respect to $PM_{2.5}$ concentrations due to overall improved speeds.

6.3 Mobile Source Air Toxics

Projected 2030 "Build" VMTs for each alternative are predicted to increase (22.5%) over 2030 "No-Build". As stated within the FHWA guidance document, MSATs are expected to decline unless VMTs more than double by 2020. Regionally, reductions in MSATs are expected over time due to EPA's vehicle and fuel regulations along with fleet turnover.

6.4 Conformity Determination

The USEPA promulgated the TCR under the CAAA, effective December 27, 1993 with recent revisions. The TCR provides criteria and procedures for determining conformity to SIPs of transportation plans, programs and projects funded or approved under Title 23 U.S.C. or the Federal Transit Act. This project is located in a CO and PM_{10} attainment area and in an O_3 and $PM_{2.5}$ non-attainment area and hence conformity determination is required. The conformity requirements are as follows:

1. The project must originate from a conforming transportation plan and program.
2. In CO, $PM_{2.5}$ and PM_{10} non-attainment and maintenance areas, the project must eliminate or reduce the severity and number of violations of the NAAQS.

In 40 CFR Part 93, the USEPA amended the TCR to include new 8-hour O_3 and $PM_{2.5}$ NAAQS. On February 23, 2006, USEPA established project-level conformity determinations in $PM_{2.5}$ non-attainment and maintenance areas and revised the project-level determinations in PM_{10} areas. This rule requires $PM_{2.5}$ hot-spot analyses included in project-level conformity determinations when new transportation

projects with significant diesel traffic is proposed. Projects of air quality concern require a quantitative $PM_{2.5}$ analysis when located within $PM_{2.5}$ non-attainment or maintenance areas.

Transportation projects that originate from a conforming STIP are considered to conform to the rule. The I-295/I-76/Route 42-Direct Connection project is listed in the FY 2007-2010 STIP (Project ID No. 355). The results of this CO analysis documents that the CO levels will be below the one-hour (35 ppm) or the eight-hour (9 ppm) NAAQS. In addition, this project is not expected to create or worsen $PM_{2.5}$ or PM_{10} violations. Furthermore, MSAT emissions will likely be lower than present levels in the design year as a result of EPA's national control programs. Therefore, this project will comply with the conformity requirements established by the Clean Air Act Amendments of 1990.

7.0 CONSTRUCTION-RELATED MSAT IMPACTS

Construction of the I-295/I-76/Route 42 Direct Connection is expected over an extended period of time. Temporary increases in MSAT emission may be caused by construction activities. There are several strategies to mitigate construction-related MSATs including a new campaign created by USEPA to reduce pollution from diesel engines. The diesel retrofit technologies are volunteer-based for testing or verification of emission reductions for each technology. This cooperative program works toward reducing particulate matter and NO_x.

Operational agreements can also mitigate emissions to avoid community exposure by reducing the engine activity or shift times. Specific construction equipment can be retrofitted with devices that provide an after-treatment of exhaust emissions such as particulate matter traps and oxidation catalysts. Ultra-low sulfur diesel can also be a strategy with cost benefits.

It is recommended that ways to minimize these temporary impacts are investigated during Final Design.

8.0 COORDINATION WITH PUBLIC AGENCIES

Five Public Information Center (PIC) meetings have been held to date: April 24, 2002; July 24, 2003; January 28, 2004; November 30, 2004; and June 13, 2005. The purpose of these meetings was to introduce the project to the public and to discuss the process that must be followed in order to select a preferred alternative and achieve environmental compliance for the project. PIC meeting attendees included the general public; local elected officials and/or their representatives; FHWA; state and county agencies such as NJ Transit, NJDEP, Camden County Department of Public Works (DPW), Port Authority Transit Corporations (PATCO)/Delaware River Port Authority (DRPA), and South Jersey Transit Authority; utilities representatives; and board members of Bellmawr Park Mutual Housing Corporation. The project need, alternatives, design, construction, and environmental constraints (including air) were among the topics discussed during the meetings.

In addition to the PICs, nine Agency Coordination Meetings (ACMs) have been held to date on November 14, 2002; December 17, 2002, February 2, 2003; March 26, 2003; May 13, 2003; June 2, 2003; October 15, 2003; June 7, 2005; and June 13, 2006.

9.0 LIST OF PREPARERS

Sharon Paul Carpenter - Ms. Paul Carpenter is a senior project manager for Paul Carpenter Associates, Inc. She received a Bachelor of Science Degree in Meteorology from Rutgers University in 1985 and has been performing air quality studies since 1986. In her career, she has performed air quality studies for clients such as the NJDOT and the New Jersey Turnpike Authority/New Jersey Highway Authority. Ms. Paul Carpenter is certified by FHWA for use with the MOBILE6.2 and CAL3QHC models.

Jane Burns - Ms. Burns is a project manager for Paul Carpenter Associates, Inc. and is certified by FHWA in MOBILE6.2. She obtained a Bachelors of Science degree from Rutgers University in 2003 and is currently studying civil engineering at New Jersey Institute of Technology. Ms. Burns has four years experience performing air quality studies for NJDOT. Ms. Burns performed air quality modeling and project management duties throughout the project duration.

Sam Lin - Mr. Lin is an environmental scientist at Paul Carpenter Associates, Inc. with three years of air quality modeling experience. He received a Bachelor of Arts degree from Rutgers University in 1998 and a Masters of Art from Texas A&M University in 2003. He performed air quality modeling and quality assurance tasks throughout the project duration.

Garth Druckenmiller - Mr. Druckenmiller is a computer-aided design specialist at Paul Carpenter Associates, Inc. with over five years of air quality modeling experience. He is certified by FHWA in MOBILE6.2. He performed air quality modeling and drafting tasks throughout the project duration.

10.0 REFERENCES

1. New Jersey Department of Environmental Protection (NJDEP) November 2001. *Air Quality Analysis for Intersections.* Prepared by the Air Quality Permitting Program, Bureau of Air Quality Evaluation.

2. U.S. Department of Transportation, Federal Highway Administration, Title 23, Code of Federal Regulations Parts 770 and 771.

3. U.S. Environmental Protection Agency, Code of Federal Regulations 40, Part 50, *National Primary and Secondary Ambient Air Quality Standards.*

4. U.S. Environmental Protection Agency, August 2003. *User's Guide to MOBILE6.1 and MOBILE6.2, Mobile Source Emission Factor Model.* EPA420-R-03-010.

5. U.S. Environmental Protection Agency, November 1992b. *User's Guide to CAL3QHC: A Modeling Methodology for Predicting Pollutant Concentrations Near Roadway Intersections*. EPA454/R-92-006.

6. U.S. Environmental Protection Agency, November 1992c. *Guideline for Modeling Carbon Monoxide From Roadway Intersections.* EPA454/R-92-005.

7. U.S. Environmental Protection Agency, September 1995. *User's Guide for the Industrial Source Complex (ISC3) Dispersion Models.* EPA454/B-95-003a.

8. U.S. Environmental Protection Agency, Federal Highway Administration, March 2006. *Transportation Conformity Guidance for Qualitative Hot-spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas*. EPA420-B-06-902.

9. U.S. Environmental Protection Agency, 1990. *Amendment to Clean Air Act (S.1630, Section 109).*

10. U.S. Federal Highway Authority, February 2006. *Memorandum: Interim Guidance on Air Toxic Analysis in NEPA Documents.* <http://www.fhwa.dot.gov/ENVIRONMENT/airtoxic/020306guidemen.htm>

11.0 GLOSSARY

1. Air Pollution – The general term alluding to the undesirable addition to the atmosphere of substances (gases, liquids, and solid particles) that are either foreign to the atmosphere or in quantities exceeding their natural concentrations.

2. Air Quality – The composition of air with respect to quantities of pollutants therein used most frequently in connection with "standards" of maximum acceptable pollutant concentrations.

3. Ambient Air Quality Standards – Maximum allowable contaminant concentrations set by state and federal agencies to protect public health and welfare. The standards were developed to protect those people who are especially susceptible to the effects of air pollutants. These susceptible individuals are primarily the very old, the very young and those with cardiac insufficiencies, anemia and/or respiratory difficulties.

4. Average Travel Speed – The summation of distances traveled by all vehicles or a specified class of vehicles over a given section of highway during a specified period of time, divided by the summation of overall travel lanes.

5. Background Level – The concentration of a pollutant that would exist in the absence of the particular source under study.

6. Carbon Monoxide (CO) – A colorless gas, odorless under atmospheric conditions, having molecular form CO.

7. Cold Vehicle Operation – For non-catalysis vehicles, it is an engine startup at least four hours after the end of the preceding trip. For catalyst-equipped vehicles, it is an engine startup at least one hour after the end of the preceding trip.

8. Emission Factor – A pollutant discharge rate. For vehicles, an emission factor is the amount of a pollutant discharged over a distance traveled. Units are grams per mile.

9. Estimated Time of Completion (ETC) – The year that a particular proposed project is completed and opened to utilization.

10. Existing Air Quality – Present day or base year air quality levels.

11. Heavy Duty Trucks – Any motor vehicle designated primarily for the transportation of property and rated at more than 8,500 pounds gross vehicle weight or designated primarily for transportation of people and having a capacity of more than 12 persons.

12. Hot-Start Operation – Vehicle startup after less than the one-hour engine-off period.

13. Hydrocarbons (HC) – A collective term used to describe a long list of organic air contaminants. A major component in total hydrocarbons is methane, which is considered unreactive. Hydrocarbons, other than methane, are considered capable of entering into photochemical reaction and, therefore, are referred to as being reactive.

14. Instability – A state in which the vertical distribution of temperature is such that an air particle, if given either an upward or downward impulse, will tend to move away with increasing speed from its original level.

15. Light Duty Trucks – Any motor vehicle designated primarily for transportation of property and rated at 8,500 pounds gross vehicle weight or less.

16. Light Duty Vehicle – Any motor vehicle designated primarily for persons and having a capacity of 12 persons or less.

17. Meteorology – The study dealing with phenomena of the atmosphere.

18. Nitrogen Oxides (NO_x) – A highly toxic gas under atmospheric conditions, essentially nitric oxide (NO) and nitrogen dioxide (NO_2).

19. Peak Hour Traffic – The highest number of vehicles found to be passing over a section of a lane or roadway during 60 consecutive minutes of a designated year.

20. ppm – Parts per million

21. Stability - A state in which the vertical distribution of temperature is such that an air particle will resist displacement from its level.

22. Surface Atmospheric Stability – The tendency, near the ground surface, of the atmosphere to enhance vertical motions (instability) or to damp out vertical motions (stability).

23. Vehicle Operating Mode – A term used to describe the type of speed changes undergone by traveling vehicles. Operating modes are a reaction of acceleration and deceleration, periods of idle, and a steady state of cruise conditions that vehicles experience on a traffic facility.

APPENDIX A

Traffic Analysis (Volumes and Speeds)

I-295/I-76/Route 42 Direct Connection Project

Operational Comparison of No Build and Various Build Alternatives

2030 AM Peak WITH MISSING MOVES

Node Number	Node Name	No Build		Alternative D & G2		Alternative D1		Alternative H1		Alternative K
I-295 SOUTHBOUND										
73	**I-295 SB @ Off-Ramp to Rt 168**									
16 in	Volume	6290	340	6290	210	6290	210	6290	210	
No Build	Movement	Freeway	Ramp	Freeway	Ramp	Freeway	Ramp	Freeway	Ramp	
	Avg Speed (mph)	14	28	14	*35*	13	*35*	14	*35*	Same as Alternative D1
	Delay / Veh (s)	43	14	23	*1*	26	*1*	24	*1*	
5	**I-295 SB @ On-Ramp from Rt 168 NB**									
	Volume	6290	330	6290	640	6290	640	6290	640	
	Movement	Freeway	Ramp	Freeway	Ramp	Freeway	Ramp	Freeway	Ramp	
	Avg Speed (mph)	12	32	12	24	13	24	12	24	
	Delay / Veh (s)	31	1	26	1	23	1	26	1	
4	**I-295 SB @ Rt 168 SB On-Ramp**									
6 in	Volume	6620	310	6930	1200	6930	1200	6930	1200	
No Build	Movement	Freeway	Ramp	Freeway	Ramp	Freeway	Ramp	Freeway	Ramp	
	Avg Speed (mph)	13	31	16	28	14	29	15	28	
	Delay / Veh (s)	13	1	8	3	6	3	6	3	
32	**I-295 SB @ Ramp C (off-ramp)**									
	Volume					6080	2050			
	Movement	na	na	na	na	Freeway	Ramp	na	na	
	Avg Speed (mph)	na	na	na	na	36	*36*	na	na	
	Delay / Veh (s)	na	na	na	na	4	*4*	na	na	
1	**I-295 SB @ Ramp B (off-ramp)**									
	Volume					4540	1540			
	Movement	na	na	na	na	Freeway	Ramp	na	na	
	Avg Speed (mph)	na	na	na	na	48	*48*	na	na	
	Delay / Veh (s)	na	na	na	na	3	*3*	na	na	
32	**I-295 SB @ Ramp B/C (off-ramp)**									
3 in	Volume	4080	2850	4540	3590	na	na	4540	3590	
No Build	Movement	To I-295 SB	To I-76 WB	To I-295 SB	To Ramps B & C	na	na	To I-295 SB	To Ramps B & C	
	Avg Speed (mph)	21	21	41	*41*	na	*na*	41	*41*	
	Delay / Veh (s)	45	45	5	*5*	na	*na*	5	*5*	
57	**Ramp B & Ramp C Split**									
17 in H1	Volume	na	na	2050	1540	na	na	2050	1540	
	Movement	na	na	To Ramp C	To Ramp B	na	na	To Ramp C	To Ramp B	
	Avg Speed (mph)	na	na	41	*41*	na	na	36	*36*	
	Delay / Veh (s)	na	na	2	*2*	na	na	2	*2*	
12	**I-295 SB @ Ramp F (on-ramp)**									
	Volume	2460	1350	4540	380	4540	380	4540	380	
	Movement	Freeway	Ramp	Freeway	Ramp	Freeway	Ramp	Freeway	Ramp	
	Avg Speed (mph)	39	33	48	42	49	40	48	40	
	Delay / Veh (s)	2	4	4	2	4	3	4	3	
102	**I-295 SB @ Missing Moves Ramp A**									
108 in	Volume	3810	860	4920	860	4920	860	4920	860	
No Build	Movement	Freeway	Ramp	Freeway	Ramp	Freeway	Ramp	Freeway	Ramp	
	Avg Speed (mph)	45	33	46	37	46	37	45	32	
	Delay / Veh (s)	11	4	6	2	6	2	6	4	

Operational Comparison of No Build and Various Build Alternatives

2030 AM Peak WITH MISSING MOVES

Node Number	Node Name	No Build		Alternative D & G2		Alternative D1	Alternative H1	Alternative K
I-295 NORTHBOUND								
111	**I-295 NB @ Missing Moves Ramp B**							
116 in	Volume	5360	840	6090	840			
No Build	Movement	Freeway	Ramp	Freeway	Ramp	Same as Alternative D	Same as Alternative D	Same as Alternative D
	Avg Speed (mph)	26	40	41	*41*			
	Delay / Veh (s)	14	5	4	*4*			
42	**I-295 NB @ Ramp E (off-ramp)**							
33 in	Volume	1710	3650	4700	1390			
No Build	Movement	To I-76 X	To I-76 Local	Freeway	Ramp			
	Avg Speed (mph)	45	43	41	*41*			
	Delay / Veh (s)	11	12	5	*5*			
34	**I-295 NB @ Rt 42 NB Junction 1**	I-295 & I-76 Coincident						
	Volume	4490	3650					
	Movement	Rt 42	I-295	na	na			
	Avg Speed (mph)	11	26	na	na			
	Delay / Veh (s)	33	3	na	na			
23	**I-295 NB @ Rt 42 NB Junction 2**	I-295 & I-76 Coincident						
	Volume	4070	4070					
	Movement	Rt 42	I-295	na	na			
	Avg Speed (mph)	22	23	na	na			
	Delay / Veh (s)	20	17	na	na			
36	**I-295 NB @ Ramp D (on-ramp)**							
40 in	Volume	4070	2230	6280	990			
No Build	Movement	I-295 NB	Ramp D	Freeway	Ramp			
	Avg Speed (mph)	33	26	42	38			
	Delay / Veh (s)	8	13	3	2			
46	**I-295 NB @ Ramp A (on-ramp)**							
43 after	Volume			4700	1580			
Relocation	Movement	na	na	Freeway	Ramp			
	Avg Speed (mph)	na	na	48	38			
	Delay / Veh (s)	na	na	6	4			
47	**I-295 NB @ Off Ramp to Rt 168**							
35 in	Volume	5700	600	5740	1530			
No Build	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	49	44	40	*25*			
	Delay / Veh (s)	1	0.4	5	*1*			
49	**I-295 NB @ On-Ramp from Rt 168 SB**							
18 in	Volume	5700	170	5740	170			
No Build	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	48	32	46	22			
	Delay / Veh (s)	2	0.4	2	1			
16	**I-295 NB @ On-Ramp from Rt 168 NB**							
72 in	Volume	5870	640	5910	370			
No Build	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	42	31	44	32			
	Delay / Veh (s)	2	3	1	1			

I-295/I-76/Route 42 Direct Connection Project

Operational Comparison of No Build and Various Build Alternatives

2030 AM Peak WITH MISSING MOVES

Node Number	Node Name	No Build		Alternative D & G2		Alternative D1	Alternative H1	Alternative K
Rt 42 NORTHBOUND & I-76 WESTBOUND								
81 / 110	**Rt 42 NB @ Benigno Blvd Off-Ramp**							
57 in	Volume	6950	1420	8890	1680			
No Build	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	29	43	26	*26*	Same as Alternative D	Same as Alternative D	Same as Alternative D
	Delay / Veh (s)	164	153	10	*10*			
56	**Rt 42 NB @ Benigno Blvd On-Ramp**							
60 in	Volume	6950	320	8890	540			
No Build	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	21	33	22	32			
	Delay / Veh (s)	27	0.3	28	0.3			
	I-76 WB Split							
39 in	Volume	2780	4490					
No Build	Movement	Express	Local	na	na			
	Avg Speed (mph)	24	10	na	na			
	Delay / Veh (s)	13	43	na	na			
9	**Rt 42 NB @ Ramp A (off-ramp)**							
23 in	Volume	4070	4070	7850	1580			
No Build	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	22	23	34	*34*			
	Delay / Veh (s)	20	17	16	*16*			
23	**I-76 WB @ Ramp E (on-ramp)**	I-295 & I-76 Coincident						
34 in	Volume	4490	3650	7850	1390			
No Build	Movement	Rt 42	Ramp	Freeway	Ramp			
	Avg Speed (mph)	11	26	42	40			
	Delay / Veh (s)	33	3	7	3			
2	**I-76 WB @ Ramp B**							
	Volume	4070	2850	9240	1540			
	Movement	I-76 Local Only	Ramp	Freeway	Ramp			
	Avg Speed (mph)	26	26	20	41			
	Delay / Veh (s)	31	41	7	1			
21	**I-76 WB @ Market St Off-Ramp**							
	Volume	6780	140	10640	140			
	Movement	I-76 Local Only	Ramp	Freeway	Ramp			
	Avg Speed (mph)	17	17	30	*30*			
	Delay / Veh (s)	29	29	19	*19*			
20	**I-76 WB @ Rt 130 Off-Ramp**							
	Volume	5430	1350	8960	1680			
	Movement	I-76 Local Only	Ramp	Freeway	Ramp			
	Avg Speed (mph)	43	46	48	*48*			
	Delay / Veh (s)	2	1	1	*1*			
118	**I-76 WB @ Rt 130 On-Ramp**							
64 in	Volume	6280	710	8960	1010			
No Build	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	47	41	48	43			
	Delay / Veh (s)	4	0.2	5	0			

I-295/I-76/Route 42 Direct Connection Project

Operational Comparison of No Build and Various Build Alternatives

2030 AM Peak WITH MISSING MOVES

Node Number	Node Name	No Build		Alternative D & G2		Alternative D1	Alternative H1	Alternative K
Rt 42 SOUTHBOUND & I-76 EASTBOUND								
89	**I-76 EB @ Rt 130 Off Ramp**							
43 in	Volume	6020	960	6200	590			
No Build	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	48	*45*	49	*49*	Same as Alternative D	Same as Alternative D	Same as Alternative D
	Delay / Veh (s)	1	*1*	1	*1*			
41	**I-76 EB @ Rt 130 On Ramp**							
43 in	Volume	6020	1630	6200	650			
No Build	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	46	26	49	35			
	Delay / Veh (s)	5	1	4	0.1			
40	**I-76 EB @ Ramp D (off-ramp)**							
41 in	Volume	5420	2230	5860	990			
No Build	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	40	34	47	*47*			
	Delay / Veh (s)	12	19	6	*6*			
30	**I-76 EB @ Ramp F (off-ramp)**	Left Off-Ramp to I-295						
63 in	Volume	4070	1350	5480	380			
No Build	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	51	42	48	*48*			
	Delay / Veh (s)	1	2	3	*3*			
13	**Rt 42 SB @ Ramp C (on-ramp)**							
	Volume	4070	1620	5480	2050			
	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	50	42	47	34			
	Delay / Veh (s)	1	1	6	2			
24	**Rt 42 SB @ Leaf Avenue Off-Ramp**							
	Volume	5460	230	7150	380			
	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	49	47	46	*46*			
	Delay / Veh (s)	2	2	2	*1*			
25	**Rt 42 SB @ Leaf Avenue On-Ramp**							
	Volume	5460	910	7150	630			
	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	47	32	46	32			
	Delay / Veh (s)	1	1	1	1			
26/114	**Rt 42 SB @ Missing Moves Ramp B**							
119 in	Volume	6370	840	7780	840			
No Build	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	46	36	48	37			
	Delay / Veh (s)	4	4	3	3			

I-295/I-76/Rt 42 Direct Connection Project

Operational Comparison of No Build and Various Build Alternatives

2030 PM Peak WITH MISSING MOVES

Node Number	Node Name	No Build		Alternative D & G2		Alternative D1		Alternative H1		Alternative K
I-295 SOUTHBOUND										
73	**I-295 SB @ Off-Ramp to Rt 168**									
16 in	Volume	5010	760	6550	320	6550	320	6550	320	
No Build	Movement	Freeway	Ramp	Freeway	Ramp	Freeway	Ramp	Freeway	Ramp	
	Avg Speed (mph)	18	32	16	27	16	27	16	27	Same as Alternative D1
	Delay / Veh (s)	19	5	19	7	19	7	19	7	
5	**I-295 SB @ On-Ramp from Rt 168 NB**									
	Volume	5010	120	6550	380	6550	380	6550	380	
	Movement	Freeway	Ramp	Freeway	Ramp	Freeway	Ramp	Freeway	Ramp	
	Avg Speed (mph)	19	21	13	24	13	24	13	24	
	Delay / Veh (s)	14	2	23	1	23	1	23	1	
4	**I-295 SB @ Rt 168 SB On-Ramp**									
6 in	Volume	5130	200	6930	1150	6930	1150	6930	1150	
No Build	Movement	Freeway	Ramp	Freeway	Ramp	Freeway	Ramp	Freeway	Ramp	
	Avg Speed (mph)	12	30	15	30	15	30	15	30	
	Delay / Veh (s)	14	2	7	3	7	3	7	3	
11	**I-295 SB @ Ramp C (off-ramp)**									
(32 in	Volume	2030	1880	na	na	5450	2630	na	na	
3/1/06	Movement	To I-295 SB	To I-76 EB	na	na	Freeway	Ramp	na	na	
	Avg Speed (mph)	35	32	na	na	47	40	na	na	
	Delay / Veh (s)	1	1	na	na	1	2	na	na	
1	**I-295 SB @ Ramp B (off-ramp)**									
	Volume	na	na	na	na	4520	930	na	na	
	Movement	na	na	na	na	Freeway	Ramp	na	na	
	Avg Speed (mph)	na	na	na	*na*	50	50	na	*na*	
	Delay / Veh (s)	na	na	na	*na*	3	3	na	*na*	
32	**I-295 SB @ Ramp B/C (off-ramp)**									
3 in	Volume	3910	1420	4520	3560	na	na	4520	3560	
No Build	Movement	To I-295 SB	To I-76 WB	To I-295 SB	To Ramps B & C	na	na	To I-295 SB	To Ramps B & C	
	Avg Speed (mph)	16	17	44	40	na	*na*	44	40	
	Delay / Veh (s)	67	62	4	5	na	*na*	4	5	
57	**Ramp B & Ramp C Split**									
17 in H1	Volume			2630	930	na	na	2630	930	
	Movement	na	na	To Ramp C	To Ramp B	na	na	To Ramp C	To Ramp B	
	Avg Speed (mph)	na	na	40	38	na	*na*	40	38	
	Delay / Veh (s)	na	na	1	3	na	*na*	1	3	
12	**I-295 SB @ Ramp F (on-ramp)**									
	Volume	2030	1830	4520	1320	4520	1320	4520	1320	
	Movement	Freeway	Ramp	Freeway	Ramp	Freeway	Ramp	Freeway	Ramp	
	Avg Speed (mph)	34	39	47	37	47	37	47	37	
	Delay / Veh (s)	4	3	5	6	5	6	5	6	
102	**I-295 SB @ Missing Moves Ramp A**									
108 in	Volume	3860	840	5840	840	5840	840	5840	840	
No Build	Movement	Freeway	Ramp	Freeway	Ramp	Freeway	Ramp	Freeway	Ramp	
	Avg Speed (mph)	49	37	43	31	43	31	43	31	
	Delay / Veh (s)	7	3	8	5	8	5	8	5	

I-295/I-76/Rt 42 Direct Connection Project

Operational Comparison of No Build and Various Build Alternatives

2030 PM Peak WITH MISSING MOVES

Node Number	Node Name	No Build		Alternative D & G2		Alternative D1	Alternative H1	Alternative K
I-295 NORTHBOUND								
111	**I-295 NB @ Missing Moves Ramp B**							
116 in	Volume	4150	860	5820	860			
No Build	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	*46*	49	44	48	Same as Alternative D	Same as Alternative D	Same as Alternative D
	Delay / Veh (s)	*1*	2	3	2			
42	**I-295 NB @ Ramp E (off-ramp)**							
33 in	Volume	1360	2790	5060	760			
No Build	Movement	To I-76 X	To I-76 Local	Freeway	Ramp			
	Avg Speed (mph)	42	45	45	45			
	Delay / Veh (s)	13	11	4	4			
34	**I-295 NB @ Rt 42 NB Junction 1**	I-295 & I-76 Coincident						
	Volume	2790	4530					
	Movement	I-295	Rt 42	na	na			
	Avg Speed (mph)	23	10	na	na			
	Delay / Veh (s)	4	37	na	na			
23	**I-295 NB @ Rt 42 NB Junction 2**	I-295 & I-76 Coincident						
	Volume	4080	3240					
	Movement	I-295	Rt 42	na	na			
	Avg Speed (mph)	15	21	na	na			
	Delay / Veh (s)	32	20	na	na			
36	**I-295 NB @ Ramp D (on-ramp)**							
40 in	Volume	4080	2850	6710	1660			
No Build	Movement	I-295 NB	Ramp D	Freeway	Ramp			
	Avg Speed (mph)	27	27	30	34			
	Delay / Veh (s)	19	12	9	4			
46	**I-295 NB @ Ramp A (on-ramp)**							
43 after	Volume			5060	1650			
Relocation	Movement	na	na	Freeway	Ramp			
	Avg Speed (mph)	na	na	46	35			
	Delay / Veh (s)	na	na	8	5			
47	**I-295 NB @ Off Ramp to Rt 168**							
35 in	Volume	5710	1220	6650	1720			
No Build	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	49	42	33	27			
	Delay / Veh (s)	1	1	10	13			
49	**I-295 NB @ On-Ramp from Rt 168 SB**							
18 in	Volume	5710	370	6650	90			
No Build	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	49	24	47	23			
	Delay / Veh (s)	1	1	2	1			
16	**I-295 NB @ On-Ramp from Rt 168 NB**							
72 in	Volume	6080	580	6740	190			
No Build	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	*46*	31	46	33			
	Delay / Veh (s)	*1*	2	1	1			

I-295/I-76/Rt 42 Direct Connection Project

Operational Comparison of No Build and Various Build Alternatives

2030 PM Peak WITH MISSING MOVES

Node Number	Node Name	No Build		Alternative D & G2		Alternative D1	Alternative H1	Alternative K
Rt 42 NORTHBOUND & I-76 WESTBOUND								
110	**Rt 42 NB @ Benigno Blvd Off-Ramp**							
57 in	Volume	5730	1520	7470	1350			
No Build	Movement	Freeway	Ramp	Freeway	Ramp	Same as Alternative D	Same as Alternative D	Same as Alternative D
	Avg Speed (mph)	19	31	35	38			
	Delay / Veh (s)	47	23	5	3			
56	**Rt 42 NB @ Benigno Blvd On-Ramp**							
60 in	Volume	5730	360	7470	560			
No Build	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	10	25	30	31			
	Delay / Veh (s)	77	2	15	0.4			
39 in	**I-76 WB Split**							
No Build	Volume	1560	4530					
	Movement	Express	Local	na	na			
	Avg Speed (mph)	30	8	na	na			
	Delay / Veh (s)	9	56	na	na			
9	**Rt 42 NB @ Ramp A (off-ramp)**	I-295 & I-76 Coincident						
23 in	Volume	3240	4080	6380	1650			
No Build	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	21	15	35	27			
	Delay / Veh (s)	20	32	16	27			
23	**I-76 WB @ Ramp E (on-ramp)**	I-295 & I-76 Coincident						
34 in	Volume	4530	2790	6380	760			
No Build	Movement	Rt 42	I-295	Freeway	Ramp			
	Avg Speed (mph)	10	23	47	44			
	Delay / Veh (s)	37	4	4	2			
2	**I-76 WB @ Ramp B**							
	Volume	3240	1420	7140	930			
	Movement	I-76 Local Only	Ramp	Freeway	Ramp			
	Avg Speed (mph)	49	51	45	41			
	Delay / Veh (s)	5	4	2	1			
21	**I-76 WB @ Market St Off-Ramp**							
	Volume	4400	260	7810	260			
	Movement	I-76 Local Only	Ramp	Freeway	Ramp			
	Avg Speed (mph)	40	37	47	47			
	Delay / Veh (s)	6	6	4	4			
20	**I-76 WB @ Rt 130 Off-Ramp**							
	Volume	3360	1040	7250	560			
	Movement	I-76 Local Only	Ramp	Freeway	Ramp			
	Avg Speed (mph)	52	46	48	47			
	Delay / Veh (s)	1	1	2	1			
118	**I-76 WB @ Rt 130 On-Ramp**							
64 in	Volume	6280	710	7250	130			
No Build	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	46	41	48	41			
	Delay / Veh (s)	4	0.3	5	0			

I-295/I-76/Rt 42 Direct Connection Project

Operational Comparison of No Build and Various Build Alternatives

2030 PM Peak WITH MISSING MOVES

Node Number	Node Name	No Build		Alternative D & G2		Alternative D1	Alternative H1	Alternative K
Rt 42 SOUTHBOUND & I-76 EASTBOUND								
89	**I-76 EB @ Rt 130 Off-Ramp**							
92 in	Volume	10040	540	9550	1580			
No Build	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	39	43	40	28	Same as Alternative D	Same as Alternative D	Same as Alternative D
	Delay / Veh (s)	1	1	4	10			
41	**I-76 EB @ Rt 130 On Ramp**							
43 in	Volume	10040	480	9550	1450			
No Build	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	44	37	46	28			
	Delay / Veh (s)	7	0.2	6	0.4			
40	**I-76 EB @ Ramp D (off-ramp)**							
41 in	Volume	7670	2850	9340	1660			
No Build	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	40	39	40	35			
	Delay / Veh (s)	12	13	12	17			
30	**I-76 EB @ Ramp F (off-ramp)**							
63 in	Volume	5840	1830	8020	1320			
No Build	Movement	To Rt 42 S	To I295 S	Freeway	Ramp			
	Avg Speed (mph)	48	42	47	45			
	Delay / Veh (s)	2	3	3	4			
13	**Rt 42 SB @ Ramp C (on-ramp)**							
	Volume	5840	1880	8020	2630			
	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	47	33	43	30			
	Delay / Veh (s)	2	4	9	3			
24	**Rt 42 SB @ Leaf Avenue Off-Ramp**							
	Volume	7600	120	10370	280			
	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	49	43	42	42			
	Delay / Veh (s)	1	0.1	2	0.1			
25	**Rt 42 SB @ Leaf Avenue On-Ramp**							
	Volume	7600	370	10370	670			
	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	49	30	46	32			
	Delay / Veh (s)	1	1	1	1			
114	**Rt 42 SB @ Missing Moves Ramp B**							
119 in	Volume	7970	860	11040	860			
No Build	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	47	38	47	36			
	Delay / Veh (s)	4	3	4	4			

I-295/I-76/Route 42 Direct Connection Project

Operational Comparison of No Build and Various Build Alternatives

2030 AM Peak NO MISSING MOVES

Node Number	Node Name	No Build		Alternative D & G2		Alternative D1		Alternative H1		Alternative K
I-295 SOUTHBOUND										
73	**I-295 SB @ Off-Ramp to Rt 168**									
16 in	Volume	6290	340	6290	210	6290	210	6290	210	
No Build	Movement	Freeway	Ramp	Freeway	Ramp	Freeway	Ramp	Freeway	Ramp	Same as Alternative D1
	Avg Speed (mph)	14	28	14	*35*	13	*35*	14	*35*	
	Delay / Veh (s)	43	14	23	*1*	26	*1*	24	*1*	
5	**I-295 SB @ On-Ramp from Rt 168 NB**									
	Volume	6290	330	6290	640	6290	640	6290	640	
	Movement	Freeway	Ramp	Freeway	Ramp	Freeway	Ramp	Freeway	Ramp	
	Avg Speed (mph)	12	32	12	24	13	24	12	24	
	Delay / Veh (s)	31	1	26	1	23	1	26	1	
4	**I-295 SB @ Rt 168 SB On-Ramp**									
6 in	Volume	6620	310	6930	1200	6930	1200	6930	1200	
No Build	Movement	Freeway	Ramp	Freeway	Ramp	Freeway	Ramp	Freeway	Ramp	
	Avg Speed (mph)	13	31	16	28	14	29	15	28	
	Delay / Veh (s)	13	1	8	3	6	3	6	3	
32	**I-295 SB @ Ramp C (off-ramp)**									
	Volume					6080	2050			
	Movement	na	na	na	na	Freeway	Ramp	na	na	
	Avg Speed (mph)	na	na	na	na	36	*36*	na	na	
	Delay / Veh (s)	na	na	na	na	4	*4*	na	na	
1	**I-295 SB @ Ramp B (off-ramp)**									
	Volume					4540	1480			
	Movement	na	na	na	na	Freeway	Ramp	na	na	
	Avg Speed (mph)	na	na	na	na	48	*48*	na	na	
	Delay / Veh (s)	na	na	na	na	3	*3*	na	na	
32	**I-295 SB @ Ramp B/C (off-ramp)**									
3 in	Volume	4080	2850	4540	3530	na	na	4540	3530	
No Build	Movement	To I-295 SB	To I-76 WB	To I-295 SB	To Ramps B & C	na	na	To I-295 SB	To Ramps B & C	
	Avg Speed (mph)	21	21	41	*41*	na	*na*	41	*41*	
	Delay / Veh (s)	45	45	5	*5*	na	*na*	5	*5*	
57	**Ramp B & Ramp C Split**									
17 in H1	Volume	na	na	2050	1480	na	na	2050	1480	
	Movement	na	na	To Ramp C	To Ramp B	na	na	To Ramp C	To Ramp B	
	Avg Speed (mph)	na	na	41	*41*	na	na	36	*36*	
	Delay / Veh (s)	na	na	2	*2*	na	na	2	*2*	
12	**I-295 SB @ Ramp F (on-ramp)**									
	Volume	2460	1350	4540	380	4540	380	4540	380	
	Movement	Freeway	Ramp	Freeway	Ramp	Freeway	Ramp	Freeway	Ramp	
	Avg Speed (mph)	39	33	48	42	49	40	48	40	
	Delay / Veh (s)	2	4	4	2	4	3	4	3	
89/102	**I-295 SB @ Missing Moves Ramp A**									
108 in	Volume									
No Build	Movement	Freeway	Ramp	Freeway	Ramp	Freeway	Ramp	Freeway	Ramp	
	Avg Speed (mph)									
	Delay / Veh (s)									

I-295/I-76/Route 42 Direct Connection Project

Operational Comparison of No Build and Various Build Alternatives

2030 AM Peak NO MISSING MOVES

Node Number	Node Name	No Build		Alternative D & G2		Alternative D1	Alternative H1	Alternative K
I-295 NORTHBOUND								
111	**I-295 NB @ Missing Moves Ramp B**							
116 in	Volume							
No Build	Movement	Freeway	Ramp	Freeway	Ramp	Same as Alternative D	Same as Alternative D	Same as Alternative D
	Avg Speed (mph)							
	Delay / Veh (s)							
42	**I-295 NB @ Ramp E (off-ramp)**							
33 in	Volume	1730	3700	5280	1640			
No Build	Movement	To I-76 X	To I-76 Local	Freeway	Ramp			
	Avg Speed (mph)	41	38	36	35			
	Delay / Veh (s)	15	19	8	9			
34	**I-295 NB @ Rt 42 NB Junction 1**	I-295 & I-76 Coincident						
	Volume	4490	3700					
	Movement	Rt 42	I-295	na	na			
	Avg Speed (mph)	10	20	na	na			
	Delay / Veh (s)	36	4	na	na			
23	**I-295 NB @ Rt 42 NB Junction 2**	I-295 & I-76 Coincident						
	Volume	4040	4150					
	Movement	Rt 42	I-295	na	na			
	Avg Speed (mph)	20	21	na	na			
	Delay / Veh (s)	22	19	na	na			
36	**I-295 NB @ Ramp D (on-ramp)**							
40 in	Volume	4150	2140	6950	990			
No Build	Movement	I-295 NB	Ramp D	Freeway	Ramp			
	Avg Speed (mph)	36	28	43	37			
	Delay / Veh (s)	8	10	3	3			
46	**I-295 NB @ Ramp A (on-ramp)**							
43 after	Volume			5280	1670			
Relocation	Movement	na	na	Freeway	Ramp			
	Avg Speed (mph)	na	na	49	38			
	Delay / Veh (s)	na	na	6	3			
47	**I-295 NB @ Off Ramp to Rt 168**							
35 in	Volume	5700	590	6370	1530			
No Build	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	49	44	41	33			
	Delay / Veh (s)	1	0.4	6	8			
49	**I-295 NB @ On-Ramp from Rt 168 SB**							
18 in	Volume	5700	230	6370	170			
No Build	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	47	33	47	25			
	Delay / Veh (s)	2	0.2	2	0.1			
16	**I-295 NB @ On-Ramp from Rt 168 NB**							
72 in	Volume	5930	630	6540	370			
No Build	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	40	31	44	32			
	Delay / Veh (s)	3	2	1	1			

I-295/I-76/Route 42 Direct Connection Project

Operational Comparison of No Build and Various Build Alternatives

2030 AM Peak NO MISSING MOVES

Node Number	Node Name	No Build		Alternative D & G2		Alternative D1	Alternative H1	Alternative K
Rt 42 NORTHBOUND & I-76 WESTBOUND								
62	**Rt 42 NB @ Benigno Blvd Off-Ramp**							
31 in	Volume	7020	630	8980	900			
No Build	Movement	Freeway	Ramp	Freeway	Ramp			
57 in K	Avg Speed (mph)	10	35	16	34	Same as Alternative D	Same as Alternative D	Same as Alternative D
82 in H1	Delay / Veh (s)	39	5	20	4			
56	**Rt 42 NB @ Benigno Blvd On-Ramp**							
114 in	Volume	7020	330	8980	540			
No Build	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	9	20	14	29			
	Delay / Veh (s)	17	2	13	0.4			
	I-76 WB Split							
39 in	Volume	2860	4490					
No Build	Movement	Express	Local	na	na			
	Avg Speed (mph)	13	10	na	na			
	Delay / Veh (s)	34	44	na	na			
9	**Rt 42 NB @ Ramp A (off-ramp)**							
23 in	Volume	4040	4150	7850	1670			
No Build	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	20	21	32	26			
	Delay / Veh (s)	22	19	10	16			
23	**I-76 WB @ Ramp E (on-ramp)**	I-295 & I-76 Coincident						
34 in	Volume	4490	3700	7850	1640			
No Build	Movement	Rt 42	Ramp	Freeway	Ramp			
	Avg Speed (mph)	10	20	44	38			
	Delay / Veh (s)	36	4	6	5			
2	**I-76 WB @ Ramp B**							
	Volume	4040	2830	9490	1480			
	Movement	I-76 Local Only	Ramp	Freeway	Ramp			
	Avg Speed (mph)	20	22	13	39			
	Delay / Veh (s)	49	44	12	2			
21	**I-76 WB @ Market St Off-Ramp**							
	Volume	6720	150	10640	140			
	Movement	I-76 Local Only	Ramp	Freeway	Ramp			
	Avg Speed (mph)	17	16	26	22			
	Delay / Veh (s)	30	32	26	33			
20	**I-76 WB @ Rt 130 Off-Ramp**							
	Volume	5320	1400	8960	1680			
	Movement	I-76 Local Only	Ramp	Freeway	Ramp			
	Avg Speed (mph)	52	44	49	44			
	Delay / Veh (s)	1	1	1	2			
118	**I-76 WB @ Rt 130 On-Ramp**							
64 in	Volume	9910	1080	8960	1010			
No-Build	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	48	40	48	35			
	Delay / Veh (s)	3	0.3	5	0.2			

I-295/I-76/Route 42 Direct Connection Project

Operational Comparison of No Build and Various Build Alternatives

2030 AM Peak NO MISSING MOVES

Node Number	Node Name	No Build		Alternative D & G2		Alternative D1	Alternative H1	Alternative K
Rt 42 SOUTHBOUND & I-76 EASTBOUND								
89	**I-76 EB @ Rt 130 Off Ramp**							
92 in	Volume	5990	950	6200	590			
No Build	Movement	Freeway	Ramp	Freeway	Ramp	Same as Alternative D	Same as Alternative D	Same as Alernative D
	Avg Speed (mph)	*47*	26	49	*49*			
	Delay / Veh (s)	1	3	1	*1*			
41	**I-76 EB @ Rt 130 On Ramp**							
43 in	Volume	5990	1640	6200	650			
No Build	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	48	25	49	35			
	Delay / Veh (s)	5	1	4	0.1			
40	**I-76 EB @ Ramp D (off-ramp)**							
41 in	Volume	5490	2140	5860	990			
No Build	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	41	41	47	*47*			
	Delay / Veh (s)	12	12	6	*6*			
30	**I-76 EB @ Ramp F (off-ramp)**	Left Off-Ramp to I-295						
63 in	Volume	4140	1350	5480	380			
No Build	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	48	48	48	*48*			
	Delay / Veh (s)	1	1	3	*3*			
13	**Rt 42 SB @ Ramp C (on-ramp)**							
	Volume	4140	1640	5480	2050			
	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	50	40	47	34			
	Delay / Veh (s)	1	1	6	2			
24	**Rt 42 SB @ Leaf Avenue Off-Ramp**							
	Volume	5550	230	7150	380			
	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	48	48	46	*46*			
	Delay / Veh (s)	2	2	2	*1*			
25	**Rt 42 SB @ Leaf Avenue On-Ramp**							
	Volume	5550	1030	7150	630			
	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	45	30	46	32			
	Delay / Veh (s)	1	1	1	1			
26/114	**Rt 42 SB @ Missing Moves Ramp B**							
	Volume							
	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)							
	Delay / Veh (s)							

I-295/I-76/Rt 42 Direct Connection Project

Operational Comparison of No Build and Various Build Alternatives

2030 PM Peak NO MISSING MOVES

Node Number	Node Name	No Build		Alternative D & G2		Alternative D1		Alternative H1		Alternative K
I-295 SOUTHBOUND										
73	**I-295 SB @ Off-Ramp to Rt 168**									
16 in	Volume	5080	730	6550	320	6550	320	6550	320	
No Build	Movement	Freeway	Ramp	Freeway	Ramp	Freeway	Ramp	Freeway	Ramp	Same as Alternative D1
	Avg Speed (mph)	19	34	16	29	16	29	16	29	
	Delay / Veh (s)	18	4	19	5	19	5	19	5	
5	**I-295 SB @ On-Ramp from Rt 168 NB**									
	Volume	5080	130	6550	480	6550	480	6550	480	
	Movement	Freeway	Ramp	Freeway	Ramp	Freeway	Ramp	Freeway	Ramp	
	Avg Speed (mph)	15	23	13	24	13	24	13	24	
	Delay / Veh (s)	20	1	23	1	23	1	23	1	
4	**I-295 SB @ Rt 168 SB On-Ramp**									
6 in	Volume	5210	170	6930	1070	6930	1070	6930	1070	
No Build	Movement	Freeway	Ramp	Freeway	Ramp	Freeway	Ramp	Freeway	Ramp	
	Avg Speed (mph)	11	31	15	29	15	29	15	29	
	Delay / Veh (s)	18	1	7	3	7	3	7	3	
32	**I-295 SB @ Ramp C (off-ramp)**									
11 in	Volume	2050	1870	na	na	5290	2710	na	na	
No Build	Movement	To I-295 SB	To I-76 EB	na	na	Freeway	Ramp	na	na	
	Avg Speed (mph)	17	34	na	na	42	33	na	na	
	Delay / Veh (s)	8	1	na	na	2	4	na	na	
1	**I-295 SB @ Ramp B (off-ramp)**									
	Volume	na	na	na	na	4520	770	na	na	
	Movement	na	na	na	na	Freeway	Ramp	na	na	
	Avg Speed (mph)	na	na	na	na	50	51	na	na	
	Delay / Veh (s)	na	na	na	na	3	2	na	na	
32	**I-295 SB @ Ramp B/C (off-ramp)**									
3 in	Volume	3920	1460	4520	3480	na	na	4520	3480	
No Build	Movement	To I-295 SB	To I-76 WB	To I-295 SB	To Ramps B & C	na	na	To I-295 SB	To Ramps B & C	
	Avg Speed (mph)	17	16	43	41	na	na	43	41	
	Delay / Veh (s)	61	66	4	4	na	na	4	4	
57	**Ramp B & Ramp C Split**									
17 in H1	Volume			2710	770	na	na	2710	770	
	Movement	na	na	To Ramp C	To Ramp B	na	na	To Ramp C	To Ramp B	
	Avg Speed (mph)	na	na	39	41	na	na	39	41	
	Delay / Veh (s)	na	na	3	2	na	na	3	2	
12	**I-295 SB @ Ramp F (on-ramp)**									
	Volume	2030	1710	4520	1240	4520	1240	4520	1240	
	Movement	Freeway	Ramp	Freeway	Ramp	Freeway	Ramp	Freeway	Ramp	
	Avg Speed (mph)	34	38	47	37	47	37	47	37	
	Delay / Veh (s)	4	3	5	5	5	5	5	5	
102	**I-295 SB @ Missing Moves Ramp A**									
108 in	Volume									
No Build	Movement	Freeway	Ramp	Freeway	Ramp	Freeway	Ramp	Freeway	Ramp	
	Avg Speed (mph)									
	Delay / Veh (s)									

I-295/I-76/Rt 42 Direct Connection Project

Operational Comparison of No Build and Various Build Alternatives

2030 PM Peak NO MISSING MOVES

Node Number	Node Name	No Build		Alternative D & G2		Alternative D1	Alternative H1	Alternative K
I-295 NORTHBOUND								
111	**I-295 NB @ Missing Moves Ramp B**							
116 in	Volume							
No Build	Movement	Freeway	Ramp	Freeway	Ramp	Same as Alternative D	Same as Alternative D	Same as Alternative D
	Avg Speed (mph)							
	Delay / Veh (s)							
42	**I-295 NB @ Ramp E (off-ramp)**							
33 in	Volume	1410	2940	5060	870			
No Build	Movement	To I-76 X	To I-76 Local	Freeway	Ramp			
	Avg Speed (mph)	41	44	44	45			
	Delay / Veh (s)	14	12	4	4			
34	**I-295 NB @ Rt 42 NB Junction 1**	I-295 & I-76 Coincident						
	Volume	2940	4500					
	Movement	I-295	Rt 42	na	na			
	Avg Speed (mph)	21	10	na	na			
	Delay / Veh (s)	5	37	na	na			
23	**I-295 NB @ Rt 42 NB Junction 2**	I-295 & I-76 Coincident						
	Volume	4170	3270					
	Movement	I-295	Rt 42	na	na			
	Avg Speed (mph)	22	22	na	na			
	Delay / Veh (s)	19	18	na	na			
36	**I-295 NB @ Ramp D (on-ramp)**							
40 in	Volume	4170	2760	6710	1660			
No Build	Movement	I-295 NB	Ramp D	Freeway	Ramp			
	Avg Speed (mph)	23	25	30	34			
	Delay / Veh (s)	29	18	9	4			
46	**I-295 NB @ Ramp A (on-ramp)**							
43 after	Volume			5060	1650			
Relocation	Movement	na	na	Freeway	Ramp			
	Avg Speed (mph)	na	na	46	35			
	Delay / Veh (s)	na	na	8	5			
47	**I-295 NB @ Off Ramp to Rt 168**							
35 in	Volume	5800	1130	6650	1720			
No Build	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	49	28	33	27			
	Delay / Veh (s)	1	5	10	13			
49	**I-295 NB @ On-Ramp from Rt 168 SB**							
18 in	Volume	5710	300	6650	90			
No Build	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	49	22	47	23			
	Delay / Veh (s)	1	2	2	1			
16	**I-295 NB @ On-Ramp from Rt 168 NB**							
72 in	Volume	6100	460	6740	190			
No Build	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	44	31	46	33			
	Delay / Veh (s)	2	3	1	1			

I-295/I-76/Rt 42 Direct Connection Project

Operational Comparison of No Build and Various Build Alternatives

2030 PM Peak NO MISSING MOVES

Node Number	Node Name	No Build		Alternative D & G2		Alternative D1	Alternative H1	Alternative K
Rt 42 NORTHBOUND & I-76 WESTBOUND								
82	**Rt 42 NB @ Benigno Blvd Off-Ramp**							
37 in	Volume	5730	710	7540	540			
No Build	Movement	Freeway	Ramp	Freeway	Ramp			
1 in D, 82 in D	Avg Speed (mph)	8	18	40	49	Same as Alternative D	Same as Alternative D	Same as Alternative D
62 in K	Delay / Veh (s)	51	17	3	1			
56	**Rt 42 NB @ Benigno Blvd On-Ramp**							
60 in	Volume	5730	350	7540	560			
No Build	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	7	30	35	32			
	Delay / Veh (s)	33	0.4	9	0.4			
39 in	**I-76 WB Split**							
No Build	Volume	1580	4500					
	Movement	Express	Local	na	na			
	Avg Speed (mph)	33	8	na	na			
	Delay / Veh (s)	7	59	na	na			
9	**Rt 42 NB @ Ramp A (off-ramp)**	I-295 & I-76 Coincident						
23 in	Volume	3270	4170	6470	1650			
No Build	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	22	22	35	33			
	Delay / Veh (s)	19	18	11	18			
23	**I-76 WB @ Ramp E (on-ramp)**	I-295 & I-76 Coincident						
34 in	Volume	4500	2940	6470	870			
No Build	Movement	Rt 42	I-295	Freeway	Ramp			
	Avg Speed (mph)	10	21	46	42			
	Delay / Veh (s)	37	5	3	2			
2	**I-76 WB @ Ramp B**							
	Volume	3270	1460	7340	770			
	Movement	I-76 Local Only	Ramp	Freeway	Ramp			
	Avg Speed (mph)	47	50	42	42			
	Delay / Veh (s)	6	5	2	1			
21	**I-76 WB @ Market St Off-Ramp**							
	Volume	4410	320	7400	260			
	Movement	I-76 Local Only	Ramp	Freeway	Ramp			
	Avg Speed (mph)	36	33	48	48			
	Delay / Veh (s)	7	9	4	4			
20	**I-76 WB @ Rt 130 Off-Ramp**							
	Volume	3370	1040	6840	560			
	Movement	I-76 Local Only	Ramp	Freeway	Ramp			
	Avg Speed (mph)	53	45	49	46			
	Delay / Veh (s)	1	1	1	1			
118	**I-76 WB @ Rt 130 On-Ramp**							
64 in	Volume	6360	710	6840	130			
No Build	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	46	41	49	42			
	Delay / Veh (s)	4	0.2	4	0			

I-295/I-76/Rt 42 Direct Connection Project

Operational Comparison of No Build and Various Build Alternatives

2030 PM Peak NO MISSING MOVES

Node Number	Node Name	No Build		Alternative D & G2		Alternative D1	Alternative H1	Alternative K
Rt 42 SOUTHBOUND & I-76 EASTBOUND								
89	**I-76 EB @ Rt 130 Off-Ramp**							
92 in	Volume	9720	940	9610	1480			
No Build	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	36	40	37	28	Same as Alternative D	Same as Alternative D	Same as Alternative D
	Delay / Veh (s)	1	1	5	11			
41	**I-76 EB @ Rt 130 On Ramp**							
43 in	Volume	9720	970	9610	1450			
No Build	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	23	26	45	28			
	Delay / Veh (s)	39	1	7	0.4			
40	**I-76 EB @ Ramp D (off-ramp)**							
41 in	Volume	7930	2760	9360	1660			
No Build	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	23	25	39	33			
	Delay / Veh (s)	41	36	13	20			
30	**I-76 EB @ Ramp F (off-ramp)**							
63 in	Volume	6220	1710	8120	1240			
No Build	Movement	To Rt 42 S	To I295 S	Freeway	Ramp			
	Avg Speed (mph)	40	41	47	46			
	Delay / Veh (s)	3	3	4	3			
13	**Rt 42 SB @ Ramp C (on-ramp)**							
	Volume	6220	1870	8120	2710			
	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	34	38	42	33			
	Delay / Veh (s)	5	2	9	2			
24	**Rt 42 SB @ Leaf Avenue Off-Ramp**							
	Volume	7980	110	10630	200			
	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	17	41	38	33			
	Delay / Veh (s)	21	2	5	2			
25	**Rt 42 SB @ Leaf Avenue On-Ramp**							
	Volume	7980	1610	10630	670			
	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)	16	9	42	32			
	Delay / Veh (s)	7	78	2	0.4			
114	**Rt 42 SB @ Missing Moves Ramp B**							
119 in	Volume							
No Build	Movement	Freeway	Ramp	Freeway	Ramp			
	Avg Speed (mph)							
	Delay / Veh (s)							

APPENDIX B

FY 2007-2010

Statewide Transportation Improvement Program (STIP)

Project Listing

FY 2007-10 STATEWIDE TRANSPORTATION IMPROVEMENT PROGRAM
New Jersey Department of Transportation Projects

PROJECT NAME	*Project ID No.*	*TIP No.*
Route 295/42/I-76, Direct Connection, Camden County	**355**	**355**

This project will provide a direct connection for I-295 traffic through the interchange with I-76 and Route 42. The project will improve safety and reduce congestion by eliminating ramp movements on mainline I-295 as well as eliminating the merge of I-295 traffic with I-76 and Route 42 traffic.

Presently, I-295 traffic must use exit ramps that are posted at 35-mph to merge onto I-76 for a short distance before returning to the I-295 mainline. Drivers traveling through the interchange on I-295 must contend with vehicles entering from Route 42 and I-76, creating dangerous weaving movements. As the major carrier of Pennsylvania-bound commuter traffic via the Walt Whitman and Ben Franklin Bridges and as the primary recreational connection to the Jersey shore via Route 42 and the Atlantic City Expressway, this interchange is the busiest in the region. This interchange is one of the 10 most congested locations in New Jersey (#1 in the DVRPC region), and has an average crash rate four times higher than the statewide average.

The project is currently in the Draft Environmental Impact Statement (DEIS) stage. The original list of 26 alternatives has been reduced to a short list of five for further study. Alternatives include a tunnel to carry I-295 under I-76/Route 42, stacking northbound and southbound I-295 over each other, and side-by-side alignments. The proposed project must deal with several constraints and challenges including impacts on residential/commercial properties, a cemetery, and wetlands/floodplains. As a Hyperbuild project, the schedule is to complete technical environmental work in 2005, circulate the DEIS in 2006, issue Final EIS and Record of Decision in 2007, undertake design engineering in 2007-2009, and advance to construction in 2009-2012. The potential cost range is $250-$450 million, depending on the alternative selected.

The following special Federal appropriations were allocated to this project. FY 2003/Q02 $993,500 (balance available $0) and FY 2005/Interstate Maintenance Discretionary $826,667 (balance available $0).

COUNTY: Camden

MUNICIPALITY: Bellmawr Boro Mount Ephraim Boro

MILEPOSTS: 25.71 - 28.20

STRUCTURE NO.: N/A

LEGISLATIVE DISTRICT: 5 **SPONSOR:** NJDOT

PROGRAM CATEGORY: Congestion Relief - Hwy Operational Improvements

MPO	Phase	Fund	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
DVRPC	FA	I-MAINT	$2,100,000				

US Department of Transportation
Federal Highway Administration
New Jersey Department of Transportation