

TRAFFIC FORECAST COVER LETTER

May 29, 2018

MEMORANDUM TO: David Stark, PE
NCDOT Priority Projects Unit

FROM: Peter Trencansky, PE, PTOE, AICP
Patriot Transportation Engineering, PLLC

SUBJECT: Traffic Forecast for I-5870
Wake County
I-440 at Ridge Road/Crabtree Valley Avenue Interchange

Please find attached the 2017 and 2045 traffic forecast for STIP Project Number I-5870 in Wake County. The proposed project includes a new interchange on I-440 at Ridge Road to connect with Crabtree Valley Avenue and to realign and widen Crabtree Valley Avenue between Edwards Mill Road (SR 3009) and Ridge Road. The project will also modify the I-440/Glenwood Ave (US 70) interchange and includes improvements to the Glenwood Avenue at Blue Ridge Road/Lead Mine Road intersection. This forecast was requested for use in the project development activities associated with the project, including the NEPA documentation and Preliminary Roadway Design.

This is the first forecast for this project. The project is located within the boundaries of the Capital Area Metropolitan Planning Organization (CAMPO). The following three scenarios are provided in this forecast:

- 2017 Base Year No-Build
- 2017 Base Year Build – 2 Alternatives
- 2045 Future Year No-Build
- 2045 Future Year Build – 2 Alternatives

The build forecasts were based on the conceptual designs for each of the following alternatives:

- Alternative 1 – 2011 City of Raleigh Study Preferred Alternative, with echelon intersection at Glenwood Avenue and Blue Ridge Road/Lead Mine Road
- Alternative 2 – Diverging Diamond Interchange (DDI) Conceptual Alternative, with a Continuous Flow Intersection (CFI) option at Glenwood Avenue and Blue Ridge Road/Lead Mine Road

David Keilson (NCDOT Division 5 Division Planning Engineer), Mark Eatman (NCDOT Transportation Planning Division), Alex Rickard (CAMPO Deputy Director) and Tim Gardiner (Wake County Transportation Planner) were consulted during the development of this forecast.

Fiscal Constraint

The project is located within the CAMPO boundaries; therefore, the travel demand model and traffic forecast is fiscally constrained to match the assumptions of the corresponding Metropolitan Transportation Plan (MTP). The *Connect 2045 – The Metropolitan Transportation Plan* (2045 MTP) includes the proposed project within the 2035 horizon year of roadway projects and describes it as follows:

- A79a, STIP I-5870 – Crabtree Valley Ave / I-440 Connector – New roadway from I-440 to Blue Ridge Rd
- A79b, STIP I-5870 – Crabtree Valley Ave Widening/Realign – New roadway and widening from Blue Ridge Rd to Creedmoor Rd

Additionally, the following additional projects that may affect the proposed project are included in the 2045 MTP and are assumed to be constructed prior to 2045:

- A682 (2025), no STIP – Blue Ridge Road – Widening 2 lanes to 3 lanes from Duraleigh to Crabtree Valley Ave
- A101 (2035), U-2823 – US 70 – Widening 4 lanes to 6 lanes from Lumley/Westgate Rd to Duraleigh/Millbrook Rd
- A195 (2035) – Creedmoor Rd – Widening 4 lanes to 6 lanes from Glenwood Ave to Strickland Rd
- A135 (2035) – Lead Mine Rd – Widening 3 lanes to 4 lanes from Town & Country Rd to Millbrook Rd
- A446 (2035) – Glenwood Avenue – Widening 4 lanes to 6 lanes from Womans Club Dr to Oberlin Rd
- A448 (2025) – Six Forks Rd – Widening 4 lanes to 6 lanes from Ramblewood Road to Lynn Road
- F83 (2025), I-5708 – I-440 Interchange Improvements at Wake Forest Road (SR 2000)
- F10 (2025), U-2719 – I-440 Widening – Widening 4 lanes to 6 lanes from US 1/64 to Wade Avenue
- A562 (2025), U-5936 – Wade Avenue Widening – Widening 4 lanes to 6 lanes from I-40 to I-440
- A21 (2035), no STIP – Lake Boone Trail Ext – New 4-lane roadway from Blue Ridge Rd to Edwards Mill Ext

Travel Demand Model

The Triangle Regional Model v6 (provided by ITRE on 02/01/2018 as authorized by NCDOT) was utilized as a tool in the development of the forecast to determine the Base and Future year scenario traffic volumes. The Triangle Model was developed in TransCAD (version 6 Build 9195) and was calibrated based on a base year of 2013, and has models for intermediate years of 2025 and 2035 and a future year of 2045.

Forecast Methodology

The 2017 Base Year No-Build traffic volumes and design factors were developed based upon current counts and historic AADT trend projections. The 2045 future year no-build traffic volumes generally included the development of compound annual growth rates between two model years. The compound annual growth rates were then applied to the AADT volumes from the 2017 scenario to develop initial volumes for 2045. Engineering judgment adjustments were applied as needed in finalizing the volumes to develop a balanced forecast.

The development of the 2017 and 2045 Build volumes were based partially on diversion of traffic between No-Build and Build model data and partially on the manual re-allocation of trip paths from specific origins and destinations. Passive origin-destination data collected by StreetLight Data, Inc. was utilized in determining changes in access to and from Crabtree Valley Mall.

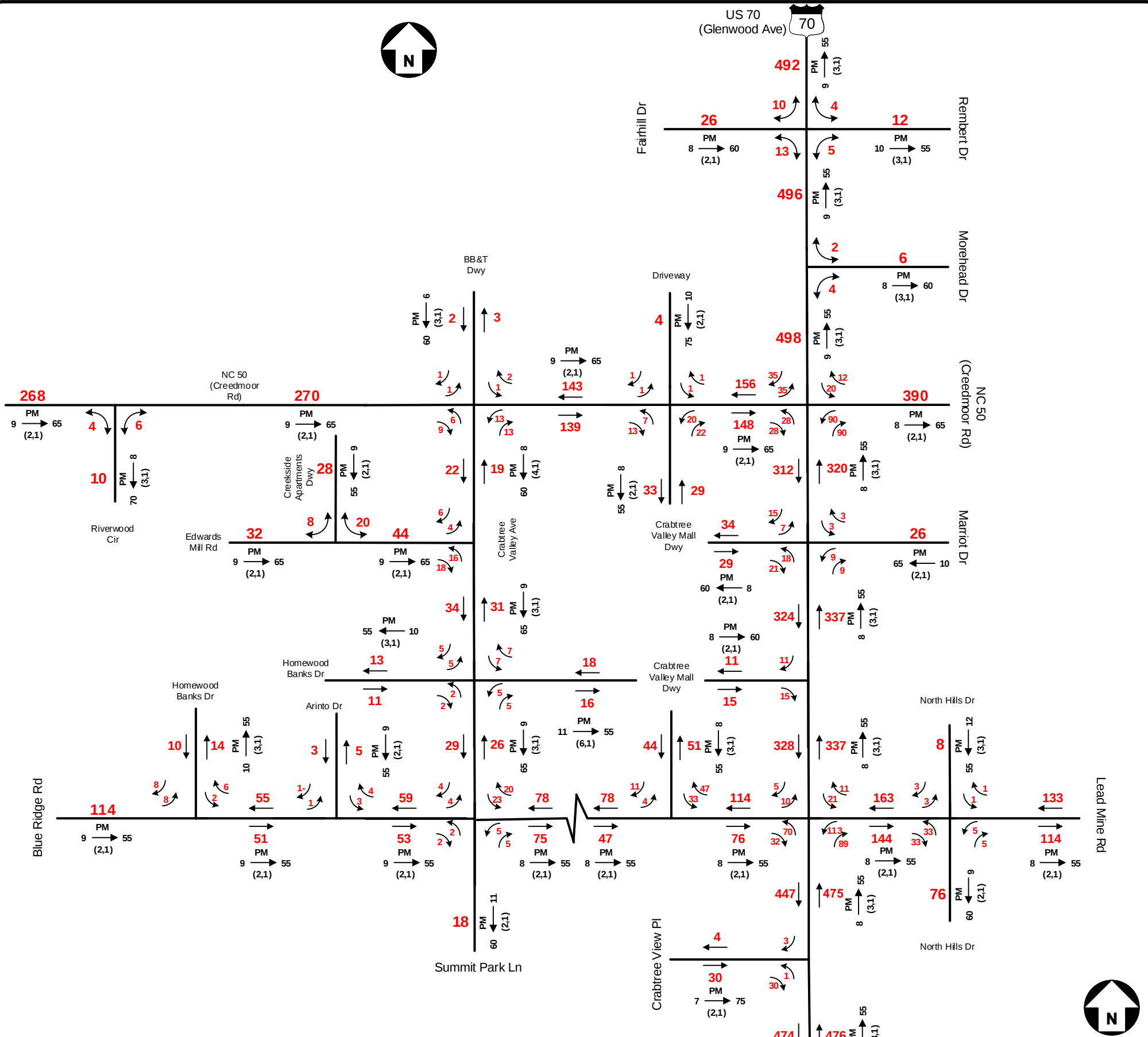
Interpolation/Extrapolation

The vicinity of the proposed project includes several large projects that will affect the capacity and traffic volumes of roadways included in this forecast. Therefore, only limited use of interpolation is permissible.

To estimate AADT volumes between 2017 and 2022 or 2040 and 2045, straight line interpolation between the 2017 Base Year and the 2045 Future Year scenarios is acceptable. Interpolation of volumes between 2023 and 2040 is not acceptable and, if needed, an interim year forecast should be developed. AADT volumes may be extrapolated for up to two years immediately following 2045. If it is determined that any of these assumptions have become inconsistent with the project and surrounding area activity, please request updated projections at this location.

This forecast has been reviewed and approved by the NCDOT Transportation Planning Division on May 29, 2018.

cc: (Final distribution for your records via e-mail as PDF attachments):
Brenda Moore, PE, CPM (roadwaydesign@ncdot.gov)
James Dunlop, PE, Congestion Management Section (jdunlop@ncdot.gov)
Clark Morrison, PE PhD, Pavement Management (cmorrison@ncdot.gov)
Michael Kneis, PE, PE, Division 5 Division Project Delivery Engineer (mkneis@ncdot.gov)
David Keilson, PE, Division 5 Planning Engineer (dpkeilson@ncdot.gov)
Mark Eatman, Transportation Planning Division (mreatman@ncdot.gov)
Keith Dixon, State Traffic Forecast Engineer (trafficforecast@ncdot.gov)
Chris Lukasina, CAMPO Executive Director (chris.lukasina@campo-nc.us)
Traffic Forecasting GIS Support (trafficforecastinggissupport@ncdot.gov)



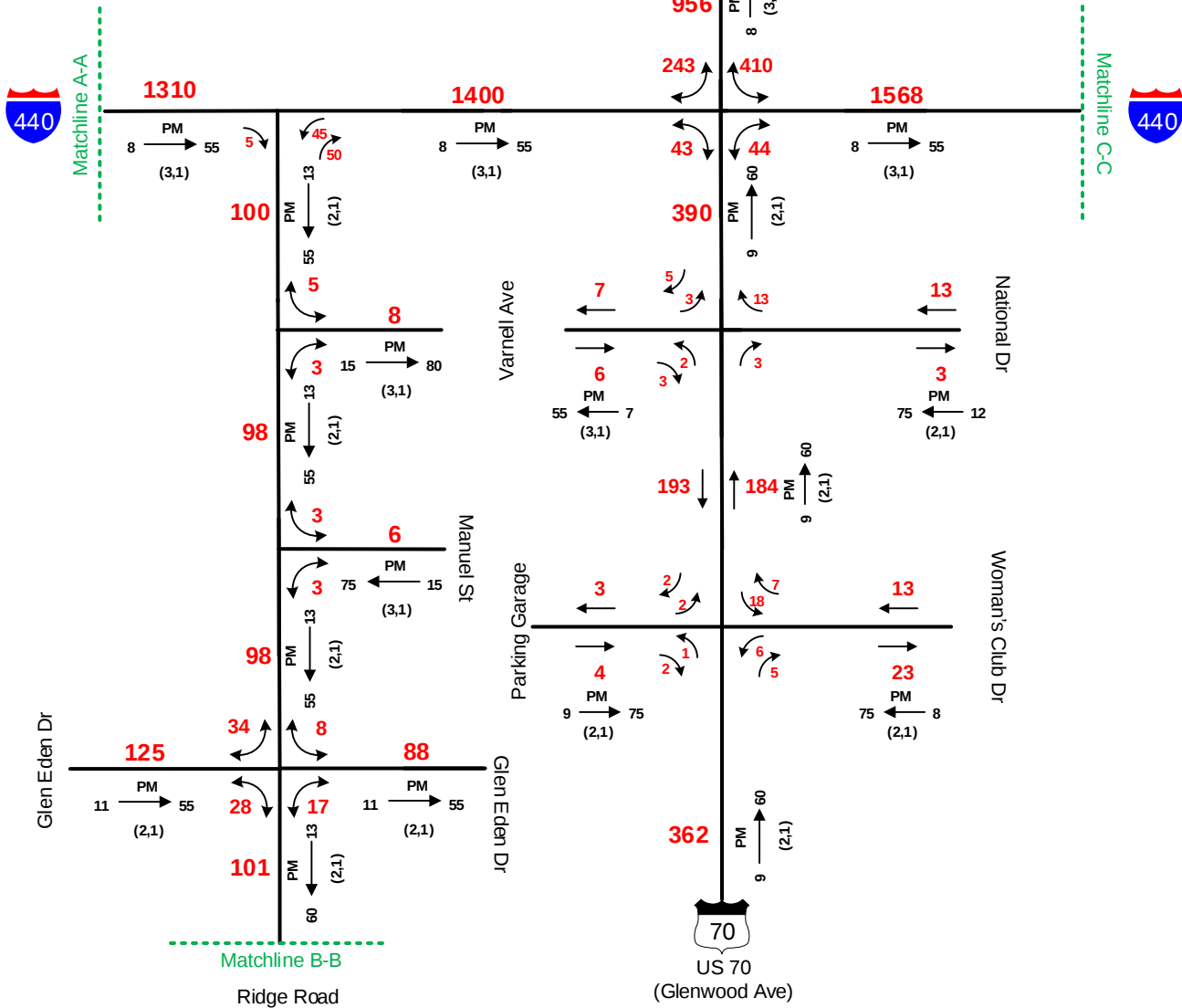
2017 AVERAGE ANNUAL DAILY TRAFFIC

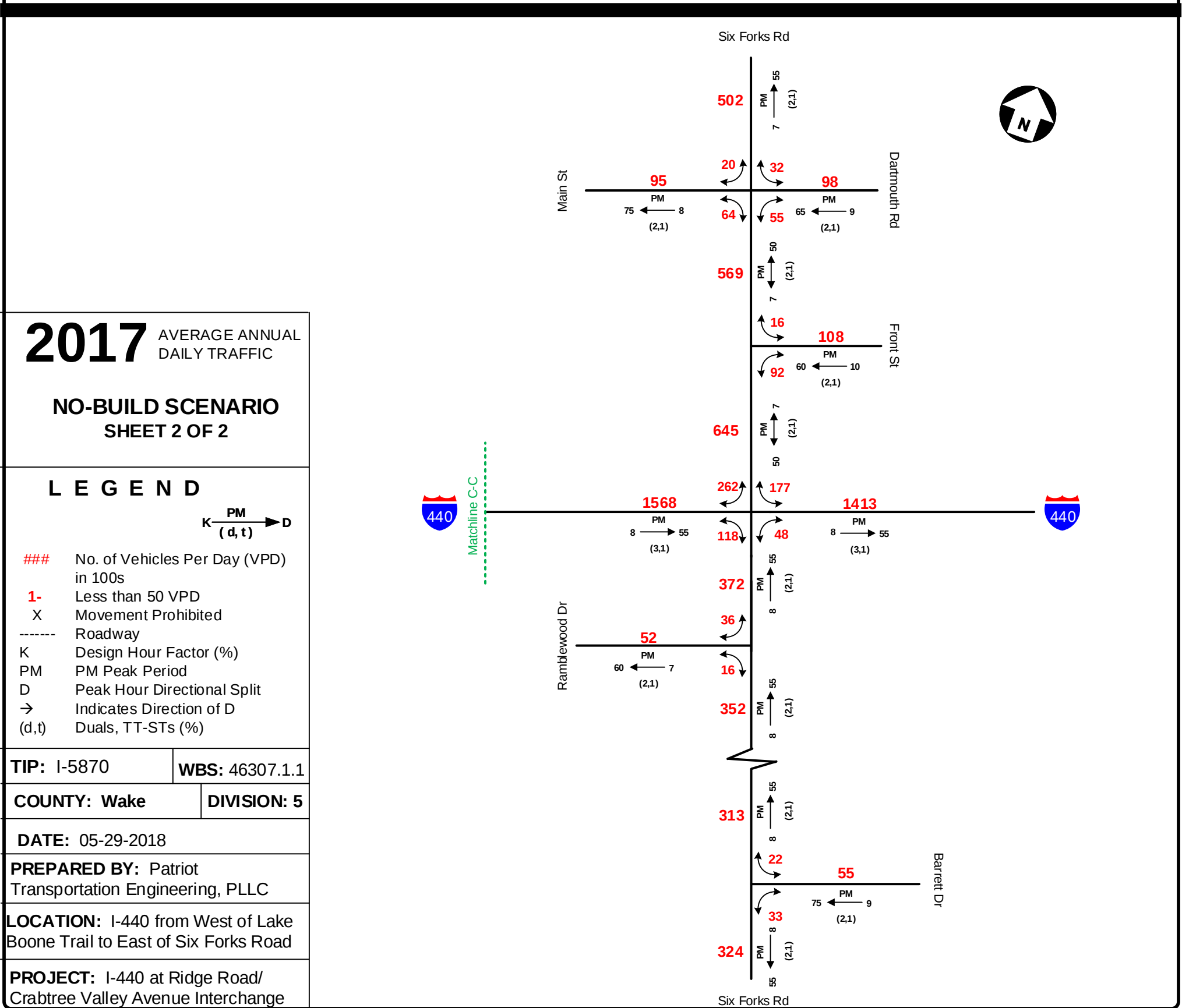
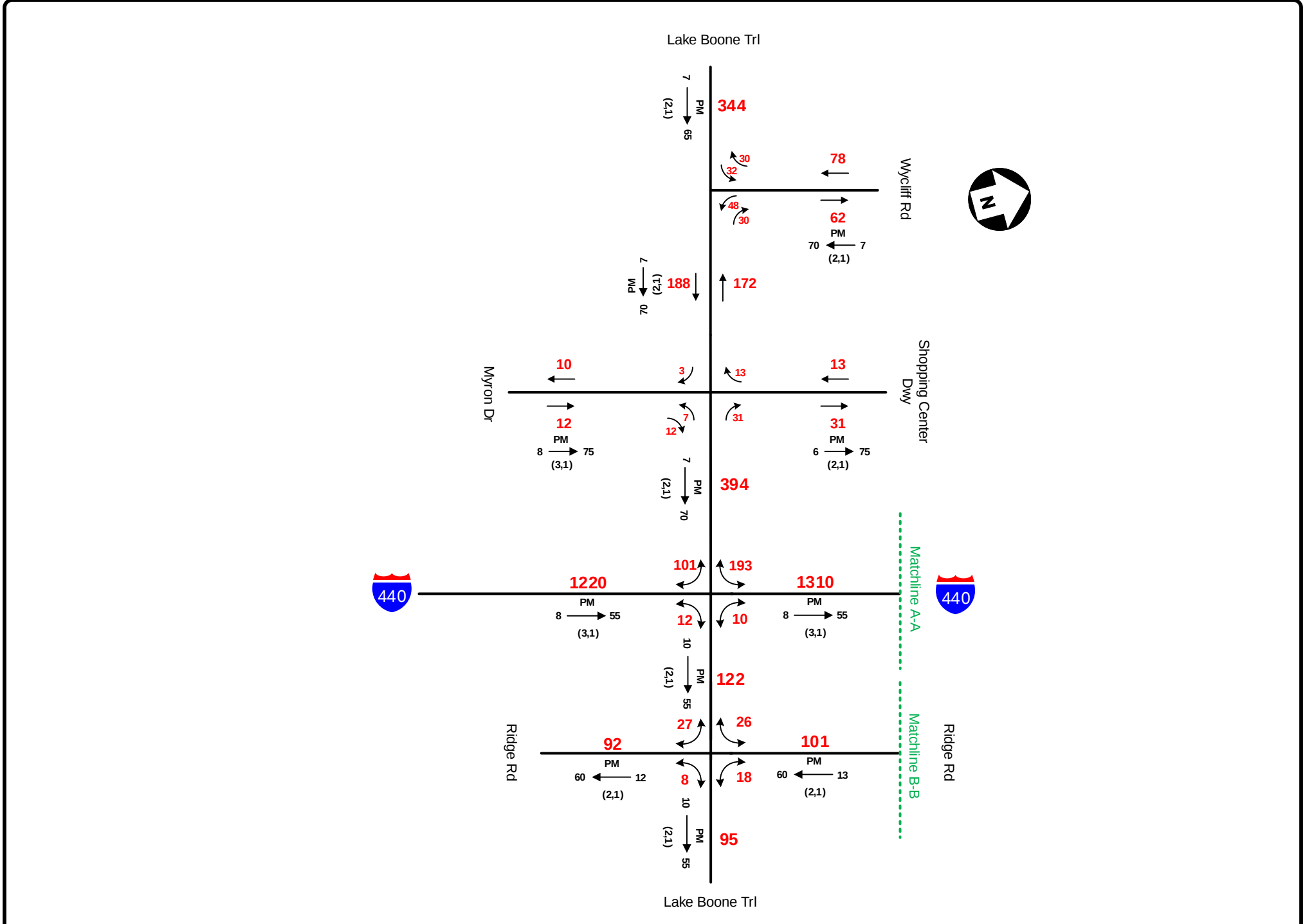
NO-BUILD SCENARIO SHEET 1 OF 2

LEGEND

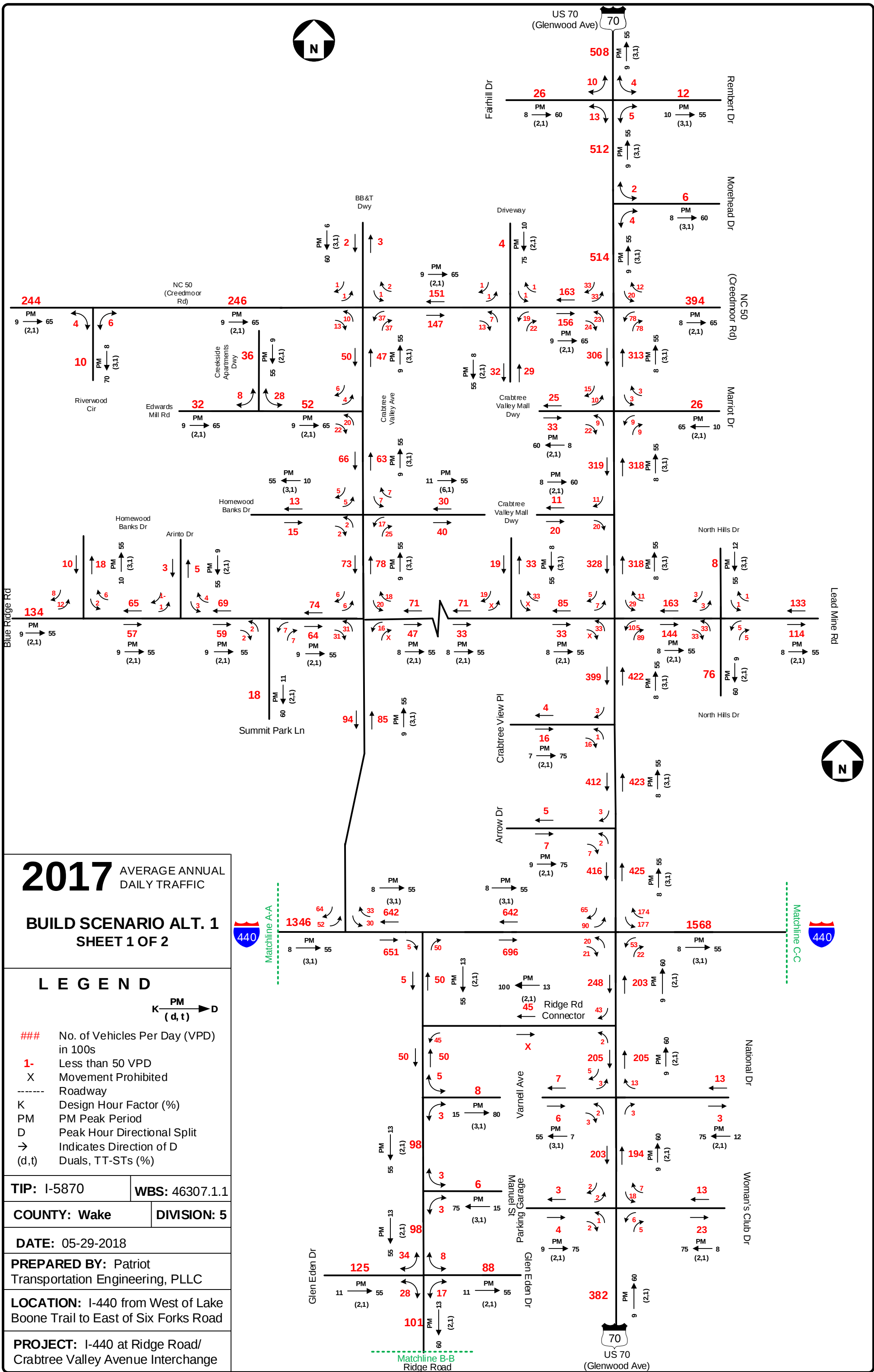
- ### No. of Vehicles Per Day (VPD) in 100s
- 1- Less than 50 VPD
- X Movement Prohibited
- Roadway
- K Design Hour Factor (%)
- PM PM Peak Period
- D Peak Hour Directional Split
- Indicates Direction of D
- (d,t) Duals, TT-STs (%)

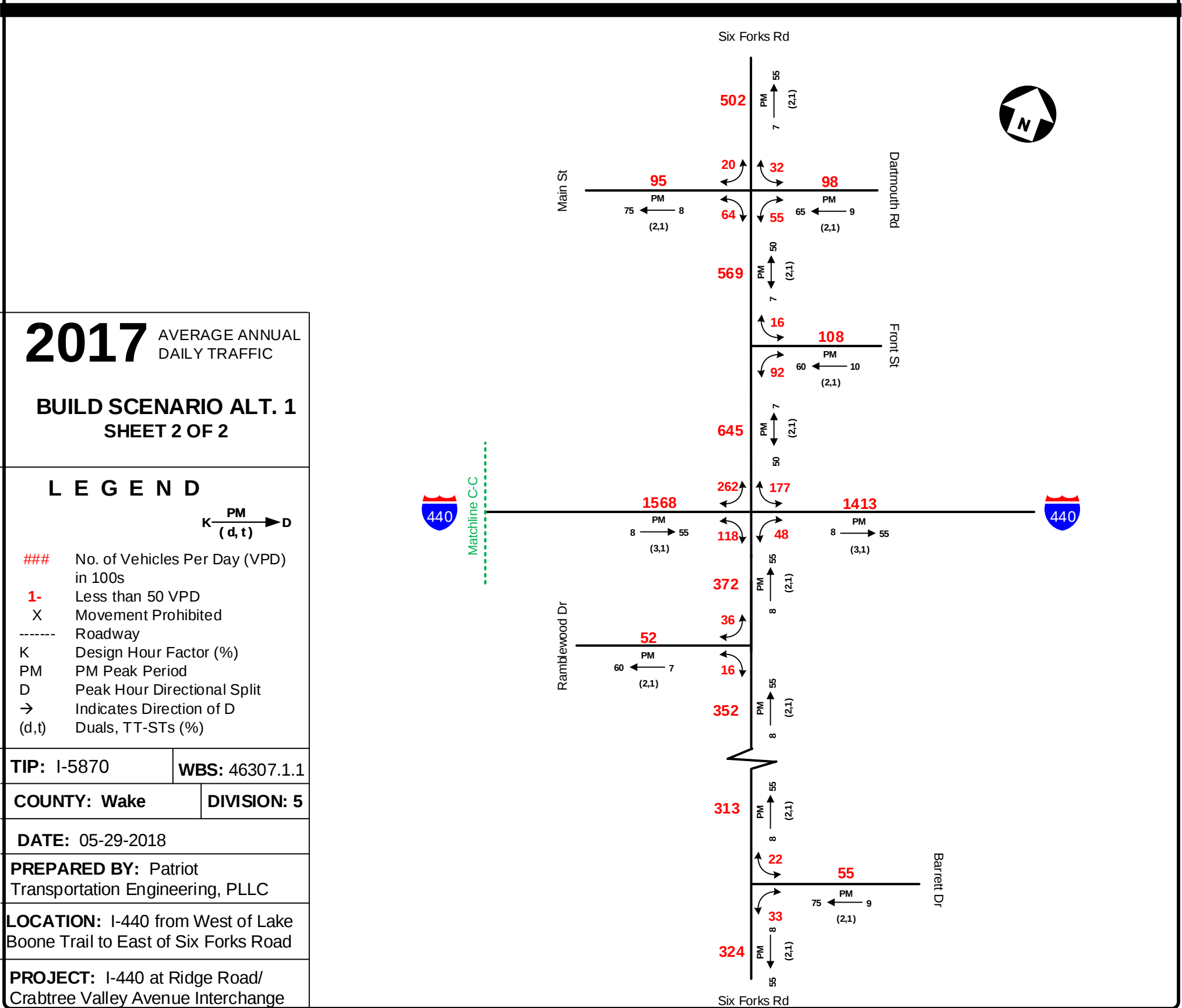
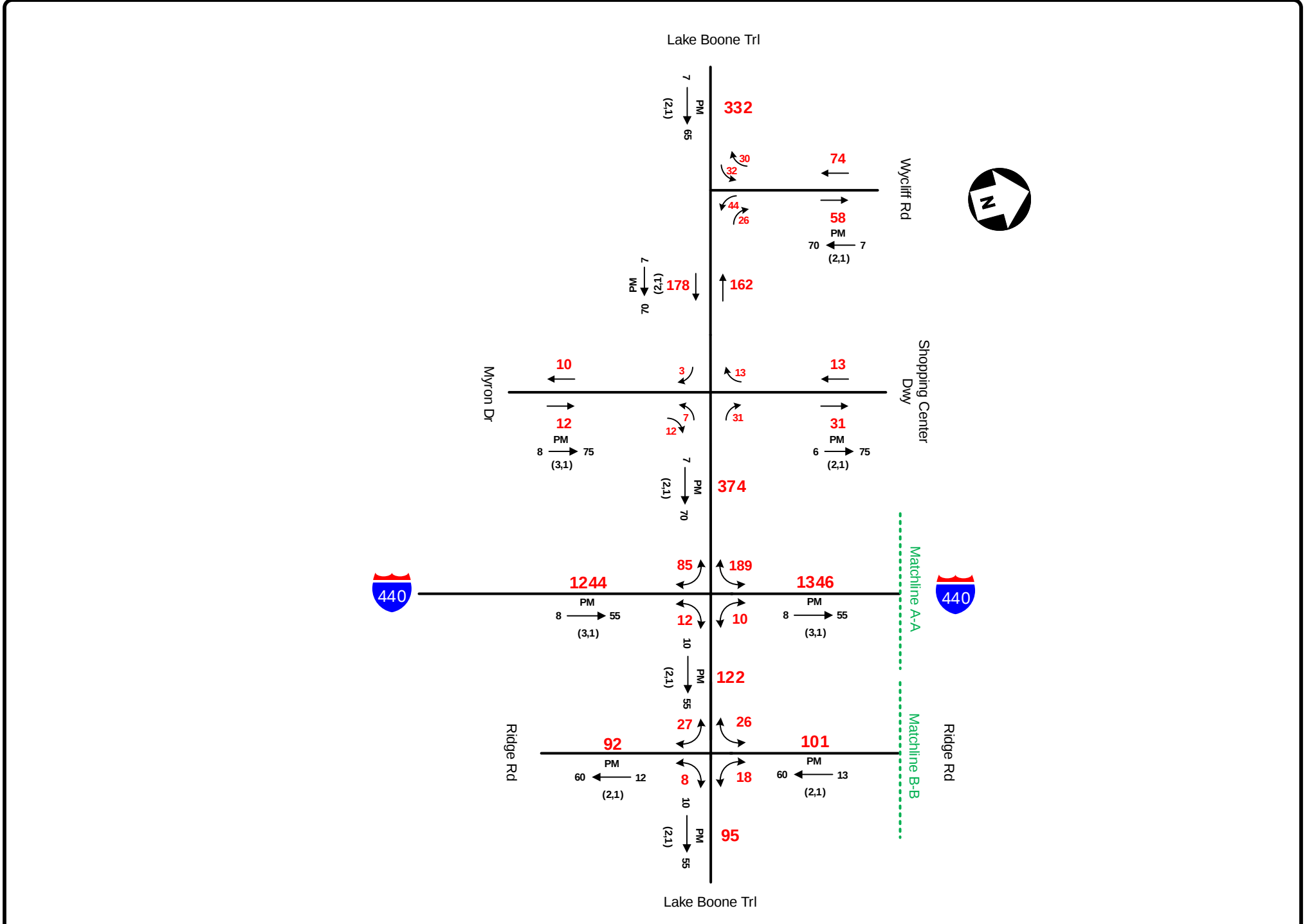
TIP: I-5870	WBS: 46307.1.1
COUNTY: Wake	DIVISION: 5
DATE: 05-29-2018	
PREPARED BY: Patriot Transportation Engineering, PLLC	
LOCATION: I-440 from West of Lake Boone Trail to East of Six Forks Road	
PROJECT: I-440 at Ridge Road/ Crabtree Valley Avenue Interchange	





2017 AVERAGE ANNUAL DAILY TRAFFIC	
NO-BUILD SCENARIO SHEET 2 OF 2	
LEGEND	
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SHEET 2 OF 2

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(d, t)

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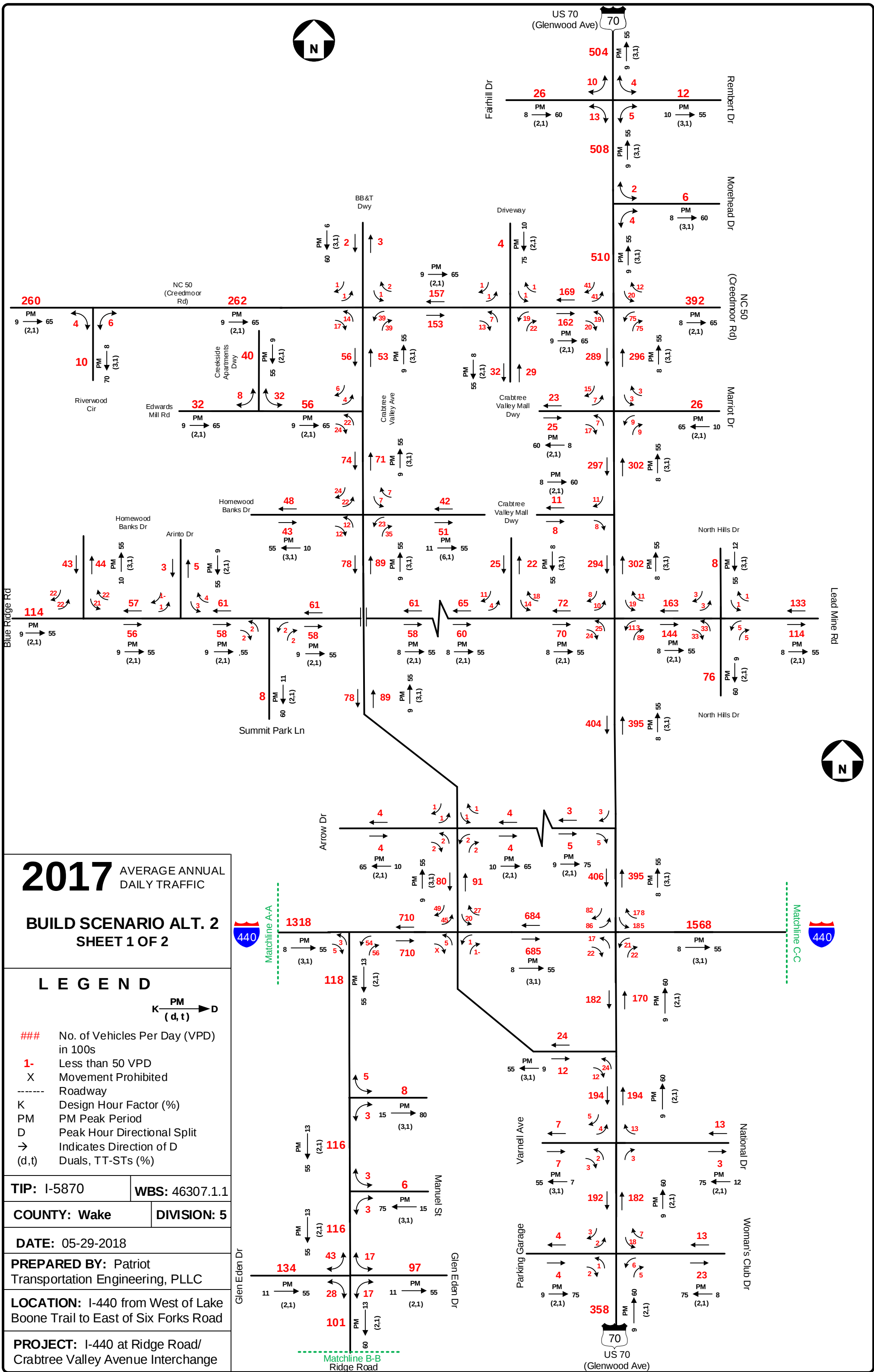
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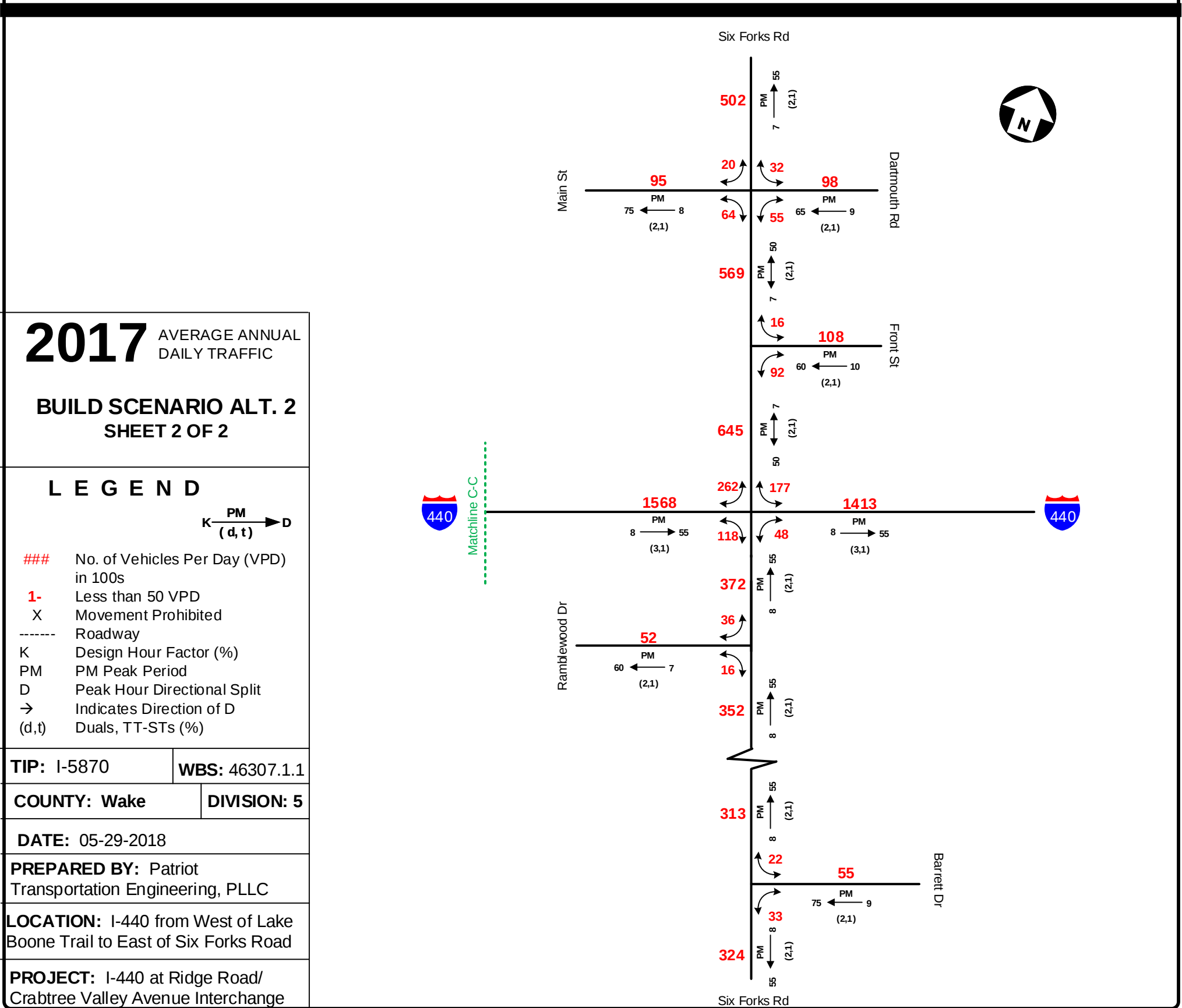
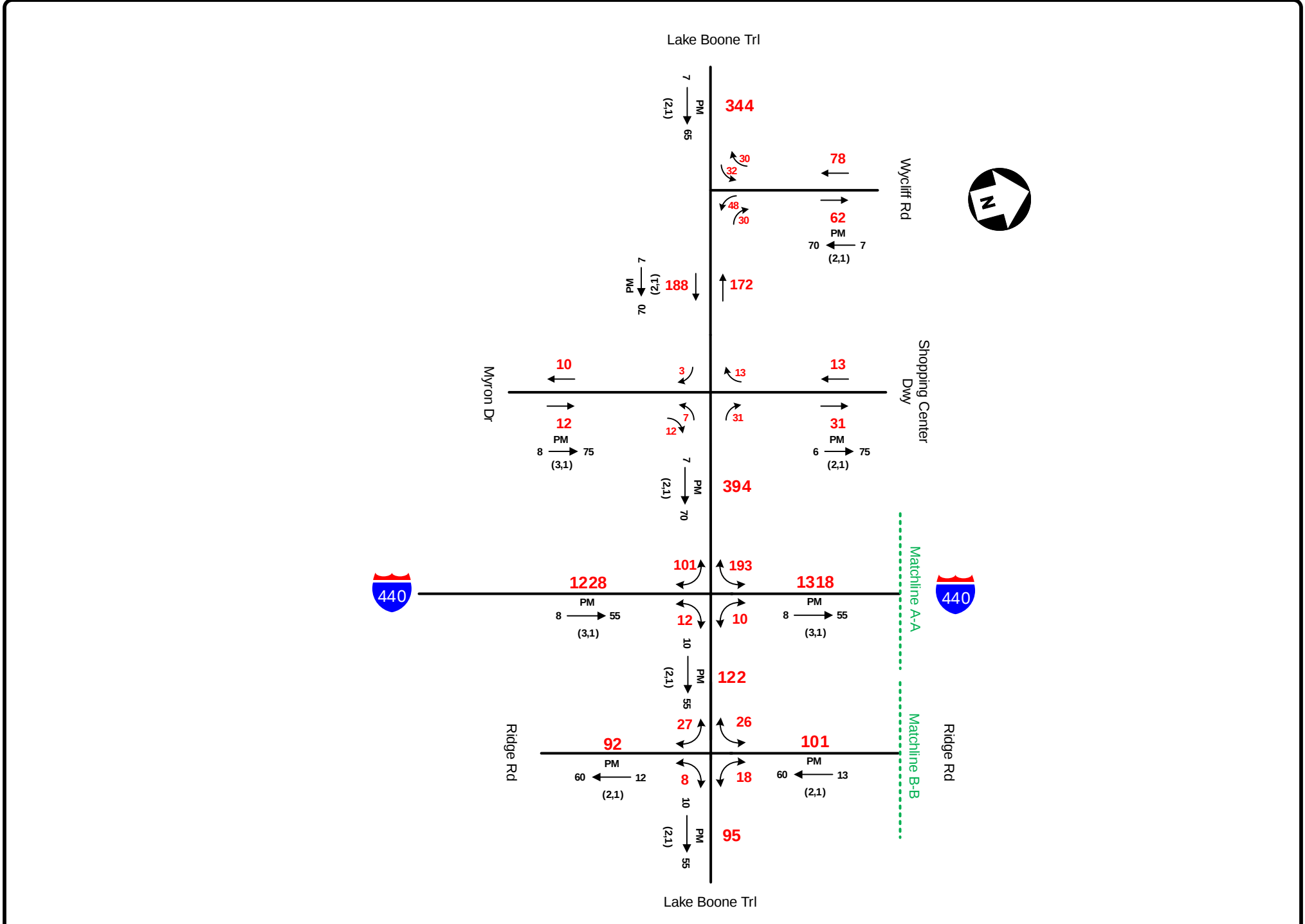
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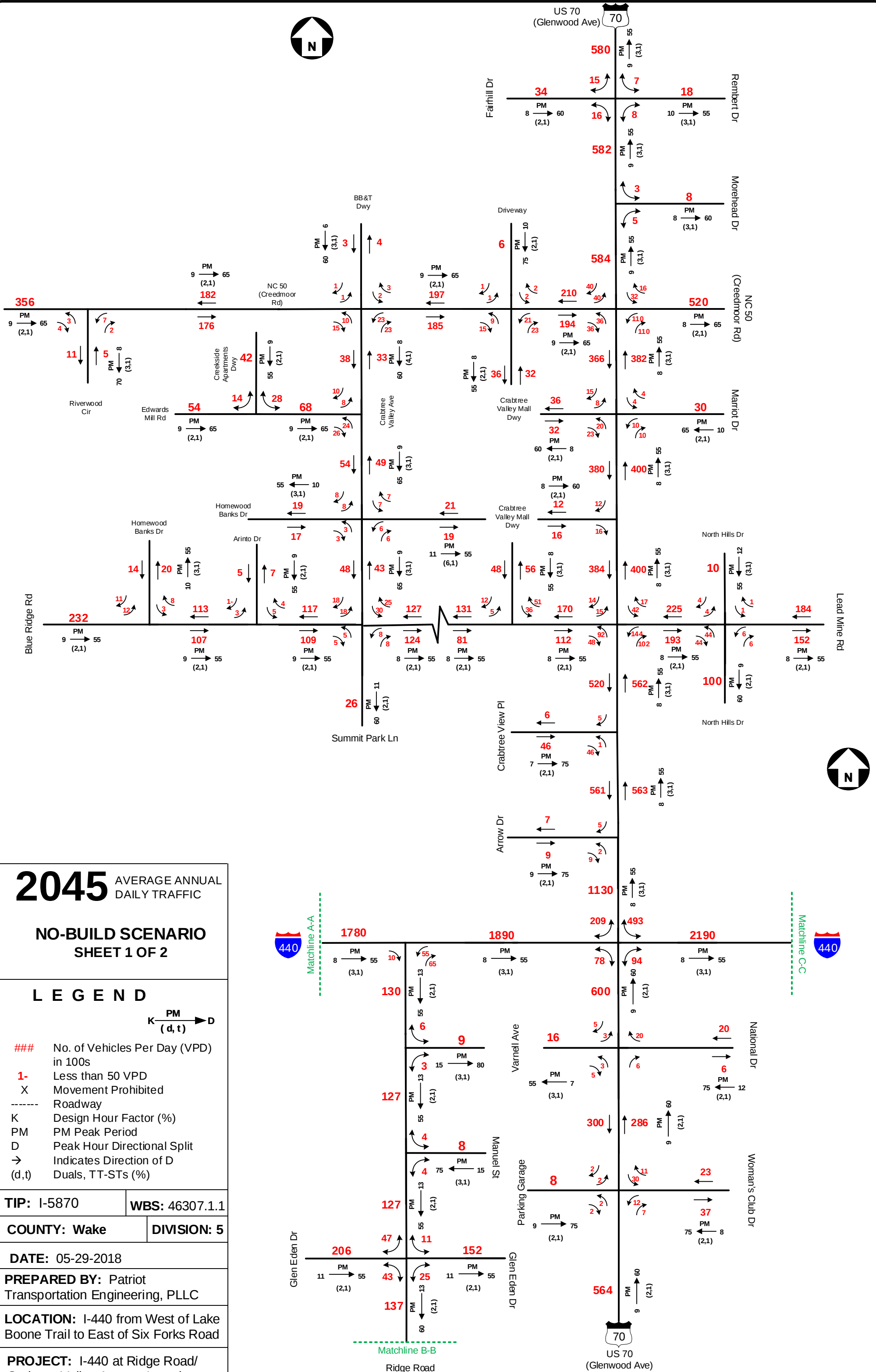
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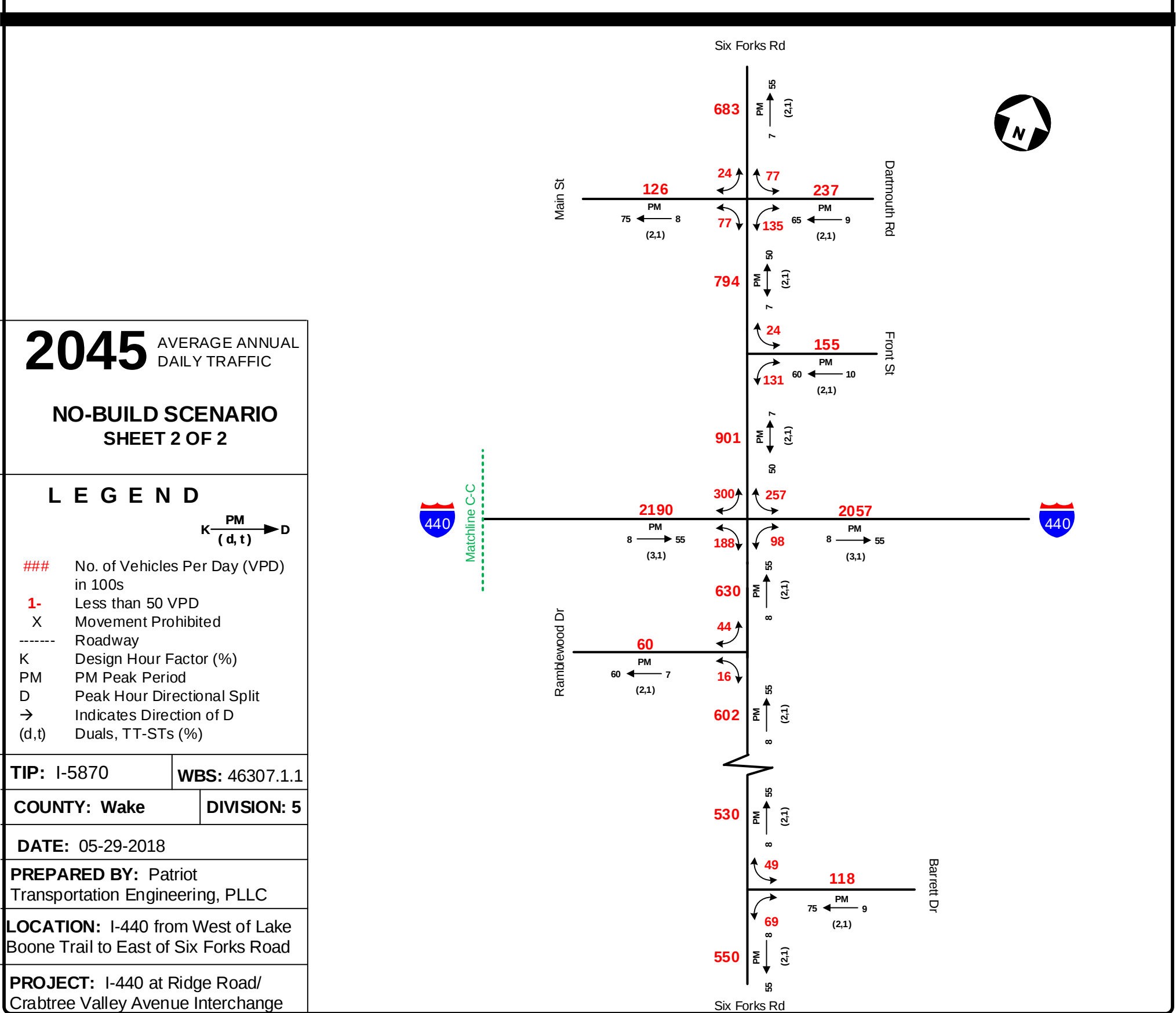
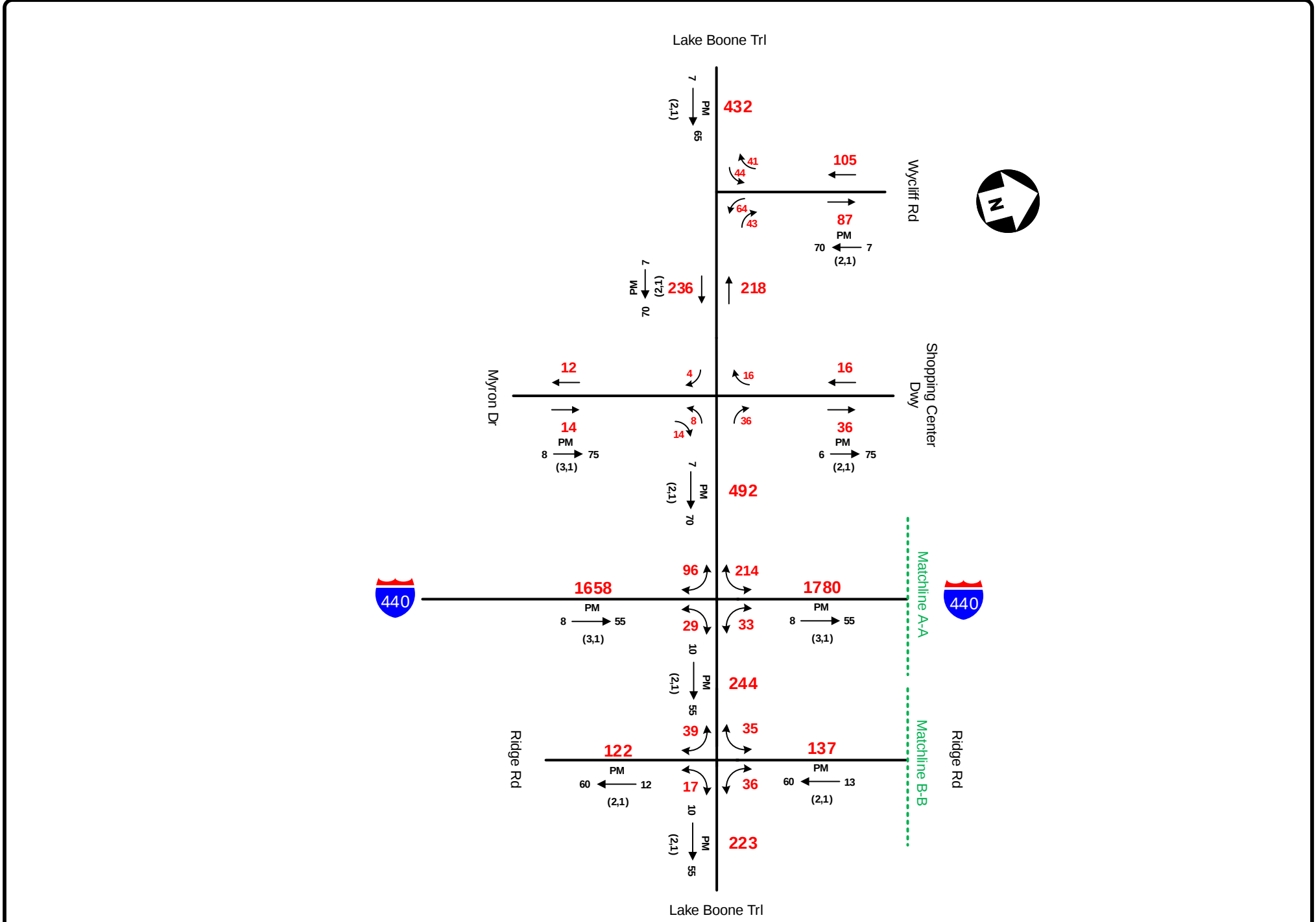
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SHEET 2 OF 2

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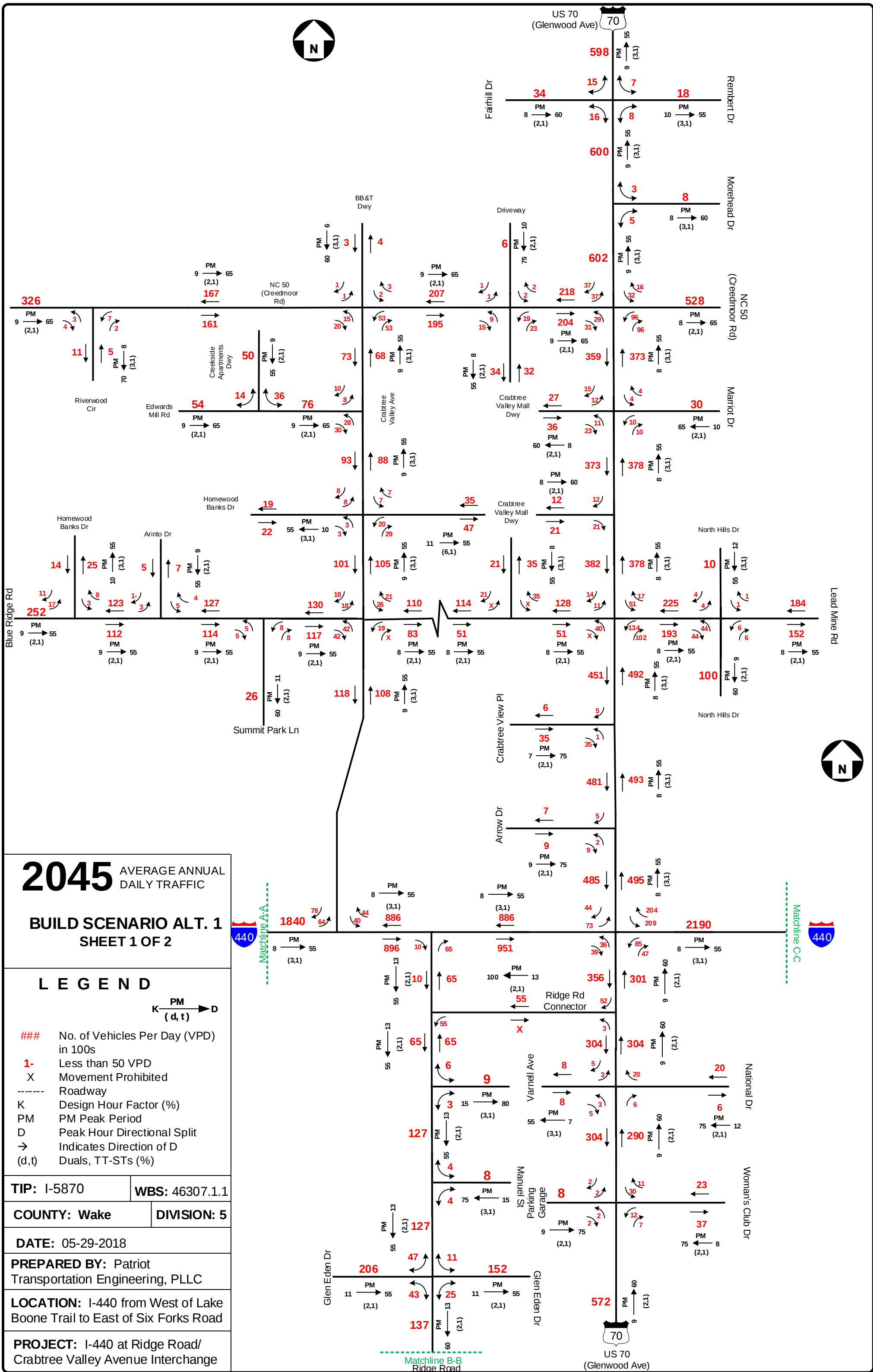
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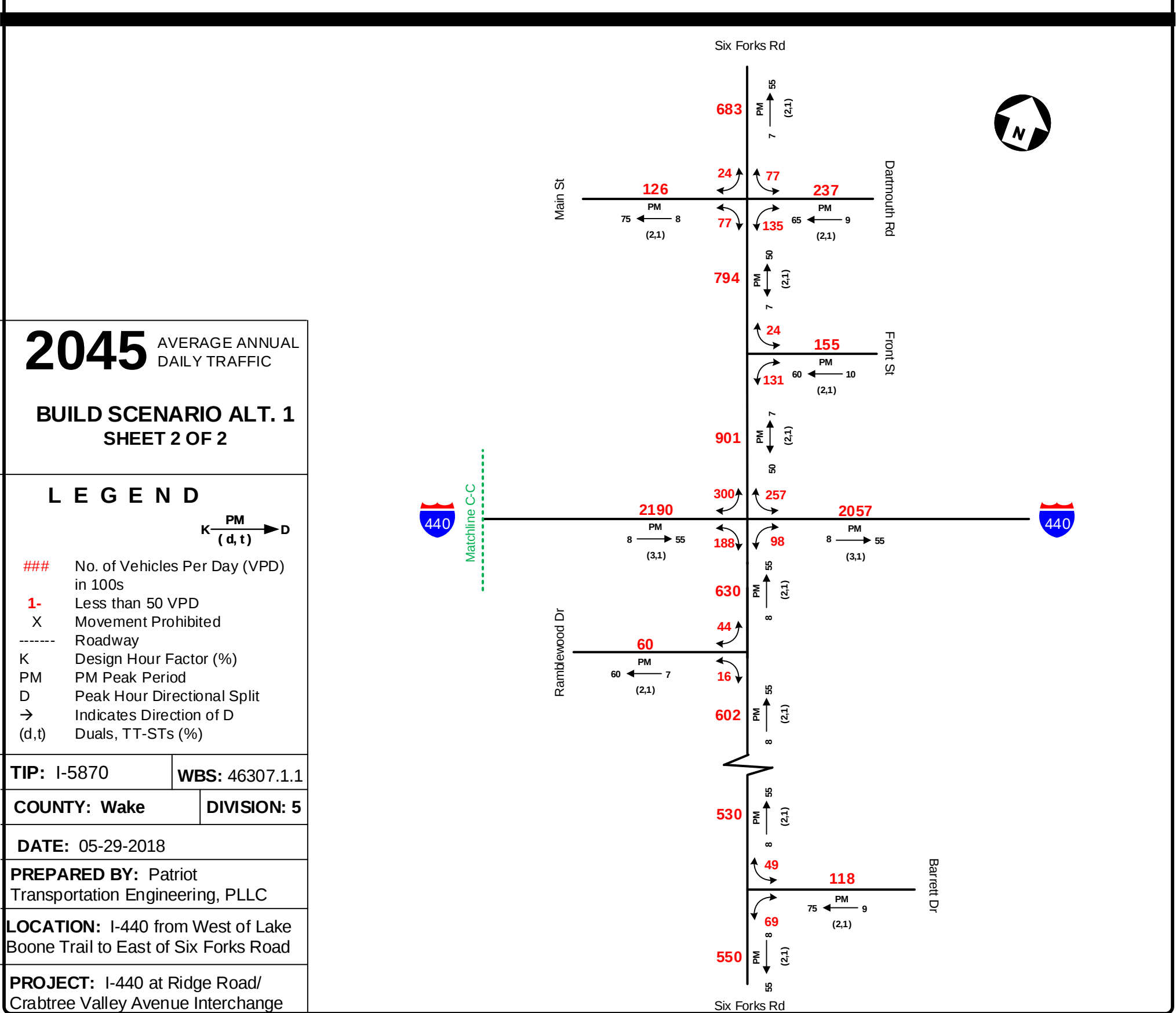
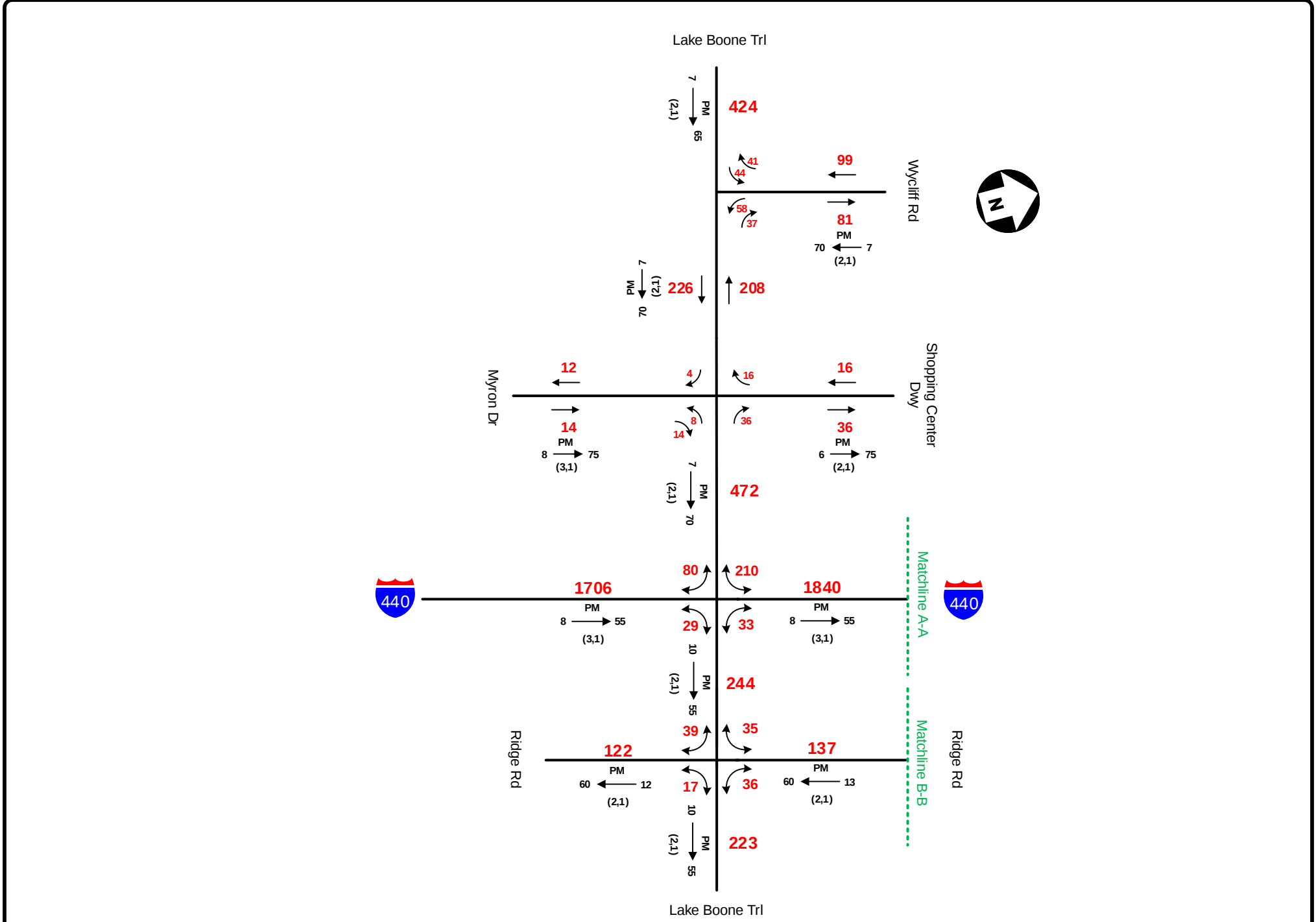
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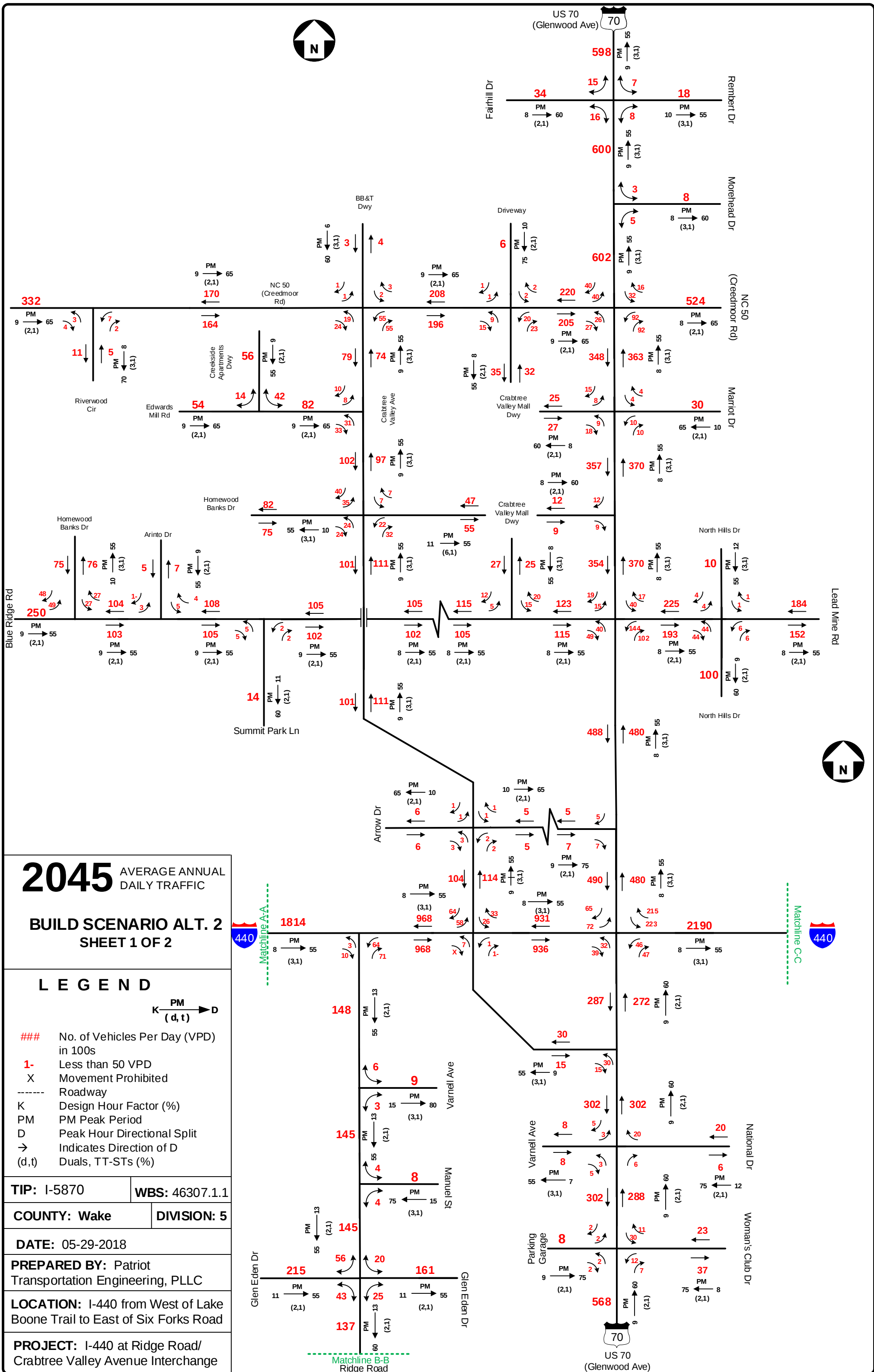
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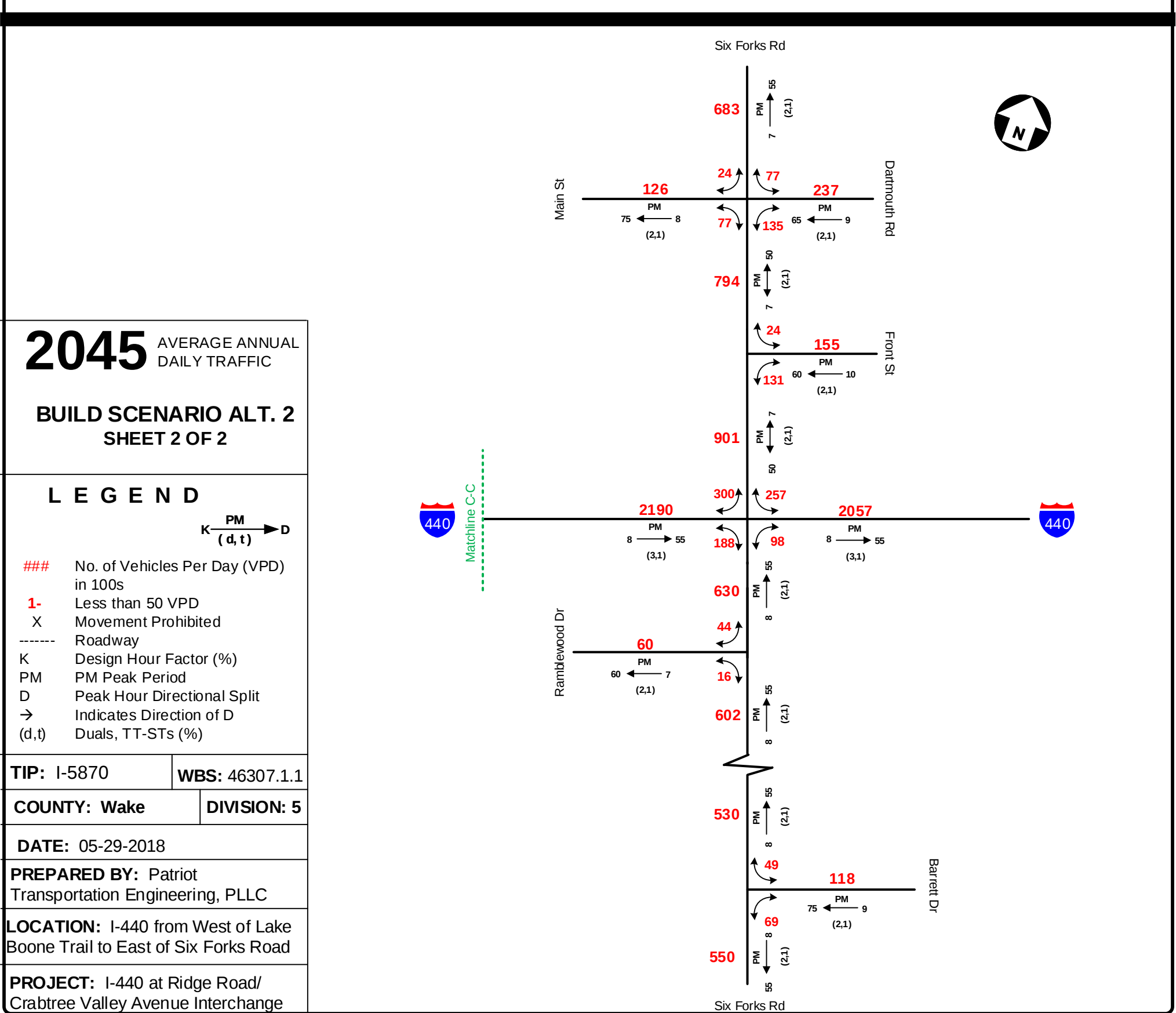
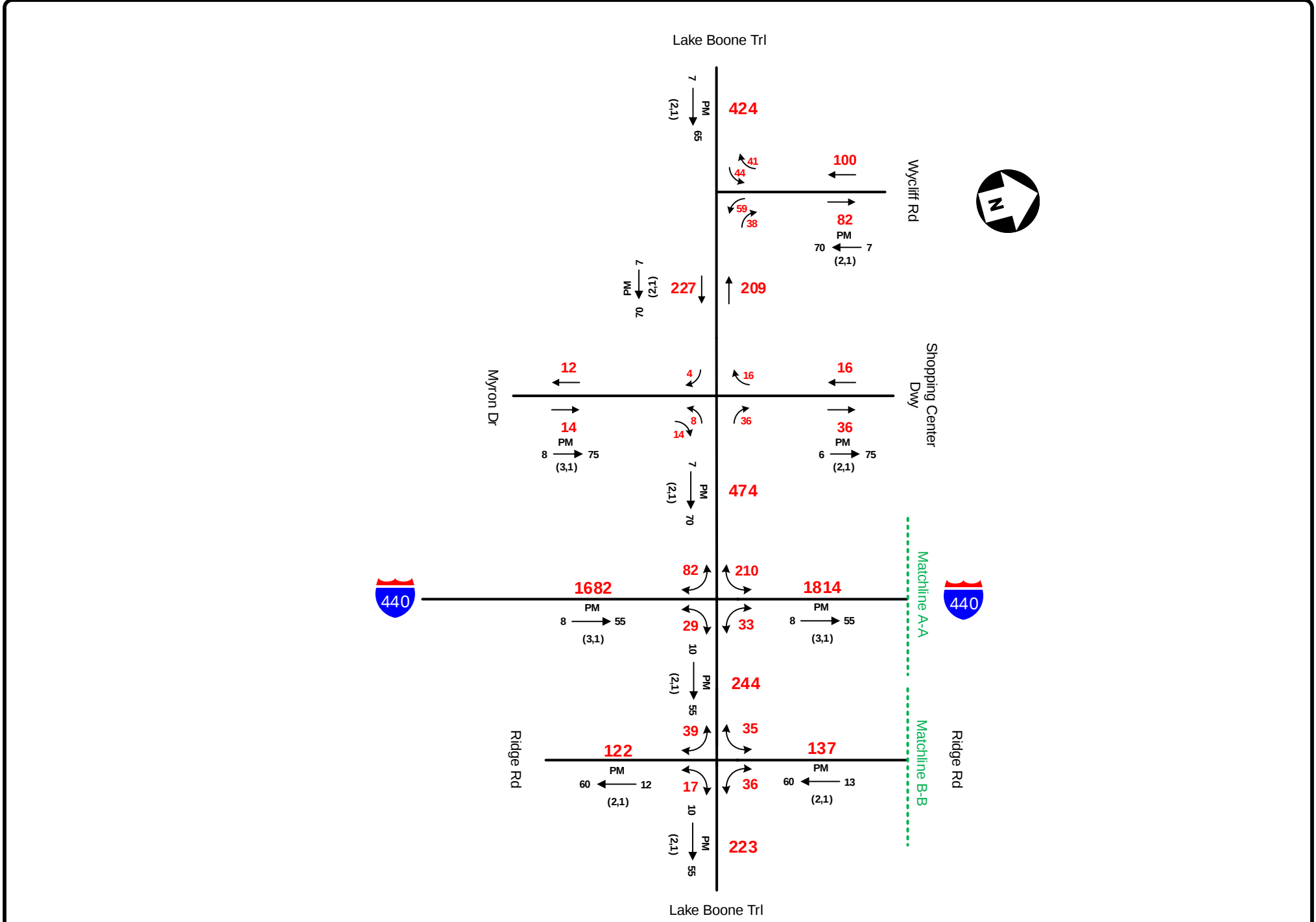
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