To submit comments on this report please use the contact information below:

**Ms. Melissa Williams, Planning & Community Relations Manager**, MDTA Division of Planning & Program Development

*Email:* mwilliams9@mdta.state.md.us

*Address:* MDTA Division of Planning & Program Development, 2310 Broening Highway, Baltimore, MD 21224

**Ms. Jennifer Rohrer, MDTA Environmental Manager**, MDTA Division of Planning & Program Development

*Email:* jrohrer1@mdta.state.md.us

*Address:* MDTA Division of Planning & Program Development, 2310 Broening Highway, Baltimore, MD 21224

# I-95 FROM MORAVIA ROAD TO THE FORT MCHENRY TUNNEL

# AIR QUALITY ANALYSIS EVALUATION

May 2016

**Baltimore City, Maryland**

**U.S. DEPARTMENT OF TRANSPORTATION**
**FEDERAL HIGHWAY ADMINISTRATION**

**MARYLAND DEPARTMENT OF TRANSPORTATION**
**STATE HIGHWAY ADMINISTRATION**

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## I. INTRODUCTION

This analysis presents the results of a review of air quality impacts associated with The Maryland Transportation Authority's (MDTA) proposed improvements to I-95 from Moravia Road to the Fort McHenry Tunnel in Baltimore City, Maryland. This analysis is intended as an evaluation of the project level air quality impacts of the proposed roadway improvements. This evaluation is provided to meet the requirements of the Clean Air Act (CAA) and the National Environmental Policy Act (NEPA).

In the project area, I-95 is a divided urban interstate running north to south with three travel lanes in each direction. Land use within the project area includes medium density residential, commercial, forest, industrial, institutional, other developed lands, and high density residential. The project area extends for approximately 3.7 miles along I-95, from the Fort McHenry Tunnel to north of US 40 (**Figure 1**)**.**

The purpose of the project is to improve capacity within the project limits. This will be accomplished by restriping I-95 to provide an additional mainline lane in each direction; adjusting the deck of the viaduct structures to relocate the existing median shoulder/lane cross slope break to the new shoulder/lane edge; reconstructing the existing median at-grade traffic barriers and bridge parapets to accommodate the roadway cross slope adjustments; reconstructing outside bridge parapets to 42”; and reconstructing existing at-grade shoulders with full depth pavement section. Refer to **Appendix A** for project design plans.

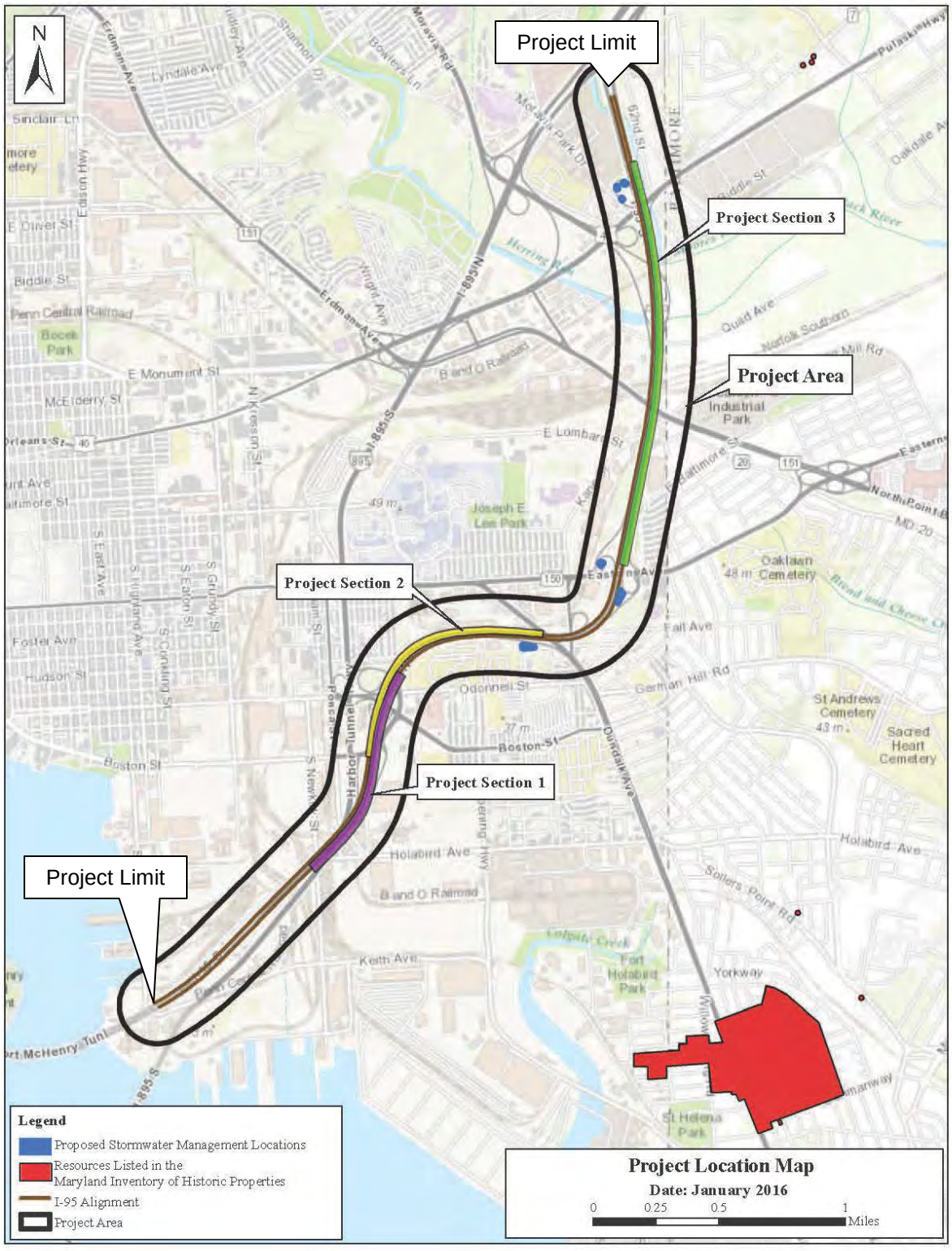



**FIGURE 1 – Location Map**

## II. AIR QUALITY BACKGROUND

The Clean Air Act (CAA) Amendments and the Final Transportation Conformity Rule (40 CFR Parts 51 and 93) direct the U.S. Environmental Protection Agency (EPA) to implement environmental policies and regulations that will ensure acceptable levels of air quality. Both the CAA and the Final Transportation Conformity Rule apply to the proposed transportation project because it involves federal action and funding.

According to the CAA, Title I, Section 176 (c) 2, *"No federal agency may approve, accept, or fund any transportation plan, program, or project unless such plan, program, or project has been found to conform to any applicable implementation plan in effect under this chapter."* The CAA, Title I, Section 176 (c) 1, defines conformity as; *"Conformity to an implementation plan's purpose of eliminating or reducing the severity and number of violations of the national ambient air quality standards and achieving expeditious attainment of such standards; and that such activities will not:*

*i. cause or contribute to any new violation of any standard in any area;*
*ii. increase the frequency or severity of any existing violation of any standard in any area; or*
*iii. delay timely attainment of any standard or any required interim emission reductions or other milestones in any area."*

As required by the CAA, National Ambient Air Quality Standards (NAAQS) have been established for six major air pollutants. These pollutants, known as criteria pollutants, are carbon monoxide (CO), nitrogen dioxide ($NO_2$), ozone ($O_3$), particulate matter ($PM_{10}$ & $PM_{2.5}$), sulfur dioxide ($SO_2$), and lead (Pb). These national standards are summarized in **Table 1**. The "primary" standards have been established to protect the public health. The "secondary" standards are intended to protect the nation's welfare, accounting for air pollutant effects on soil, water, visibility, materials, vegetation, and other aspects of the general welfare.

The CAA Amendments require that the EPA publish a designation list of all geographic areas in compliance with the NAAQS, as well as those areas not in compliance with the NAAQS. The designation of an area is made on a pollutant-by-pollutant basis. EPA's area designations consist of attainment, unclassified, maintenance, and nonattainment. Ambient air quality is monitored through a network of stations to determine conditions throughout the country. EPA reviews the monitoring data, designating areas where pollutant levels exceed the NAAQS as nonattainment. After a nonattainment area improves conditions to meet the standard for the corresponding pollutant, it is re-designated as a maintenance area. Typically these designations are applied to entire counties or groups of counties.

To comply with the CAA, EPA has issued proposed rules, guidance clarifications, and final rules concerning transportation conformity and pollutants for which standards have been set. Following is a summary of recent rules and clarifications:

- *Transportation Conformity Rule $PM_{2.5}$ and $PM_{10}$ Amendments; Final Rule*, March 24, 2010;
- *Using MOVES in Project-Level Carbon Monoxide Analyses*, December 2010;

- *Transportation Conformity Rule Restructuring Amendments*, March 14, 2012;
- *Transportation Conformity Regulations, as of April 2012*;
- *National Ambient Air Quality Standards for Particulate Matter*, January 15, 2013; and
- Update to the *Transportation Conformity Guidance for Quantitative Hot-Spot Analyses in $PM_{2.5}$ and $PM_{10}$ Nonattainment and Maintenance Areas*, November 2015.

EPA has only provided rules and guidance for project level analyses of CO and particulate matter ($PM_{2.5}$ and $PM_{10}$).

**TABLE 1 - National Ambient Air Quality Standards (NAAQS)**

| Pollutant | Primary/ Secondary | Primary Standards | | Form |
|---|---|---|---|---|
| | | Level | Averaging Time | |
| Carbon Monoxide 76 FR 54294 | Primary | 9 ppm | 8-hour | Not to be exceeded more than once per year |
| | | 35 ppm | 1-hour | |
| Lead 73 FR 66964 | Primary and Secondary | 0.15 µg/$m^3$ | Rolling 3-Month Average | Not to be exceeded |
| Nitrogen Dioxide 77 FR 20218 | Primary | 100 ppb | 1-hour | 98$^{th}$ percentile, averaged over 3 years |
| | Primary and Secondary | 53 ppb | Annual | Annual Mean |
| Particulate Matter ($PM_{10}$) 78 FR 3086 | Primary and Secondary | 150 µg/m | 24-hour | Not to be exceeded more than once per year on average over 3 years |
| Particulate Matter ($PM_{2.5}$) 71 FR 61144 | Primary | 12 µg/$m^3$ | Annual | Annual mean averaged over 3 years |
| | Secondary | 15 µg/$m^3$ | Annual | Annual mean averaged over 3 years |
| | Primary and Secondary | 35 µg/$m^3$ | 24-hour | 98$^{th}$ percentile, averaged over 3 years |
| Ozone 80 FR 65292 | Primary and Secondary | 0.070 ppm | 8-hour | Annual fourth highest daily maximum 8-hour concentration, averaged over 3 years |
| Sulfur Dioxide 77 FR 20218 | Primary | 75 ppb | 1-hour | Not to be exceeded more than once per year |
| | Secondary | 0.5 ppm | 3-hour | |

In addition to the criteria pollutants for which there are NAAQS, EPA also regulates air toxics. Toxic air pollutants are those pollutants known or suspected to cause cancer or other serious health effects. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners), and stationary sources (e.g., factories or refineries). The CAA identified 188 air toxics. In 2001 EPA identified a list of 21 Mobile Source Air Toxics (MSATs), and highlighted six of these MSATs as "priority" MSAT. The EPA identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk

drivers. These seven MSATs are: acrolein; benzene; 1,3-butadiene; diesel exhaust (organic gases and diesel particulate matter); formaldehyde; naphthalene; and polycyclic organic matter.

## III. ENVIRONMENTAL ANALYSIS

The I-95 from Moravia Road to the Fort McHenry Tunnel improvement project is located in Baltimore City, Maryland, which is part of the Baltimore, MD designated area. The CO maintenance period for this region ended December 15, 2015; therefore the area is no longer subject to transportation conformity in regards to CO. The area was classified as maintenance for the 1997 annual $PM_{2.5}$ standard by EPA on December 16, 2014. Maryland is neither within a $PM_{10}$ maintenance nor nonattainment area.

For regional conformity determination, states develop State Implementation Plans (SIPs) to establish a plan for attaining and maintaining the NAAQS, as required by the CAA. Proposed and existing transportation projects and programs are compiled in short term (covering approximately 2-6 years) and long term (covering approximately 20 years) plans called transportation improvement programs (TIPs) and long range plans, respectively, for urbanized areas. As defined by the United States Census Bureau, urbanized areas are geographic areas with a population greater than 50,000. These urbanized areas are governed by Metropolitan Planning Organizations (MPOs). MPOs are policy-making organizations which develop the TIPs and long range plans for their respective urbanized areas. Per 40 CFR 93.115, a project must be included in a long range plan and TIP that conforms to the SIP to achieve regional conformity. For the Baltimore, MD area, the Baltimore Regional Transportation Board (BRTB) serves as the MPO. The current long range plan, *Maximize2040,* was adopted by BRTB on November 24, 2015. The latest TIP, covering fiscal years 2016 to 2019, was also adopted by BRTB on November 24, 2015. This assessment includes regional conformity determination for the project.

At the project level, pollutants could possibly have localized (hot-spot) levels above the NAAQS. As outlined by 40 CFR 93.116 in the *Transportation Conformity Regulations, as of April 2012,* any highway or transit project which is proposed to receive funding assistance and/or approval through federal programs or the Federal Highway Administration (FHWA) must not *"cause or contribute to any new localized CO, $PM_{10}$, and/or $PM_{2.5}$ violations, increase the frequency or severity of any existing CO, $PM_{10}$, and/or $PM_{2.5}$ violations, or delay timely attainment of any NAAQS or any required interim emission reductions or other milestones in CO, $PM_{10}$, and $PM_{2.5}$ nonattainment and maintenance areas."* To determine project level conformity, analyses must be performed for the respective pollutant set in the corresponding nonattainment or maintenance area where a project is located. To make the determination that a project is conforming, consultation in accordance with 40 CFR 93.105 is completed via the Interagency Consultation Group (ICG). The ICG for Maryland highway projects includes a representative from FHWA, EPA, the Maryland Department of the Environment (MDE), and the appropriate MPO. This assessment includes a project level conformity determination.

## IV. ENVIRONMENTAL CONSEQUENCES

### 1. Regional Conformity Determination

The currently approved BRTB long range transportation plan and TIP have been determined to conform to the requirements of the Clean Air Act Amendments of 1990 in accordance with 40 CFR 93.114. The current conformity determination is consistent with the final conformity rule found in 40 CFR Parts 51 and 93. The current long range plan includes the project as part of a list of MDTA projects, with the project name I-95: Section 00, therefore, the project is included in a regionally conforming long range plan that meets the requirements of 40 CFR 93.115.

### 2. Project Level Conformity

Since Baltimore City is within a maintenance area for $PM_{2.5}$, a project-specific $PM_{2.5}$ assessment has been provided.

To assist in analyzing potential project impacts to $PM_{2.5}$ levels, recent ambient air quality data from MDE air monitoring stations has been referenced. The closest MDE air monitoring station for the study area is located at the Baltimore City Fire Department in Baltimore, Maryland. Monitoring data is also available at stations located at the Oldtown Fire Station in Baltimore, MD, and 600 Dorsey Avenue in Essex, MD. All these stations are located in EPA Region 3. Monitored ambient, annual $PM_{2.5}$ data at these stations for the years 2013-2015 is presented in **Table 2** (see **Appendix B** for details).

**TABLE 2 – Monitored $PM_{2.5}$ Data 2013-2015**

| **Site (ordered by closest to farthest from project location)** | **Site 24510008 Baltimore City Fire Dept. Baltimore MD** | | | **Site 245100040 Oldtown Fire Station Baltimore MD** | | | **Site 240053001 600 Dorsey Avenue Essex MD** | | |
|---|---|---|---|---|---|---|---|---|---|
| **Year** | ***2013*** | ***2014*** | ***2015*** | ***2013*** | ***2014*** | ***2015*** | ***2013*** | ***2014*** | ***2015*** |
| **Weighted Annual Mean ($ug/m^3$)** | 9.4 | 9.3 | 9.9 | 9.1 | 11.1 | 11.1 | 9.5 | 9.7 | 10.1 |

On March 10, 2006, EPA issued a final rule to address localized impacts of particulate matter: "*$PM_{2.5}$ and $PM_{10}$ Hot-Spot Analyses in Project-Level Transportation Conformity Determinations for the New $PM_{2.5}$ and Existing $PM_{10}$ National Ambient Air Quality Standards*" (71 FR 12468). These rule amendments require the assessment of localized air quality impacts of federally funded or approved transportation projects in $PM_{10}$ and $PM_{2.5}$ nonattainment and maintenance areas. In November 2013 EPA issued "*Transportation Conformity Guidance for Quantitative Hot-Spot Analyses in $PM_{2.5}$ and $PM_{10}$ Nonattainment and Maintenance Areas,*" which helps state and local agencies complete quantitative $PM_{2.5}$ and $PM_{10}$ hot-spot analyses for project-level transportation conformity determinations of certain highway and transit projects.

Projects that require hot-spot analysis for $PM_{2.5}$ are those that are listed in 40 CFR 93.123(b)(1), which Appendix B to the December 2010 *Transportation Conformity Guidance for Quantitative*

*Hot-Spot Analyses in $PM_{2.5}$ and $PM_{10}$ Nonattainment and Maintenance Areas* defines as examples of projects of local air quality concern and include:

*(i) New highway projects that have a significant number of diesel vehicles, and expanded projects that have a significant increase in the number of diesel vehicles;*
*(ii) Projects affecting intersections that are at Level-of-Service D, E, or F with a significant number of diesel vehicles, or those that will change to Level-of-Service D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project;*
*(iii) New bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location;*
*(iv) Expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location; and*
*(v) Projects in or affecting locations, areas, or categories of sites which are identified in the $PM_{10}$ or $PM_{2.5}$ applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violations.*

As discussed in examples outlined in the preamble to the March 10, 2006 final rule, projects of local air quality concern, 40 CFR 93.123(b)(1)(i) and (ii), have been interpreted as applying to projects that would involve a significant increase in the number of diesel transit buses and diesel trucks on the existing facility. As provided in the November 2015 guidance, Appendix B, examples of projects that are of air quality concern and, therefore, covered by 40 CFR 93.123(b)(1)(i) and (ii) include the following:

- A project on a new highway or expressway that serves a significant volume of diesel truck traffic, such as facilities with greater than 125,000 annual average daily traffic (AADT) and 8% or more of such AADT is diesel truck traffic;
- New exit ramps and other highway facility improvements to connect a highway or expressway to a major freight, bus, or intermodal terminal;
- Expansion of an existing highway or other facility that affects a congested intersection (operated at Level-of-Service D, E, or F) that has a significant increase in the number of diesel trucks; and,
- Similar highway projects that involve a significant increase in the number of diesel transit busses and/or diesel trucks.

To assist with the ICG process, MDTA has prepared the following assessment of the proposed improvements:

- This project is considered under the following paragraph of 40 CFR 93:
    - 40 CFR 92.123(b)(1)(i), as amended, which includes *"New highway projects that have a significant number of diesel vehicles, and expanded projects that have a significant increase in the number of diesel vehicles."*

- The proposed improvements do not meet the criteria set forth in 40 CFR 93.123(b)(1)(i) to be considered a project of local air quality concern based on the following considerations:

    - The proposed project involves restriping I-95 to provide an additional mainline lane in each direction between the Fort McHenry Tunnel and north of US 40.
    - As shown in **Tables 3** and **4**, I-95 accommodates between 8 and 11 percent truck traffic within the project limits. For the 2040 no-build conditions, the highest average daily traffic (ADT) directional volume is 87,700 vehicles per day, southbound along I-95, south of Moravia Road, and the highest directional average daily number of trucks is 7,855, southbound along I-95, north of O'Donnel Street. For the 2040 build conditions, the highest average daily traffic (ADT) directional volume is 89,150 vehicles per day, southbound on I-95, south of Moravia Road, which is 1,450 more daily vehicles than the no-build condition (87,700). The highest directional average daily number of trucks is 8,340 vehicles, northbound on I-95, north of O'Donnel Street, which is 140 more daily trucks than the no-build condition (8,200).
    - Depicted truck percentages represent the amount of light, medium and heavy truck activity along the given roadway segment. Unless predicated by significant land use changes (heavy truck generators), existing truck percentages are used as the primary factor in determining future percentages. The build condition will improve operation of the roadway, relieving system congestion and improving safety, but will not necessarily induce new truck traffic origin-destination patterns.

Based on review and analysis as discussed above, there will not be a substantial increase in the number of diesel trucks with the construction of the project and it is determined that the project will meet the Clean Air Act and 40 CFR 93.109 requirements for Fine Particulate Matter – $PM_{2.5}$. These requirements are met without a hot-spot analysis because the project has not been found to be a project of local air quality concern as outlined under 40 CFR 93.123(b)(1). The project will not cause or contribute to a new violation of the $PM_{2.5}$ NAAQS, increase the frequency or severity of any existing violation, or delay timely attainment of any $PM_{2.5}$ standard or any required interim $PM_{2.5}$ emission reductions or other milestones.

**TABLE 3 - Traffic Data – I-95 Southbound**

| Segment | Condition | Existing 2015 | No-Build 2040 | Build 2040 |
|---|---|---|---|---|
| North of US 40 | ADT (vpd) | 57,250 | 73,400 | 74,850 |
| | Percent Trucks (%) | 9 | 9 | 9 |
| | Daily Truck Volumes (vpd) | 5,153 | 6,606 | 6,737 |
| South of Moravia Road | ADT (vpd) | 70,050 | 87,700 | 89,150 |
| | Percent Trucks (%) | 8 | 8 | 8 |
| | Daily Truck Volumes (vpd) | 5,604 | 7,016 | 7,132 |
| South of Eastern Avenue | ADT (vpd) | 67,700 | 81,800 | 83,250 |
| | Percent Trucks (%) | 9 | 9 | 9 |
| | Daily Truck Volumes (vpd) | 6,093 | 7,362 | 7,493 |
| North of O'Donnel Street | ADT (vpd) | 72,600 | 87,280 | 88,730 |
| | Percent Trucks (%) | 9 | 9 | 9 |
| | Daily Truck Volumes (vpd) | 6,534 | 7,855 | 7,986 |
| South of O'Donnel Street | ADT (vpd) | 62,100 | 71,720 | 73,170 |
| | Percent Trucks (%) | 9 | 9 | 9 |
| | Daily Truck Volumes (vpd) | 5,589 | 6,455 | 6,585 |
| South of Keith Avenue | ADT (vpd) | 66,500 | 75,420 | 76,870 |
| | Percent Trucks (%) | 10 | 10 | 10 |
| | Daily Truck Volumes (vpd) | 6,650 | 7,542 | 7,687 |

**TABLE 4 - Traffic Data – I-95 Northbound**

| Segment | Condition | Existing 2015 | No-Build 2040 | Build 2040 |
|---|---|---|---|---|
| North of US 40 | ADT (vpd) | 51,950 | 66,550 | 67,950 |
| | Percent Trucks (%) | 11 | 11 | 11 |
| | Daily Truck Volumes (vpd) | 5,715 | 7,321 | 7,475 |
| South of Moravia Road | ADT (vpd) | 66,600 | 83,150 | 84,550 |
| | Percent Trucks (%) | 9 | 9 | 9 |
| | Daily Truck Volumes (vpd) | 5,994 | 7,484 | 7,610 |
| South of Eastern Avenue | ADT (vpd) | 57,250 | 69,400 | 70,800 |
| | Percent Trucks (%) | 10 | 10 | 10 |
| | Daily Truck Volumes (vpd) | 5,725 | 6,940 | 7,080 |
| North of O'Donnel Street | ADT (vpd) | 68,450 | 82,000 | 83,400 |
| | Percent Trucks (%) | 10 | 10 | 10 |
| | Daily Truck Volumes (vpd) | 6,845 | 8,200 | 8,340 |
| South of O'Donnel Street | ADT (vpd) | 58,150 | 66,850 | 68,250 |
| | Percent Trucks (%) | 10 | 10 | 10 |
| | Daily Truck Volumes (vpd) | 5,815 | 6,685 | 6,825 |
| South of Keith Avenue | ADT (vpd) | 61,950 | 70,200 | 71,600 |
| | Percent Trucks (%) | 10 | 10 | 10 |
| | Daily Truck Volumes (vpd) | 6,195 | 7,020 | 7,160 |

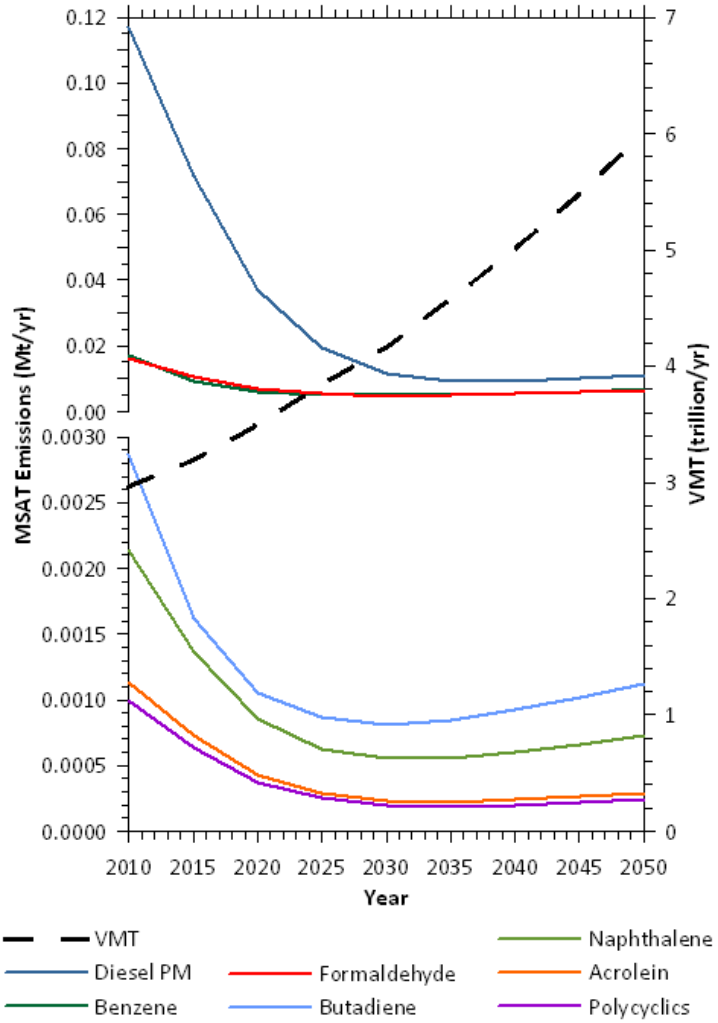
## 3. MSAT Assessment

The FHWA December 2012 *Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA* requires an assessment of MSATs under specific conditions. The project qualifies as a programmatic categorical exclusion under 23 CFR 771.117(c). Therefore in accordance with the referenced FHWA guidance, the project would be considered a Project with No Meaningful Potential MSAT Effects.

The purpose of the project is to improve capacity within the project limits. This project has been determined to generate minimal air quality impacts for CAA criteria pollutants and has not been linked with any special MSAT concerns. As such, this project will not result in substantial changes in traffic volumes, vehicle mix, basic project location, or any other factor that would cause an increase in MSAT impacts of the project from that of the no-build alternative.

Moreover, EPA regulations for vehicle engines and fuels will cause overall MSAT emissions to decline significantly over the next several decades. Based on regulations now in effect, an analysis of national trends with EPA's Motor Vehicle Emission Simulator (MOVES) model forecasts a combined reduction of over 80 percent in the total annual emission rate for the priority MSAT from 2010 to 2050 while vehicle-miles of travel are projected to increase by over

100 percent (**Figure 2**). This will both reduce the background level of MSAT as well as the possibility of even minor MSAT emissions from this project.




Note: Trends for specific locations may be different, depending on locally derived information representing vehicle-miles travelled, vehicle speeds, vehicle mix, fuels, emission control programs, meteorology, and other factors.
Source: EPA MOVES2010b model runs conducted during May - June 2012 by FHWA.

**FIGURE 2 - National MSAT Emission Trends 1999 – 2050 for Vehicles Operating on Roadways Using EPA's MOVES2010b Model**

## 4. Construction Impacts

The construction phase of the proposed project has the potential to impact the local ambient air quality by generating fugitive dust through activities such as demolition and materials handling. The State of Maryland has addressed this possibility by establishing procedures to be followed by contractors involved in site work through publishing the *Maryland State Highway Administration Standard Specifications for Construction and Materials*. The Maryland Air and

Radiation Management Administration was consulted to determine the adequacy of the specifications in terms of satisfying the requirements of the *Regulations Governing the Control of Air Pollution in the State of Maryland*. The Maryland Air and Radiation Management Administration found the specifications to be consistent with the requirements of these regulations. Therefore, during the construction period, all appropriate measures (Code of Maryland Regulations 26.11.06.03 D) would be incorporated to minimize the impact of the proposed transportation improvements on the air quality of the area. Mobile source emissions can also be minimized during construction by not permitting idling delivery trucks or other equipment during periods of unloading or other non-active use. The existing number of traffic lanes should be maintained during construction, to the maximum extent possible, and construction schedules should be planned in a manner that will not create traffic disruption and increase air pollutants. Application of these measures will ensure that the construction impact of the project is insignificant.

## V. INTERAGENCY CONSULTATION GROUP / PUBLIC COORDINATION

Copies of this air quality analysis will be circulated to FHWA, EPA, MDE, and BRTB staff for a 15 day Interagency Consultation Group review and comment period. Any responses and comments will be addressed and will be catalogued in **Appendix D**. The resulting air quality analysis will be placed on SHA and MDTA's website for a 15 day public review and comment period.

# APPENDIX

**A - PLANS**

**B - MONITORED AMBIENT AIR QUALITY DATA 2013-2015**

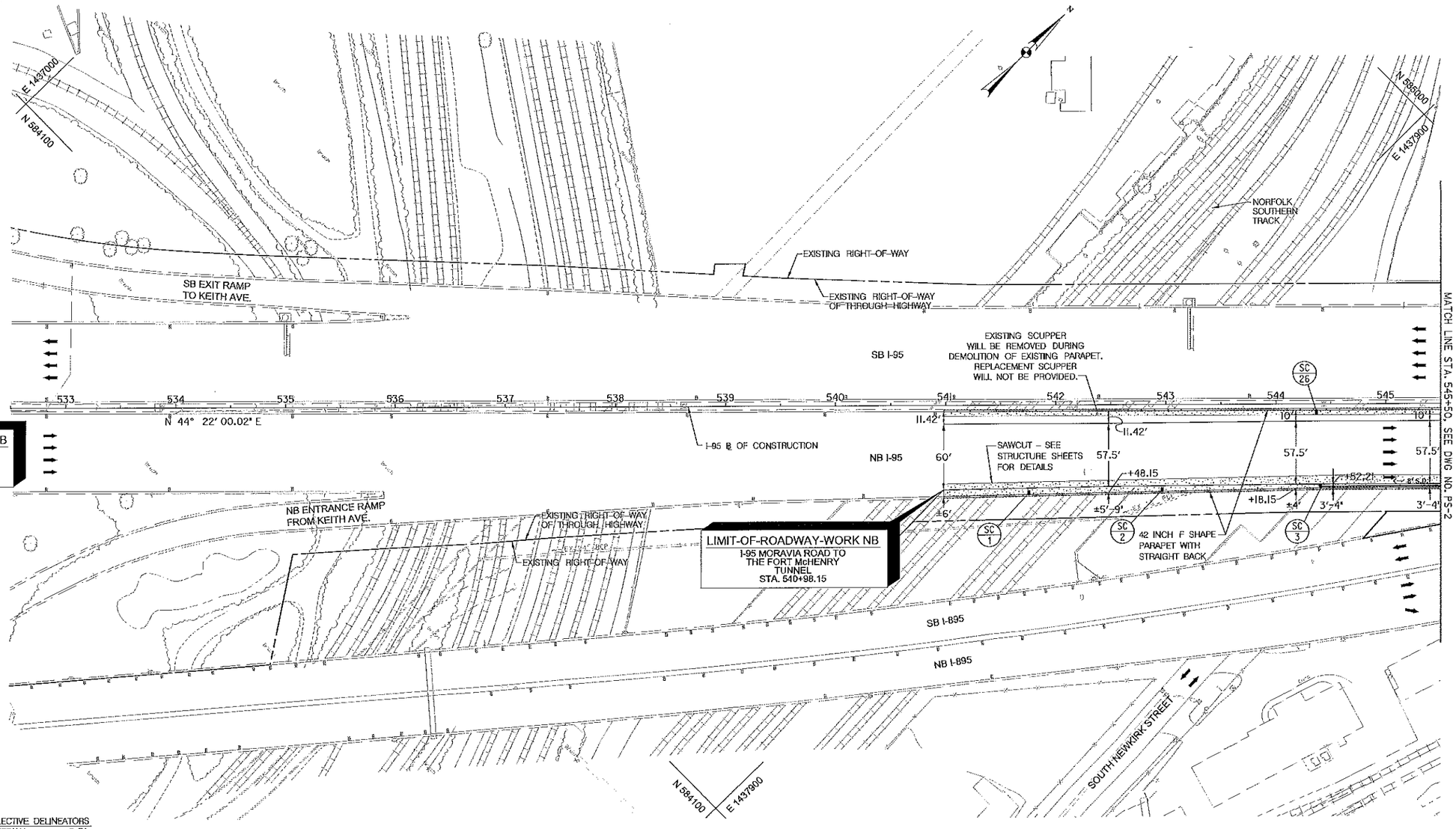
**C - TRAFFIC DATA**

**D - INTERAGENCY CONSULTATION GROUP COORDINATION**

# APPENDIX A - PLANS

TO FORT McHENRY TUNNEL

TO WHITE MARSH




CONCRETE TRAFFIC BARRIER REFLECTIVE DELINEATORS

| | |
|---|---|
| STA. 540+98 TO STA. 545+50, RT MEDIAN | 5 EA |
| STA. 540+98 TO STA. 545+50, RT OUTSIDE | 5 EA |

| CROSS REFERENCE | DWG. NO. |
|---|---|
| TYPICAL SECTION | TS-1 |
| GEOMETRIC LAYOUT | GS-1 |
| SUPERELEVATION TABLE | SE-4 |
| TRAFFIC CONTROL | MT-4, MT-24 |
| STRUCTURAL SHEETS | SI-1 TO S2-23 |
| DRAINAGE SCHEDULE | DD-1 |
| SIGNING PLAN | SN-2.01, SN-2.02 |
| LIGHTING PLAN | LT-03, LT-04 |
| ITS PLAN | ITS-02, ITS-03 |
| SEDIMENT CONTROL PLAN | ES-1 |

SCALE IN FEET
50 0 50 100

LEGEND
- FULL DEPTH PAVEMENT AND VARIABLE DEPTH OVERLAY
- CONCRETE OVERLAY OR FULL DEPTH DECK REPLACEMENT
- GRIND AND RESURFACE
- WEDGE AND LEVEL
- (1/201) PROPOSED INLET/SCUPPER
- PROPOSED MOD. TYPE 'S' INLET, 8 L.F. RCP AND PIPE CONNECTION
- SB2-2 SOIL BORING AND BORING NUMBER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MARYLAND TRANSPORTATION AUTHORITY
*Engineering Division*

ADDENDUMS & REVISIONS

| NO. | DESCRIPTION | BY | DATE |
|---|---|---|---|
| | | | |

# I-95 FROM MORAVIA ROAD TO THE FORT McHENRY TUNNEL

I-95 (BALTIMORE CITY)

ROADWAY PLAN

| | | | |
|---|---|---|---|
| DESIGNED BY D.J.R. | DRAWN BY A.W.G. | CHECKED BY J.M.R. | |
| CONST. REVIEW BY | DATE MAY 2016 | SCALE AS SHOWN | |

CONTRACT NO. FT-3003

DRAWING NO. **PS-1 of 16**

SHEET NO. 24 OF 488

\\balsrv01\v2014\2014\14006_MDTAAE2795\Task 19 - I-95 Moravia to FMT Design\CADD\Plans\pHD-P001_I95.dgn

Monday, May 23, 2016 AT 10:45 AM

TO FORT McHENRY TUNNEL

TO WHITE MARSH

CURVE NO. 1
P.I. N 585,893.5818
E 1,439,002.5954
Δ = 12°-38'-28.37"
Do = 2°-59'-31.01"
R = 1,915.00'
L = 422.51'
T = 212.12'
E = 11.71'
S/E = SEE SUPERELEVATION TABLE

CURVE NO. R-1
P.I. N 585,767.2789
E 1,439,082.6039
Δ = 21°-22'-48.94"
Do = 3°-27'-43.13"
R = 1,655.00'
L = 617.57'
T = 312.42'
E = 29.23'
S/E = SEE SUPERELEVATION TABLE

LIMIT-OF-RESTRIPING SB
I-95 MORAVIA ROAD TO THE FORT McHENRY TUNNEL
STA. 550+80.00

LIMIT-OF-ROADWAY-WORK SB
I-95 MORAVIA ROAD TO THE FORT McHENRY TUNNEL
STA. 556+00.00

SOUTH NEWKIRK STREET

E 1438000
N 585000

N 585150
E 1438600

EXISTING RIGHT-OF-WAY
EXISTING RIGHT-OF-WAY OF THROUGH HIGHWAY

SB I-895
NB I-895

MATCH LINE STA. 545+50, SEE DWG NO. PS-1

MATCH LINE STA. 558+50, SEE DWG NO. PS-3

SC Sta 557+41.28
SB ENTRANCE RAMP FROM INTERSTATE AVE.
42 INCH F SHAPE PARAPET WITH STRAIGHT BACK
SAWCUT -- SEE STRUCTURE SHEETS FOR DETAILS
R=2,041'

POT Sta 10+00.00=
POS Sta 553+12.41, 60.31' RT

TS Sta 549+41.28

SPIRAL 1-B

CURVE NO. 1

I-95 ℄ OF CONSTRUCTION

N 44° 22' 00.02" E

SAWCUT -- SEE STRUCTURE SHEETS FOR DETAILS

PC Sta 12+83.55

NB EXIT RAMP TO INTERSTATE AVE.

CURVE NO. R-1

42 INCH F SHAPE PARAPET WITH STRAIGHT BACK

CANTON RAILROAD TRACK

CSX TRACK

PONCA STREET

PONCABIRD PASS

RAPPOLLA STREET

SCALE IN FEET
50 0 50 100

CONCRETE TRAFFIC BARRIER REFLECTIVE DELINEATORS

| | |
|---|---|
| STA. 545+50 TO STA. 558+50, RT MEDIAN | 13 EA |
| STA. 545+50 TO STA. 556+00, RT OUTSIDE | 11 EA |
| STA. 556+00 TO STA. 558+50, LT MEDIAN | 2 EA |
| STA. 556+10 TO STA. 558+50, RT OUTSIDE | 2 EA |

REMOVE AND RESET TRAFFIC BARRIER END TREATMENT -- ANY TYPE
STA. 555+88 TO STA. 556+10, RT 1 EA

| CROSS REFERENCE | DWG. NO. |
|---|---|
| TYPICAL SECTION | TS-1, TS-2, TS-7 |
| GEOMETRIC LAYOUT | GS-1 |
| SUPERELEVATION TABLE | SE-4, SE-6 |
| TRAFFIC CONTROL | MT-5, MT-25 |
| STRUCTURAL SHEETS | S2-1 TO S3-14 |
| DRAINAGE SCHEDULE | DD-1 |
| SIGNING PLAN | SN-2.02, SN-2.03 |
| LIGHTING PLAN | LT-04, LT-05 |
| ITS PLAN | ITS-03, ITS-04 |
| SEDIMENT CONTROL PLAN | ES-2 |

LEGEND
- FULL DEPTH PAVEMENT AND VARIABLE DEPTH OVERLAY
- CONCRETE OVERLAY OR FULL DEPTH DECK REPLACEMENT
- GRIND AND RESURFACE
- WEDGE AND LEVEL
- (I/201) PROPOSED INLET/SCUPPER
- PROPOSED MOD. TYPE 'S' INLET, 8 L.F. RCP AND PIPE CONNECTION
- SB2-2 SOIL BORING AND BORING NUMBER


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ADDENDUMS & REVISIONS

| NO. | DESCRIPTION | BY | DATE |
|---|---|---|---|
| | | | |
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# I-95 FROM MORAVIA ROAD TO THE FORT McHENRY TUNNEL

I-95 (BALTIMORE CITY)

ROADWAY PLAN

| | | | |
|---|---|---|---|
| DESIGNED BY D.J.R. | DRAWN BY A.W.G. | CHECKED BY J.M.R. | |
| CONST. REVIEW BY | DATE MAY 2016 | SCALE AS SHOWN | |

CONTRACT NO. FT-3003

DRAWING NO. **PS-2 of 16**

SHEET NO. 25 OF 488

\\balsrv01\v2014\2014\14006_MDTAAE2795\Task 19 - I-95 Moravia to FMT Design\CADD\Plans\pHD-P002_195.dgn

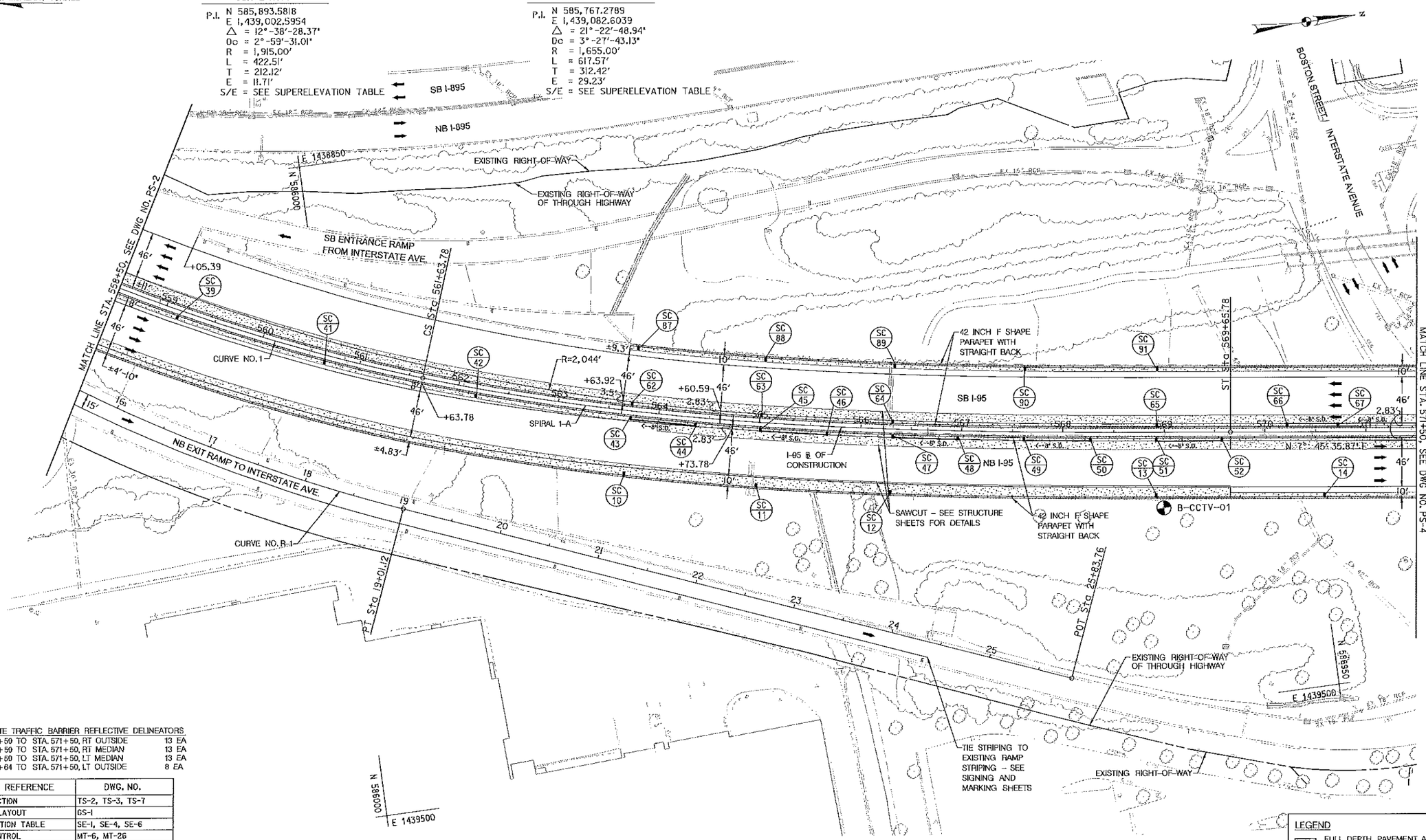
Monday, May 23, 2016 AT 10:45 AM

TO FORT McHENRY TUNNEL

TO WHITE MARSH

CURVE NO. 1
P.I. N 585,893.5818
E 1,439,002.5954
△ = 12°-38'-28.37"
Dc = 2°-59'-31.01"
R = 1,915.00'
L = 422.51'
T = 212.12'
E = 11.71'
S/E = SEE SUPERELEVATION TABLE

CURVE NO. R-1
P.I. N 585,767.2789
E 1,439,082.6039
△ = 21°-22'-48.94"
Dc = 3°-27'-43.13"
R = 1,655.00'
L = 617.57'
T = 312.42'
E = 29.23'
S/E = SEE SUPERELEVATION TABLE




CONCRETE TRAFFIC BARRIER REFLECTIVE DELINEATORS

| | |
|---|---|
| STA. 558+50 TO STA. 571+50, RT OUTSIDE | 13 EA |
| STA. 558+50 TO STA. 571+50, RT MEDIAN | 13 EA |
| STA. 558+50 TO STA. 571+50, LT MEDIAN | 13 EA |
| STA. 563+64 TO STA. 571+50, LT OUTSIDE | 8 EA |

| CROSS REFERENCE | DWG. NO. |
|---|---|
| TYPICAL SECTION | TS-2, TS-3, TS-7 |
| GEOMETRIC LAYOUT | GS-1 |
| SUPERELEVATION TABLE | SE-1, SE-4, SE-6 |
| TRAFFIC CONTROL | MT-6, MT-26 |
| STRUCTURAL SHEETS | S2-1 TO S5-25 |
| DRAINAGE SCHEDULE | DD-1 |
| SIGNING PLAN | SN-2.03, SN-2.04 |
| LIGHTING PLAN | LT-05, LT-06 |
| ITS PLAN | ITS-04, ITS-05 |
| SEDIMENT CONTROL PLAN | ES-3 |
| SOIL BORING SHEETS | SB-1 |

LEGEND
- FULL DEPTH PAVEMENT AND VARIABLE DEPTH OVERLAY
- CONCRETE OVERLAY OR FULL DEPTH DECK REPLACEMENT
- GRIND AND RESURFACE
- WEDGE AND LEVEL
- (1/201) PROPOSED INLET/SCUPPER
- PROPOSED MOD. TYPE 'S' INLET, 8 L.F. RCP AND PIPE CONNECTION
- (SB2-2) SOIL BORING AND BORING NUMBER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ADDENDUMS & REVISIONS

| NO. | DESCRIPTION | BY | DATE |
|---|---|---|---|
| | | | |
| | | | |
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| | | | |
| | | | |

# I-95 FROM MORAVIA ROAD TO THE FORT McHENRY TUNNEL

I-95 (BALTIMORE CITY)

ROADWAY PLAN

CONTRACT NO. FT-3003

DRAWING NO. PS-3 of 16

DESIGNED BY D.J.R. | DRAWN BY A.W.G. | CHECKED BY J.M.R.

CONST. REVIEW BY | DATE MAY 2016 | SCALE AS SHOWN

SHEET NO. 26 OF 488

\\balsrv01\v2014\2014\14006_MDTAAE2795\Task 19 - I-95 Moravia to FMT Design\CADD\Plans\pHD-P003_195.dgn

Monday, May 23, 2016 AT 10:45 AM

TO FORT McHENRY TUNNEL

TO WHITE MARSH

CURVE NO. 2

P.I. N 587,821.1890
E 1,439,366.0933
△ = 14°-24'-06.05"
Dc = 1°-15'-00.00"
R = 4,583.66'
L = 1,152.13'
T = 579.12'
E = 36.44'
S/E = SEE ELEVATION TABLE

MATCH LINE STA. 571+50, SEE DWG NO. PS-3

MATCH LINE STA. 584+50, SEE DWG NO. PS-5

E 1439050

N 587150

SAWCUT - SEE STRUCTURE SHEETS FOR DETAILS

EXISTING RIGHT-OF-WAY

EXISTING RIGHT-OF-WAY OF THROUGH HIGHWAY

O'DONNELL STREET

SB I-95

CURVE NO. 2

NB I-95

42 INCH F SHAPE PARAPET WITH STRAIGHT BACK

I-95 ℄ OF CONSTRUCTION

PC Sta 573+39.73

N 7° 45' 35.87" E

INTERSTATE AVENUE

EXISTING RIGHT-OF-WAY OF THROUGH HIGHWAY

EXISTING RIGHT-OF-WAY

O'DONNELL STREET CUTOFF

N 588200

E 1439700

N 587450

E 1439700

EXISTING RIGHT-OF-WAY / EXISTING RIGHT-OF-WAY OF THROUGH HIGHWAY

EXISTING RIGHT-OF-WAY

SCALE IN FEET
50 0 50 100

CONCRETE TRAFFIC BARRIER REFLECTIVE DELINEATORS

| | |
|---|---|
| STA. 571+50 TO STA. 584+50, RT OUTSIDE | 13 EA |
| STA. 571+50 TO STA. 584+50, RT MEDIAN | 13 EA |
| STA. 571+50 TO STA. 584+50, LT MEDIAN | 13 EA |
| STA. 571+50 TO STA. 584+50, LT OUTSIDE | 13 EA |

| CROSS REFERENCE | DWG. NO. |
|---|---|
| TYPICAL SECTION | TS-3, TS-7, TS-8 |
| GEOMETRIC LAYOUT | GS-1, GS-2 |
| SUPERELEVATION TABLE | SE-1, SE-6, SE-8 |
| TRAFFIC CONTROL | MT-7, MT-27 |
| STRUCTURAL SHEETS | S4-1 TO S5-25 |
| DRAINAGE SCHEDULE | DD-1 |
| SIGNING PLAN | SN-2.04, SN-2.05 |
| LIGHTING PLAN | LT-06, LT-07 |
| ITS PLAN | ITS-05, ITS-06 |
| SEDIMENT CONTROL PLAN | ES-4 |

LEGEND

- FULL DEPTH PAVEMENT AND VARIABLE DEPTH OVERLAY
- CONCRETE OVERLAY OR FULL DEPTH DECK REPLACEMENT
- GRIND AND RESURFACE
- WEDGE AND LEVEL
- (1/201) PROPOSED INLET/SCUPPER
- PROPOSED MOD. TYPE 'S' INLET, & L.F. RCP AND PIPE CONNECTION
- SB2-2 SOIL BORING AND BORING NUMBER

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ADDENDUMS & REVISIONS

| NO. | DESCRIPTION | BY | DATE |
|---|---|---|---|
| | | | |
| | | | |
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| | | | |
| | | | |

# I-95 FROM MORAVIA ROAD TO THE FORT McHENRY TUNNEL

I-95 (BALTIMORE CITY)

ROADWAY PLAN

CONTRACT NO. FT-3003

DRAWING NO. PS-4 of 16

| | | | |
|---|---|---|---|
| DESIGNED BY D.I.R. | DRAWN BY A.W.G. | CHECKED BY J.M.R. | SHEET NO. 27 OF 488 |
| CONST. REVIEW BY | DATE MAY 2016 | SCALE AS SHOWN | |

\\balsrv01\v2014\2014\14006_MDTAAE2795\Task 19 - I-95 Moravia to FMT Design\CADD\Plans\pHD-P004_I95.dgn

Monday, May 23, 2016 AT 10:45 AM

TO FORT McHENRY TUNNEL

TO WHITE MARSH

CURVE NO. 2
P.I. N 587,821.1890
E 1,439,366.0933
△ = 14°-24'-06.05"
Dc = 1°-15'-00.00"
R = 4,583.66'
L = 1,152.13'
T = 579.12'
E = 36.44'
S/E = SEE ELEVATION TABLE

CURVE NO. 3
P.I. N 588,566.9113
E 1,439,669.8347
△ = 11°-16'-36.99"
Dc = 2°-30'-07.20"
R = 2,290.00'
L = 450.72'
T = 226.09'
E = 11.13'
S/E = SEE ELEVATION TABLE

CURVE NO. 4
P.I. N 589,017.4429
E 1,439,967.3411
△ = 23°-15'-19.95"
Dc = 3°-45'-25.56"
R = 1,525.00'
L = 618.98'
T = 313.81'
E = 31.95'
S/E = SEE ELEVATION TABLE

CURVE NO. 5
P.I. N 589,428.4035
E 1,440,592.8292
△ = 25°-38'-23.16"
Dc = 3°-00'-00.00"
R = 1,909.86'
L = 854.66'
T = 434.61'
E = 48.83'
S/E = SEE ELEVATION TABLE

EXISTING RIGHT-OF-WAY

CONCRETE TRAFFIC BARRIER TRANSITION TYPE A - SEE DE-2

42 INCH F SHAPE CONCRETE TRAFFIC BARRIER, SINGLE FACE - TYPE 1

CONCRETE TRAFFIC BARRIER TRANSITION TYPE B - SEE DE-2

EXISTING RIGHT-OF-WAY OR THROUGH HIGHWAY

TIE STRIPING TO EXISTING EXIT RAMP STRIPING - SEE SIGNING AND MARKING SHEETS

TYPE J TRAFFIC BARRIER END TREATMENT, 9 CYLINDERS

MODIFIED 42 INCH F SHAPE CONCRETE TRAFFIC BARRIER

SB EXIT RAMP TO O'DONNELL ST.

E 1439450

N 588450

CURVE NO. 2

R=1,863'

SB I-95

NB I-95

CURVE NO. 3

CANTON RR TRACK

42 INCH F SHAPE CONCRETE TRAFFIC BARRIER, SINGLE FACE - TYPE 1

MODIFIED 42 INCH F SHAPE CONCRETE TRAFFIC BARRIER

N 589450

E 1440250

MATCH LINE STA. 584+50, SEE DWG NO. PS-4

42 INCH F SHAPE PARAPET WITH STRAIGHT BACK

SAWCUT - SEE STRUCTURE SHEETS FOR DETAILS

PCC Sta 584+91.86

O'DONNELL STREET

PCC Sta 589+42.58

CURVE NO. R-3

CURVE NO. R-2

CURVE NO. 4

FULL DEPTH SAWCUT

PCC Sta 35+11.04

I-95 E/O CONSTRUCTION

CURVE NO. R-4

NB ENTRANCE RAMP FROM O'DONNELL STREET

PCC Sta 31+84.43

PCC Sta 30+00.00

CURVE NO. 6

R=1,818'

MATCH LINE STA. 597+50, SEE DWG NO. PS-6

TIE STRIPING TO EXISTING RAMP STRIPING - SEE SIGNING AND MARKING SHEETS

EXISTING RIGHT-OF-WAY OF THROUGH HIGHWAY

EXISTING RIGHT-OF-WAY

CURVE NO. R-3
P.I. N 588,743.1519
E 1,439,900.0802
△ = 17°-45'-48.20"
Dc = 5°-26'-48.20"
R = 1,053.50'
L = 326.62'
T = 164.63'
E = 12.79'
S/E = SEE ELEVATION TABLE

CURVE NO. R-4
P.I. N 589,080.8412
E 1,440,140.1959
△ = 25°-00'-04.89"
Dc = 5°-05'-12.23"
R = 1,126.38'
L = 491.50'
T = 249.73'
E = 27.35'
S/E = SEE ELEVATION TABLE

CURVE NO. R-2
P.I. N 588,497.2215
E 1,439,821.8229
△ = 22°-48'-56.18"
Dc = 12°-22'-15.41"
R = 463.15'
L = 184.43'
T = 93.45'
E = 9.33'
S/E = SEE ELEVATION TABLE

Mt CARMEL CEMETERY

N 588450

E 1440250

42 INCH F SHAPE CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 1

| | |
|---|---|
| STA. 588+98 TO STA. 591+48, LT OUTSIDE | 265 LF |
| STA. 591+02 TO STA. 591+48, LT RAMP | 50 LF |
| STA. 593+85 TO STA. 595+00, LT MEDIAN | 115 LF |

MODIFIED 42 INCH F SHAPE CONCRETE TRAFFIC BARRIER

| | |
|---|---|
| STA. 588+97 TO STA. 593+85, LT MEDIAN | 489 LF |
| STA. 595+00 TO STA. 597+50, LT MEDIAN | 251 LF |
| STA. 589+22 TO STA. 597+50, RT MEDIAN | 826 LF |

34 INCH F SHAPE CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 2

| | |
|---|---|
| STA. 590+98 TO STA. 591+07, RT OUTSIDE | 11 LF |
| STA. 591+14 TO STA. 591+17, RT OUTSIDE | 3 LF |

CONCRETE TRAFFIC BARRIER TRANSITION TYPE A

| | |
|---|---|
| STA. 590+91 TO STA. 591+02, LT RAMP | 12.5 LF |

CONCRETE TRAFFIC BARRIER TRANSITION TYPE B

| | |
|---|---|
| STA. 591+48 TO STA. 591+78, LT OUTSIDE | 1 EA |

REMOVAL OF EXISTING CONCRETE BARRIER (ANY TYPE)

| | |
|---|---|
| STA. 588+97 TO STA. 597+50, LT MEDIAN | 855 LF |
| STA. 589+22 TO STA. 597+50, RT MEDIAN | 826 LF |
| STA. 588+86 TO STA. 591+78, LT OUTSIDE | 295 LF |
| STA. 590+91 TO STA. 591+79, LT RAMP | 93 LF |
| STA. 590+98 TO STA. 591+17, RT OUTSIDE | 21 LF |

| CROSS REFERENCE | DWG. NO. |
|---|---|
| TYPICAL SECTION | TS-3, TS-8, TS-9 |
| GEOMETRIC LAYOUT | GS-2 |
| SUPERELEVATION TABLE | SE-1, SE-6, SE-7, SE-8 |
| TRAFFIC CONTROL | MT-8, MT-28 |
| STRUCTURAL SHEETS | S4-1 TO S5-25 |
| DRAINAGE SCHEDULE | DD-1, DD-2 |
| SIGNING PLAN | SN-2.05, SN-2.06 |
| LIGHTING PLAN | LT-07, LT-08 |
| ITS PLAN | ITS-06, ITS-07 |
| SEDIMENT CONTROL PLAN | ES-5 |

CONCRETE TRAFFIC BARRIER REFLECTIVE DELINEATORS

| | |
|---|---|
| STA. 584+50 TO STA. 597+50, LT MEDIAN | 13 EA |
| STA. 584+50 TO STA. 597+50, RT MEDIAN | 13 EA |
| STA. 584+50 TO STA. 591+78, LT OUTSIDE | 8 EA |
| STA. 584+50 TO STA. 585+94, RT OUTSIDE | 1 EA |
| STA. 590+91 TO STA. 591+79, LT RAMP | 1 EA |

TYPE J TRAFFIC BARRIER END TREATMENT, 9 CYLINDERS

| | |
|---|---|
| STA. 591+96, LT GORE | 1 EA |

GRINDING ASPHALT PAVEMENT 0 INCH TO 2 INCHES

| | |
|---|---|
| STA. 588+97 TO STA. 597+50, LT | 7,095 SY |
| STA. 589+16 TO STA. 597+50, RT | 9,119 SY |

SCALE IN FEET
50 0 50 100

LEGEND
- FULL DEPTH PAVEMENT AND VARIABLE DEPTH OVERLAY
- CONCRETE OVERLAY OR FULL DEPTH DECK REPLACEMENT
- GRIND AND RESURFACE
- WEDGE AND LEVEL
- (1/201) PROPOSED INLET/SCUPPER
- PROPOSED MOD. TYPE 'S' INLET, 8 L.F. RCP AND PIPE CONNECTION
- SB2-2 SOIL BORING AND BORING NUMBER

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Engineering Division

ADDENDUMS & REVISIONS

| NO. | DESCRIPTION | BY | DATE |
|---|---|---|---|
| | | | |

# I-95 FROM MORAVIA ROAD TO THE FORT McHENRY TUNNEL

I-95 (BALTIMORE CITY)

ROADWAY PLAN

CONTRACT NO. FT-3003

DRAWING NO. PS-5 of 16

DESIGNED BY D.J.R. | DRAWN BY A.W.G. | CHECKED BY J.M.R.

CONST. REVIEW BY | DATE MAY 2016 | SCALE AS SHOWN

SHEET NO. 28 OF 488

\\bdsrv01\v2014\2014\14006_MDTAAE2795\Task 19 - I-95 Moravia to FMT Design\CADD\Plans\pHD-P005_195.dgn

Monday, May 23, 2016 AT 10:46 AM

TO FORT McHENRY TUNNEL

TO WHITE MARSH

CURVE NO. 5
P.I. N 589,428.4035
E 1,440,592.8292
△ = 25°-38'-23.16"
Dc = 3°-00'-00.00"
R = 1,909.86'
L = 854.66'
T = 434.61'
E = 48.83'
S/E = SEE ELEVATION TABLE

CURVE NO. 6
P.I. N 589,551.2108
E 1,441,505.1962
△ = 9°-41'-47.62"
Dc = 1°-00'-00.00"
R = 5,729.58'
L = 969.66'
T = 485.99'
E = 20.57'
S/E = SEE ELEVATION TABLE

N 589750

E 1440500

EXISTING RIGHT-OF-WAY

EXISTING RIGHT-OF-WAY OF THROUGH HIGHWAY

CANTON RR TRACK

MATCH LINE STA. 610+50, SEE DWG NO. PS-7

MATCH LINE STA. 597+50, SEE DWG NO. PS-5

FULL DEPTH SAWCUT

SB2-1

SB I-95

NB I-95

I-95 ℄ OF CONSTRUCTION

CURVE NO. 5

CURVE NO. 6

PCC STA. 604+16.21

CONCRETE TRAFFIC BARRIER TRANSITION TYPE A - SEE DE-2

B-NB2-01

R=1,812'

MODIFIED 42 INCH F SHAPE CONCRETE TRAFFIC BARRIER

EXISTING RIGHT-OF-WAY OF THROUGH HIGHWAY

EXISTING RIGHT-OF-WAY

MT CARMEL CEMETERY

OHEB SHALOM CEMETERY

EX-MH 1B

EX-MH 3

EX-MH 4

EX-MH 5

EX-I 29

PC 6

PC 7

PC 8

PC 9

PC 10

I 7

I 8

I 9

I 10

I 11

599

600

601

602

603

604

605

606

607

608

609

610

24" RCP

57.5'

48'

46'

60'

17.0'

12.3'

11.42'

+10.53

+16.21

+96.21

+11.61

+12.7'

+59.24

+15.9'

±3.3'

E 1440500

N 589000

N 589000

E 1441450

MODIFIED 42 INCH F SHAPE CONCRETE TRAFFIC BARRIER

| | |
|---|---|
| STA. 597+50 TO STA. 607+04, LT MEDIAN | 954 LF |
| STA. 597+50 TO STA. 607+04, RT MEDIAN | 950 LF |

CONCRETE TRAFFIC BARRIER TRANSITION TYPE A

| | |
|---|---|
| STA. 607+04 TO STA. 607+16, LT MEDIAN | 12.5 LF |
| STA. 607+04 TO STA. 607+16, RT MEDIAN | 12.5 LF |

REMOVAL OF EXISTING CONCRETE BARRIER (ANY TYPE)

| | |
|---|---|
| STA. 597+50 TO STA. 607+16, LT MEDIAN | 987 LF |
| STA. 597+50 TO STA. 607+16, RT MEDIAN | 963 LF |

CONCRETE TRAFFIC BARRIER REFLECTIVE DELINEATORS

| | |
|---|---|
| STA. 597+50 TO STA. 607+16, LT MEDIAN | 10 EA |
| STA. 597+50 TO STA. 607+16, RT MEDIAN | 10 EA |

GRINDING ASPHALT PAVEMENT 0 INCH TO 2 INCHES

| | |
|---|---|
| STA. 597+50 TO STA. 610+50, LT | 11,207 SY |
| STA. 597+50 TO STA. 610+50, RT | 12,441 SY |

| CROSS REFERENCE | DWG. NO. |
|---|---|
| TYPICAL SECTION | TS-3, TS-9 |
| GEOMETRIC LAYOUT | GS-2, GS-3 |
| SUPERELEVATION TABLE | SE-1, SE-2, SE-7 |
| TRAFFIC CONTROL | MT-9, MT-29 |
| DRAINAGE SCHEDULE | DD-2 |
| SIGNING PLAN | SN-2.06, SN-2.07 |
| LIGHTING PLAN | LT-08, LT-09 |
| ITS PLAN | ITS-07, ITS-08 |
| SEDIMENT CONTROL PLAN | ES-6 |
| SOIL BORING SHEETS | SB-2 |

LEGEND

- FULL DEPTH PAVEMENT AND VARIABLE DEPTH OVERLAY
- CONCRETE OVERLAY OR FULL DEPTH DECK REPLACEMENT
- GRIND AND RESURFACE
- WEDGE AND LEVEL
- PROPOSED INLET/SCUPPER (I 201)
- PROPOSED MOD. TYPE 'S' INLET, 8 L.F. RCP AND PIPE CONNECTION
- SOIL BORING AND BORING NUMBER (SB2-2)

SCALE IN FEET
50 0 50 100


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*Engineering Division*

ADDENDUMS & REVISIONS

| NO. | DESCRIPTION | BY | DATE |
|---|---|---|---|
| | | | |

# I-95 FROM MORAVIA ROAD TO THE FORT McHENRY TUNNEL

I-95 (BALTIMORE CITY)

ROADWAY PLAN

CONTRACT NO. FT-3003

DRAWING NO. PS-6 of 16

| | | | |
|---|---|---|---|
| DESIGNED BY D.J.R. | DRAWN BY A.W.G. | CHECKED BY J.M.R. | SHEET NO. 29 OF 488 |
| CONST. REVIEW BY | DATE MAY 2016 | SCALE AS SHOWN | |

\\balsrv01\v2014\2014\14006_MDTAAE2795\Task 19 - I-95 Moravia to FMT Design\CADD\Plans\pHD-P006_I95.dgn

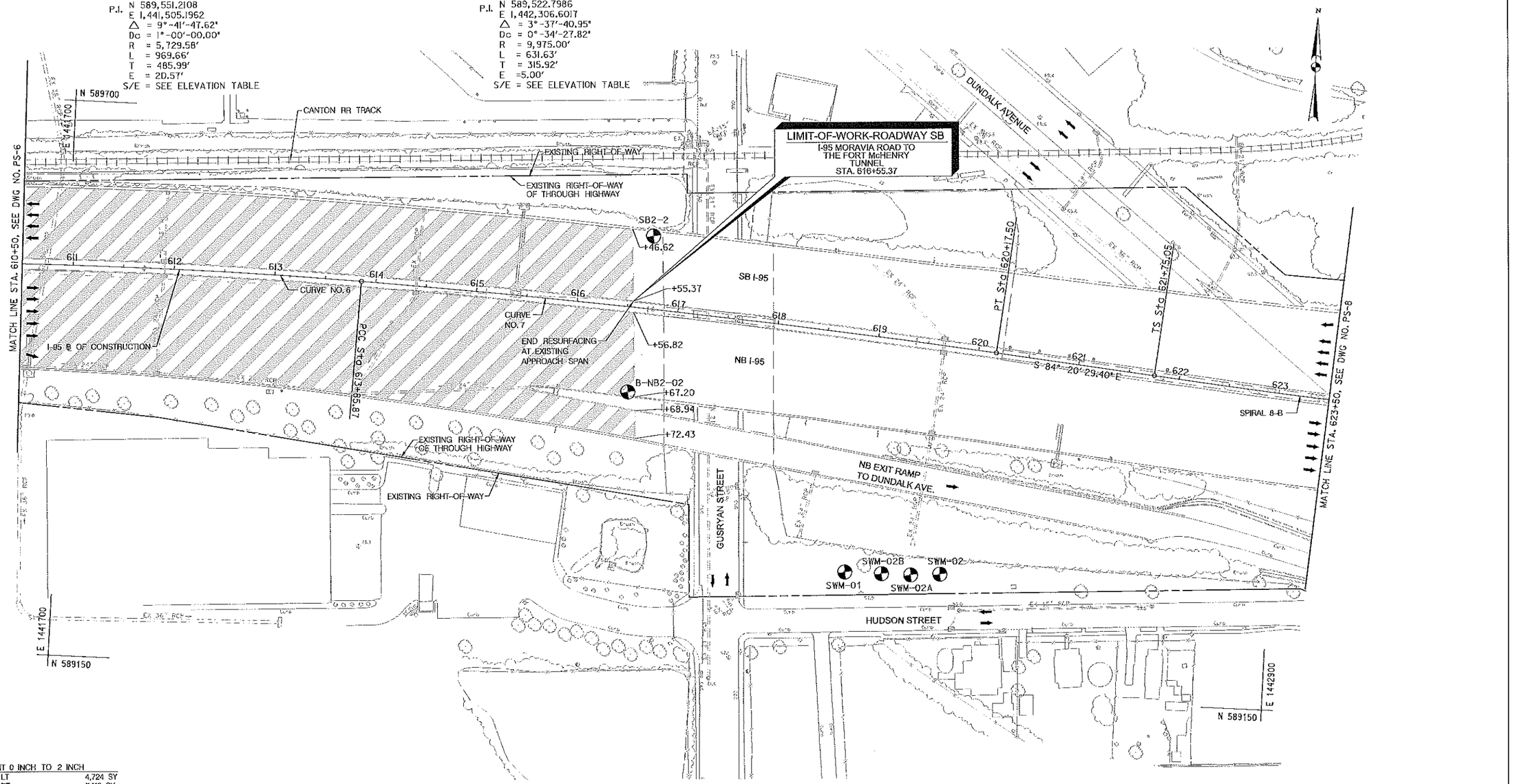
Monday, May 23, 2016 AT 10:46 AM

TO FORT McHENRY TUNNEL

TO WHITE MARSH

CURVE NO. 6
P.I. N 589,551.2108
E 1,441,505.1962
△ = 9°-41'-47.62"
Dc = 1°-00'-00.00"
R = 5,729.58'
L = 969.66'
T = 485.99'
E = 20.57'
S/E = SEE ELEVATION TABLE

CURVE NO. 7
P.I. N 589,522.7986
E 1,442,306.6017
△ = 3°-37'-40.95"
Dc = 0°-34'-27.82"
R = 9,975.00'
L = 631.63'
T = 315.92'
E = 5.00'
S/E = SEE ELEVATION TABLE




GRINDING ASPHALT PAVEMENT 0 INCH TO 2 INCH

| | |
|---|---|
| STA. 610+50 TO STA. 616+55, LT | 4,724 SY |
| STA. 610+50 TO STA. 616+57, RT | 7,118 SY |

| CROSS REFERENCE | DWG. NO. |
|---|---|
| TYPICAL SECTION | TS-9 |
| GEOMETRIC LAYOUT | GS-3 |
| TRAFFIC CONTROL | MT-10, MT-30 |
| SIGNING PLAN | SN-2.07 |
| LIGHTING PLAN | LT-09, LT-10 |
| ITS PLAN | ITS-08 |
| SEDIMENT CONTROL PLAN | ES-7 |
| SOIL BORING SHEETS | SB-3, SB-4 |

SCALE IN FEET
50 0 50 100

LEGEND
- FULL DEPTH PAVEMENT AND VARIABLE DEPTH OVERLAY
- CONCRETE OVERLAY OR FULL DEPTH DECK REPLACEMENT
- GRIND AND RESURFACE
- WEDGE AND LEVEL
- (1/201) PROPOSED INLET/SCUPPER
- PROPOSED MOD. TYPE 'S' INLET, 8 L.F. RCP AND PIPE CONNECTION
- SB2-2 SOIL BORING AND BORING NUMBER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*Engineering Division*

ADDENDUMS & REVISIONS

| NO. | DESCRIPTION | BY | DATE |
|---|---|---|---|
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# I-95 FROM MORAVIA ROAD TO THE FORT McHENRY TUNNEL

I-95 (BALTIMORE CITY)

ROADWAY PLAN

CONTRACT NO. FT-3003

DRAWING NO. PS-7 of 16

| | | | |
|---|---|---|---|
| DESIGNED BY D.J.R. | DRAWN BY A.W.G. | CHECKED BY J.M.R. | SHEET NO. 30 OF 488 |
| CONST. REVIEW BY | DATE MAY 2016 | SCALE AS SHOWN | |

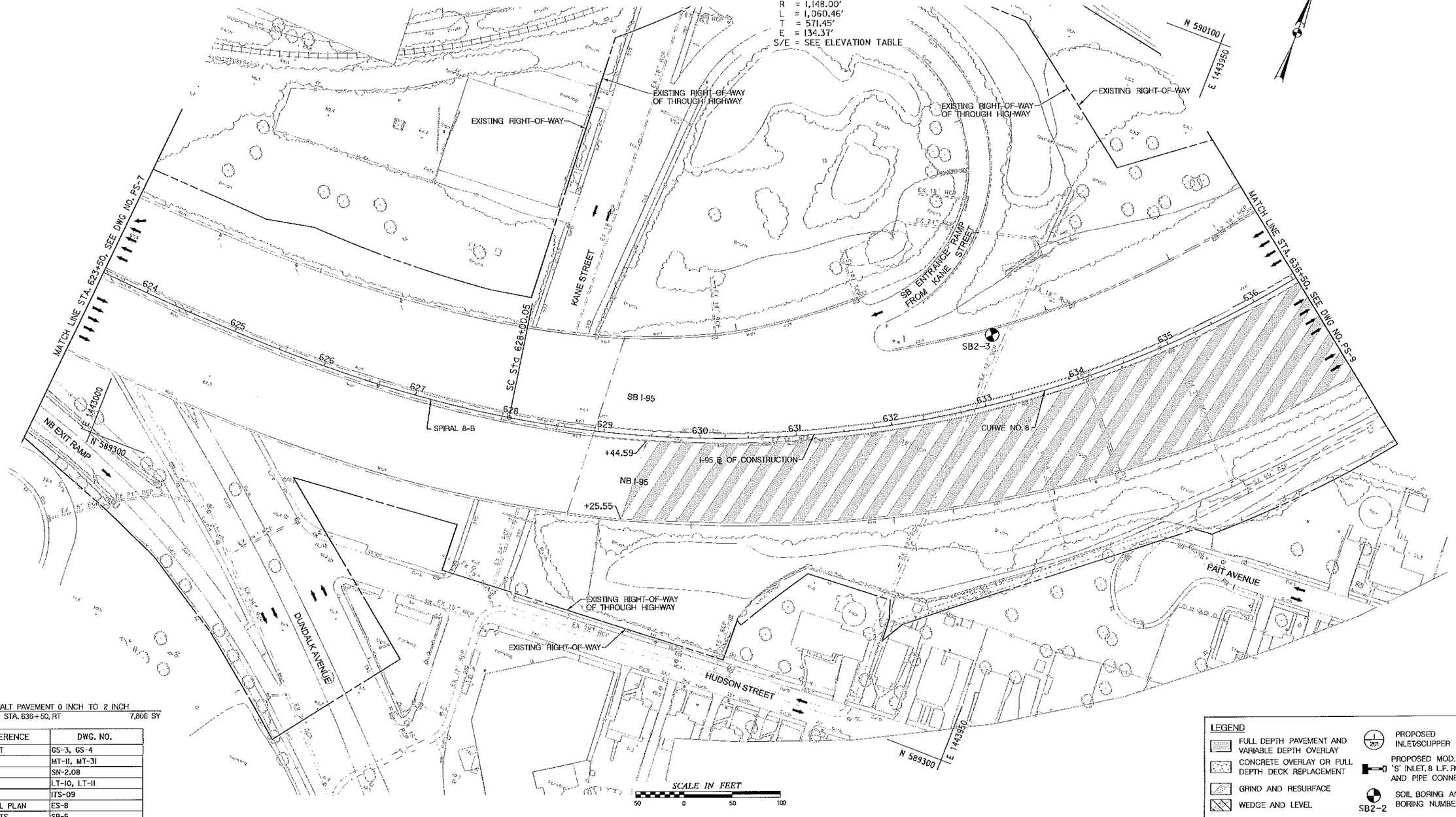
\\balsrv01\v2014\2014\14006_MDTAAE2795\Task 19 - I-95 Moravia to FMT Design\CADD\Plans\pHD-P007_I95.dgn

Monday, May 23, 2016 AT 10:46 AM

TO FORT McHENRY TUNNEL

TO WHITE MARSH

CURVE NO. 8
P.I. N 589,569.7066
E 1,443,963.5684
△ = 52°-55'-36.09"
Dc = 4°-59'-27.32"
R = 1,148.00'
L = 1,060.46'
T = 571.45'
E = 134.37'
S/E = SEE ELEVATION TABLE




GRINDING ASPHALT PAVEMENT 0 INCH TO 2 INCH
STA. 629+45 TO STA. 636+50, RT 7,806 SY

| CROSS REFERENCE | DWG. NO. |
|---|---|
| GEOMETRIC LAYOUT | GS-3, GS-4 |
| TRAFFIC CONTROL | MT-11, MT-31 |
| SIGNING PLAN | SN-2.08 |
| LIGHTING PLAN | LT-10, LT-11 |
| ITS PLAN | ITS-09 |
| SEDIMENT CONTROL PLAN | ES-8 |
| SOIL BORING SHEETS | SB-5 |

LEGEND
- FULL DEPTH PAVEMENT AND VARIABLE DEPTH OVERLAY
- CONCRETE OVERLAY OR FULL DEPTH DECK REPLACEMENT
- GRIND AND RESURFACE
- WEDGE AND LEVEL
- PROPOSED INLET/SCUPPER (I 201)
- PROPOSED MOD. TYPE 'S' INLET, 8 L.F. RCP AND PIPE CONNECTION
- SOIL BORING AND BORING NUMBER (SB2-2)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ADDENDUMS & REVISIONS

| NO. | DESCRIPTION | BY | DATE |
|---|---|---|---|
| | | | |

# I-95 FROM MORAVIA ROAD TO THE FORT McHENRY TUNNEL

I-95 (BALTIMORE CITY)

ROADWAY PLAN

| | | | |
|---|---|---|---|
| DESIGNED BY D.I.R. | DRAWN BY A.W.G. | CHECKED BY J.M.R. | SHEET NO. 31 OF 488 |
| CONST. REVIEW BY | DATE MAY 2016 | SCALE AS SHOWN | |

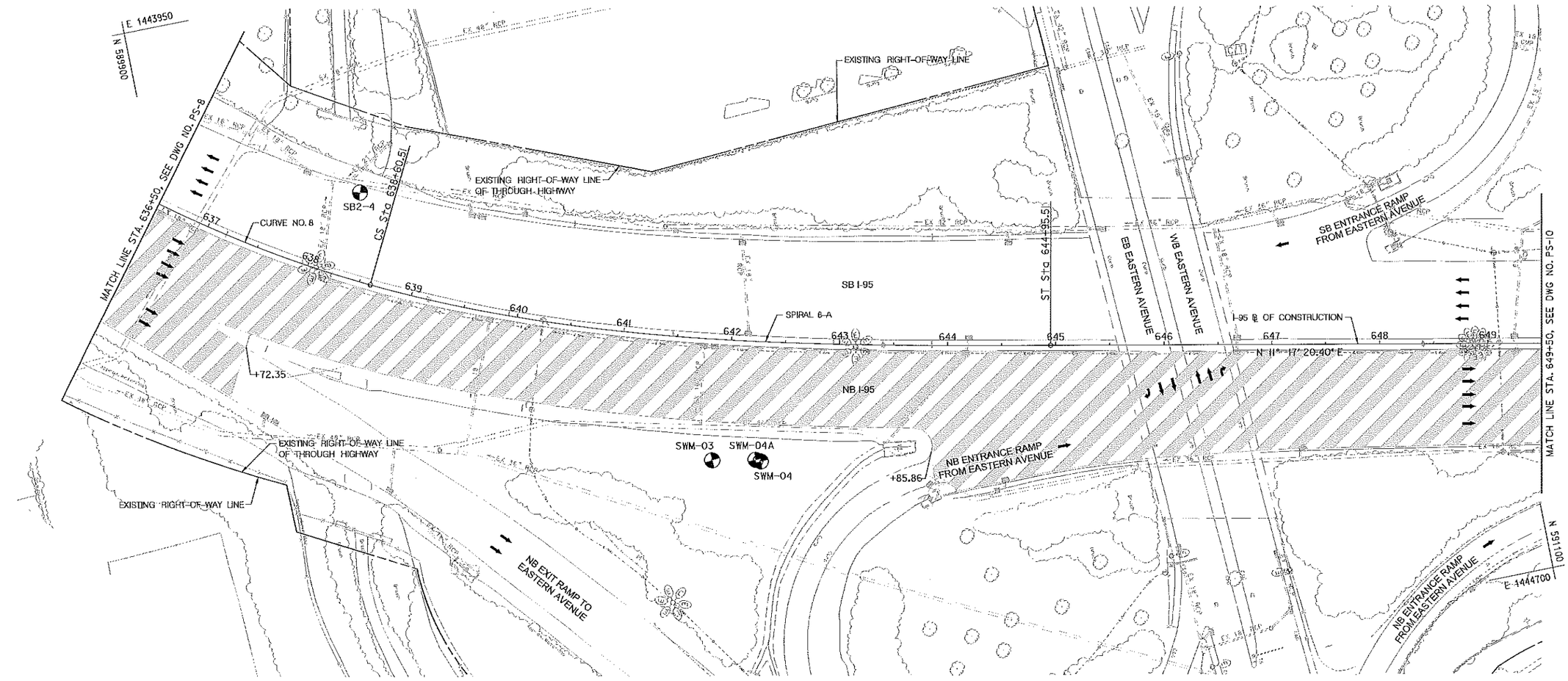
CONTRACT NO. FT-3003
DRAWING NO. PS-8 of 16

\\balsrv01\v2014\2014\14006_MDTAAE2795\Task 19 - I-95 Moravia to FMT Design\CADD\Plans\pH0-P008_I95.dgn

Monday, May 23, 2016 AT 10:46 AM

TO FORT McHENRY TUNNEL

TO WHITE MARSH




GRINDING ASPHALT PAVEMENT 0 INCH TO 2 INCHES
STA. 636+50 TO STA. 649+50, RT 12,862 SY

| CROSS REFERENCE | DWG. NO. |
|---|---|
| TYPICAL SECTION | TS-4 |
| GEOMETRIC LAYOUT | GS-4 |
| TRAFFIC CONTROL | MT-12, MT-22 |
| SIGNING PLAN | SN-2.09 |
| LIGHTING PLAN | LT-11, LT-12 |
| ITS PLAN | ITS-10 |
| SEDIMENT CONTROL PLAN | ES-9 |
| STORMWATER MANAGEMENT PLAN | SW-5 |
| SOIL BORING SHEETS | SB-6 |

N 589900
E 1444700

SCALE IN FEET
50 0 50 100

LEGEND
- FULL DEPTH PAVEMENT AND VARIABLE DEPTH OVERLAY
- CONCRETE OVERLAY OR FULL DEPTH DECK REPLACEMENT
- GRIND AND RESURFACE
- WEDGE AND LEVEL
- PROPOSED INLET/SCUPPER (291)
- PROPOSED MOD. TYPE 'S' INLET, 8 L.F. RCP AND PIPE CONNECTION
- SOIL BORING AND BORING NUMBER (SB2-2)

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ADDENDUMS & REVISIONS

| NO. | DESCRIPTION | BY | DATE |
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# I-95 FROM MORAVIA ROAD TO THE FORT McHENRY TUNNEL

I-95 (BALTIMORE CITY)

ROADWAY PLAN

| | | | |
|---|---|---|---|
| DESIGNED BY D.I.R. | DRAWN BY A.W.G. | CHECKED BY J.M.R. | |
| CONST. REVIEW BY | DATE MAY 2016 | SCALE AS SHOWN | |

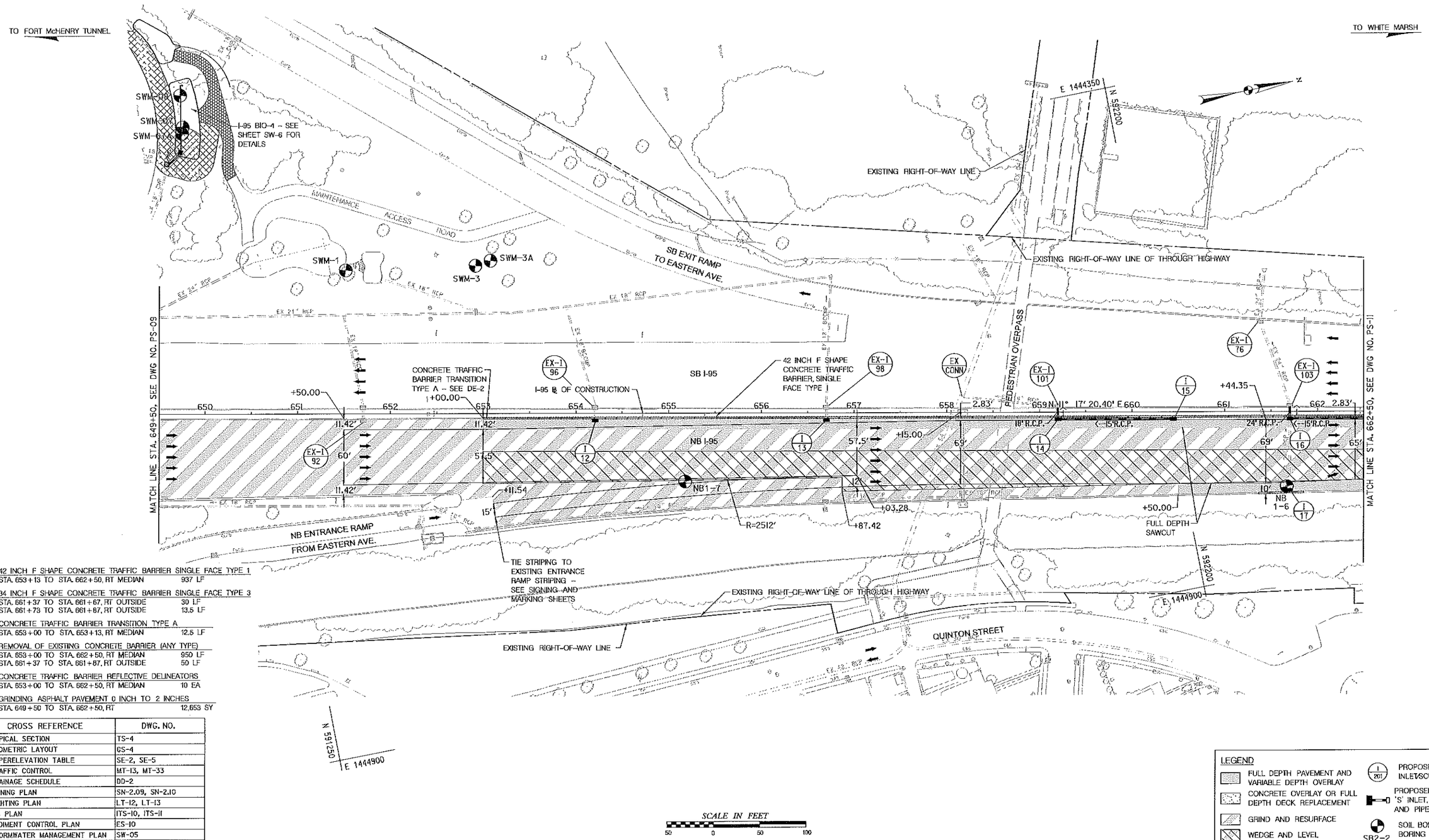
CONTRACT NO. FT-3003

DRAWING NO. **PS-9 of 16**

SHEET NO. 32 OF 488

\\balsrv01\v2014\2014\140005_MDTAAE2795\Task 19 - I-95 Moravia to FMT Design\CADD\Plans\pHD-P009_I95.dgn

Monday, May 23, 2016 AT 10:46 AM




| 42 INCH F SHAPE CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 1 | |
|---|---|
| STA. 653+13 TO STA. 662+50, RT MEDIAN | 937 LF |
| **34 INCH F SHAPE CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 3** | |
| STA. 661+37 TO STA. 661+67, RT OUTSIDE | 30 LF |
| STA. 661+78 TO STA. 661+87, RT OUTSIDE | 13.5 LF |
| **CONCRETE TRAFFIC BARRIER TRANSITION TYPE A** | |
| STA. 653+00 TO STA. 653+13, RT MEDIAN | 12.5 LF |
| **REMOVAL OF EXISTING CONCRETE BARRIER (ANY TYPE)** | |
| STA. 653+00 TO STA. 662+50, RT MEDIAN | 950 LF |
| STA. 661+37 TO STA. 661+87, RT OUTSIDE | 50 LF |
| **CONCRETE TRAFFIC BARRIER REFLECTIVE DELINEATORS** | |
| STA. 653+00 TO STA. 662+50, RT MEDIAN | 10 EA |
| **GRINDING ASPHALT PAVEMENT 0 INCH TO 2 INCHES** | |
| STA. 649+50 TO STA. 662+50, RT | 12,653 SY |

| CROSS REFERENCE | DWG. NO. |
|---|---|
| TYPICAL SECTION | TS-4 |
| GEOMETRIC LAYOUT | GS-4 |
| SUPERELEVATION TABLE | SE-2, SE-5 |
| TRAFFIC CONTROL | MT-13, MT-33 |
| DRAINAGE SCHEDULE | DD-2 |
| SIGNING PLAN | SN-2.09, SN-2.10 |
| LIGHTING PLAN | LT-12, LT-13 |
| ITS PLAN | ITS-10, ITS-11 |
| SEDIMENT CONTROL PLAN | ES-10 |
| STORMWATER MANAGEMENT PLAN | SW-05 |
| SOIL BORING SHEETS | SB-7, SB-8 |

SCALE IN FEET
50 0 50 100

LEGEND
- FULL DEPTH PAVEMENT AND VARIABLE DEPTH OVERLAY
- CONCRETE OVERLAY OR FULL DEPTH DECK REPLACEMENT
- GRIND AND RESURFACE
- WEDGE AND LEVEL
- (1/201) PROPOSED INLET/SCUPPER
- PROPOSED MOD. TYPE 'S' INLET, 8 L.F. RCP AND PIPE CONNECTION
- SB2-2 SOIL BORING AND BORING NUMBER

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|---|---|---|---|
| NO. | DESCRIPTION | BY | DATE |
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# I-95 FROM MORAVIA ROAD TO THE FORT McHENRY TUNNEL

I-95 (BALTIMORE CITY)

ROADWAY PLAN

CONTRACT NO. FT-3003

DRAWING NO. **PS-10 of 16**

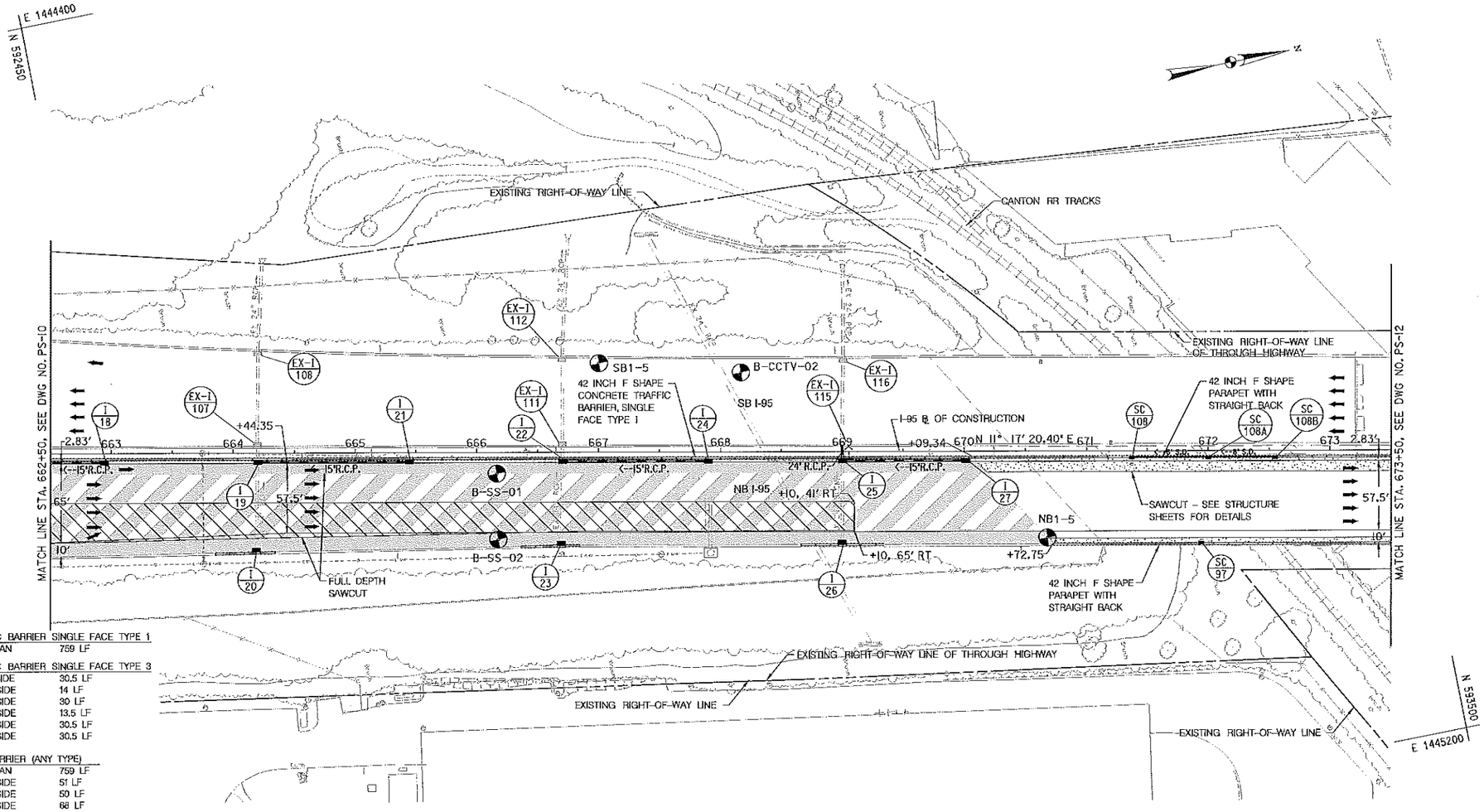
| DESIGNED BY D.J.R. | DRAWN BY A.W.G. | CHECKED BY J.M.B. | SHEET NO. 33 OF 488 |
|---|---|---|---|
| CONST. REVIEW BY | DATE MAY 2016 | SCALE AS SHOWN | |

\\baltsrv01\w2014\2014\14006_MDTAAE2795\Task 19 - I-95 Moravia to FMT Design\CADD\Plans\pHD-P010_I95.dgn

Monday, May 23, 2016 AT 10:46 AM

TO FORT McHENRY TUNNEL

TO WHITE MARSH




42 INCH F SHAPE CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 1

| | |
|---|---|
| STA. 662+50 TO STA. 670+09, RT MEDIAN | 759 LF |

34 INCH F SHAPE CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 3

| | |
|---|---|
| STA. 663+86 TO STA. 664+16, RT OUTSIDE | 30.5 LF |
| STA. 664+23 TO STA. 664+37, RT OUTSIDE | 14 LF |
| STA. 666+36 TO STA. 666+66, RT OUTSIDE | 30 LF |
| STA. 666+73 TO STA. 666+86, RT OUTSIDE | 13.5 LF |
| STA. 668+66 TO STA. 668+97, RT OUTSIDE | 30.5 LF |
| STA. 669+03 TO STA. 669+34, RT OUTSIDE | 30.5 LF |

REMOVAL OF EXISTING CONCRETE BARRIER (ANY TYPE)

| | |
|---|---|
| STA. 662+50 TO STA. 670+09, RT MEDIAN | 759 LF |
| STA. 663+86 TO STA. 664+37, RT OUTSIDE | 51 LF |
| STA. 666+36 TO STA. 666+86, RT OUTSIDE | 50 LF |
| STA. 668+66 TO STA. 669+34, RT OUTSIDE | 68 LF |

CONCRETE TRAFFIC BARRIER REFLECTIVE DELINEATORS

| | |
|---|---|
| STA. 662+50 TO STA. 673+50, RT MEDIAN | 11 EA |
| STA. 670+73 TO STA. 673+50, RT OUTSIDE | 3 EA |

GRINDING ASPHALT PAVEMENT 0 INCH TO 2 INCHES

| | |
|---|---|
| STA. 662+50 TO STA. 670+73, RT | 5,402 SY |

| CROSS REFERENCE | DWG. NO. |
|---|---|
| TYPICAL SECTION | TS-4 |
| GEOMETRIC LAYOUT | GS-4 |
| SUPERELEVATION TABLE | SE-2, SE-5 |
| TRAFFIC CONTROL | MT-14, MT-34 |
| STRUCTURAL SHEETS | S6-1 TO S6-27 |
| DRAINAGE SCHEDULE | DD-1, DD-2 |
| SIGNING PLAN | SN-2.10, SN-2.11 |
| LIGHTING PLAN | LT-13, LT-14 |
| ITS PLAN | ITS-11, ITS-12 |
| SEDIMENT CONTROL PLAN | ES-11 |
| SOIL BORING SHEETS | SB-9, SB-10 |

SCALE IN FEET
50 0 50 100

LEGEND

- FULL DEPTH PAVEMENT AND VARIABLE DEPTH OVERLAY
- CONCRETE OVERLAY OR FULL DEPTH DECK REPLACEMENT
- GRIND AND RESURFACE
- WEDGE AND LEVEL
- (1/201) PROPOSED INLET/SCUPPER
- PROPOSED MOD. TYPE 'S' INLET, 8 L.F. RCP AND PIPE CONNECTION
- SB2-2 SOIL BORING AND BORING NUMBER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*Engineering Division*

ADDENDUMS & REVISIONS

| NO. | DESCRIPTION | BY | DATE |
|---|---|---|---|
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# I-95 FROM MORAVIA ROAD TO THE FORT McHENRY TUNNEL

I-95 (BALTIMORE CITY)

ROADWAY PLAN

| | | | |
|---|---|---|---|
| DESIGNED BY D.L.R. | DRAWN BY A.W.G. | CHECKED BY J.M.R. | |
| CONST. REVIEW BY | DATE MAY 2016 | SCALE AS SHOWN | |

CONTRACT NO. FT-3003

DRAWING NO. **PS-11 of 16**

SHEET NO. 34 OF 488

\\balsrv01\v2014\2014\14006_MDTAAE2795\Task 19 - I-95 Moravia to FMT Design\CADD\Plans\pHD-P011_I95.dgn

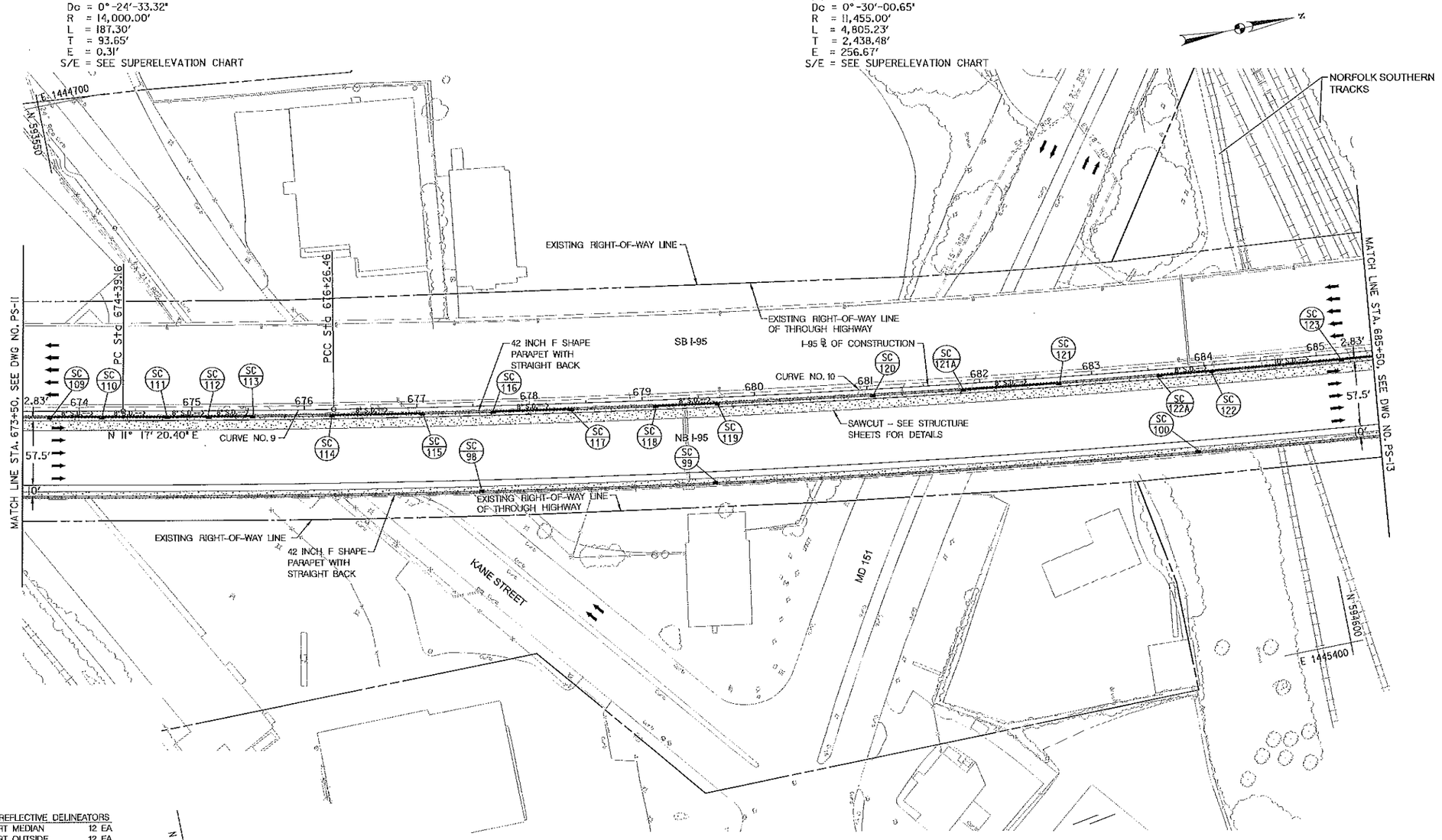
Monday, May 23, 2016 AT 10:46 AM

TO FORT McHENRY TUNNEL

CURVE NO. 9
P.I. N 593,663.3670
E 1,444,999.2327
△ = 0°-45'-59.51"
Dc = 0°-24'-33.32"
R = 14,000.00'
L = 187.30'
T = 93.65'
E = 0.31'
S/E = SEE SUPERELEVATION CHART

CURVE NO. 10
P.I. N 596,152.9143
E 1,445,461.6530
△ = 24°-02'-05.52"
Dc = 0°-30'-00.65"
R = 11,455.00'
L = 4,805.23'
T = 2,438.48'
E = 256.67'
S/E = SEE SUPERELEVATION CHART

TO WHITE MARSH




CONCRETE TRAFFIC BARRIER REFLECTIVE DELINEATORS

| | |
|---|---|
| STA. 673+50 TO STA. 685+50, RT MEDIAN | 12 EA |
| STA. 673+50 TO STA. 685+50, RT OUTSIDE | 12 EA |

| CROSS REFERENCE | DWG. NO. |
|---|---|
| TYPICAL SECTION | TS-4 |
| GEOMETRIC LAYOUT | GS-4 |
| SUPERELEVATION TABLE | SE-2 |
| TRAFFIC CONTROL | MT-15, MT-35 |
| STRUCTURAL SHEETS | S6-1 TO S6-27 |
| DRAINAGE SCHEDULE | DD-1 |
| SIGNING PLAN | SN-2.11, SN-2.12 |
| LIGHTING PLAN | LT-14, LT-15 |
| ITS PLAN | ITS-12, ITS-13 |
| SEDIMENT CONTROL PLAN | ES-12 |

SCALE IN FEET
50 0 50 100

LEGEND
- FULL DEPTH PAVEMENT AND VARIABLE DEPTH OVERLAY
- CONCRETE OVERLAY OR FULL DEPTH DECK REPLACEMENT
- GRIND AND RESURFACE
- WEDGE AND LEVEL
- (1/201) PROPOSED INLET/SCUPPER
- PROPOSED MOD. TYPE 'S' INLET, 8 L.F. RCP AND PIPE CONNECTION
- SB2-2 SOIL BORING AND BORING NUMBER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ADDENDUMS & REVISIONS

| NO. | DESCRIPTION | BY | DATE |
|---|---|---|---|
| | | | |

# I-95 FROM MORAVIA ROAD TO THE FORT McHENRY TUNNEL

I-95 (BALTIMORE CITY)

ROADWAY PLAN

| | | | |
|---|---|---|---|
| DESIGNED BY D.I.R. | DRAWN BY A.W.G. | CHECKED BY J.M.R. | |
| CONST. REVIEW BY | DATE MAY 2016 | SCALE AS SHOWN | |

CONTRACT NO. FT-3003
DRAWING NO. **PS-12 of 16**
SHEET NO. 35 OF 488

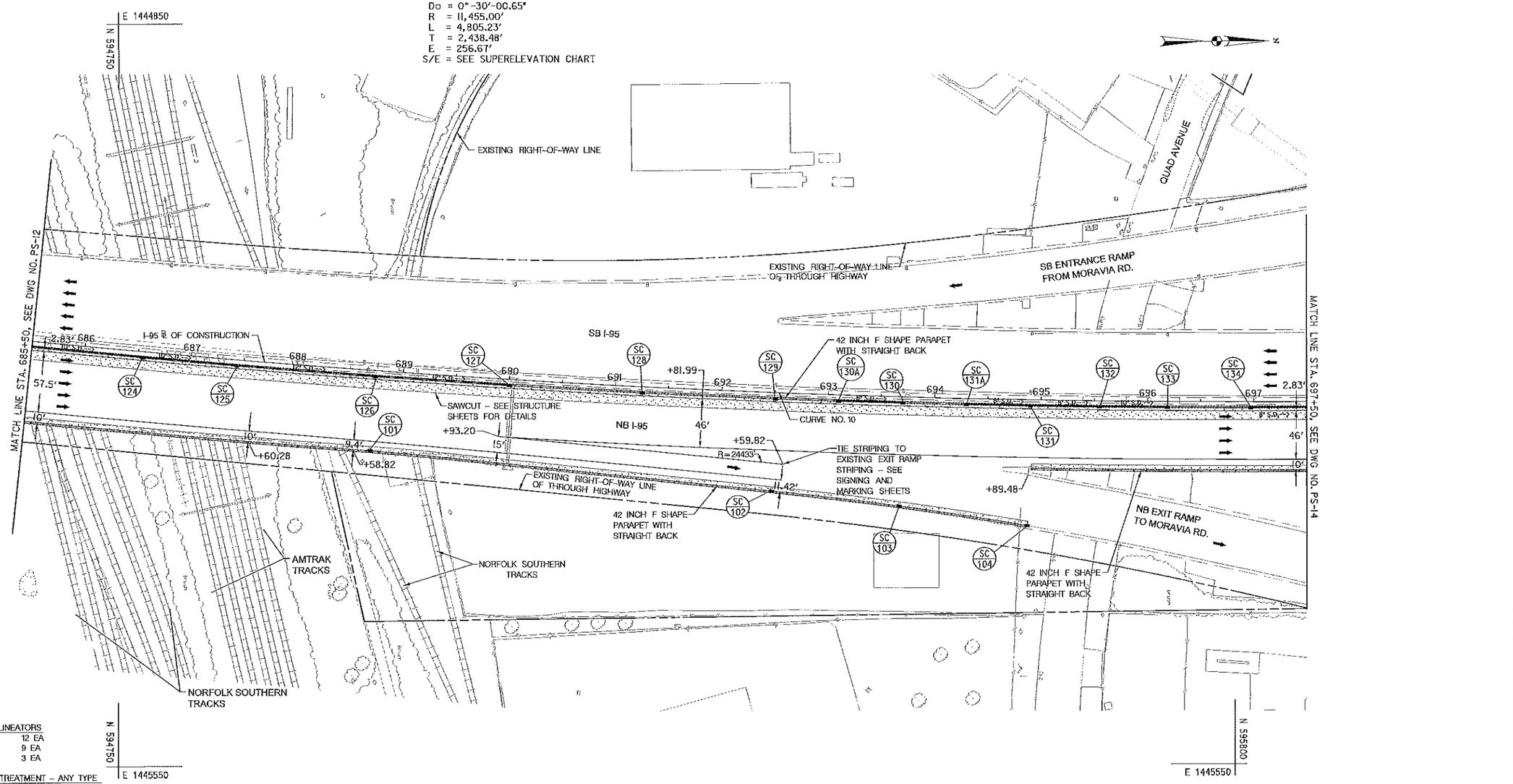
\\balsrv01\v2014\2014\14006_MDTAAE2795\Task 19 - I-95 Moravia to FMT Design\CADD\Plans\pHD-P012_I95.dgn

Monday, May 23, 2016 AT 10:46 AM

TO FORT McHENRY TUNNEL

TO WHITE MARSH

CURVE NO. 10
P.I. N 596,152.9143
E 1,445,461.6530
△ = 24°-02'-05.52"
Dc = 0°-30'-00.65"
R = 11,455.00'
L = 4,805.23'
T = 2,438.48'
E = 256.67'
S/E = SEE SUPERELEVATION CHART




CONCRETE TRAFFIC BARRIER REFLECTIVE DELINEATORS

| | |
|---|---|
| STA. 685+50 TO STA. 697+50, RT MEDIAN | 12 EA |
| STA. 685+50 TO STA. 694+89, RT OUTSIDE | 9 EA |
| STA. 694+92 TO STA. 697+50, RT OUTSIDE | 3 EA |

REMOVE AND RESET TRAFFIC BARRIER END TREATMENT - ANY TYPE

| | |
|---|---|
| STA. 694+65 TO STA. 694+90, RT | 1 EA |

| CROSS REFERENCE | DWG. NO. |
|---|---|
| TYPICAL SECTION | TS-4, TS-5 |
| GEOMETRIC LAYOUT | GS-4, GS-5 |
| SUPERELEVATION TABLE | SE-2, SE-3 |
| TRAFFIC CONTROL | MT-16 MT-36 |
| STRUCTURAL SHEETS | S6-1 TO S6-27 |
| DRAINAGE SCHEDULE | DD-1 |
| SIGNING PLAN | SN-2.12, SN-2.13 |
| LIGHTING PLAN | LT-15, LT-16 |
| ITS PLAN | ITS-13, ITS-14 |
| SEDIMENT CONTROL PLAN | ES-13 |

SCALE IN FEET
50 0 50 100

LEGEND
- FULL DEPTH PAVEMENT AND VARIABLE DEPTH OVERLAY
- CONCRETE OVERLAY OR FULL DEPTH DECK REPLACEMENT
- GRIND AND RESURFACE
- WEDGE AND LEVEL
- (201) PROPOSED INLET/SCUPPER
- PROPOSED MOD. TYPE 'S' INLET, 8 L.F. RCP AND PIPE CONNECTION
- SB2-2 SOIL BORING AND BORING NUMBER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| NO. | DESCRIPTION | BY | DATE |
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# I-95 FROM MORAVIA ROAD TO THE FORT McHENRY TUNNEL

I-95 (BALTIMORE CITY)

ROADWAY PLAN

CONTRACT NO. FT-3003

DRAWING NO. PS-13 of 16

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|---|---|---|---|
| DESIGNED BY D.L.R. | DRAWN BY A.W.G. | CHECKED BY J.M.R. | SHEET NO. 36 OF 488 |
| CONST. REVIEW BY | DATE MAY 2016 | SCALE AS SHOWN | |

\\balsrv01\v2014\2014\14006_MDTAAE2795\Task 19 - I-95 Moravia to FMT Design\CADD\Plans\pHD-PD13_195.dgn

Monday, May 23, 2016 AT 10:46 AM

TO FORT McHENRY TUNNEL

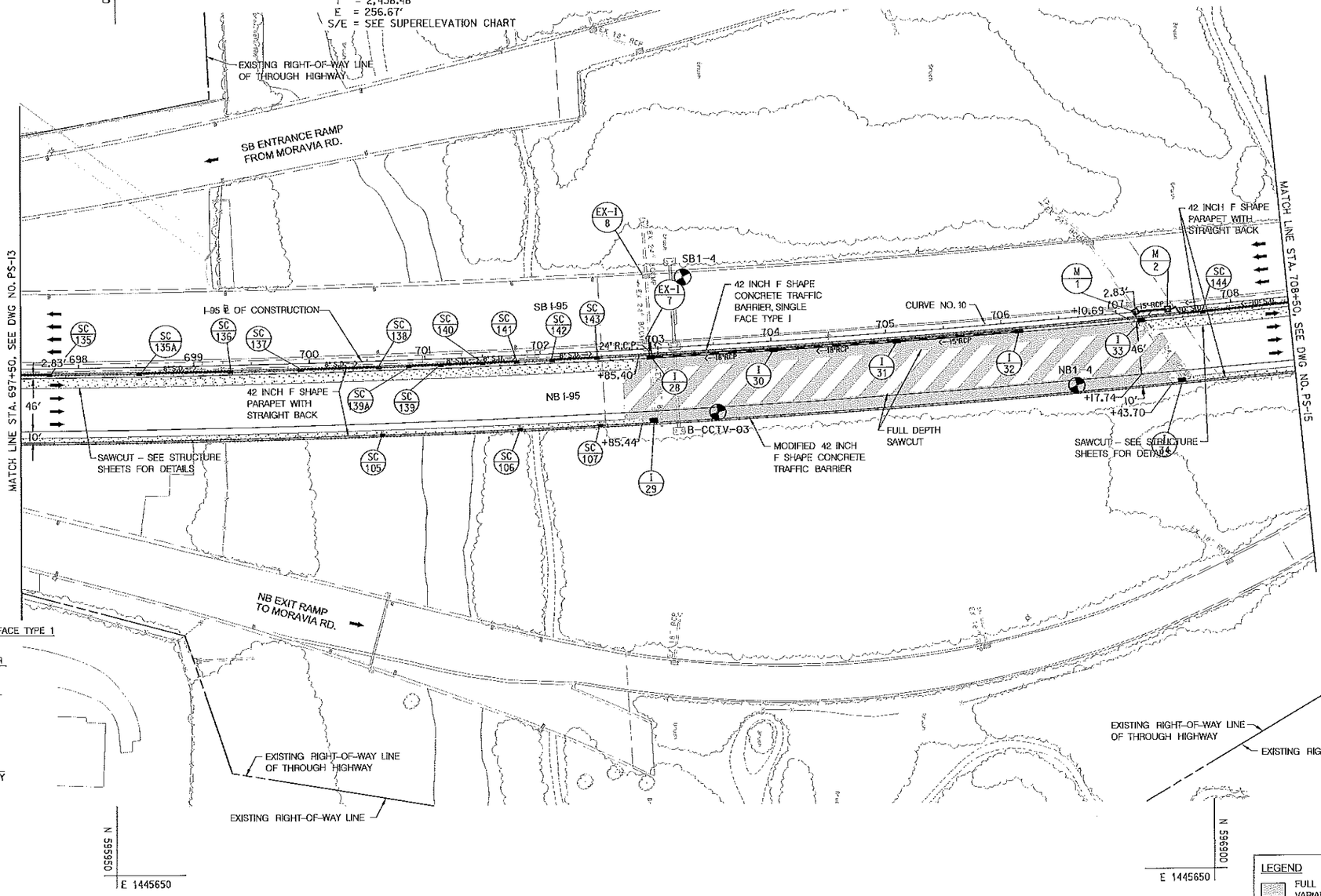
TO WHITE MARSH

E 1444850

N 595950

CURVE NO. 10

P.I. N 596,152.9143
E 1,445,461.6530
△ = 24°-02'-05.52"
Dc = 0°-30'-00.65"
R = 11,455.00'
L = 4,805.23'
T = 2,438.48'
E = 256.67'
S/E = SEE SUPERELEVATION CHART




| 42 INCH F SHAPE CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 1 | |
|---|---|
| STA. 702+85 TO STA. 707+11, RT MEDIAN | 425 LF |
| **MODIFIED 42 INCH F SHAPE CONCRETE TRAFFIC BARRIER** | |
| STA. 702+85 TO STA. 707+44, RT OUTSIDE | 461 LF |
| **REMOVAL OF EXISTING CONCRETE BARRIER (ANY TYPE)** | |
| STA. 702+85 TO STA. 707+11, RT MEDIAN | 425 LF |
| STA. 702+85 TO STA. 707+44, RT OUTSIDE | 461 LF |
| **CONCRETE TRAFFIC BARRIER REFLECTIVE DELINEATORS** | |
| STA. 697+50 TO STA. 708+50, RT MEDIAN | 11 EA |
| STA. 697+50 TO STA. 708+50, RT OUTSIDE | 11 EA |
| **GRINDING ASPHALT PAVEMENT 0 INCH TO 2 INCHES** | |
| STA. 702+70 TO STA. 707+61, RT | 2,484 SY |

| CROSS REFERENCE | DWG. NO. |
|---|---|
| TYPICAL SECTION | TS-5 |
| GEOMETRIC LAYOUT | GS-5 |
| SUPERELEVATION TABLE | SE-3 |
| TRAFFIC CONTROL | MT-17 MT-37 |
| STRUCTURAL SHEETS | S6-1 TO S7-19 |
| DRAINAGE SCHEDULE | DD-1, DD-2 |
| SIGNING PLAN | SN-2.13, SN-2.14 |
| LIGHTING PLAN | LT-16, LT-17 |
| ITS PLAN | ITS-14, ITS-15 |
| SEDIMENT CONTROL PLAN | ES-14 |
| SOIL BORING SHEETS | SB-11 |

SCALE IN FEET
50 0 50 100

LEGEND
- FULL DEPTH PAVEMENT AND VARIABLE DEPTH OVERLAY
- CONCRETE OVERLAY OR FULL DEPTH DECK REPLACEMENT
- GRIND AND RESURFACE
- WEDGE AND LEVEL
- PROPOSED INLET/SCUPPER
- PROPOSED MOD. TYPE 'S' INLET, 8 L.F. RCP AND PIPE CONNECTION
- SOIL BORING AND BORING NUMBER (SB2-2)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www.rkk.com


MARYLAND TRANSPORTATION AUTHORITY
*Engineering Division*

ADDENDUMS & REVISIONS

| NO. | DESCRIPTION | BY | DATE |
|---|---|---|---|
| | | | |

# I-95 FROM MORAVIA ROAD TO THE FORT McHENRY TUNNEL

I-95 (BALTIMORE CITY)

ROADWAY PLAN

CONTRACT NO. FT-3003

DRAWING NO. PS-14 of 16

| DESIGNED BY D.J.R. | DRAWN BY A.W.G. | CHECKED BY J.M.R. | SHEET NO. 37 OF 488 |
|---|---|---|---|
| CONST. REVIEW BY | DATE MAY 2016 | SCALE AS SHOWN | |

\\balsrv01\v2014\2014\14006_MDTAAE2795\Task 19 - I-95 Moravia to FMT Design\CADD\Plans\pHD-PD14_I95.dgn

Monday, May 23, 2016 AT 10:16 AM

TO FORT McHENRY TUNNEL

TO WHITE MARSH

CURVE NO. 10
P.I. N 596,152.9143
E 1,445,461.6530
Δ = 24°-02'-05.52"
Dc = 0°-30'-00.65"
R = 11,455.00'
L = 4,805.23'
T = 2,438.48'
E = 256.67'
S/E = SEE SUPERELEVATION CHART

E 1444600
N 598100

CSX TRACKAGE

NB EXIT RAMP TO MORAVIA RD.

EXISTING RIGHT-OF-WAY LINE OF THROUGH HIGHWAY

EXISTING RIGHT-OF-WAY LINE

MATCH LINE STA. 708+50, SEE DWG NO. PS-14

MATCH LINE STA. 720+50, SEE DWG NO. PS-16

SC 145 | SC 146 | SC 147 | SC 148 | SC 149

42 INCH F SHAPE PARAPET WITH STRAIGHT BACK

I-95 ℄ OF CONSTRUCTION

SB I-95

SB1-3

NB I-95

NB1-3

NB1-2

CURVE NO. 10

42 INCH E SHAPE CONCRETE TRAFFIC BARRIER, SINGLE FACE TYPE I

EX-I 3 | EX-I 4

I 35 | I 36 | I 37 | I 38 | I 39 | I 40 | I 41 | I 42 | I 43 | I 44 | I 45 | I 48

708 | 709 | 710 | 711 | 712 | 713 | 714 | 715 | 716 | 717 | 718 | 719 | 720

+12.83 | +01.43 | +97.38 | +37.84 | +79.66 | 2.83'

47' | 46' | 21' | 10.5' | 10'

15"RCP | 18"RCP

SAWCUT - SEE STRUCTURE SHEETS FOR DETAILS

FULL DEPTH SAWCUT

NB EXIT RAMP TO PULASKI HWY.

TIE STRIPING TO EXISTING EXIT RAMP STRIPING

EXISTING RIGHT-OF-WAY LINE OF THROUGH HIGHWAY

N 597050
E 1445400

N 598100
E 1445400

42 INCH F SHAPE CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 1
STA. 712+01 TO STA. 720+50, RT MEDIAN 849 LF

REMOVAL OF EXISTING CONCRETE BARRIER (ANY TYPE)
STA. 712+01 TO STA. 720+50, RT MEDIAN 849 LF

CONCRETE TRAFFIC BARRIER REFLECTIVE DELINEATORS
STA. 708+50 TO STA. 720+50, RT MEDIAN 12 EA
STA. 708+50 TO STA. 712+38, RT OUTSIDE 4 EA

GRINDING ASPHALT PAVEMENT 0 INCH TO 2 INCHES
STA. 711+87 TO STA. 720+50, RT 7,133 SY

REMOVE AND RESET TRAFFIC BARRIER END TREATMENT -- ANY TYPE
STA. 717+54 TO STA. 717+79, RT 1 EA

| CROSS REFERENCE | DWG. NO. |
|---|---|
| TYPICAL SECTION | TS-5 |
| GEOMETRIC LAYOUT | GS-5 |
| SUPERELEVATION TABLE | SE-3 |
| TRAFFIC CONTROL | MT-18 MT-38 |
| STRUCTURAL SHEETS | S7-1 TO S7-19 |
| DRAINAGE SCHEDULE | DD-2 |
| SIGNING PLAN | SN-2.14 |
| LIGHTING PLAN | LT-17, LT-18 |
| ITS PLAN | ITS-15 |
| SEDIMENT CONTROL PLAN | ES-15 |
| SOIL BORING SHEETS | SB-12 |

SCALE IN FEET
50 0 50 100

LEGEND
- FULL DEPTH PAVEMENT AND VARIABLE DEPTH OVERLAY
- CONCRETE OVERLAY OR FULL DEPTH DECK REPLACEMENT
- GRIND AND RESURFACE
- WEDGE AND LEVEL
- (201) PROPOSED INLET/SCUPPER
- PROPOSED MOD. TYPE 'S' INLET, 8 L.F. RCP AND PIPE CONNECTION
- SB2-2 SOIL BORING AND BORING NUMBER

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Engineering Division

ADDENDUMS & REVISIONS

| NO. | DESCRIPTION | BY | DATE |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

# I-95 FROM MORAVIA ROAD TO THE FORT McHENRY TUNNEL

I-95 (BALTIMORE CITY)

ROADWAY PLAN

CONTRACT NO. FT-3003

DRAWING NO. PS-15 of 16

| | | | |
|---|---|---|---|
| DESIGNED BY D.J.R. | DRAWN BY A.W.G. | CHECKED BY J.M.R. | SHEET NO. 38 OF 488 |
| CONST. REVIEW BY | DATE MAY 2016 | SCALE AS SHOWN | |

\\balsrv01\v2014\2014\14006_MDTAAE2795\Task 19 - I-95 Moravia to FMT Design\CADD\Plans\phD-P015_I95.dgn

Monday, May 23, 2016 AT 10:46 AM

TO FORT McHENRY TUNNEL

TO WHITE MARSH

| CURVE NO. 10 | |
|---|---|
| P.I. | N 596,152.9143 |
| | E 1,445,461.6530 |
| △ | = 24°-02'-05.52" |
| Dc | = 0°-30'-00.65" |
| R | = 11,455.00' |
| L | = 4,805.23' |
| T | = 2,438.48' |
| E | = 256.67' |
| S/E | = SEE SUPERELEVATION CHART |

| CURVE NO. 11 | |
|---|---|
| P.I. | N 598,706.4107 |
| | E 1,444,848.0284 |
| △ | = 0°-56'-18.75" |
| Dc | = 0°-15'-00.00" |
| R | = 22,918.3118' |
| L | = 375.42' |
| T | = 187.71' |
| E | = 0.77' |
| S/E | = SEE SUPERELEVATION CHART |

DRIVEWAY FOR MAINTENANCE ROAD, SEE STANDARD NO. MD 630.03

MORAVIA PARK DRIVE

I-95 RTO 2 - SEE SHEET SWM-ROF DETAILS

SWM-05 SWM-01 SWM-06A

EXISTING RIGHT-OF-WAY LINE OF THROUGH HIGHWAY

EXISTING RIGHT-OF-WAY LINE

SB ENTRANCE RAMP FROM PULASKI HWY.

EXISTING RIGHT-OF-WAY LINE OF THROUGH HIGHWAY

LIMIT-OF-ROADWAY-WORK NB

I-95 MORAVIA ROAD TO THE FORT McHENRY TUNNEL STA. 734+61.30

SB1-1

SB1-2

SB1-2A

42 INCH F SHAPE CONCRETE TRAFFIC BARRIER, SINGLE FACE TYPE 1

PCC Sta. 724+31.69

SB I-95

PT Sta. 728+07.11

I-95 ℄ OF CONSTRUCTION

CURVE NO. 10

CURVE NO. 11

+77.25

+66.01

+53.73

+45.00

+41.43

+70.00

+81.31

+83.67

+10.07

+03.83

CONCRETE TRAFFIC BARRIER TRANSITION TYPE A SEE DE-2

NB I-95

NB1-1

FULL DEPTH SAWCUT

B-CCTV-04

MATCH LINE STA. 720+50, SEE DWG NO. PS-15

NB EXIT RAMP TO PULASKI HWY.

PULASKI HIGHWAY

US 40

EXISTING RIGHT-OF-WAY LINE OF THROUGH HIGHWAY

EXISTING RIGHT-OF-WAY LINE

N 592350

E 1445100

E 1444350

N 592350

| 42 INCH F SHAPE CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 1 | |
|---|---|
| STA. 720+50 TO STA. 722+54, RT MEDIAN | 204 LF |

| 34 INCH F SHAPE CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 1 | |
|---|---|
| STA. 721+56 TO STA. 721+79, RT OUTSIDE | 23 LF |
| STA. 721+85 TO STA. 722+07, RT OUTSIDE | 21.5 LF |

| CONCRETE TRAFFIC BARRIER TRANSITION TYPE A | |
|---|---|
| STA. 722+54 TO STA. 722+66, RT MEDIAN | 12.5 LF |

| REMOVAL OF EXISTING CONCRETE BARRIER (ANY TYPE) | |
|---|---|
| STA. 720+50 TO STA. 722+78, RT MEDIAN | 228 LF |
| STA. 721+56 TO STA. 722+07, RT OUTSIDE | 51 LF |

| REMOVE AND RESET EXISTING TRAFFIC BARRIER W BEAM | |
|---|---|
| STA. 725+92 TO STA. 729+41, RT MEDIAN | 349 LF |
| STA. 726+07 TO STA. 730+12, RT OUTSIDE | 405 LF |

| CROSS REFERENCE | DWG. NO. |
|---|---|
| TYPICAL SECTION | TS-5, TS-6 |
| GEOMETRIC LAYOUT | GS-5 |
| SUPERELEVATION TABLE | SE-3, SE-5 |
| TRAFFIC CONTROL | MT-19, MT-39 |
| DRAINAGE SCHEDULE | DD-2 |
| SIGNING PLAN | SN-2.14 TO SN-2.16 |
| LIGHTING PLAN | LT-18, LT-19 |
| ITS PLAN | ITS-15 TO ITS-17 |
| SEDIMENT CONTROL PLAN | ES-16 |
| STORMWATER MANAGEMENT PLAN | SW-10 |
| SOIL BORING SHEETS | SB-13 TO SB-15 |

| CONCRETE TRAFFIC BARRIER REFLECTIVE DELINEATORS | |
|---|---|
| STA. 720+60 TO STA. 722+78, RT MEDIAN | 2 EA |

| GRINDING ASPHALT PAVEMENT 0 INCH TO 2 INCHES | |
|---|---|
| STA. 720+50 TO STA. 722+10, RT | 1,291 SY |
| STA. 725+54 TO STA. 734+61, RT | 5,957 SY |

| STANDARD TYPE A CURB 8 INCH X 16 INCH | |
|---|---|
| LEFT RAMP | 38 LF |

| 6 INCH PORTLAND CEMENT CONCRETE PAVEMENT FOR DRIVEWAY, MIX 6 | |
|---|---|
| LEFT RAMP | 25 SY |

SCALE IN FEET

50 0 50 100

LEGEND

- FULL DEPTH PAVEMENT AND VARIABLE DEPTH OVERLAY
- CONCRETE OVERLAY OR FULL DEPTH DECK REPLACEMENT
- GRIND AND RESURFACE
- WEDGE AND LEVEL
- (201) PROPOSED INLET/SCUPPER
- PROPOSED MOD. TYPE 'S' INLET, 8 L.F. RCP AND PIPE CONNECTION
- SB2-2 SOIL BORING AND BORING NUMBER


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MARYLAND TRANSPORTATION AUTHORITY

*Engineering Division*

ADDENDUMS & REVISIONS

| NO. | DESCRIPTION | BY | DATE |
|---|---|---|---|
| | | | |

# I-95 FROM MORAVIA ROAD TO THE FORT McHENRY TUNNEL

I-95 (BALTIMORE CITY)

ROADWAY PLAN

| | | | |
|---|---|---|---|
| DESIGNED BY D.J.R. | DRAWN BY A.W.G. | CHECKED BY J.M.R. | |
| CONST. REVIEW BY | DATE MAY 2016 | SCALE AS SHOWN | |

CONTRACT NO. FT-3003

DRAWING NO. PS-16 of 16

SHEET NO. 39 OF 488

\\balsrv01\v2014\2014\14006_MDTAAE2795\Task 19 - I-95 Moravia to FMT Design\CADD\Plans\pHD-PD16_195.dgn

Monday, May 23, 2016 AT 10:46 AM

# APPENDIX B - MONITORED AMBIENT AIR QUALITY DATA 2013-2015

# Monitor Values Report

**Geographic Area:** Maryland
**Pollutant:** PM2.5
**Year:** 2015
**Exceptional Events:** Included (if any)
Note: The * indicates the mean does not satisfy minimum data completeness criteria.

| Obs | First Max | Second Max | Third Max | Fourth Max | 98th Percentile | Weighted Annual Mean | Exc Events | Monitor Number | Site ID | Address | City | County | State | EPA Region |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 118 | 28.4 | 26.2 | 23.5 | 23.2 | 24 | 9.7 | None | 1 | 240031003 | Anne Arundel Co. Public Works Bldg. 7409 Baltimore Annapolis Blvd. | Glen Burnie | Anne Arundel | MD | 03 |
| 123 | 29.4 | 24.8 | 22.8 | 21.3 | 23 | 9.1 | None | 1 | 240051007 | Padonia Elementary School, 9834 Greenside Drive | Cockeysville | Baltimore | MD | 03 |
| 69 | 28.6 | 21.2 | 19.7 | 18.3 | 21 | 8.3 | None | 2 | 240051007 | Padonia Elementary School, 9834 Greenside Drive | Cockeysville | Baltimore | MD | 03 |
| 126 | 28.5 | 27.9 | 26.2 | 24.3 | 26 | 10.1 | None | 1 | 240053001 | 600 Dorsey Avenue | Essex | Baltimore | MD | 03 |
| 350 | 30.7 | 30 | 27.5 | 27.2 | 26 | 9.8 | None | 3 | 240150003 | Fair Hill Natural Resource Mgmt Area, 4600 Telegraph Road | Not in a City | Cecil | MD | 03 |
| 341 | 21.1 | 20.9 | 20.8 | 20.6 | 20 | 7.9 | None | 3 | 240190004 | University Of Maryland For Environmental And Estuarine Studies | Not in a City | Dorchester | MD | 03 |
| 343 | 20.3 | 18 | 17.7 | 16.6 | 15 | 5.1 | None | 3 | 240230002 | Piney Run, Frostburg Reservoir, Finzel | Grantsville | Garrett | MD | 03 |
| 354 | 29.1 | 27 | 24.8 | 23.7 | 22 | 8.3 | None | 3 | 240251001 | Edgewood Chemical Biological Center (Apg), Waehli Road | Edgewood | Harford | MD | 03 |
| 300 | 31.8 | 26 | 25.3 | 23.7 | 23 | 9.2* | None | 3 | 240270006 | Interstate 95 South Welocme Center | North Laurel | Howard | MD | 03 |
| 337 | 24.5 | 24.5 | 24.2 | 23.9 | 22 | 9.3 | Included | 3 | 240290002 | Millington Wildlife Management Area, Massey - Maryland Line Road (Route 330) | Not in a City | Kent | MD | 03 |
| 338 | 30.8 | 24.6 | 24.4 | 22.8 | 22 | 9.7 | None | 3 | 240313001 | Lathrop E. Smith Environmental Education Center, 5110 Meadowside Lane | Not in a City | Montgomery | MD | 03 |
| 120 | 28.4 | 19.9 | 19.6 | 19.4 | 20 | 8.1 | None | 1 | 240330030 | Howard University'S Beltsville Laboratory, 12003 Old Baltimore Pike | Beltsville | Prince George's | MD | 03 |
| 32 | 28.1 | 18.1 | 15.4 | 14.4 | 28 | 8.9 | None | 2 | 240330030 | Howard University'S Beltsville Laboratory, 12003 Old Baltimore Pike | Beltsville | Prince George's | MD | 03 |

Get detailed information about this report, including column descriptions, at http://www.epa.gov/airquality/airdata/ad_about_reports.html#mon

AirData reports are produced from a direct query of the AQS Data Mart. The data represent the best and most recent information available to EPA from state agencies. However, some values may be absent due to incomplete reporting, and some values may change due to quality assurance activities. The AQS database is updated daily by state, local, and tribal organizations who own and submit the data. Please contact the appropriate air quality monitoring agency to report any data problems. <http://www.epa.gov/airquality/airdata/ad_contacts.html>

Readers are cautioned not to rank order geographic areas based on AirData reports. Air pollution levels measured at a particular monitoring site are not necessarily representative of the air quality for an entire county or urban area.

This report is based on monitor-level summary statistics. Air quality standards for some pollutants (PM2.5 and Pb) allow for combining data from multiple monitors into a site-level summary statistic that can be compared to the standard. In those cases, the site-level statistics may differ from the monitor-level statistics upon which this report is based.

Source: U.S. EPA AirData <http://www.epa.gov/airdata>
Generated: May 24, 2016

# Monitor Values Report

**Geographic Area:** Maryland
**Pollutant:** PM2.5
**Year:** 2015
**Exceptional Events:** Included (if any)
Note: The * indicates the mean does not satisfy minimum data completeness criteria.

| Obs | First Max | Second Max | Third Max | Fourth Max | 98th Percentile | Weighted Annual Mean | Exc Events | Monitor Number | Site ID | Address | City | County | State | EPA Region |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 345 | 32.5 | 27.7 | 26.7 | 26.1 | 24 | 11.2 | None | 3 | 240330030 | Howard University'S Beltsville Laboratory, 12003 Old Baltimore Pike | Beltsville | Prince George's | MD | 03 |
| 123 | 23.8 | 18.7 | 18.3 | 17.8 | 18 | 7.9 | None | 1 | 240338003 | Pg County Equestrian Center, 14900 Pennsylvania Ave. | Greater Upper Marlboro | Prince George's | MD | 03 |
| 59 | 23.9 | 19.3 | 15.8 | 14.4 | 19 | 7.5 | None | 2 | 240338003 | Pg County Equestrian Center, 14900 Pennsylvania Ave. | Greater Upper Marlboro | Prince George's | MD | 03 |
| 319 | 32.7 | 28.9 | 28.4 | 28.3 | 25 | 10.2 | None | 3 | 240430009 | Md Correctional Institution 18530 Roxbury Road | Not in a City | Washington | MD | 03 |
| 119 | 28.9 | 25.8 | 25.6 | 24.5 | 26 | 9.3 | None | 1 | 245100007 | Northwest Police Station, 5271 Reistertown Road | Baltimore | Baltimore (City) | MD | 03 |
| 125 | 29.5 | 26.5 | 25.9 | 21.9 | 26 | 9.9 | None | 1 | 245100008 | Baltimore City Fire Dept.-Truck Company 20; 5714 Eastern Avenue | Baltimore | Baltimore (City) | MD | 03 |
| 348 | 33.8 | 31.2 | 30.7 | 30.3 | 30 | 9.7 | None | 1 | 245100040 | Oldtown Fire Station, 1100 Hillen Street | Baltimore | Baltimore (City) | MD | 03 |
| 328 | 35.2 | 33 | 32.7 | 32.5 | 30 | 11.1* | None | 3 | 245100040 | Oldtown Fire Station, 1100 Hillen Street | Baltimore | Baltimore (City) | MD | 03 |

Get detailed information about this report, including column descriptions, at http://www.epa.gov/airquality/airdata/ad_about_reports.html#mon

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Source: U.S. EPA AirData <http://www.epa.gov/airdata>
Generated: May 24, 2016

# Monitor Values Report

**Geographic Area:** Maryland
**Pollutant:** PM2.5
**Year:** 2014
**Exceptional Events:** Included (if any)
Note: The * indicates the mean does not satisfy minimum data completeness criteria.

| Obs | First Max | Second Max | Third Max | Fourth Max | 98th Percentile | Weighted Annual Mean | Exc Events | Monitor Number | Site ID | Address | City | County | State | EPA Region |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 120 | 24.1 | 23 | 22.9 | 22.5 | 23 | 9.1 | None | 1 | 240031003 | Anne Arundel Co. Public Works Bldg. 7409 Baltimore Annapolis Blvd. | Glen Burnie | Anne Arundel | MD | 03 |
| 115 | 23 | 21.4 | 20.8 | 20.6 | 21 | 8.9 | None | 1 | 240051007 | Padonia Elementary School, 9834 Greenside Drive | Cockeysville | Baltimore | MD | 03 |
| 58 | 21.4 | 21.2 | 19 | 16.2 | 21 | 7.7 | None | 2 | 240051007 | Padonia Elementary School, 9834 Greenside Drive | Cockeysville | Baltimore | MD | 03 |
| 110 | 25.9 | 23.3 | 21.6 | 21.3 | 22 | 9.7 | None | 1 | 240053001 | 600 Dorsey Avenue | Essex | Baltimore | MD | 03 |
| 335 | 28.8 | 28.4 | 28.1 | 27.6 | 24 | 8.6 | None | 3 | 240150003 | Fair Hill Natural Resource Mgmt Area, 4600 Telegraph Road | Not in a City | Cecil | MD | 03 |
| 346 | 24.5 | 22.1 | 21.5 | 21.5 | 19 | 8.6 | None | 3 | 240190004 | University Of Maryland For Environmental And Estuarine Studies | Not in a City | Dorchester | MD | 03 |
| 324 | 22.4 | 20.9 | 18.9 | 17.5 | 16 | 6.4* | None | 3 | 240230002 | Piney Run, Frostburg Reservoir, Finzel | Grantsville | Garrett | MD | 03 |
| 351 | 30.8 | 30.5 | 29.4 | 26.8 | 21 | 10.3 | None | 3 | 240251001 | Edgewood Chemical Biological Center (Apg), Waehli Road | Edgewood | Harford | MD | 03 |
| 261 | 25.9 | 23 | 22.8 | 22.2 | 21 | 12.0* | None | 3 | 240270006 | Interstate 95 South Welocme Center | North Laurel | Howard | MD | 03 |
| 339 | 29.2 | 24.7 | 21.9 | 21.7 | 20 | 8.2 | None | 3 | 240290002 | Millington Wildlife Management Area, Massey - Maryland Line Road (Route 330) | Not in a City | Kent | MD | 03 |
| 340 | 27.7 | 23.2 | 23 | 21.9 | 20 | 9 | None | 3 | 240313001 | Lathrop E. Smith Environmental Education Center, 5110 Meadowside Lane | Not in a City | Montgomery | MD | 03 |
| 119 | 22 | 18.1 | 17.4 | 16.2 | 17 | 7.8 | None | 1 | 240330030 | Howard University'S Beltsville Laboratory, 12003 Old Baltimore Pike | Beltsville | Prince George's | MD | 03 |
| 29 | 13.9 | 13 | 12.9 | 10.7 | 14 | 6.7 | None | 2 | 240330030 | Howard University'S Beltsville Laboratory, 12003 Old Baltimore Pike | Beltsville | Prince George's | MD | 03 |
| 341 | 26.7 | 26.1 | 26 | 24.8 | 23 | 9.9 | None | 3 | 240330030 | Howard University'S Beltsville Laboratory, 12003 Old Baltimore Pike | Beltsville | Prince George's | MD | 03 |

Get detailed information about this report, including column descriptions, at http://www.epa.gov/airquality/airdata/ad_about_reports.html#mon

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Readers are cautioned not to rank order geographic areas based on AirData reports. Air pollution levels measured at a particular monitoring site are not necessarily representative of the air quality for an entire county or urban area.

This report is based on monitor-level summary statistics. Air quality standards for some pollutants (PM2.5 and Pb) allow for combining data from multiple monitors into a site-level summary statistic that can be compared to the standard. In those cases, the site-level statistics may differ from the monitor-level statistics upon which this report is based.

Source: U.S. EPA AirData <http://www.epa.gov/airdata>
Generated: May 24, 2016

# Monitor Values Report

**Geographic Area:** Maryland
**Pollutant:** PM2.5
**Year:** 2014
**Exceptional Events:** Included (if any)
Note: The * indicates the mean does not satisfy minimum data completeness criteria.

| Obs | First Max | Second Max | Third Max | Fourth Max | 98th Percentile | Weighted Annual Mean | Exc Events | Monitor Number | Site ID | Address | City | County | State | EPA Region |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 115 | 20.4 | 17.1 | 15.4 | 14 | 15 | 7.8 | None | 1 | 240338003 | Pg County Equestrian Center, 14900 Pennsylvania Ave. | Greater Upper Marlboro | Prince George's | MD | 03 |
| 57 | 17.3 | 15.9 | 13.2 | 13.1 | 16 | 7.1* | None | 2 | 240338003 | Pg County Equestrian Center, 14900 Pennsylvania Ave. | Greater Upper Marlboro | Prince George's | MD | 03 |
| 344 | 35.3 | 31.4 | 29.7 | 27.9 | 27 | 8.8 | None | 3 | 240430009 | Md Correctional Institution 18530 Roxbury Road | Not in a City | Washington | MD | 03 |
| 122 | 22.4 | 20.9 | 20.3 | 19.7 | 20 | 8.5 | None | 1 | 245100007 | Northwest Police Station, 5271 Reistertown Road | Baltimore | Baltimore (City) | MD | 03 |
| 110 | 23.7 | 22.1 | 22 | 21.2 | 22 | 9.3 | None | 1 | 245100008 | Baltimore City Fire Dept.-Truck Company 20; 5714 Eastern Avenue | Baltimore | Baltimore (City) | MD | 03 |
| 322 | 30.4 | 27.4 | 26.4 | 26.1 | 21 | 9.2* | None | 1 | 245100040 | Oldtown Fire Station, 1100 Hillen Street | Baltimore | Baltimore (City) | MD | 03 |
| 348 | 32.9 | 30.5 | 29.9 | 29.1 | 23 | 11.1 | None | 3 | 245100040 | Oldtown Fire Station, 1100 Hillen Street | Baltimore | Baltimore (City) | MD | 03 |

Get detailed information about this report, including column descriptions, at http://www.epa.gov/airquality/airdata/ad_about_reports.html#mon

AirData reports are produced from a direct query of the AQS Data Mart. The data represent the best and most recent information available to EPA from state agencies. However, some values may be absent due to incomplete reporting, and some values may change due to quality assurance activities. The AQS database is updated daily by state, local, and tribal organizations who own and submit the data. Please contact the appropriate air quality monitoring agency to report any data problems. <http://www.epa.gov/airquality/airdata/ad_contacts.html>

Readers are cautioned not to rank order geographic areas based on AirData reports. Air pollution levels measured at a particular monitoring site are not necessarily representative of the air quality for an entire county or urban area.

This report is based on monitor-level summary statistics. Air quality standards for some pollutants (PM2.5 and Pb) allow for combining data from multiple monitors into a site-level summary statistic that can be compared to the standard. In those cases, the site-level statistics may differ from the monitor-level statistics upon which this report is based.

Source: U.S. EPA AirData <http://www.epa.gov/airdata>
Generated: May 24, 2016

# Monitor Values Report

**Geographic Area:** Maryland
**Pollutant:** PM2.5
**Year:** 2013
**Exceptional Events:** Included (if any)

**Duration Description=24 HOUR**

| Duration Description | Obs | First Max | Second Max | Third Max | Fourth Max | 98th Percentile | Weighted Annual Mean | Exc Events | Monitor Number | Site ID | Address | City | County | State | EPA Region |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 24 HOUR | 116 | 30.4 | 26.3 | 22.1 | 20.2 | 22 | 9.1 | None | 1 | 240031003 | Anne Arundel Co. Public Works Bldg. 7409 Baltimore Annapolis Blvd. | Glen Burnie | Anne Arundel | MD | 03 |
| 24 HOUR | 111 | 26.5 | 24.7 | 19.9 | 19.7 | 20 | 8.5 | None | 1 | 240051007 | Padonia Elementary School, 9834 Greenside Drive | Cockeysville | Baltimore | MD | 03 |
| 24 HOUR | 53 | 26.9 | 20 | 17.9 | 17.8 | 20 | 8.5 | None | 2 | 240051007 | Padonia Elementary School, 9834 Greenside Drive | Cockeysville | Baltimore | MD | 03 |
| 24 HOUR | 113 | 35.2 | 29.4 | 26.8 | 23.4 | 27 | 9.5 | None | 1 | 240053001 | 600 Dorsey Avenue | Essex | Baltimore | MD | 03 |
| 24 HOUR | 121 | 22.2 | 20.1 | 18.6 | 17.5 | 19 | 7.8 | None | 1 | 240330030 | Howard University'S Beltsville Laboratory, 12003 Old Baltimore Pike | Beltsville | Prince George's | MD | 03 |
| 24 HOUR | 32 | 21.7 | 18.5 | 16.4 | 12.7 | 22 | 8.2 | None | 2 | 240330030 | Howard University'S Beltsville Laboratory, 12003 Old Baltimore Pike | Beltsville | Prince George's | MD | 03 |
| 24 HOUR | 106 | 23.5 | 20.4 | 17.2 | 15.5 | 17 | 7.5 | None | 1 | 240338003 | Pg County Equestrian Center, 14900 Pennsylvania Ave. | Greater Upper Marlboro | Prince George's | MD | 03 |
| 24 HOUR | 50 | 16.6 | 15 | 15 | 14.7 | 17 | 7.9 | None | 2 | 240338003 | Pg County Equestrian Center, 14900 Pennsylvania Ave. | Greater Upper Marlboro | Prince George's | MD | 03 |
| 24 HOUR | 116 | 28.6 | 27 | 20.4 | 18.8 | 20 | 8.6 | None | 1 | 245100007 | Northwest Police Station, 5271 Reistertown Road | Baltimore | Baltimore (City) | MD | 03 |
| 24 HOUR | 114 | 32 | 28.7 | 24.3 | 22.8 | 24 | 9.4 | None | 1 | 245100008 | Baltimore City Fire Dept.-Truck Company 20; 5714 Eastern Avenue | Baltimore | Baltimore (City) | MD | 03 |
| 24 HOUR | 303 | 34.6 | 29.8 | 29.7 | 27.7 | 23 | 9.1 | None | 1 | 245100040 | Oldtown Fire Station, 1100 Hillen Street | Baltimore | Baltimore (City) | MD | 03 |

Get detailed information about this report, including column descriptions, at http://www.epa.gov/airquality/airdata/ad_about_reports.html#mon

AirData reports are produced from a direct query of the AQS Data Mart. The data represent the best and most recent information available to EPA from state agencies. However, some values may be absent due to incomplete reporting, and some values may change due to quality assurance activities. The AQS database is updated daily by state, local, and tribal organizations who own and submit the data. Please contact the appropriate air quality monitoring agency to report any data problems. <http://www.epa.gov/airquality/airdata/ad_contacts.html>

Readers are cautioned not to rank order geographic areas based on AirData reports. Air pollution levels measured at a particular monitoring site are not necessarily representative of the air quality for an entire county or urban area.

This report is based on monitor-level summary statistics. Air quality standards for some pollutants (PM2.5 and Pb) allow for combining data from multiple monitors into a site-level summary statistic that can be compared to the standard. In those cases, the site-level statistics may differ from the monitor-level statistics upon which this report is based.

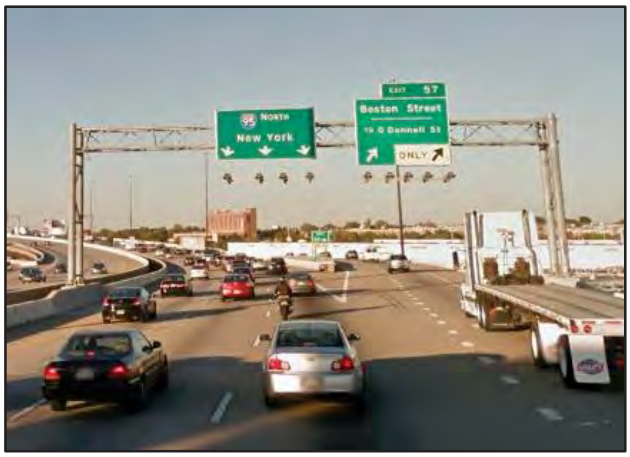
Source: U.S. EPA AirData <http://www.epa.gov/airdata>
Generated: July 17, 2015

# APPENDIX C - TRAFFIC DATA

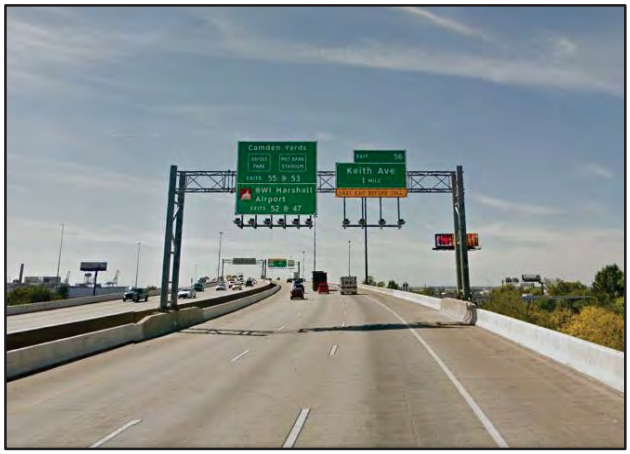
Maryland Transportation Authority

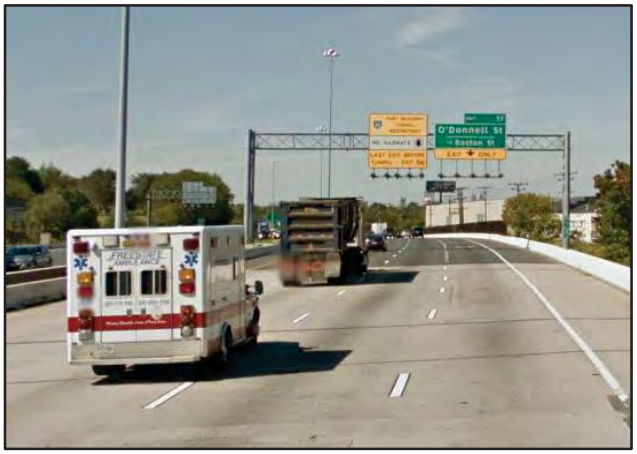
# I-95 from Moravia Road to the Fort McHenry Tunnel

## Traffic Data & Analyses Technical Report








RK&K

January 2016

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## INTRODUCTION

As part of an ongoing project for the Maryland Transportation Authority (MDTA), Rummel, Klepper, & Kahl (RK&K) has compiled traffic data and performed operational analyses to evaluate the projected impacts of providing four (4) continuous through lanes along I-95 in each direction from Moravia Road to the Fort McHenry Tunnel. MDTA requested that RK&K update the traffic volumes, traffic forecasts, and traffic analyses for the project to evaluate potential design changes and to confirm that the proposed design would operate acceptably, since it had been several years since the previous traffic analysis was completed (during the planning phase of the project in 2007). The purpose of this report is to present the latest traffic data and to present the results of the updated traffic analysis.

The project is located in Baltimore City and the study area for this traffic report extends from the I-95 Express Toll Lanes (ETLs) in the north to just north of the Fort McHenry Tunnel (FMT) toll plaza in the south. The improvements along I-95 have been split into four phases:

- "Phase 1 Southbound" includes modifications to I-95 southbound from the I-95 ETL project to north of Eastern Avenue.
- "Phase 2 Southbound" includes modifications to I-95 southbound from Kane Street to the entrance ramp from Boston Street.
- "Phase 1 Northbound" includes modifications to I-95 northbound from Eastern Avenue to the I-95 ETL.
- "Phase 2 Northbound" includes modifications to I-95 from the Fort McHenry toll plaza to the entrance ramp from O'Donnell Street.

Construction of "Phase 1 Southbound" was previously completed in 2012, while the other three phases have been combined into a single design contract (MDTA Project FT-3003). Construction of the remaining improvements along I-95 is projected to begin in January 2017 and be completed by October 2018. This schedule will allow the project to be completed prior to construction of the I-895 Canton Viaduct project. The Canton Viaduct project is scheduled to start in late 2018 and is expected to disrupt the traffic along I-895. It is anticipated that the additional capacity provided along I-95 from Moravia Road to the FMT as part of this project would help to compensate for the temporary loss of capacity along I-895.

This report presents the traffic data and operational analyses results for the I-95 project from Moravia Road to the Fort McHenry Tunnel. The analyses were performed for existing conditions (year 2015), as well as for No-Build and Build conditions for the construction year / year of opening (2018). Analyses were also performed for the future design year of 2040 to assess the long-term operational impacts. However, it should be noted that this project is a relatively low-cost, short-term improvement that was not designed to accommodate long-term traffic demand.

Traffic data presented includes peak hour volumes and the average daily traffic (ADT) for all freeway segments and ramps within the study area, as well as truck percentages. This report also discusses the analysis methodology and summarizes the results of all operational analyses.

## EXISTING CONDITIONS

The project is located in the southeast part of Baltimore City and extends along I-95 in the north-south direction. The study area extends from the I-95 Express Toll Lanes (ETLs) in the north to just north of the Fort McHenry Tunnel (FMT) toll plaza in the south. There are five interchanges within the study area that create merge, diverge and weave areas within the study limits. **Figure 1** shows the study area map. The existing roadway and traffic characteristics are discussed in the following sections.

### Existing Roadway Geometry

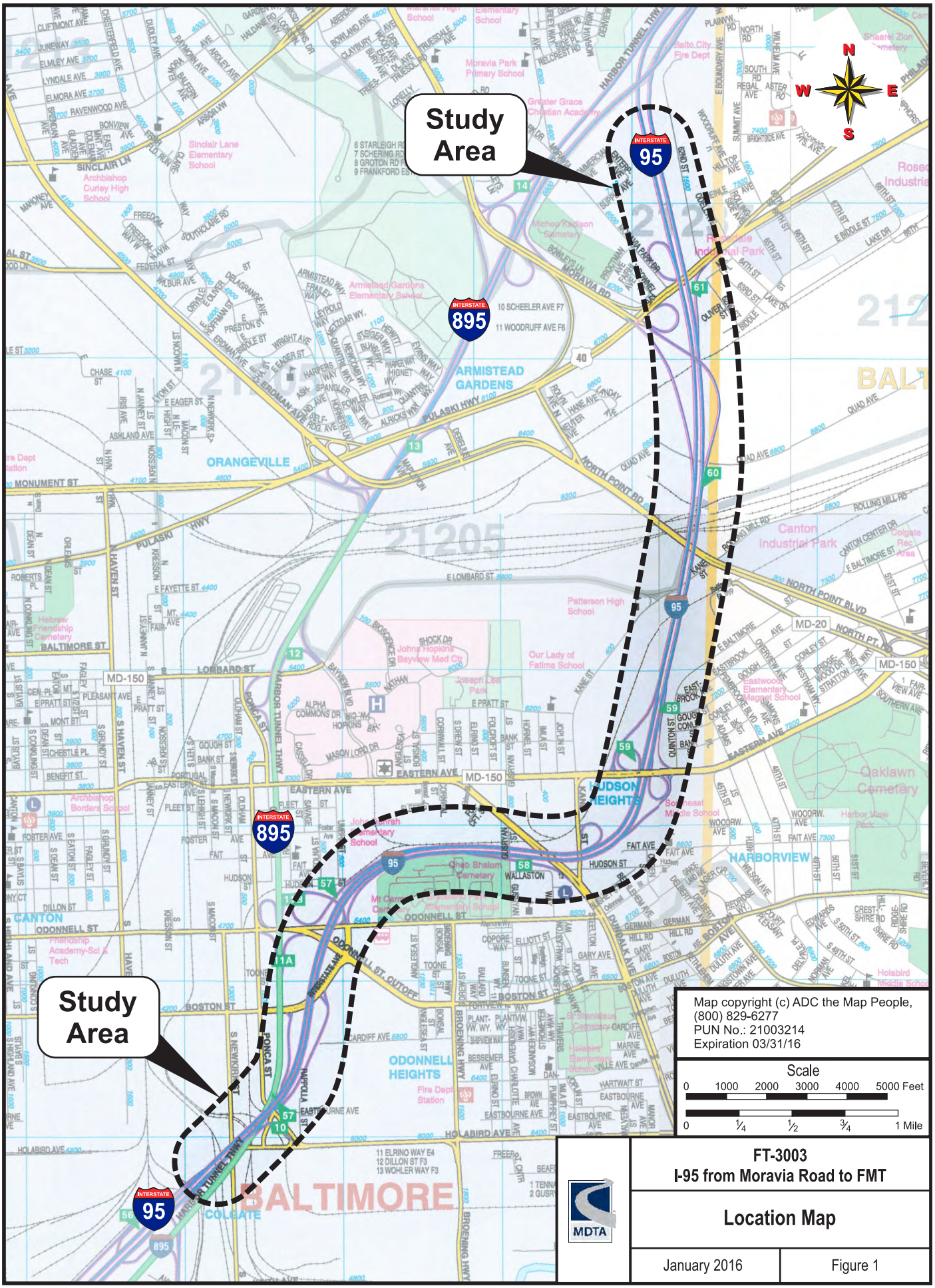
Under existing conditions, I-95 carries three (3) or four (4) through lanes in each direction within the study limits. **Figure 3A-3C** shows detailed lane diagrams of existing conditions along the project corridor (refer to **Figure 2** for a key map of the lane diagram). The 3-lane segments that will need to be re-striped and widened to four lanes as part of this project include:

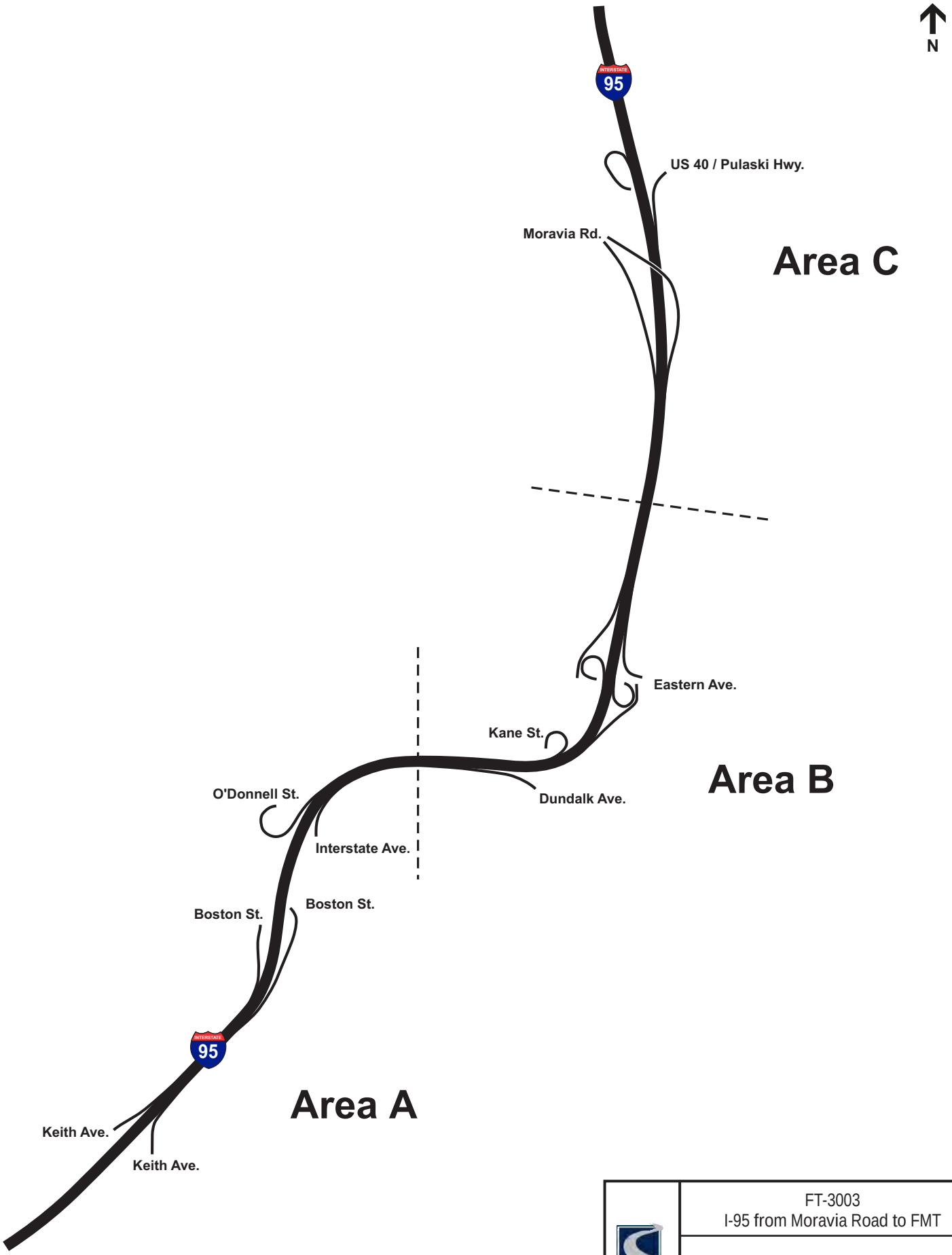
Segment 1 - Northbound I-95 between Boston Street and the entrance from Interstate Ave.
Segment 2 - Southbound I-95 between O'Donnell Street and Boston Street
Segment 3 - Northbound I-95 from Moravia Road to the I-95 ETLs

Segment 1 starts with four northbound lanes north of the FMT toll plaza and a merge from the entrance ramp from Keith Avenue, followed immediately by a diverge for the exit ramp to Boston Street, which results in a lane drop. Because the merge and diverge between Keith Avenue and Boston Street are closely spaced, the traffic operates like a weave. I-95 then carries three lanes northbound between the exit ramp to Boston Street and the entrance ramp from Interstate Avenue.

Segment 2 starts with four southbound lanes and a merge at the entrance ramp from Kane Street, followed immediately by a diverge with a lane-drop at the exit ramp to O'Donnell Street. Similar to Segment 1, the merge and diverge between Kane Street and O'Donnell Street are closely spaced and the segment operates like a weaving segment. I-95 then carries three lanes southbound between the exit ramp to O'Donnell Street and a mainline lane-add, located just prior to the Boston Street entrance ramp.

Segment 3 starts with four northbound lanes north of the entrance ramp from Eastern Avenue and a diverge at the exit ramp to Moravia Road, which results in a lane drop. This diverge is located almost immediately after the merge for the entrance ramp from Eastern Avenue, which creates a weaving behavior between the two ramps. I-95 then carries three lanes northbound beyond the exit ramp to the US 40 (Pulaski Highway) until the ramp to the I-95 ETLs forms on the left side.


Study Area
Study Area
N
S
E
W
INTERSTATE 95
INTERSTATE 895
MD-150
MD-20
ARMISTEAD GARDENS
ORANGEVILLE
HUDSON HEIGHTS
HARBORVIEW
ODONNELL HEIGHTS
CANTON
BALTIMORE
COLGATE
Map copyright (c) ADC the Map People,
(800) 829-6277
PUN No.: 21003214
Expiration 03/31/16
Scale
0 1000 2000 3000 4000 5000 Feet
0 ¼ ½ ¾ 1 Mile
MDTA
FT-3003
I-95 from Moravia Road to FMT
Location Map
January 2016
Figure 1

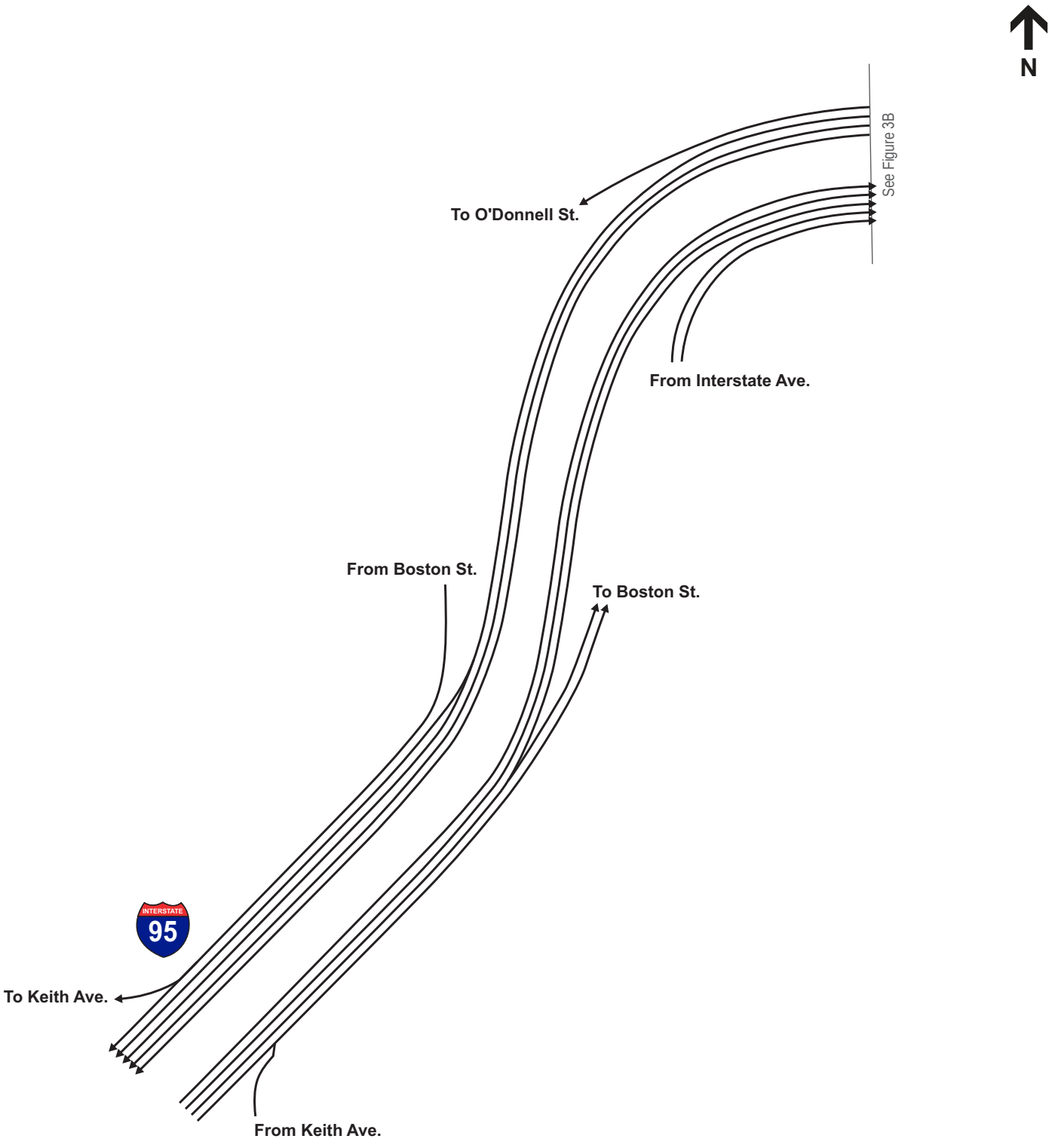



MDTA

FT-3003
I-95 from Moravia Road to FMT

I-95 Lane Diagram Key Map

January 2016 | Figure 2




Not to Scale

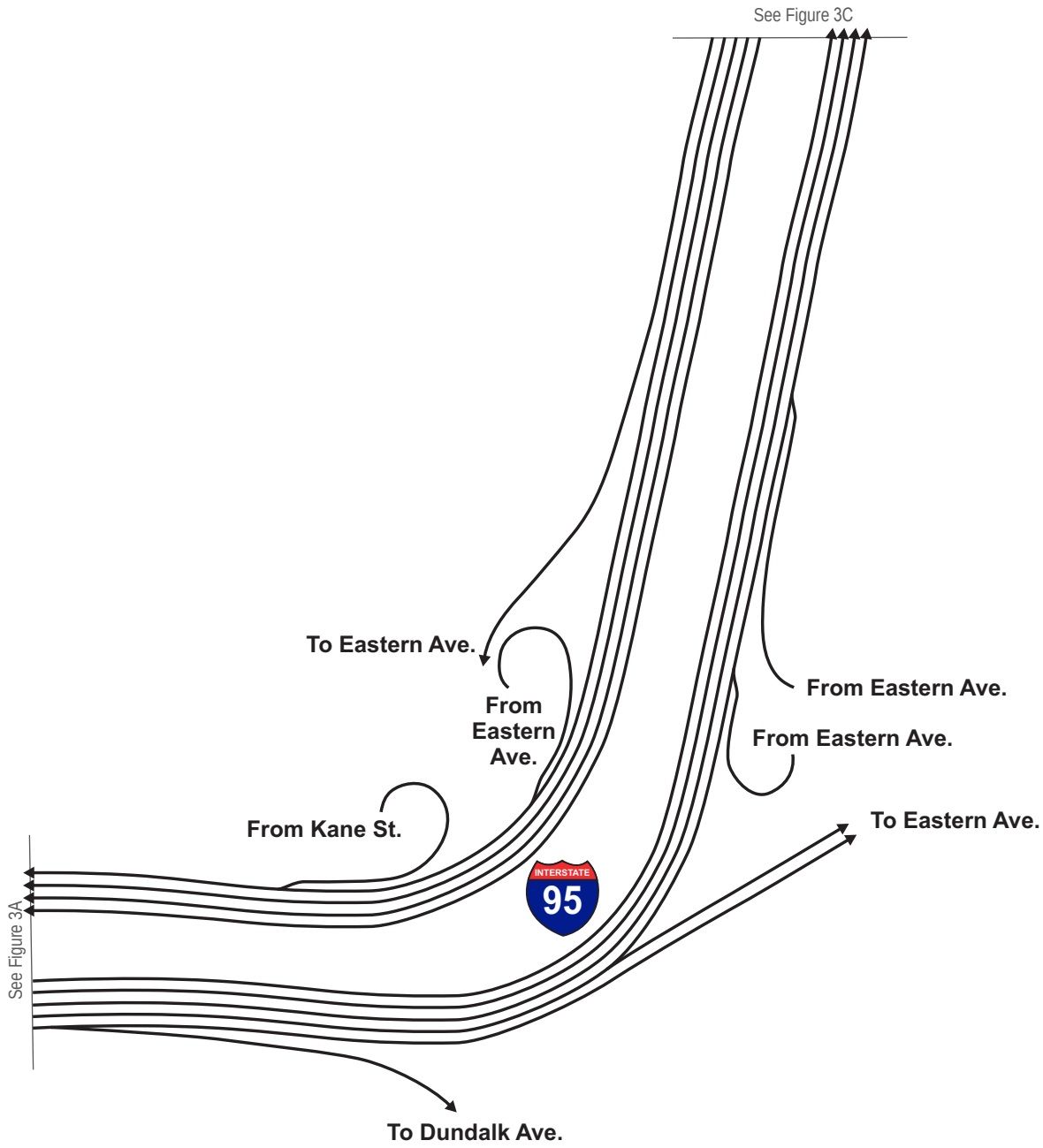
MDTA

FT-3003
I-95 from Moravia Road to FMT

I-95 Lane Diagram
Area A - Existing

January 2016

Figure 3A




Not to Scale

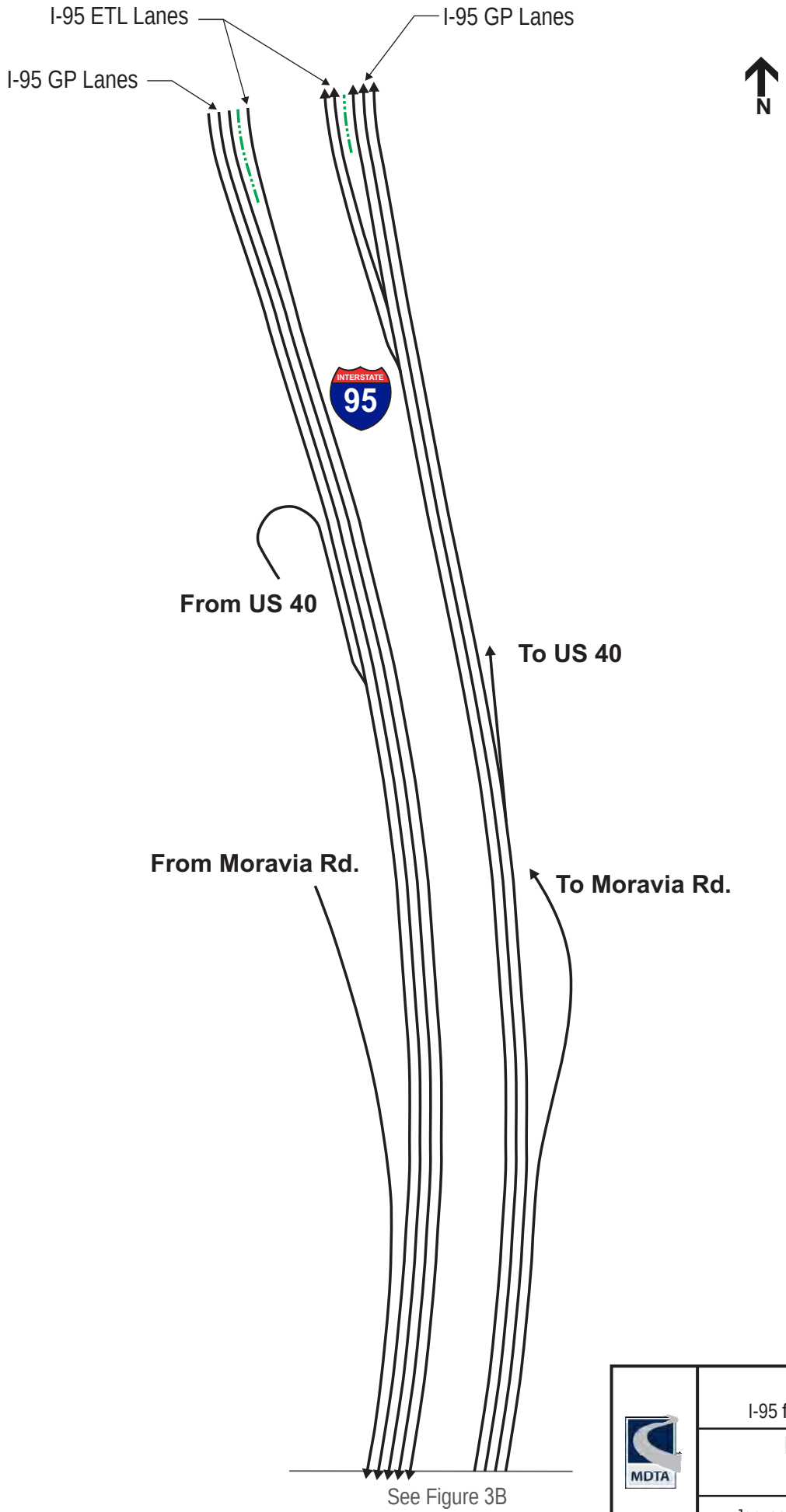
MDTA

FT-3003
I-95 from Moravia Road to FMT

I-95 Lane Diagram
Area B - Existing

January 2016

Figure 3B




Not to Scale

MDTA

FT-3003
I-95 from Moravia Road to FMT

I-95 Lane Diagram
Area C - Existing

January 2016

Figure 3C

### Traffic Volumes

Volume networks representing existing conditions were developed for the study area, using recent count data from the Fort McHenry toll plaza and from tube counts performed on mainline segments and ramps within the last three years. Count volumes were projected to the current year (2015) by applying an annual growth rate of 0.5% per year based on historical trends and were balanced between interchange ramps. The data indicates that the peak direction of travel within the study area is in the southbound direction during the AM peak hour and in the northbound direction during the PM peak hour. **Figure 4** shows the resulting 2015 balanced volume network and includes AM and PM peak hour volumes, ADT, and truck percentages for the study corridor.

### Traffic Operations

Operational analyses of existing conditions were performed using Highway Capacity Software (HCS) 2010, Version 6.60. Level of Service (LOS) was determined for all freeway sections and ramp junctions along I-95 within the study limits. HCS 2010 is a software package that implements the procedures for analyzing freeway segments, as well as the merge, diverge and weave areas based on the methodologies presented in the 2010 Highway Capacity Manual (HCM). **Table 1** summarizes the results from the HCS analyses for the 2015 existing conditions. The highway segment location numbers that are referenced in Table 1 are shown in **Figure 5**.

The HCS analyses results indicate that I-95 northbound currently operates at LOS B or better during the AM peak hour and LOS D or better during the PM peak hour, except for the weaving area between Keith Avenue and Boston Street, which operates at LOS E during the PM peak hour. The HCS analyses results also indicate that I-95 southbound operates at LOS C or better during the PM peak hour and most segments along I-95 southbound operate at LOS D or better during the AM peak hour. However, the segments between the entrance ramps from Kane Street and Boston Street, as well as the weave between Boston Street and Keith Avenue operate at LOS E during the AM peak hour.

**Figure 4. Existing (2015) Traffic Volumes and Truck Percentages**

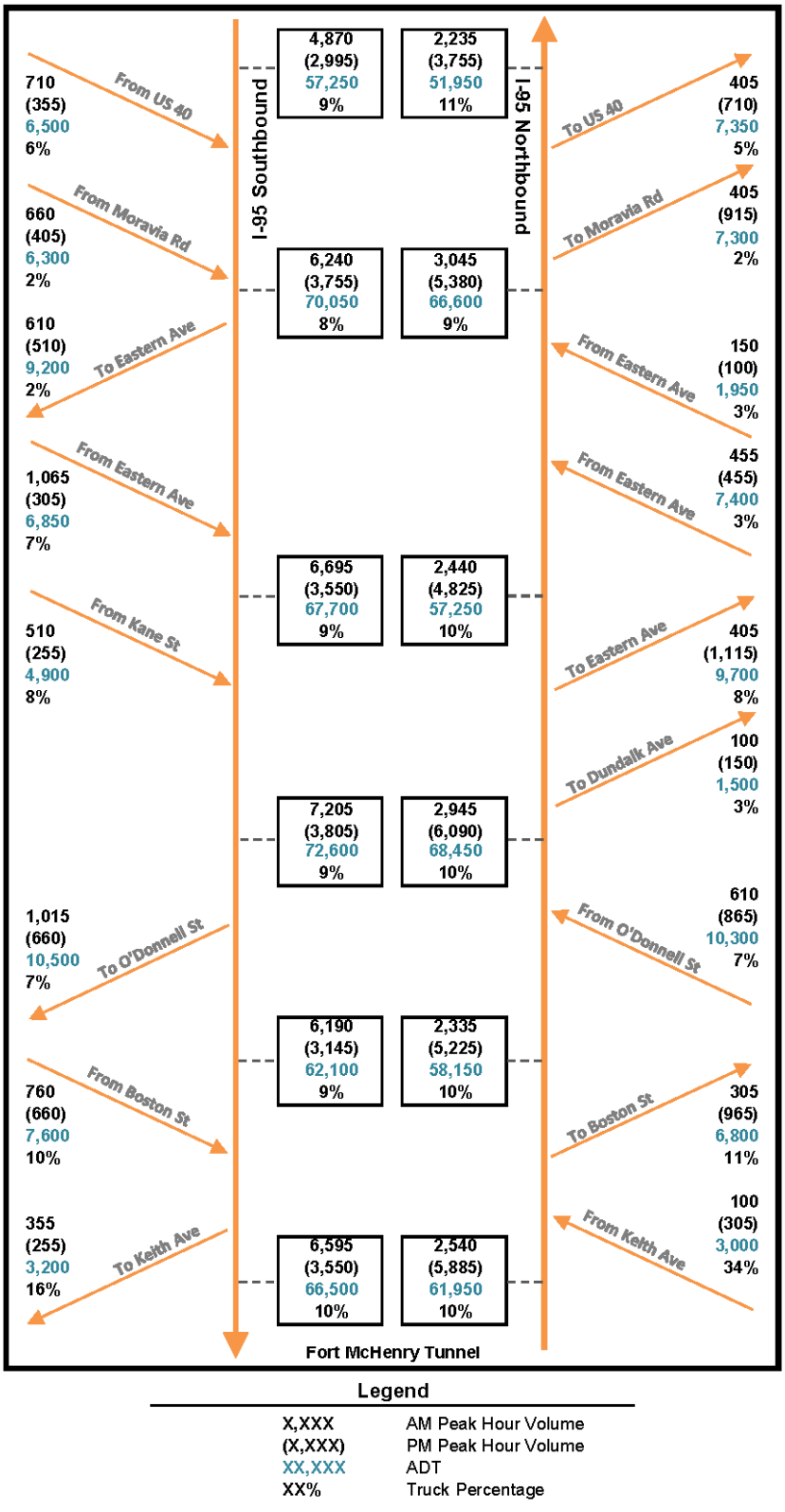


**Figure 5. Highway Segment Location Reference for HCS Analysis**

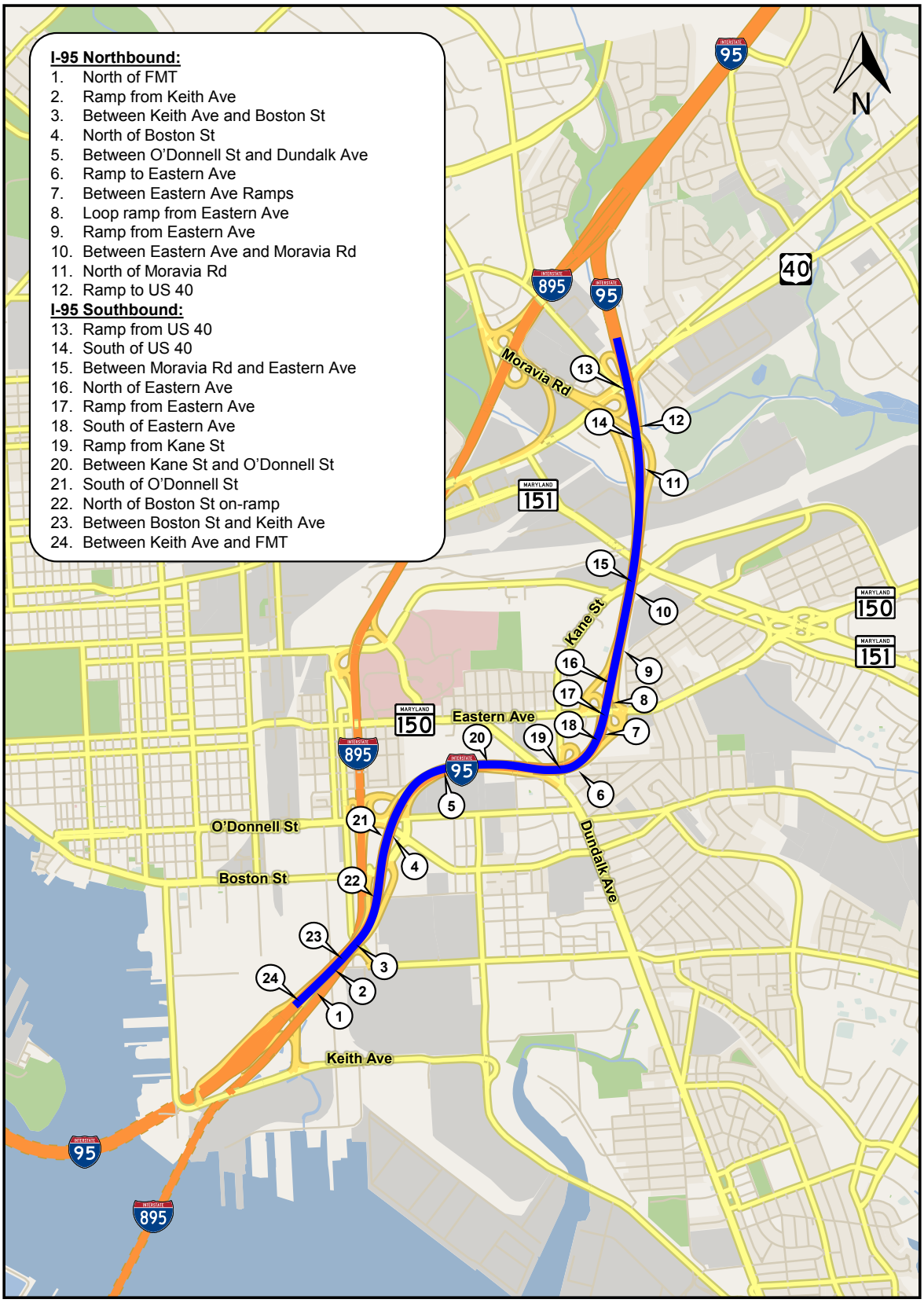


**Table 1. 2015 Existing Conditions - HCS Analyses Results**

| Dir. | No. | Highway Segment | Analysis Type | LOS (Density) | |
|---|---|---|---|---|---|
| | | | | AM | PM |
| I-95 Northbound | 1 | North of FMT | Freeway | B (11.8) | D (27.4) |
| | 2 | Ramp from Keith Ave | Merge | A (9.9) | C (23.4) |
| | 3 | Between Keith Ave and Boston St | Weaving | B (13.4) | E (35.0) |
| | 4 | North of Boston St | Freeway | B (14.5) | D (33.6) |
| | 5 | Between O'Donnell St and Dundalk Ave | Weaving | B (11.9) | C (26.6) |
| | 6 | Ramp to Eastern Ave | Major Diverge | A (10.0) | C (20.8) |
| | 7 | Between Eastern Ave Ramps | Freeway | B (11.4) | C (22.5) |
| | 8 | Loop-Ramp from Eastern Ave | Merge | B (11.9) | C (20.2) |
| | 9 | Ramp from Eastern Ave | Merge | A (9.8) | B (17.7) |
| | 10 | Between Eastern Ave and Moravia Rd | Weaving | B (15.4) | D (28.4) |
| | 11 | North of Moravia Rd | Freeway | B (16.4) | D (27.7) |
| | 12 | Ramp to US 40 | Diverge | B (16.1) | C (26.3) |
| I-95 Southbound | 13 | Ramp from US 40 | Merge | C (21.2) | B (11.8) |
| | 14 | South of US 40 | Freeway | C (25.9) | B (15.5) |
| | 15 | Between Moravia Rd and Eastern Ave | Weaving | D (30.2) | B (16.4) |
| | 16 | North of Eastern Ave | Freeway | C (26.0) | B (15.0) |
| | 17 | Ramp from Eastern Ave | Merge | D (28.3) | B (13.9) |
| | 18 | South of Eastern Ave | Freeway | D (31.7) | B (16.5) |
| | 19 | Ramp from Kane St | Merge | C (27.5) | B (14.5) |
| | 20 | Between Kane St and O'Donnell St | Weaving | E (42.0) | B (19.8) |
| | 21 | South of O'Donnell St | Freeway | E (44.8) | C (19.4) |
| | 22 | North of Boston St On-Ramp | Freeway (Lane Add) | D (28.8) | B (14.6) |
| | 23 | Between Boston St and Keith Ave | Weaving | E (35.2) | B (17.4) |
| | 24 | Between Keith Ave and FMT | Freeway | D (31.3) | B (16.5) |

## FUTURE NO-BUILD CONDITIONS

### Construction Year / Year of Opening (2018)

#### *I. Traffic Volumes*

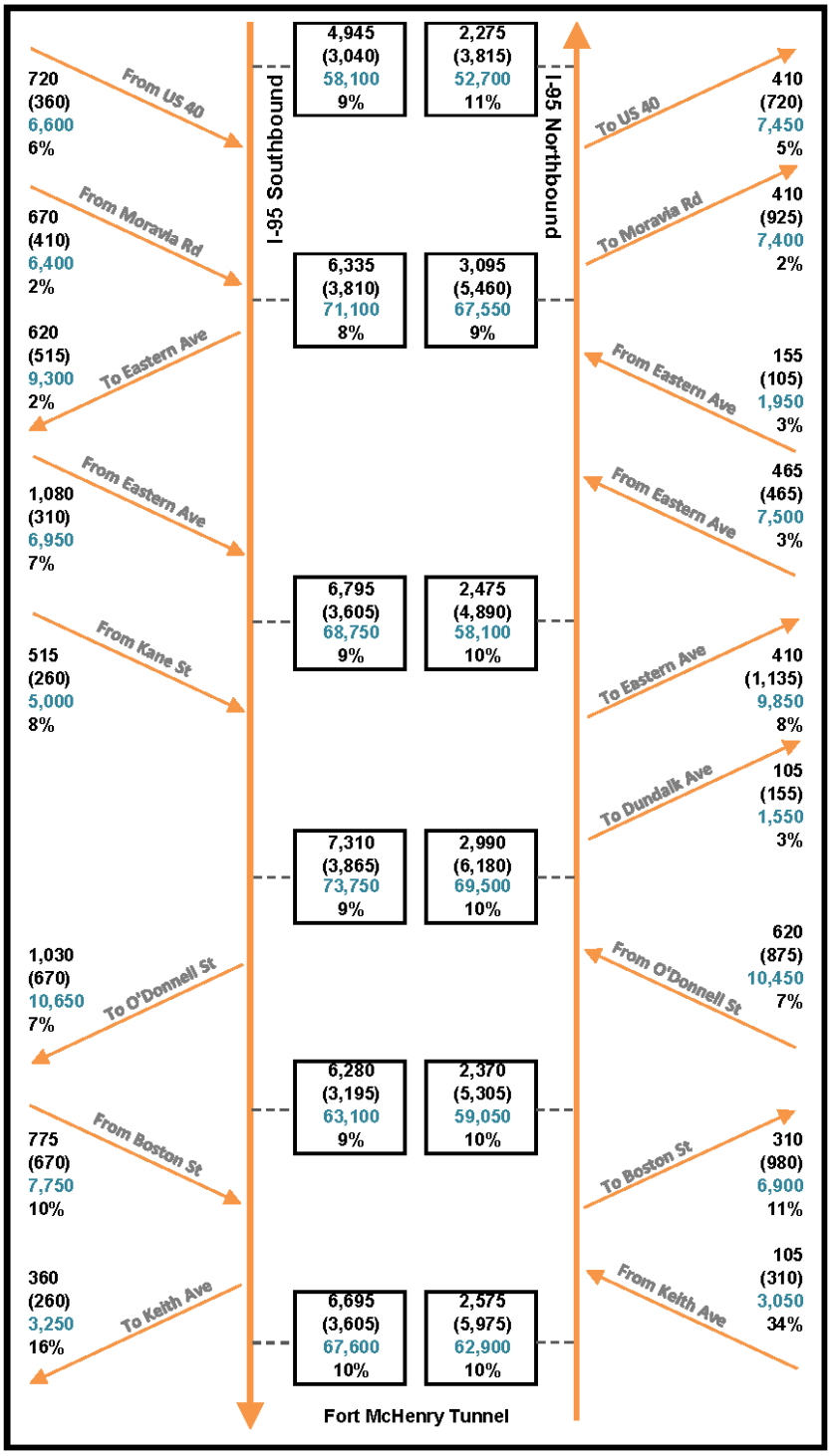
As mentioned in the introduction, the improvements along I-95 are anticipated to be completed by October 2018, prior to the initiation of the Canton Viaduct project. Several resources were consulted to develop traffic forecasts to represent the construction year / year of opening, including the 2015 FMT Toll Plaza Report provided by MDTA and the Maryland State Highway Administration (SHA) "station history" data obtained from SHA's website. The 2015 FMT Toll Plaza Report includes traffic data at the toll plaza for the period between 2006 and 2015, and the SHA data includes ADTs along I-95 for the period between 2008 and 2014. The data suggests that there has been minimal (or even negative) growth over the last 5 to 10 years along I-95 within the study area. However, to be conservative, a 0.5% growth rate per year was applied to project the existing 2015 volumes to the construction year of 2018. **Figure 6** shows the resulting 2018 volume network, including AM and PM peak hour volumes, ADT, and truck percentages for the study corridor.

#### *II. Traffic Operations*

HCS was used to determine the Level of Service (LOS) for all freeway sections as well as all ramp merge, diverge, and weave sections along I-95 for the 2018 No-Build Conditions based on the existing geometry shown in Figure 3 and the volumes shown in Figure 6. The HCS analysis results for 2018 No-Build are summarized in **Table 2**.

The HCS analysis results indicate that 2018 No-Build conditions would be expected to be similar to the existing conditions. However, the 3-lane freeway segment south of O'Donnell Street is projected to operate at LOS F (fail) during the AM peak hour in 2018 under No-Build conditions.

**Figure 6. Projected Year 2018 Traffic Volumes and Truck Percentages**




**Legend**

| | |
|---|---|
| X,XXX | AM Peak Hour Volume |
| (X,XXX) | PM Peak Hour Volume |
| XX,XXX | ADT |
| XX% | Truck Percentage |

**Table 2. 2018 No-Build Conditions - HCS Analyses Results**

| Dir. | No. | Highway Segment | Analysis Type | LOS (Density) | |
|---|---|---|---|---|---|
| | | | | AM | PM |
| I-95 Northbound | 1 | North of FMT | Freeway | B (12.0) | D (27.9) |
| | 2 | Ramp from Keith Ave | Merge | B (10.1) | C (23.8) |
| | 3 | Between Keith Ave and Boston St | Weaving | B (13.6) | E (35.7) |
| | 4 | North of Boston St | Freeway | B (14.7) | D (34.4) |
| | 5 | Between O'Donnell St and Dundalk Ave | Weaving | B (12.1) | C (27.1) |
| | 6 | Ramp to Eastern Ave | Major Diverge | B (10.1) | C (21.1) |
| | 7 | Between Eastern Ave Ramps | Freeway | B (11.5) | C (22.8) |
| | 8 | Loop-Ramp from Eastern Ave | Merge | B (12.1) | C (20.5) |
| | 9 | Ramp from Eastern Ave | Merge | A (10.0) | B (18.3) |
| | 10 | Between Eastern Ave and Moravia Rd | Weaving | B (15.6) | D (28.9) |
| | 11 | North of Moravia Rd | Freeway | B (16.7) | D (28.2) |
| | 12 | Ramp to US 40 | Diverge | B (16.4) | C (26.7) |
| I-95 Southbound | 13 | Ramp from US 40 | Merge | C (21.5) | B (12.0) |
| | 14 | South of US 40 | Freeway | D (26.2) | B (15.8) |
| | 15 | Between Moravia Rd and Eastern Ave | Weaving | D (30.8) | B (16.7) |
| | 16 | North of Eastern Ave | Freeway | D (26.4) | B (15.2) |
| | 17 | Ramp from Eastern Ave | Merge | D (28.7) | B (14.1) |
| | 18 | South of Eastern Ave | Freeway | D (32.3) | B (16.7) |
| | 19 | Ramp from Kane St | Merge | C (27.9) | B (14.8) |
| | 20 | Between Kane St and O'Donnell St | Weaving | E (42.7) | C (20.2) |
| | 21 | South of O'Donnell St | Freeway | F (46.2) | C (19.7) |
| | 22 | North of Boston St On-Ramp | Freeway (Lane Add) | D (29.3) | B (14.8) |
| | 23 | Between Boston St and Keith Ave | Weaving | E (35.9) | B (17.7) |
| | 24 | Between Keith Ave and FMT | Freeway | D (31.9) | B (16.8) |

## 2040 No-Build Conditions

### *I. Traffic Volumes*

Outputs from two regional travel demand forecasting models - the Baltimore Metropolitan Council (BMC) model and the Maryland Statewide Transportation Model (MSTM) - were used to estimate the projected traffic volumes along I-95 within the study area in the future year of 2040 for use in long-term analyses. Both models use the latest approved land use projections to forecast future travel demand and trip generation and to estimate traffic growth rates.

Link-based outputs from the BMC and the MSTM models were reviewed by the project team for all roadway segments along I-95 within the study area. The outputs include existing ADT, projected future ADT, and the corresponding growth rate. A review of the model outputs indicated that traffic is projected to grow along I-95 at a rate of approximately 1% per year for the links at the northern end of the study area. The models also indicate that the growth rate gradually decreases until it reaches approximately 0.5% per year for the links at the southern end of the study area, just north of the FMT.

Based on these findings, the project team developed a 2040 No-Build volume network by applying a growth rate of 1% per year to the existing volumes at the north end of the study area, applying a growth rate of 0.5% per year to the existing volumes at the south end of the study area, and balancing the volumes in between. **Figure 7** shows the resulting volume network for the 2040 No-Build conditions based on these projected growth rates. It includes AM and PM peak hour volumes, ADT, and truck percentages for the study corridor.

### *II. Traffic Operations*

HCS was used to determine the Level of Service (LOS) for all freeway sections as well as all ramp merge, diverge, and weave sections along I-95 for the 2040 No-Build conditions. The HCS analysis results are summarized in **Table 3**.

As a result of 25 years of traffic growth, several additional segments within the study area are projected to operate at LOS E or LOS F under 2040 No-Build conditions. The HCS analysis results indicate that the area of I-95 northbound between the entrance ramps from Keith Avenue and O'Donnell Street and between the entrance ramp from Eastern Avenue and north of Moravia Road both are projected to operate at LOS E during the PM peak hour. In the southbound direction, four segments are projected to operate at LOS F during the AM peak hour under 2040 No-Build conditions, including the area between the entrance ramp from Kane Street through the 3-lane segment prior to the Boston Street entrance ramp, as well as the weave between Boston Street and Keith Avenue.

**Figure 7. 2040 No-Build Traffic Volumes and Truck Percentages**

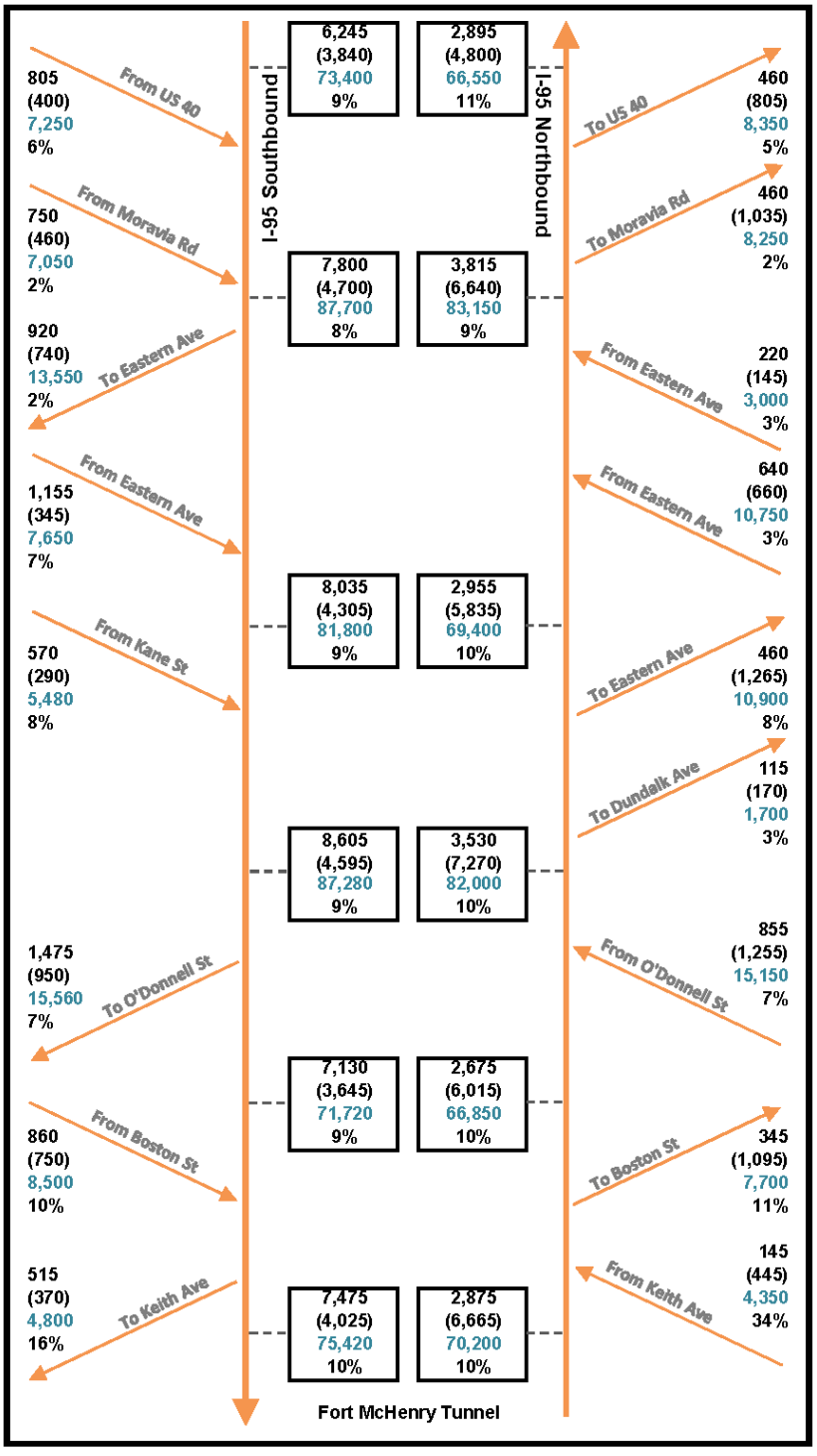


**Table 3. 2040 No-Build Conditions - HCS Analyses Results**

| Dir. | No. | Highway Segment | Analysis Type | LOS (Density) | |
|---|---|---|---|---|---|
| | | | | AM | PM |
| I-95 Northbound | 1 | North of FMT | Freeway | B (13.4) | D (31.7) |
| | 2 | Ramp from Keith Ave | Merge | B (11.5) | C (27.4) |
| | 3 | Between Keith Ave and Boston St | Weaving | B (15.5) | E (42.0) |
| | 4 | North of Boston St | Freeway | B (16.6) | E (42.6) |
| | 5 | Between O'Donnell St and Dundalk Ave | Weaving | B (14.5) | D (32.7) |
| | 6 | Ramp to Eastern Ave | Major Diverge | B (12.0) | C (24.9) |
| | 7 | Between Eastern Ave Ramps | Freeway | B (13.8) | D (27.2) |
| | 8 | Loop-Ramp from Eastern Ave | Merge | B (15.2) | C (25.3) |
| | 9 | Ramp from Eastern Ave | Merge | B (12.8) | C (22.3) |
| | 10 | Between Eastern Ave and Moravia Rd | Weaving | B (19.7) | E (36.3) |
| | 11 | North of Moravia Rd | Freeway | C (20.8) | E (37.5) |
| | 12 | Ramp to US 40 | Diverge | C (20.2) | D (31.6) |
| I-95 Southbound | 13 | Ramp from US 40 | Merge | C (26.7) | B (15.1) |
| | 14 | South of US 40 | Freeway | D (34.0) | C (19.6) |
| | 15 | Between Moravia Rd and Eastern Ave | Weaving | E (41.3) | C (21.7) |
| | 16 | North of Eastern Ave | Freeway | D (32.6) | C (18.3) |
| | 17 | Ramp from Eastern Ave | Merge | D (33.3) | B (16.7) |
| | 18 | South of Eastern Ave | Freeway | E (42.4) | C (19.9) |
| | 19 | Ramp from Kane St | Merge | F (32.6)[1] | B (17.4) |
| | 20 | Between Kane St and O'Donnell St | Weaving | F (N/A)[2] | C (24.4) |
| | 21 | South of O'Donnell St | Freeway | F (65.6) | C (22.5) |
| | 22 | North of Boston St On-Ramp | Freeway (Lane Add) | D (34.6) | B (16.9) |
| | 23 | Between Boston St and Keith Ave | Weaving | F (43.4) | C (21.0) |
| | 24 | Between Keith Ave and FMT | Freeway | E (37.5) | C (18.7) |

** Notes: 1. Merge fails because downstream freeway exceeds capacity, not due to density.*
*2. No density value is given in HCS. Weaving segment exceeds capacity.*

## PROPOSED BUILD CONDITIONS

### Original Proposed Concept

The Original Proposed concept was developed during project planning and is shown in **Figure 8A-8C**. The following improvements were recommended under the Original Proposed concept:

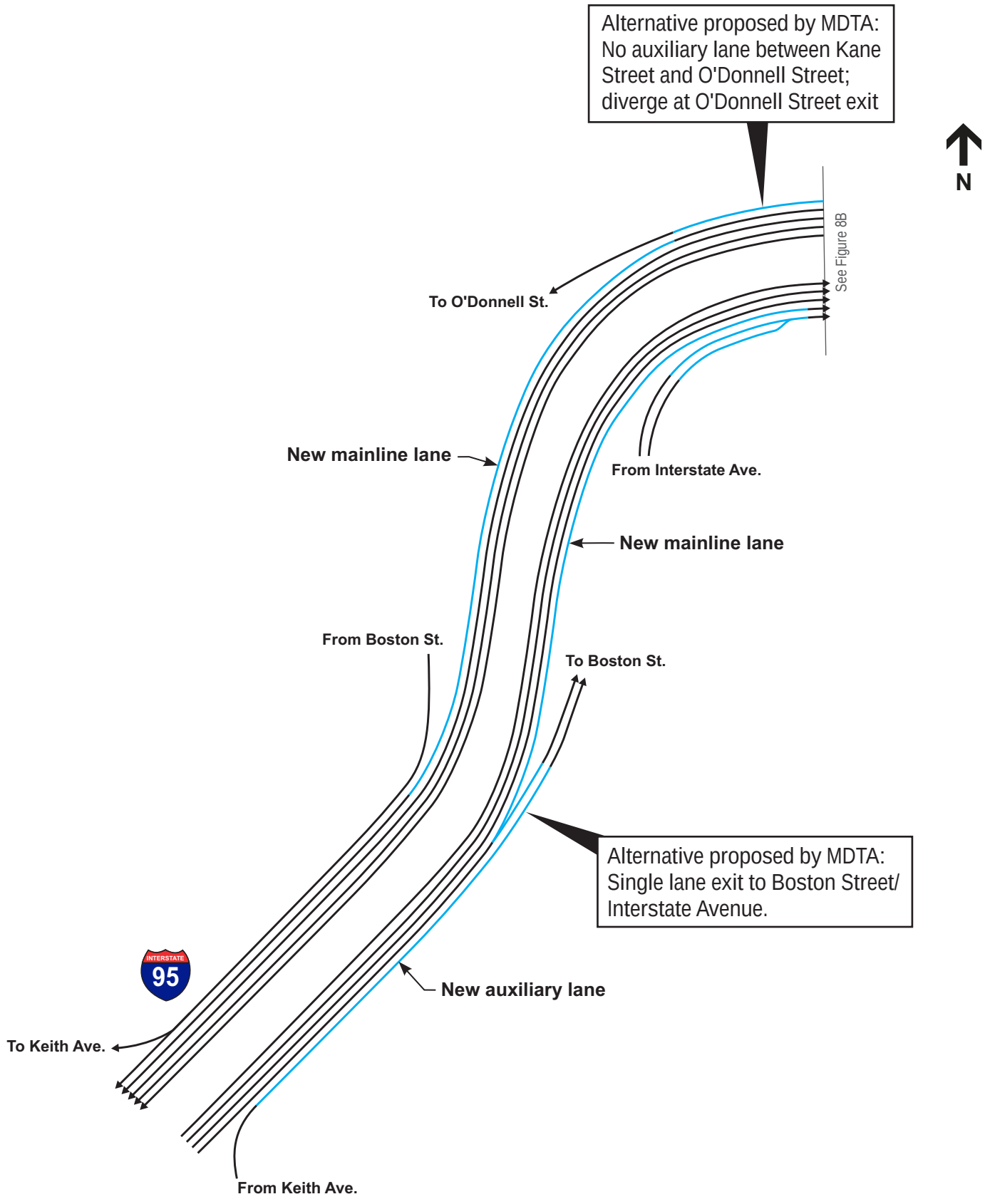
- A full auxiliary lane is introduced on I-95 northbound, between the entrance ramp from Keith Avenue and the exit ramp to Boston Street, creating a 5-lane weave between the two ramps. A new mainline lane is then added to the 3-lane segment north of the Boston Street ramp, which results in four (4) northbound lanes between Boston Street and the O'Donnell Street ramps. The proposed improvements require dropping one of the two lanes on the entrance ramp from Interstate Avenue before it merges onto the I-95 mainline.
- A full auxiliary lane is introduced on I-95 northbound, between the entrance ramp from Eastern Avenue and the exit ramp to Moravia Road, creating a 5-lane weave between the two ramps. A new lane is then added to the 3-lane segment north of the Moravia Road ramp, which results in four (4) northbound lanes through the US 40 interchange and all the way to the I-95 ETLs, where the left lane would be dropped.
- A full auxiliary lane is introduced on I-95 southbound, between the entrance ramp from Kane Street and the exit ramp to O'Donnell Street, creating a 5-lane weave between the two ramps. A new mainline lane is then added to the 3-lane segment between the O'Donnell Street ramp and entrance ramp from Boston Street, which results in four (4) continuous southbound lanes between the I-95 ETLs and the FMT.

### Alternatives Proposed By MDTA

At the beginning of the design phase of the project, three different alternative lane configurations were proposed by MDTA for evaluation by RK&K. These alternatives are noted on **Figure 8A-8C** and are discussed in detail below:

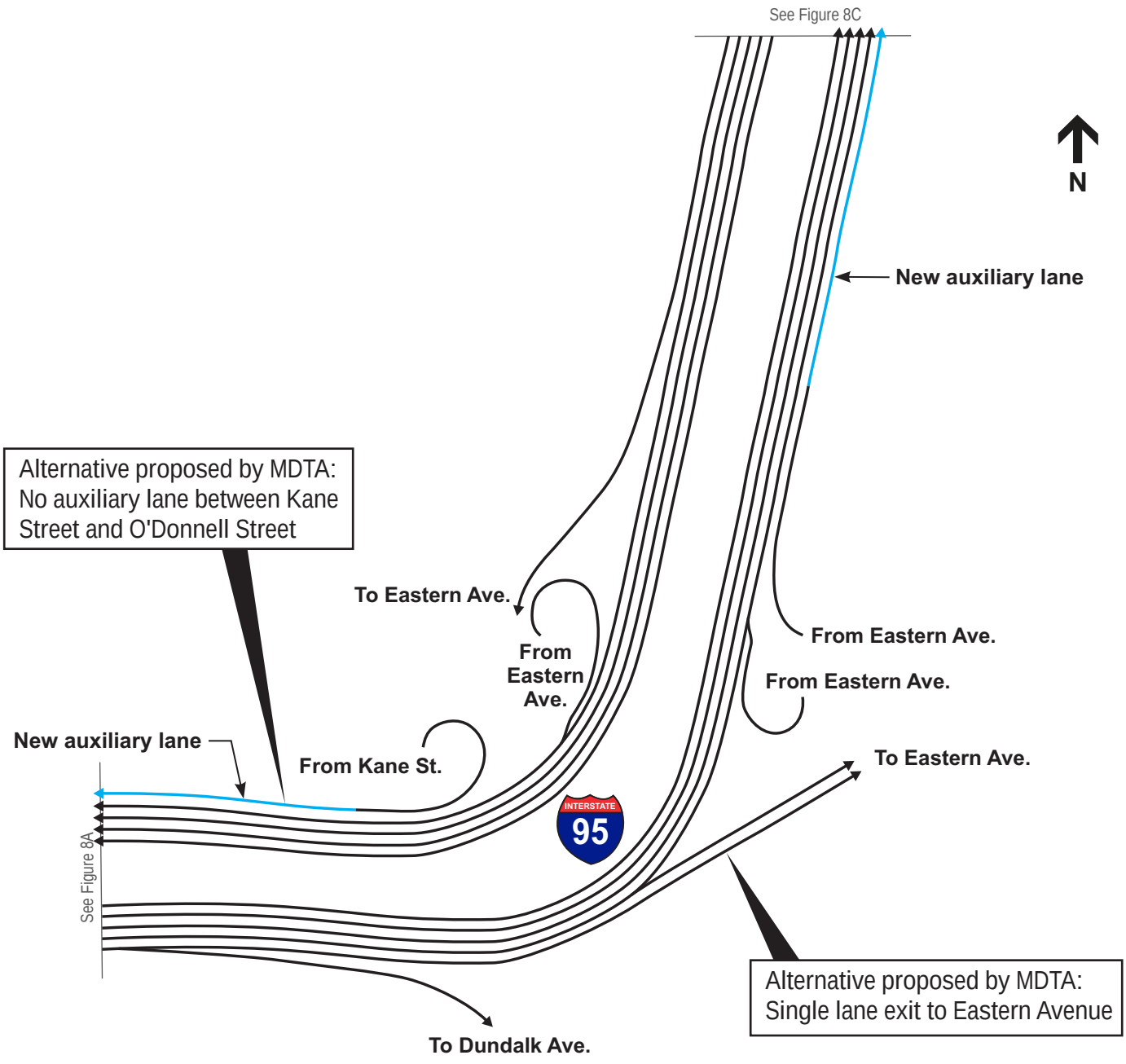
1. The first MDTA Alternative studied by RK&K proposed to maintain the existing 4-lane segment on I-95 southbound between Kane Street and O'Donnell Street ramps, as well as the existing merge for the entrance ramp from Kane Street. However, the existing lane drop at the exit ramp to O'Donnell Street would be replaced with a new 900-foot deceleration lane, allowing four through lanes to continue southbound to Boston Street.

RK&K performed HCS analysis of the Original Proposed concept and the proposed MDTA Alternative to compare the projected operations in the year of opening (2018). The results are shown in **Table 4**. The HCS analysis results indicate that both alternatives significantly improve the operations south of the exit ramp to O'Donnell Street compared to existing conditions (i.e., from LOS F to LOS D during the PM peak hour), and both alternatives operate similarly to the No-Build condition between Kane Street and O'Donnell Street. However, the alternative configuration results in fewer structural impacts and yields lower construction costs. Additionally, a review of historical crash data in the study area revealed no safety issues at the existing merge condition from Kane Street. **Therefore, the alternative configuration is recommended as the proposed configuration in this segment.**




Not to Scale

| | |
|---|---|
| MDTA | FT-3003<br>I-95 from Moravia Road to FMT |
| | I-95 Lane Diagram<br>Area A - Original Proposed |
| | January 2016 \| Figure 8A |



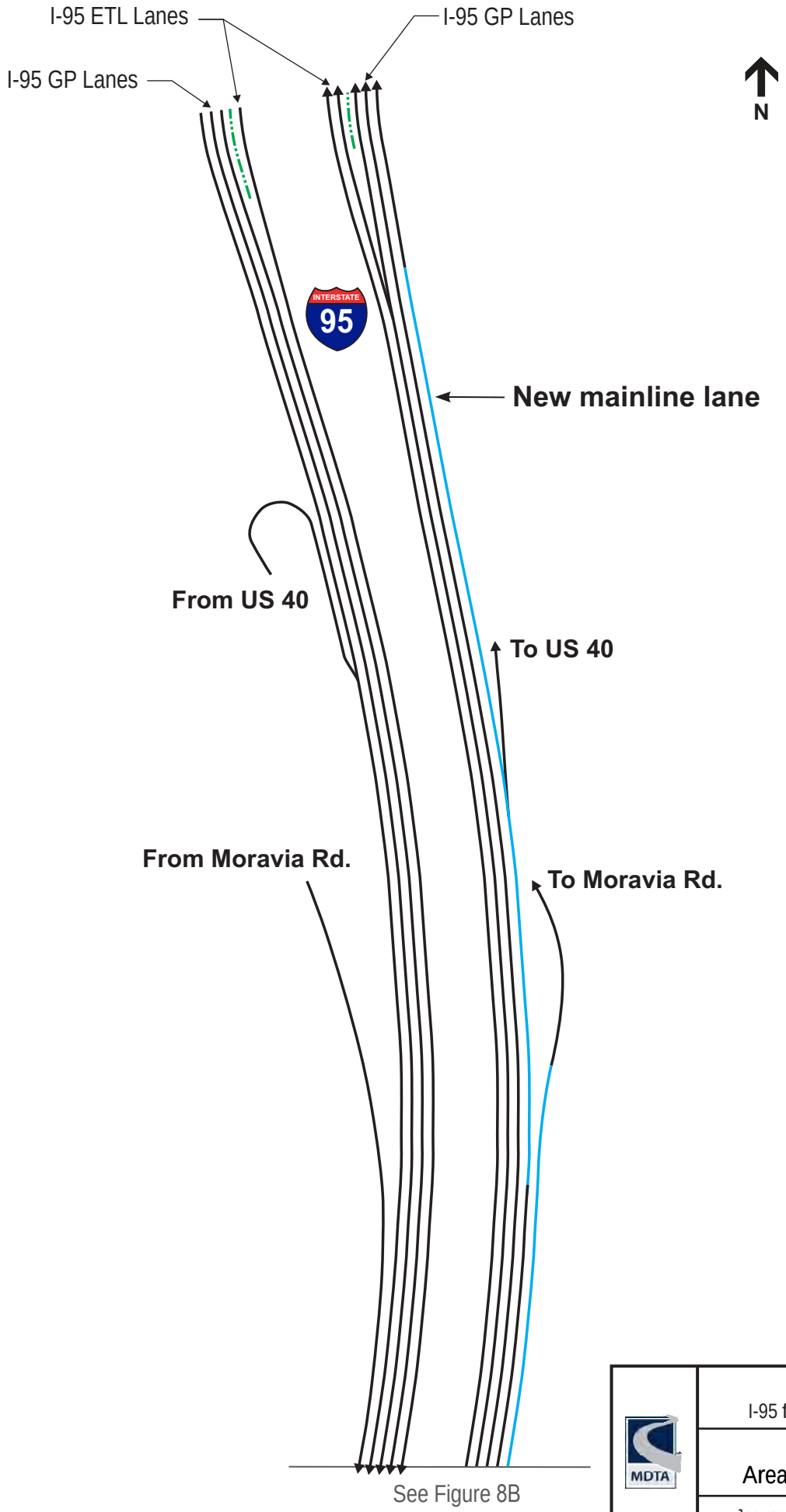

Not to Scale

MDTA

FT-3003
I-95 from Moravia Road to FMT

I-95 Lane Diagram
Area B - Original Proposed

January 2016 | Figure 8B




Not to Scale

MDTA

FT-3003
I-95 from Moravia Road to FMT

I-95 Lane Diagram
Area C - Original Proposed

January 2016

Figure 8C

**Table 4. Alternative 1 - HCS Analysis Results (I-95 SB from Kane Street to O'Donnell Street)**

| I-95 Southbound | 2018 No-Build | | | 2018 Original Proposed | | | 2018 MDTA Alternative | | |
|---|---|---|---|---|---|---|---|---|---|
| | Analysis Type | LOS (Density) | | Analysis Type | LOS (Density) | | Analysis Type | LOS (Density) | |
| | | AM | PM | | AM | PM | | AM | PM |
| **Ramp from Kane St** | Merge | C (27.9) | B (14.8) | - | - | - | Merge | C (27.9) | B (14.8) |
| **Between Kane St and O'Donnell St** | Weaving | E (42.7) | C (20.2) | Weaving | E (39.6) | B (17.6) | Freeway | E (35.9) | B (17.9) |
| **Ramp to O'Donnell St** | - | - | - | - | - | - | Diverge | D (32.1) | B (15.8) |
| **South of O'Donnell St** | Freeway | F (46.2) | C (19.7) | Freeway | D (29.3) | B (14.8) | Freeway | D (29.3) | B (14.8) |

2. The second MDTA Alternative studied proposes to reconfigure the exit ramp from I-95 northbound to Boston Street by changing the existing two-lane ramp into a single-lane ramp. This alternative would eliminate the existing "choice" lane, and instead provide four (4) exclusive northbound through lanes.

To evaluate this alternative, RK&K examined the ramp capacity and also performed HCS analysis of the weave between Keith Avenue and Boston Street. According to the HCM 2010, the capacity for a single-lane ramp is approximately 2,000 passenger cars per hour, which is well above the projected traffic demand on the ramp to Boston Street (a maximum of approximately 980 vehicles per hour during the 2018 PM peak hour, as shown in Figure 6, which equates to about 1,100 passenger cars per hour).

**Table 5** summarizes the 2018 HCS analysis results under the existing lane configuration, as well as the Original Build concept and the MDTA Alternative for I-95 northbound between Keith Avenue and Boston Street. The HCS analysis results indicate that both the Original Build concept and the Alternative Build option improve the operations between the Keith Avenue and Boston Street ramps compared to the No-Build conditions, and both result in operations of LOS D or better in 2018. The alternative configuration results in several geometric benefits, including directing traffic away from the impact attenuator in the gore area, and it also simplifies the signing. **Therefore, the alternative configuration is recommended as the proposed configuration in this segment.**

**Table 5. Alternative 2 - HCS Analysis Results (I-95 NB from Keith Avenue to Boston Street)**

| I-95 Northbound | 2018 No-Build | | | 2018 Original Proposed | | | 2018 MDTA Alternative | | |
|---|---|---|---|---|---|---|---|---|---|
| | Analysis Type | LOS (Density) | | Analysis Type | LOS (Density) | | Analysis Type | LOS (Density) | |
| | | AM | PM | | AM | PM | | AM | PM |
| **Ramp from Keith Ave** | Merge | B (10.1) | C (23.8) | - | - | - | - | - | - |
| **Between Keith Ave and Boston St** | Weaving | B (13.6) | E (35.7) | Weaving | B (10.7) | C (27.9) | Weaving | B (11.2) | D (32.0) |
| **North of Boston St** | Freeway | B (14.7) | D (34.4) | Freeway | B (11.0) | C (24.7) | Freeway | B (11.0) | C (24.7) |

3. The third MDTA Alternative studied proposes to reconfigure the exit ramp from I-95 northbound to Eastern Avenue by changing the existing two-lane ramp into a single-lane ramp. This alternative would eliminate the existing "choice" lane, and instead provide four (4) exclusive northbound through lanes.

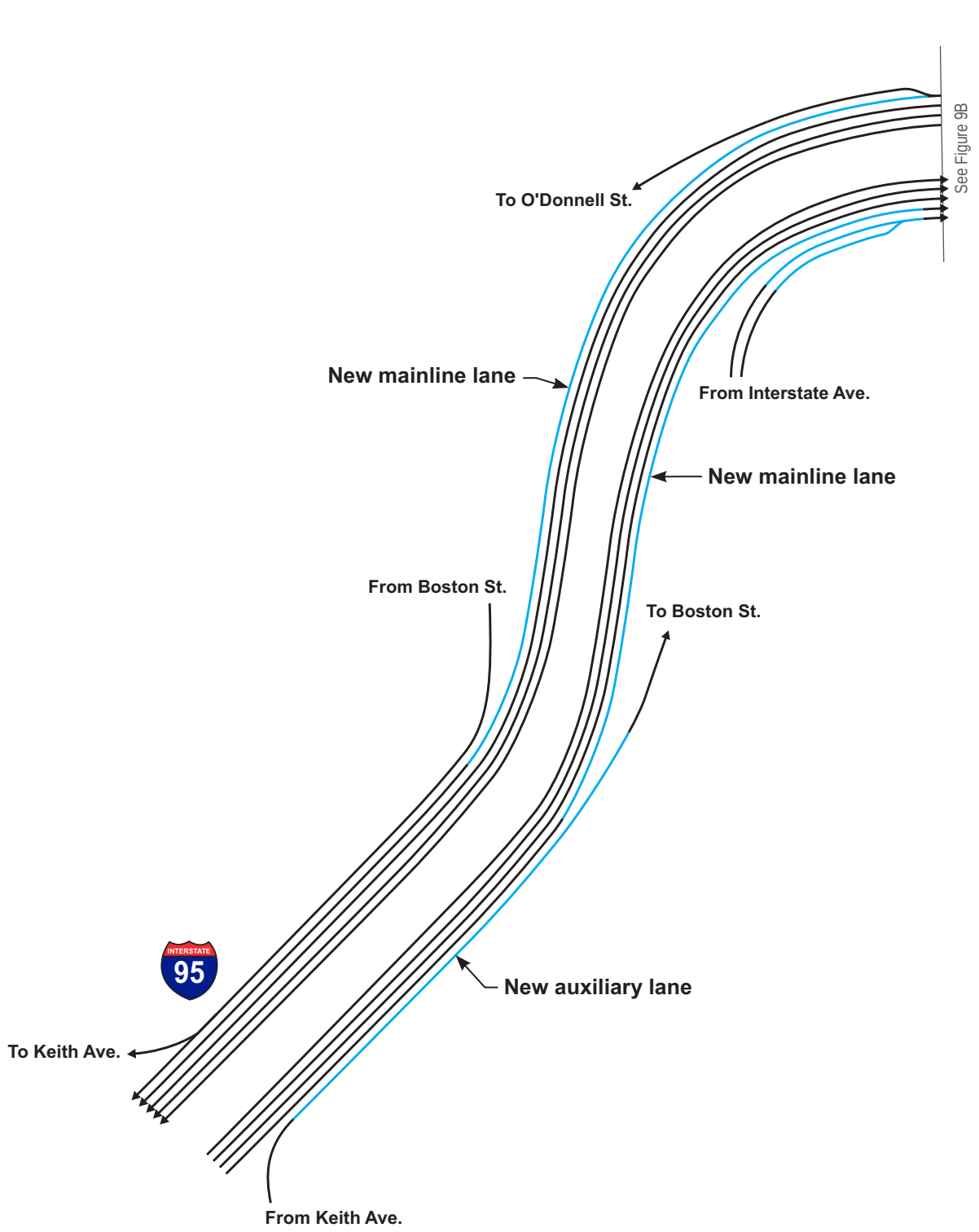
Similar to the previous alternative, RK&K evaluated this alternative by examining the ramp capacity and performing HCS analyses. The traffic volume along the ramp (a maximum of 1,135 vehicles per hour during the 2018 PM peak hour, as shown in Figure 6, which equates to about 1,250 passenger cars per hour) is well below the capacity for a single-lane ramp suggested by the HCM 2010 (approximately 2,000 passenger cars per hour). Therefore, ramp capacity would not be an issue with the proposed alternative. Additionally, the HCS analysis results indicate that the operations at the exit ramp to Eastern Avenue would remain virtually unchanged (i.e., LOS B during the AM peak hour and LOS C during the PM peak hour) between No-Build conditions, the Original Proposed concept, and the MDTA Alternative. However, since the Eastern Avenue ramp is outside of the proposed limit of work**, the project team recommends retaining the existing conditions at this location.** This recommendation was reviewed with MDTA during project meetings, and MDTA ultimately concurred with the recommendation of the project team.

### 2018 Build Conditions

Based on the results from the alternatives analyses presented in the previous section, the project team updated the design to reflect the Final Proposed conditions shown in **Figure 9A-9C**. The geometry shown in Figure 9A-9C will be referred to as the "Build" condition for the remainder of this report.

#### *I. Traffic Volumes*

For evaluating 2018 Build conditions, it was assumed that traffic demand would be unchanged from the volumes developed for 2018 No-Build conditions (shown in Figure 6) for several reasons. First, any potential induced demand would likely be a gradual trend that developed over time, and second, no near-term forecast modeling was performed during the planning stage of the project to justify the inclusion of induced demand in the 2018.




Not to Scale

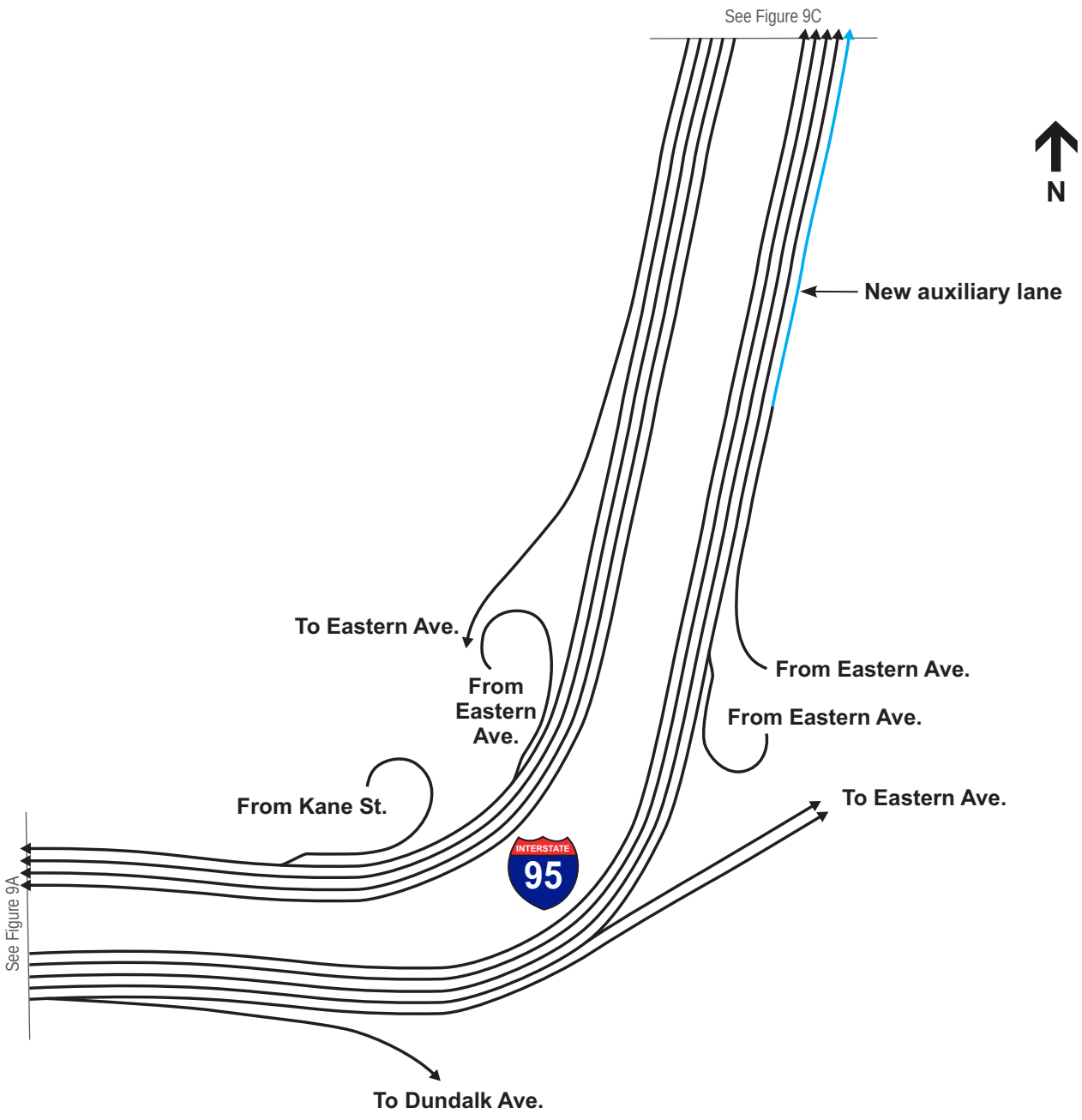
MDTA

FT-3003
I-95 from Moravia Road to FMT

I-95 Lane Diagram
Area A - Final Proposed

January 2016

Figure 9A



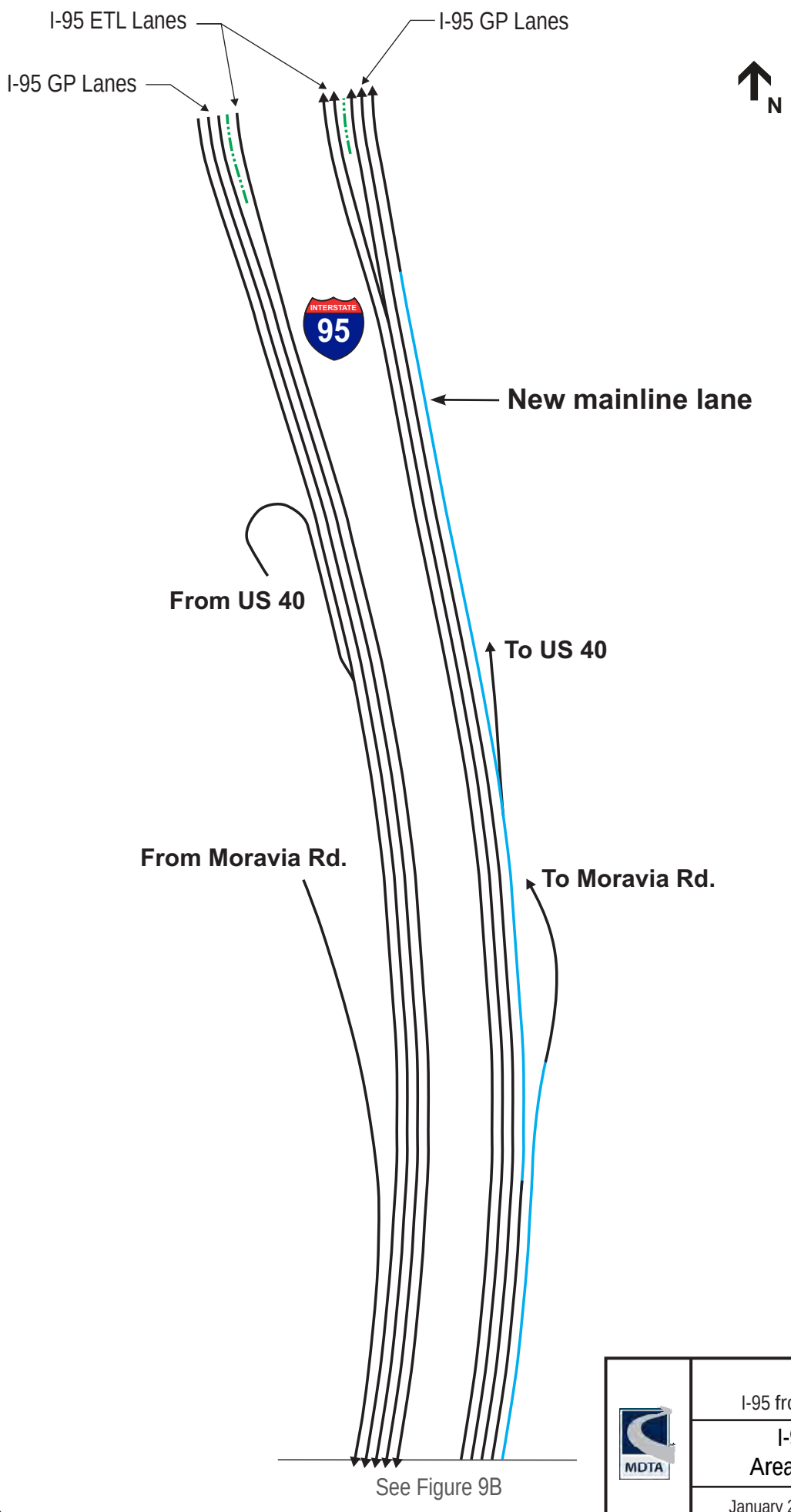

Not to Scale

MDTA

FT-3003
I-95 from Moravia Road to FMT

I-95 Lane Diagram
Area B - Final Proposed

January 2016 | Figure 9B




Not to Scale

MDTA

FT-3003
I-95 from Moravia Road to FMT

I-95 Lane Diagram
Area C - Final Proposed

January 2016

Figure 9C

### *II. Traffic Operations*

HCS was used to determine the Level of Service for all freeway sections as well as all ramp merge, diverge and weave sections along I-95 for the 2018 Build conditions based on the geometry shown in Figure 9A-9C and the volumes shown in Figure 6. The results are summarized in **Table 6**.

The HCS analysis results indicate that all segments of I-95 northbound are projected to operate at LOS D or better during all peak hours under 2018 Build conditions. In the southbound direction, the HCS analysis results indicate that most segments are projected to operate at LOS D or better during the peak hours, including the freeway segment south of O'Donnell Street, which is projected to fail under No-Build conditions in 2018. It should be noted that two segments, including the freeway segment south of Kane Street and the weave between Boston Street and Keith Avenue, would be projected to operate at LOS E during the AM peak hour in 2018.

**Table 6. 2018 Build Conditions - HCS Analyses Results**

| Dir. | No. | Highway Segment | Analysis Type | LOS (Density) | |
|---|---|---|---|---|---|
| | | | | AM | PM |
| I-95 Northbound | 1 | North of FMT | Freeway | B (12.0) | D (27.9) |
| | 2 | Between Keith Ave and Boston St | Weaving | B (11.2) | D (32.0) |
| | 3 | North of Boston St | Freeway | B (11.0) | C (24.7) |
| | 4 | Between O'Donnell St and Dundalk Ave | Weaving | B (11.9) | C (26.5) |
| | 5 | Ramp to Eastern Ave | Major Diverge | B (10.1) | C (21.1) |
| | 6 | Between Eastern Ave Ramps | Freeway | B (11.5) | C (22.8) |
| | 7 | Loop-Ramp from Eastern Ave | Merge | B (12.1) | C (20.5) |
| | 8 | Between Eastern Ave and Moravia Rd | Weaving | B (13.0) | C (25.6) |
| | 9 | North of Moravia Rd | Freeway | B (12.5) | C (21.1) |
| | 10 | Ramp to US 40 | Diverge | B (11.4) | C (20.8) |
| I-95 Southbound | 11 | Ramp from US 40 | Merge | C (21.5) | B (12.0) |
| | 12 | South of US 40 | Freeway | D (26.2) | B (15.8) |
| | 13 | Between Moravia Rd and Eastern Ave | Weaving | D (30.8) | B (16.7) |
| | 14 | North of Eastern Ave | Freeway | D (26.4) | B (15.2) |
| | 15 | Ramp from Eastern Ave | Merge | D (28.7) | B (14.1) |
| | 16 | South of Eastern Ave | Freeway | D (32.3) | B (16.7) |
| | 17 | Ramp from Kane St | Merge | C (27.9) | B (14.8) |
| | 18 | South of Kane St | Freeway | E (35.9) | B (17.9) |
| | 19 | Ramp to O'Donnell St | Diverge | D (32.1) | B (15.8) |
| | 20 | Between O'Donnell St and Boston St | Freeway | D (29.3) | B (14.8) |
| | 21 | Between Boston St and Keith Ave | Weaving | E (35.9) | B (17.7) |
| | 22 | Between Keith Ave and FMT | Freeway | D (31.9) | B (16.8) |

### Capacity Sensitivity Analysis

As mentioned earlier in this report, one of the goals of the I-95 widening is to accommodate potential diverted traffic from I-895 during construction of the Canton Viaduct project, which is expected to start in late 2018. To test the amount of "spare" capacity that would be available on I-95, the project team performed a sensitivity analysis using HCS on the Final Proposed conditions to determine the additional traffic volume that each segment could carry in the opening year of 2018 before failing (i.e., reaching LOS F). **Table 7** summarizes the findings from the capacity sensitivity analysis. It should be noted that the sensitivity analysis was only performed for the peak direction of traffic (i.e., southbound during the AM peak hour and northbound during the PM peak hour), and the "trial and error" process was terminated if LOS F was not reached after increasing the volume on a given segment by 30 percent.

The results indicate that all segments would be projected to accommodate an increase in peak hour traffic demand of at least 14 percent, with many segments having more than 30 percent spare capacity. The "chokepoints" (first segments to fail) would be between Kane Street and O'Donnell Street in the southbound direction during the AM peak, and between Keith Avenue and Boston Street in the northbound direction during the PM peak.

**Table 7. 2018 Build Conditions - Capacity Sensitivity Analysis**

| Dir. | Highway Segment | Analysis Type | % Increase for LOS F | |
|---|---|---|---|---|
| | | | AM | PM |
| I-95 Northbound | North of FMT | Freeway | - | > 30% |
| | Between Keith Ave and Boston St | Weaving | - | 24% |
| | North of Boston St | Freeway | - | > 30% |
| | Between O'Donnell St and Dundalk Ave | Weaving | - | > 30% |
| | Ramp to Eastern Ave | Major Diverge | - | > 30% |
| | Between Eastern Ave Ramps | Freeway | - | > 30% |
| | Loop-Ramp from Eastern Ave | Merge | - | > 30% |
| | Between Eastern Ave and Moravia Rd | Weaving | - | > 30% |
| | North of Moravia Rd | Freeway | - | > 30% |
| | Ramp to US 40 | Diverge | - | > 30% |
| I-95 Southbound | Ramp from US 40 | Merge | > 30% | - |
| | South of US 40 | Freeway | > 30% | - |
| | Between Moravia Rd and Eastern Ave | Weaving | 28% | - |
| | North of Eastern Ave | Freeway | > 30% | - |
| | Ramp from Eastern Ave | Merge | 22% | - |
| | South of Eastern Ave | Freeway | 22% | - |
| | Ramp from Kane St | Merge | 14% | - |
| | South of Kane St | Freeway | 14% | - |
| | Ramp to O'Donnell St | Diverge | 14% | - |
| | Between O'Donnell St and Boston St | Freeway | > 30% | - |
| | Between Boston St and Keith Ave | Weaving | 16% | - |
| | Between Keith Ave and FMT | Freeway | 23% | - |

## 2040 Build Conditions

To evaluate the long-term impacts of the proposed improvements, operations were evaluated under 2040 Build conditions.

### *I. Traffic Volumes*

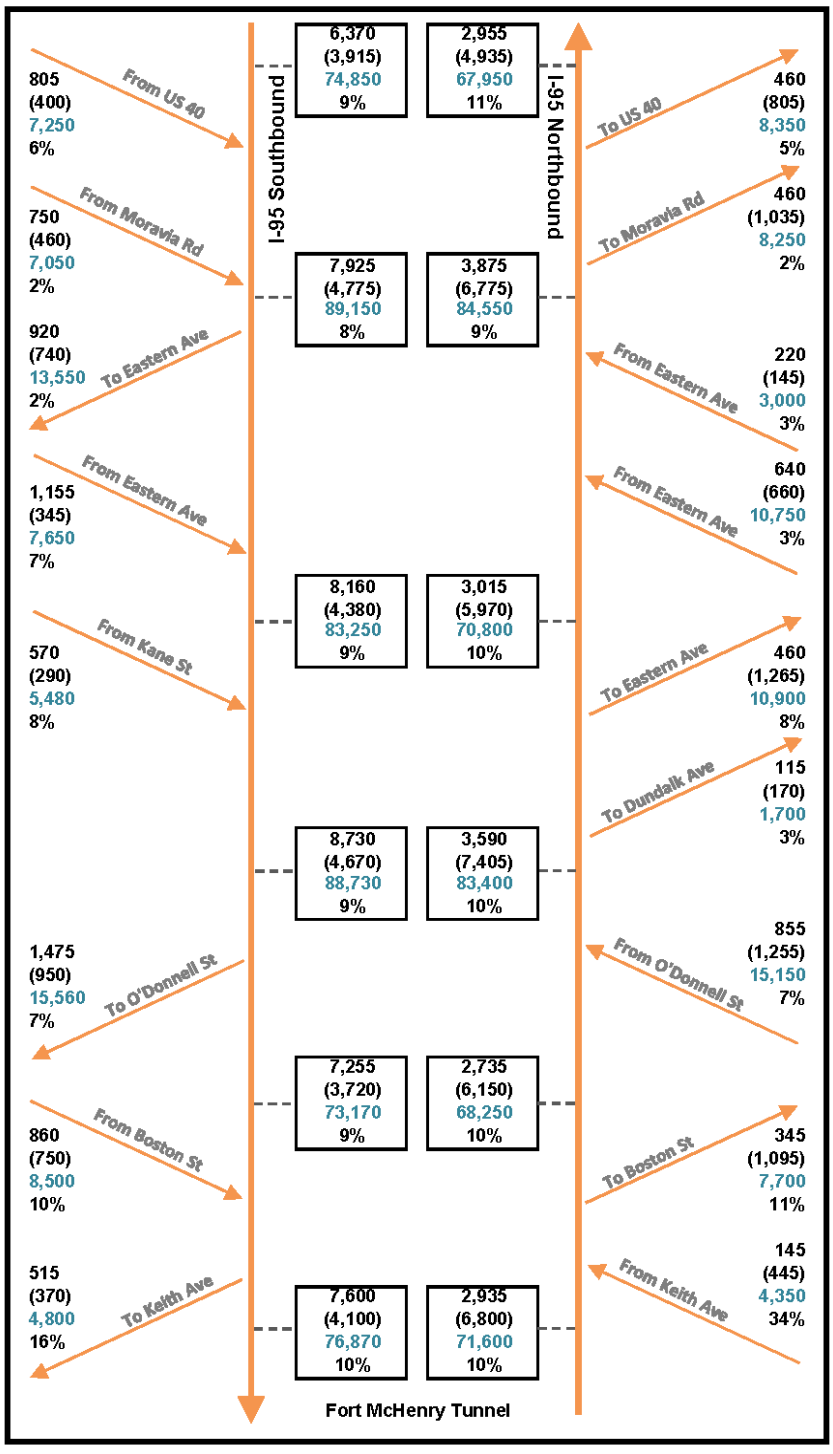
Based on modeling performed during the planning stage of the project, it is anticipated that the capacity improvements along I-95 would be projected to attract slightly more through traffic onto I-95 over the long-term (approximately 2% additional traffic compared to the No-Build). It should be noted that this shift in traffic would be expected even though some segments of I-95 are projected to fail (operate at LOS F) in the year 2040. This is because the improved I-95 corridor would still be more desirable relative to I-895 in the long-term for some travelers. This trend would primarily affect through trips, rather than local trips. Therefore, through volumes were raised by two percent (2%) in the 2040 Build forecasts compared to the 2040 No-Build volumes to account for the induced demand, while ramp volumes were unchanged. **Figure 10** shows the resulting volume network for 2040 Build conditions.

### *II. Traffic Operations*

HCS was used to determine the Level of Service for all freeway sections as well as all ramp merge, diverge, and weave sections along I-95 for the 2040 Build conditions based on the geometry shown in Figure 9A-9C and the volumes shown in Figure 10. The results are summarized in **Table 8**.

The HCS analysis results indicate that all segments of I-95 northbound are projected to operate at LOS D or better during the peak hours, except for the weave between Keith Avenue Boston Street, which is projected to operate at LOS E during the PM peak hour. In the southbound direction, the results indicate that all segments of I-95 are projected to operate at LOS C or better during the PM peak hour. During the AM peak hour, most of the segments are projected to operate at LOS D or LOS E. However, the freeway segments between Kane Street and O'Donnell Street, as well as the weave between Boston Street and Keith Avenue are projected to operate at LOS F during the AM peak hour. As noted in the introduction, this project is a relatively low-cost, short-term improvement that was not designed to accommodate long-term traffic demand. These results are being provided for informational purposes.

**Figure 10. 2040 Build Traffic Volumes and Truck Percentages**




**Legend**

| | |
|---|---|
| X,XXX | AM Peak Hour Volume |
| (X,XXX) | PM Peak Hour Volume |
| XX,XXX | ADT |
| XX% | Truck Percentage |

**Table 8. 2040 Build Conditions - HCS Analyses Results**

| Dir. | No. | Highway Segment | Analysis Type | LOS (Density) | |
|---|---|---|---|---|---|
| | | | | AM | PM |
| I-95 Northbound | 1 | North of FMT | Freeway | B (13.7) | D (32.5) |
| | 2 | Between Keith Ave and Boston St | Weaving | B (13.1) | E (39.4) |
| | 3 | North of Boston St | Freeway | B (12.7) | D (28.7) |
| | 4 | Between O'Donnell St and Dundalk Ave | Weaving | B (14.5) | D (32.6) |
| | 5 | Ramp to Eastern Ave | Major Diverge | B (12.2) | C (25.3) |
| | 6 | Between Eastern Ave Ramps | Freeway | B (14.0) | D (27.8) |
| | 7 | Loop-Ramp from Eastern Ave | Merge | B (15.4) | C (25.8) |
| | 8 | Between Eastern Ave and Moravia Rd | Weaving | B (16.7) | D (33.4) |
| | 9 | North of Moravia Rd | Freeway | B (15.9) | D (26.7) |
| | 10 | Ramp to US 40 | Diverge | B (14.7) | C (26.3) |
| I-95 Southbound | 11 | Ramp from US 40 | Merge | C (27.1) | B (15.4) |
| | 12 | South of US 40 | Freeway | D (34.9) | C (20.0) |
| | 13 | Between Moravia Rd and Eastern Ave | Weaving | E (42.1) | C (22.1) |
| | 14 | North of Eastern Ave | Freeway | D (33.5) | C (18.6) |
| | 15 | Ramp from Eastern Ave | Merge | D (33.8) | B (16.9) |
| | 16 | South of Eastern Ave | Freeway | E (43.7) | C (20.3) |
| | 17 | Ramp from Kane St | Merge | F (33.4) | B (17.7) |
| | 18 | South of Kane St | Freeway | F (51.0) | C (21.6) |
| | 19 | Ramp to O'Donnell St | Diverge | F (40.4) | C (20.7) |
| | 20 | Between O'Donnell St and Boston St | Freeway | E (35.5) | B (17.2) |
| | 21 | Between Boston St and Keith Ave | Weaving | F (44.2) | C (21.4) |
| | 22 | Between Keith Ave and FMT | Freeway | E (38.5) | C (19.1) |

**Table 9** provides a direct comparison of the 2040 for Build versus No-Build within the three segments where capacity improvements are proposed. When comparing the operational analysis results for the 2040 No-Build and the 2040 Build conditions, it is important to note that the traffic volumes are assumed to be 2% higher for the 2040 Build conditions to account for the demand that is induced by capacity improvements even along segments with no geometric changes. Therefore, some segments may appear to operate "worse" under the Build conditions. However, the comparison of the No-Build and the Build HCS results reveals that the proposed *modified* lane configurations are projected to operate better than the existing lane configurations in the year 2040, despite the fact that demand is higher.

**Table 9. 2040 No-Build vs 2040 Build - HCS Analysis Results**

| Location | Highway Segment | 2040 No-Build | | | 2040 Build | | |
|---|---|---|---|---|---|---|---|
| | | Analysis Type | LOS (Density) | | Analysis Type | LOS (Density) | |
| | | | AM | PM | | AM | PM |
| **I-95 Southbound From Kane St to O'Donnell St** | Ramp from Kane St | Merge | F (32.6) | B (17.4) | Merge | F (33.4) | B (17.7) |
| | Between Kane St and O'Donnell St | Weaving | F (N/A)[1] | C (24.4) | Freeway | F (51.0) | C (21.6) |
| | Ramp to O'Donnell St | - | - | - | Diverge | F (40.4) | C (20.7) |
| | South of O'Donnell St | Freeway | F (65.6) | C (22.5) | Freeway | E (35.5) | B (17.2) |
| **I-95 Northbound from Keith Ave to Boston St** | Ramp from Keith Ave | Merge | B (11.5) | C (27.4) | - | - | - |
| | Between Keith Ave and Boston St | Weaving | B (15.5) | E (42.0) | Weaving | B (13.1) | E (39.4) |
| | North of Boston St | Freeway | B (16.6) | E (42.6) | Freeway | B (12.7) | D (28.7) |
| **I-95 Northbound from Eastern Ave to US 40** | Between Eastern Ave and Moravia Rd | Weaving | B (19.7) | E (36.3) | Weaving | B (16.7) | D (33.4) |
| | North of Moravia Rd | Freeway | C (20.8) | E (37.5) | Freeway | B (15.9) | D (26.7) |
| | Ramp to US 40 | Diverge | C (20.2) | D (31.6) | Diverge | B (14.7) | C (26.3) |

** Note: 1. No density value is given in HCS. Weaving segment exceeds capacity.*

## SUPPLEMENTAL TRAFFIC DATA

In addition to the traffic operational analysis presented in this memorandum, the project team will also be performing traffic noise analysis and a maintenance of traffic alternatives analysis (MOTAA). Supplemental traffic data will be prepared to support those efforts.

### Noise Analysis

Supplemental traffic data required for use in noise analysis includes highest noise hour volumes, vehicle breakdown by class, free flow speeds, and traffic volume data for nearby local roads. The supplemental data for noise analysis will be presented in the noise report that is part of the environmental documentation for the project. This document is expected to be completed in early 2016.

### Maintenance of Traffic Alternatives Analysis (MOTAA)

An MOTAA report will be prepared for the project to develop and evaluate the best combination of construction phasing and temporary traffic control strategies to reduce work zone impacts. Supplemental traffic data required for the MOTAA will include 24-hour traffic data for use in evaluating acceptable overnight lane closure periods to be implemented during construction. The MOTAA report will be completed during the final design phase of the project.

## SUMMARY AND NEXT STEPS

This report presented the traffic data and operational analyses results for the I-95 project from Moravia Road to the Fort McHenry Tunnel in Baltimore City, which will provide four (4) continuous through lanes along I-95 in each direction.

Under existing conditions, I-95 operates under capacity within the study area; however, several of the segments along I-95 currently operate at LOS E during the peak hours. By the year 2018, the segment of southbound I-95, south of O'Donnell Street, is projected to fail. The proposed Build improvements are expected to have significant near-term benefits. They will improve the failing segment to LOS D, and they will also provide spare capacity along I-95 to accommodate potential diverted traffic from I-895 during construction of the Canton Viaduct project. However, additional improvements along I-95 could be considered in the future to address anticipated long-term traffic growth along the corridor, based on the results of operational analyses conducted for projected year 2040 conditions.

The project is currently in the final design stage. The next steps include preparing an MOTAA report, conducting a noise analysis as part of the environmental documentation for the project, and completing the design plans to allow the projected to be advertised in June 2016.

# APPENDIX D - INTERAGENCY CONSULTATION GROUP COORDINATION

**(to be included in final document)**