

INTER-OFFICE COMMUNICATION

TO: Scott Ockunzzi, District 3

FROM: Bryan Raderstorf, Transportation Engineer, Division of Statewide Planning & Research, Modeling & Forecasting Section

SUBJECT: LOR-90-10.76, PID 107714

DATE: March 1, 2023

In reply to a request dated January 26, 2023, the expanded plates have been reviewed and are reasonable for use. Attached are plates showing and opening and design year (2025/2045) volumes for ADT, AM DHV, PM DHV for the 6 lane configuration, as well as existing truck factors. K and D factors can be calculated from plates.

Thanks!

If you have any questions, please contact me at (614) 752-5736.

Count Evaluation Tech Memo LOR-90-10.76 Traffic Volumes

DATE: February 2, 2023
To: Scott Ockunzzi, ODOT D3
CC: Julie Cichello, D3
Kathryn Wade, D3
Scott Knebel, CMT
FROM: Giovanni Hansel, CMT
SUBJECT: Count Evaluation Technical Memo
I-90 at SR-254 interchange

This technical memo provides supporting documentation that was used to expand the existing 2025 / 2045 LOR-90-10.76 Certified Traffic Plate. AADT and DHV on the original certified traffic plate dated January 2022 were expanded using volumes adjusted with Seasonal, P&A/B&C, COVID, and growth factors as applicable. The study area map (**Figure 1**) shows the types of analyses that will be performed as part of the interchange operations study (IOS): basic freeway segments (red circle), merge/diverge (green squares), and signalized intersection (blue circle).

FIGURE 1: STUDY AREA MAP



Section 1: Data Collection

8-hour Turning Movement Counts (TMC) within the project area were collected on Thursday May 19, 2022, between the hours of 6 AM to 10 AM and 3 PM to 7 PM at five signalized intersections:

- State Route 254 at Transportation Drive
- State Route 254 at Interstate 90 WB Ramps
- State Route 254 at Interstate 90 EB Ramps
- State Route 254 at Sheffield Crossing
- State Route 254 at State Route 301

2025 / 2045 Certified Traffic Plates (see **Figures 2-5**) have been developed for the Build condition that include volumes on mainline and ramps at Interstate 90 that assumes a 6-lane configuration between the State Route 2 and State Route 611 interchanges. Volumes in the Certified Traffic Plate have been adjusted using *COVID Adjustment factor* hence represent 2025 / 2045 volumes with no reduction due to COVID. The Certified Traffic Plate was to be expanded to include turning movement volumes at the five intersections using the same growth rate of 0.68% per year used in the Certified Traffic Plate developed by NOACA.

In addition to the volume data above, the following data and tools provided by ODOT were used to develop expanded Certified Traffic Plate:

- 2021 Seasonal Adjustment Factors Table
- Peak-to-DHV Adjustment Factors Table
- Partial Count Form Spreadsheet
- Partial Count Adjustment (P&A, B&C) Factor Spreadsheet
- Statewide and Regional Traffic Analysis Dashboard

The use of these data and tools will be described in the next section(s) of the memo.

Section 2: Estimating 2025 and 2045 DHVs

Section 2.7.2 of the Ohio Traffic Forecasting Manual (Volume 2) states that one of the methods of determining DHV involves multiplying peak hour volumes by a *Peak-to-DHV Adjustment Factor*. Using this method, 2025 and 2045 DHVs at the five intersections were estimated by applying *Peak-to-DHV factor* and *Growth Factor* (based on 0.68% per year) to the 2022 AM and PM peak hour volumes.

FIGURE 2: 2025 AND 2045 CERTIFIED TRAFFIC ADT VOLUMES

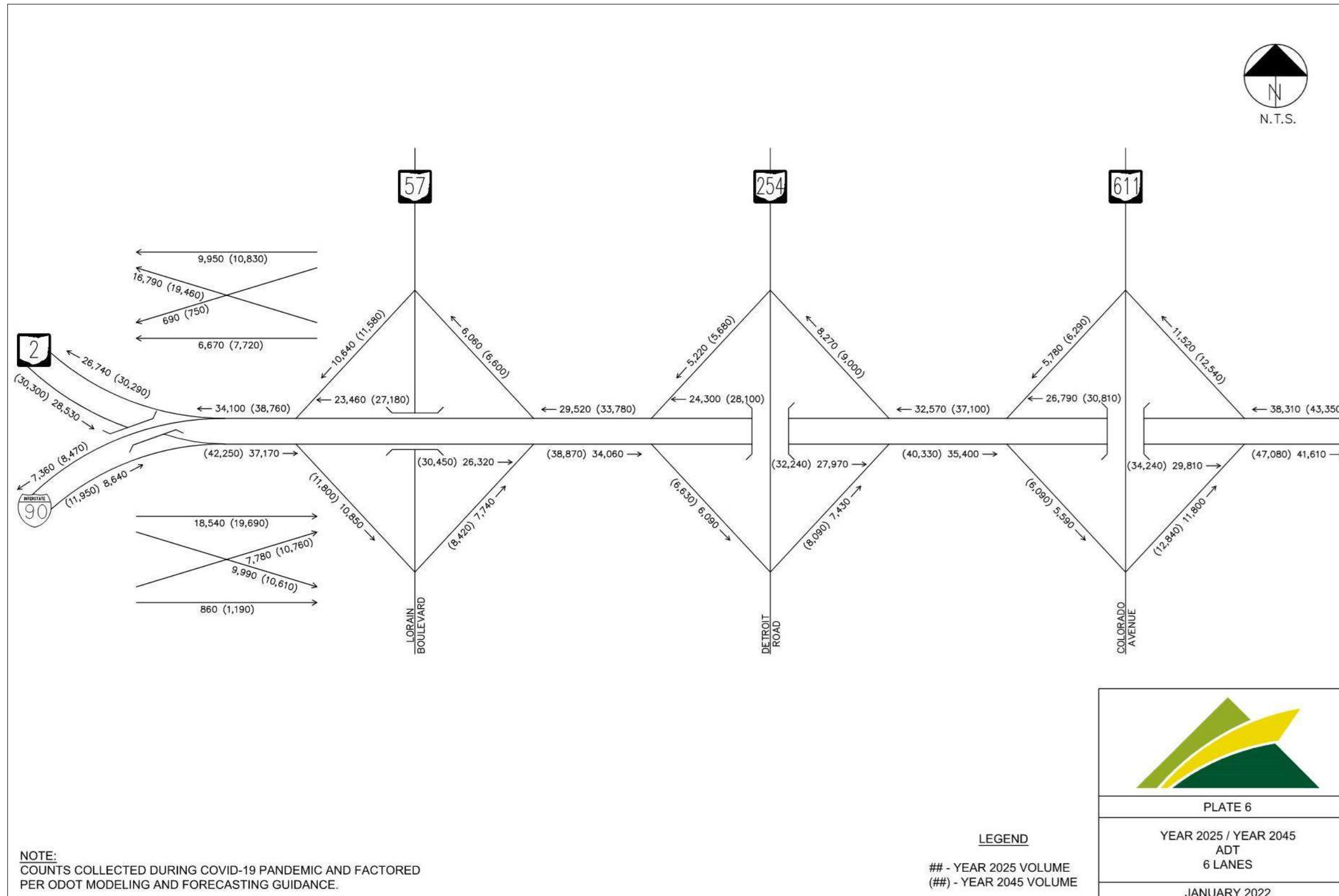


FIGURE 3: 2025 AND 2045 CERTIFIED TRAFFIC AM DESIGN HOURLY VOLUMES

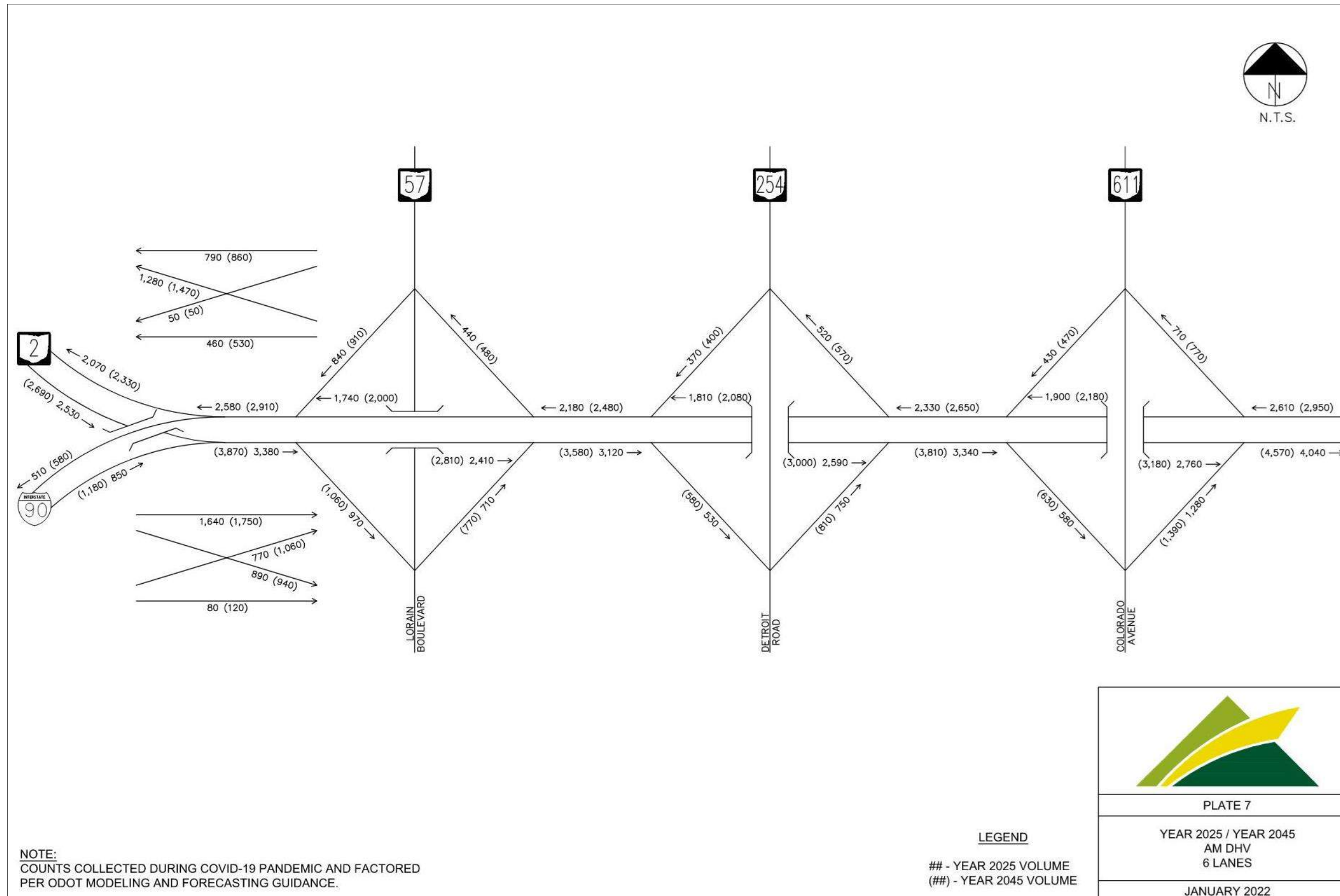


FIGURE 4: 2025 AND 2045 CERTIFIED TRAFFIC PM DESIGN HOURLY VOLUMES

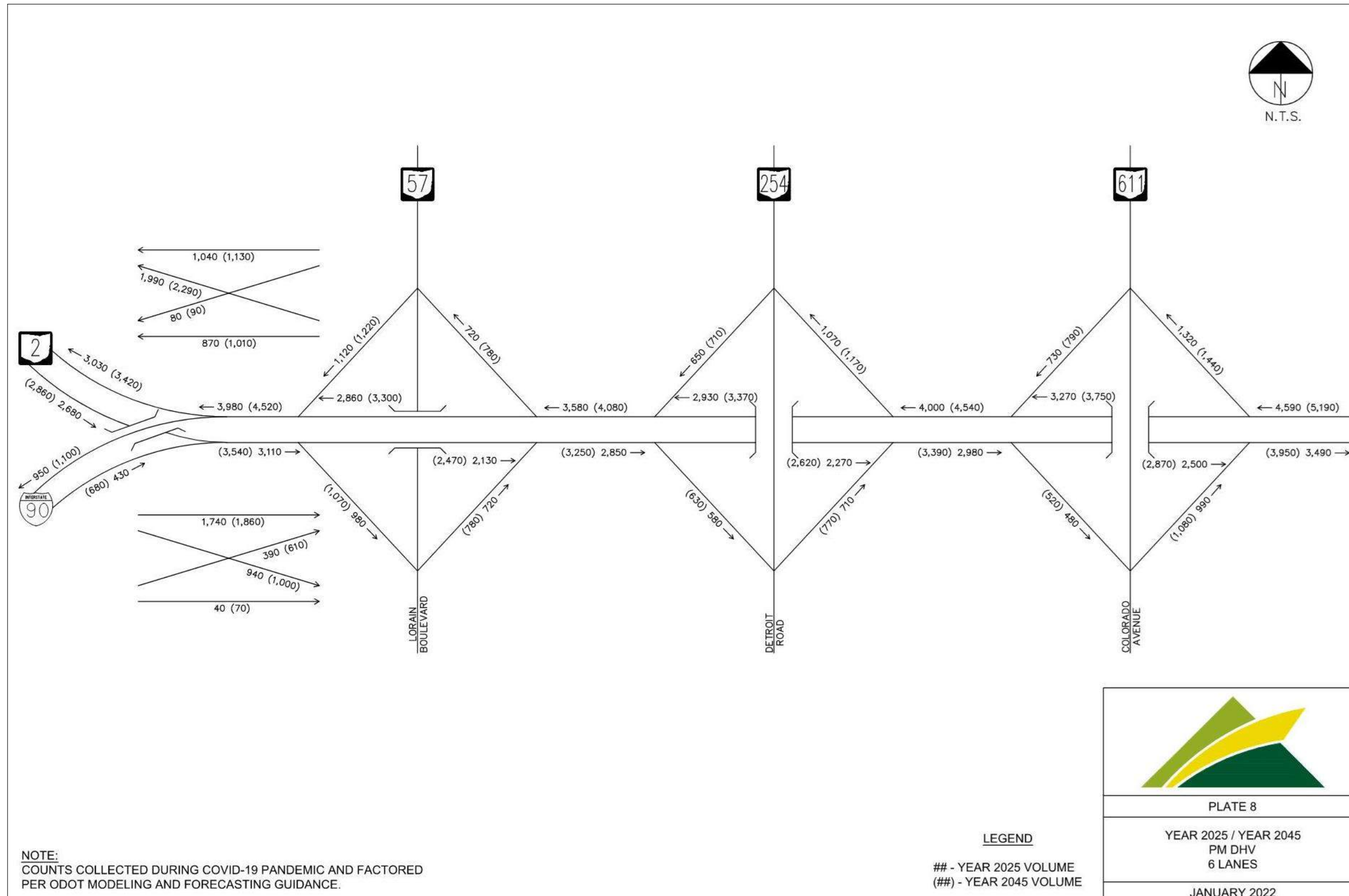
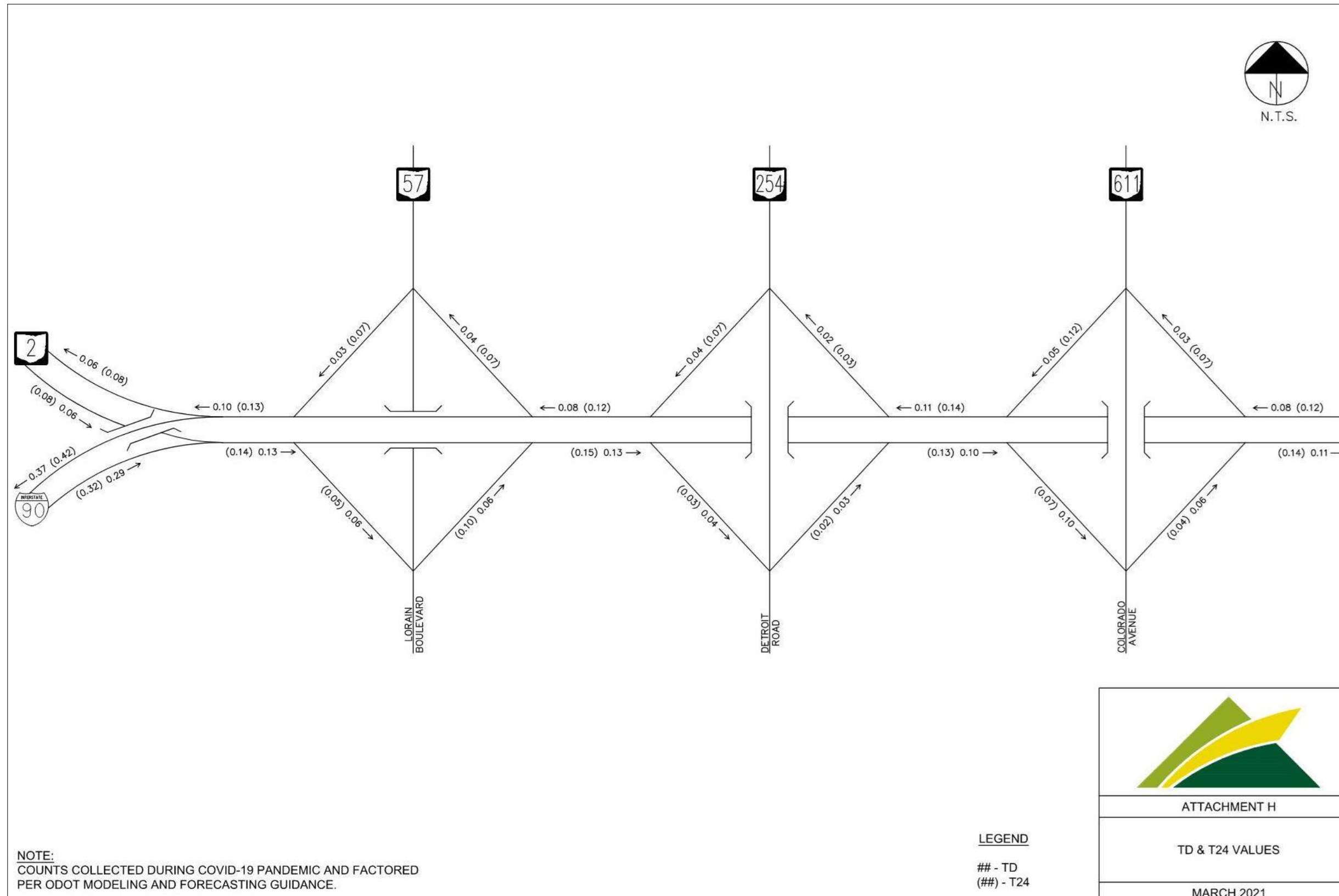


FIGURE 5: CERTIFIED TRAFFIC TD AND T24



According to ODOT's Statewide and Regional Traffic Analysis Dashboard, total traffic volumes in Northeast Ohio during the week of 5/15/2022 to 5/21/2022 is 8% lower when compared to the same week in 2019 (pre-COVID). According to the same source, total traffic volumes in District 3 during the same week is 6% lower than pre-COVID. These COVID factors were compared to the difference between the DHVs from the 2022 traffic counts (increased to 2025/ 2045 without COVID adjustments) and the Certified Traffic DHVs which include COVID adjustments. Calculated DHVs using 2022 traffic count data (and increased to 2025/ 2045 volumes) at the I-90 ramps are on average 5% lower than the Certified Traffic, which is comparable to the 6% and 8% COVID factors posted on ODOT's Statewide and Regional Traffic Analysis Dashboard. Therefore, *COVID Adjustment Factor* of 1.05 (5% increase) was applied to the expanded 2025 and 2045 DHVs.

Section 3: Estimating 2025 and 2045 ADTs

The 2025 and 2045 ADTs at the five intersections were estimated by multiplying the total 8-hour 2022 counts for each movement with *Growth Factor (based on 0.68% per year)*, *P&A Factors* (ODOT P&A Factor Spreadsheet), *Seasonal Adjustment Factors* (ODOT 2021 Seasonal Adjustment Factors Table), and *COVID Adjustment Factor* (equals 1.05). ODOT's Partial Count Form Spreadsheet was used to calculate ADTs, resulting in movement-specific 2025 and 2045 COVID Adjusted ADT estimates.

Section 4: Balancing 2025 and 2045 DHV and ADT

Section 2.6.2 of the Ohio Traffic Forecasting Manual (Volume 2) states that volume balancing is required when a difference in volume is calculated between two data points where there are no intersecting roadways or driveways in between. In addition, Section 5.4.1 of the manual states that volumes should be rounded to the nearest 10.

Driveway accesses exist on SR-254 between the intersections except between the I-90 ramps, and between the I-90 WB ramp and Transportation Dr intersections. Therefore, only upstream-downstream volume pairs at these locations were balanced. Volumes were balanced as applicable toward the average values of the upstream-downstream volume pairs, and then rounded to the nearest 10. The balanced and COVID adjusted 2025 and 2045 DHV and ADT estimates were then used to expand the Certified Traffic Plate as shown in **Figure 6** through **Figure 8**.

Section 5: Peak Hour Factor (PHF) and Truck Percentages

Peak Hour Factors (PHF) and truck percentages for the AM and PM peak hour periods were calculated following the guidance on Section 5 of the ODOT Analysis and Traffic Simulation (OATS) Manual, using the traffic counts collected for the project. These calculated PHF and truck percentages are shown in **Figure 9**.

FIGURE 6: 2025 AND 2045 EXPANDED CERTIFIED TRAFFIC ADT VOLUMES

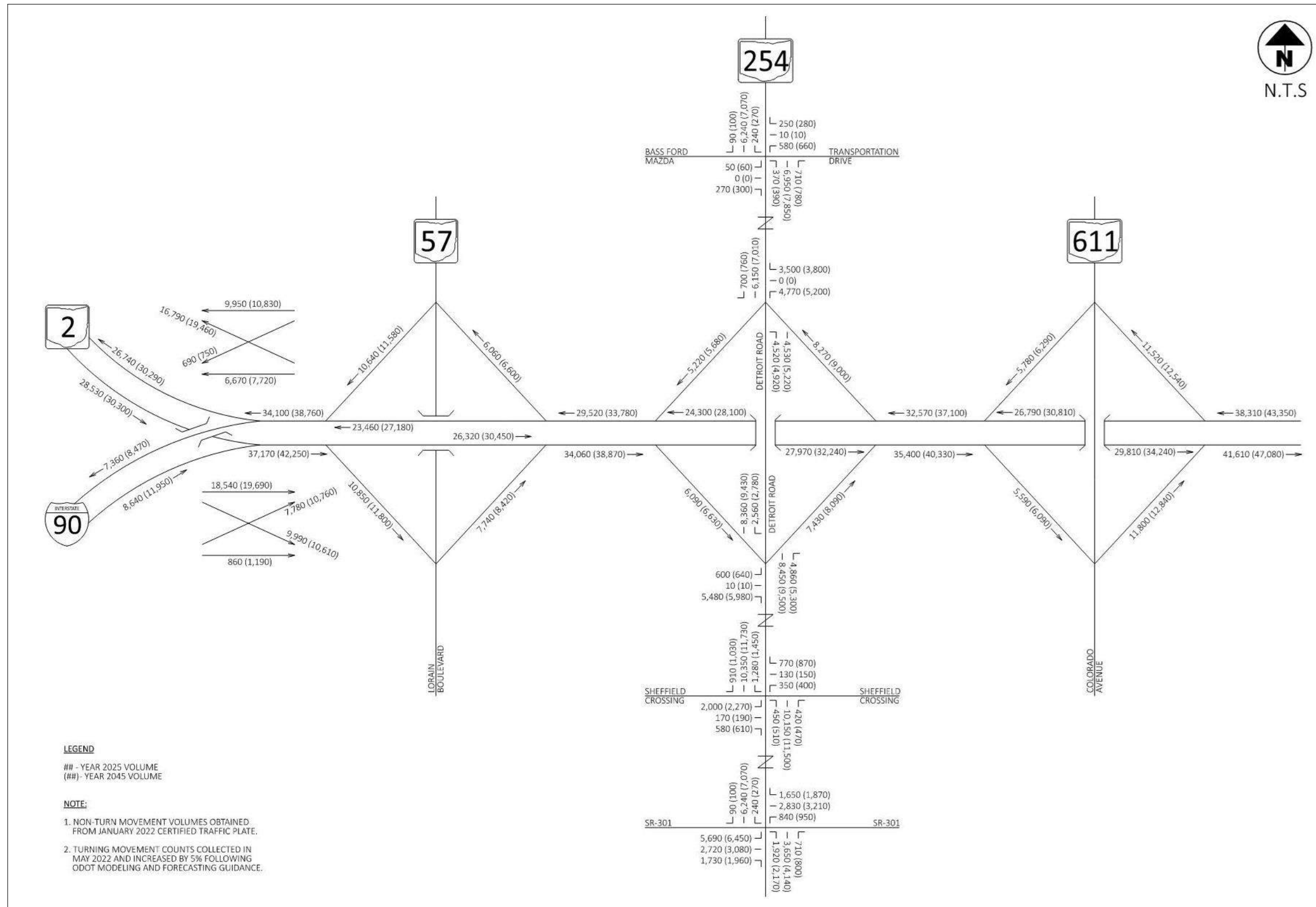


FIGURE 7: 2025 AND 2045 EXPANDED CERTIFIED TRAFFIC AM DESIGN HOURLY VOLUMES

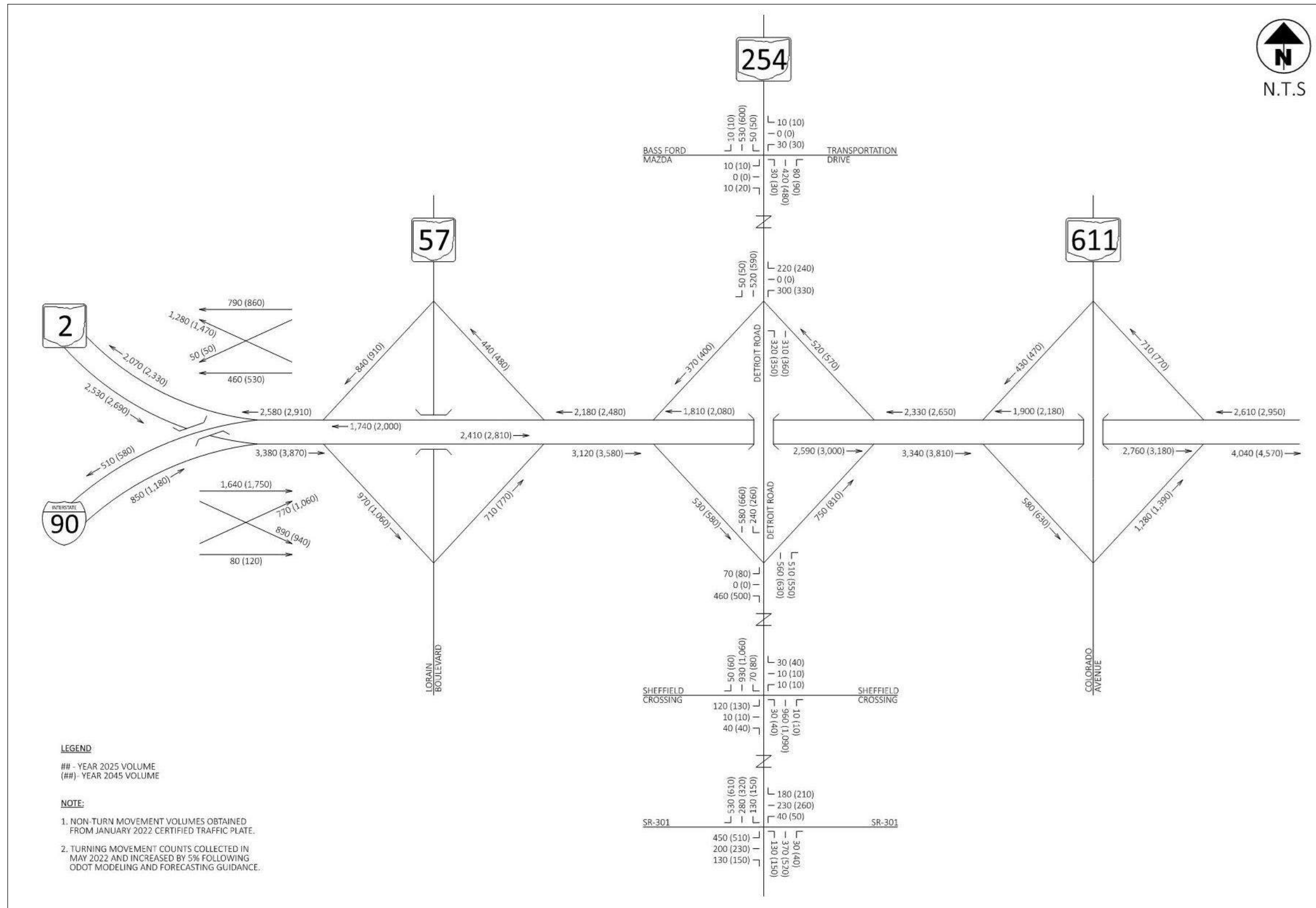


FIGURE 8: 2025 AND 2045 EXPANDED CERTIFIED TRAFFIC PM DESIGN HOURLY VOLUMES

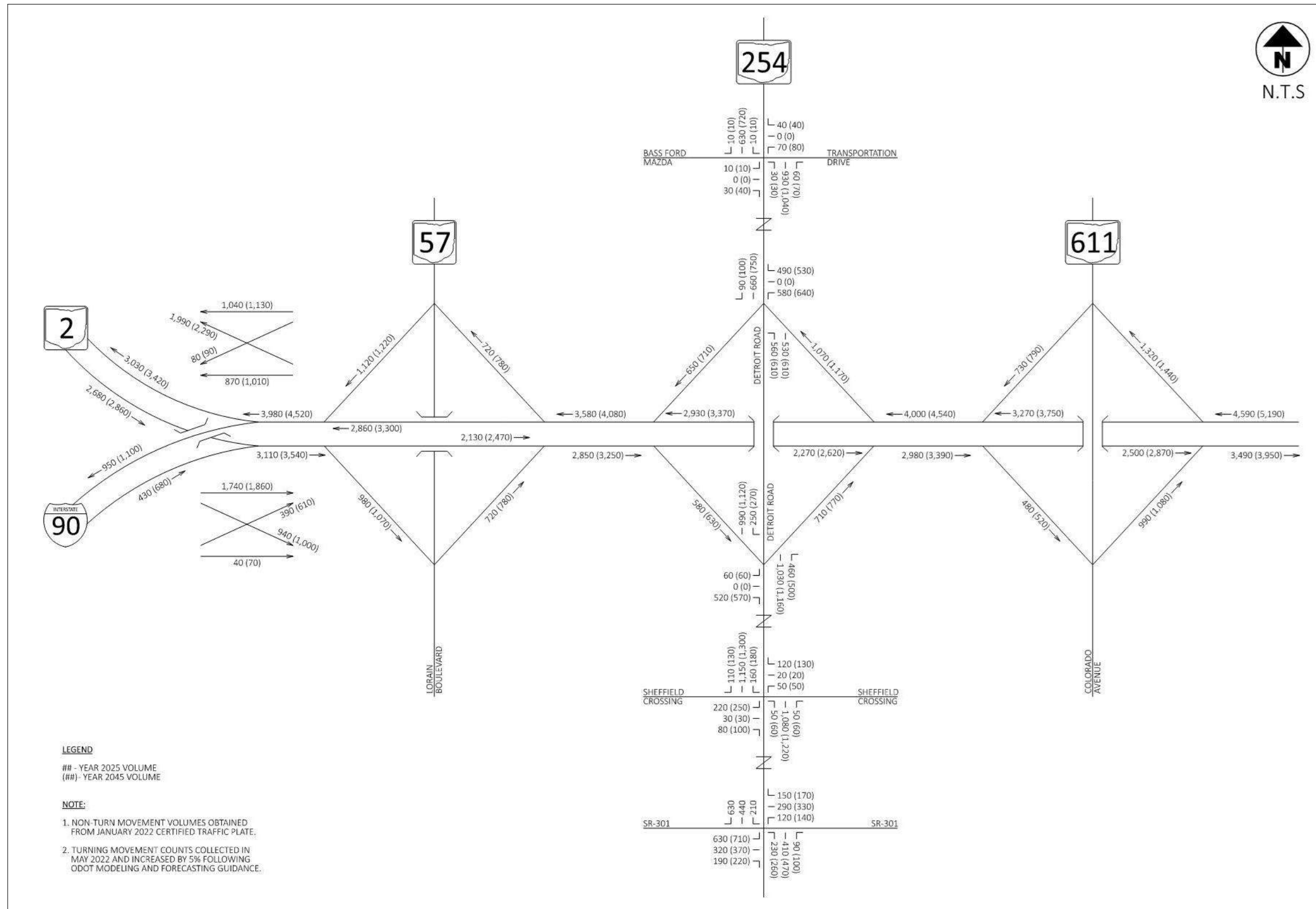


FIGURE 9: PEAK HOUR FACTORS AND EXPANDED CERTIFIED TRAFFIC TD AND T24

