Mobile Source Air Toxics Quantitative Analysis

I-35 Capital Express South from US 290/SH 71 to SH 45 Southeast

TxDOT Austin District

CSJs: 0016-01-113 and 0015-13-077

March 2021

The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried-out by TxDOT pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated 12-9-2019, and executed by FHWA and TxDOT.

Table of Contents

List of Figures

Page

List of Tables

Acronyms and Abbreviations

AADT	Average Annual Daily Traffic
ADT	Average daily traffic
AECOM GEC	AECOM General Engineering Consultant on Mobility35 Program
CAAA	Clean Air Act Amendments
CO	Carbon monoxide
CO_2	Carbon dioxide
EPA	U.S. Environmental Protection Agency
FHWA	Federal Highway Administration
FR	*Federal Register*
HEI	Health Effects Institute
I-35	Interstate Highway 35
IRIS	Integrated Risk Information System
MSAT	Mobile Source Air Toxics
NATA	National Air Toxics Assessment
NEPA	National Environmental Policy Act
POM	Polycyclic organic matter
ROW	Right of way
RTP	Regional Transportation Plan
SH 45	State Highway 45
SH 45SE	State Highway 45 Southeast
TAQA	Traffic Air Quality Analysis
TxDOT	Texas Department of Transportation
US 290	U.S. Highway 290
US 71	U.S. Highway 71
VMT	Vehicle miles traveled
vpd	Vehicles per day

INTRODUCTION

The Texas Department of Transportation (TxDOT), is assessing the environmental impacts associated with the Capital Express South project which proposes improvements to Interstate Highway (I-35) South in Austin, Travis County, Texas, from U.S. Highway 290 (US 290)/State Highway 71 (SH 71) to SH 45 Southeast (SH 45SE), with a transition area extending to Main Street in Buda, Hays County. The primary objectives of the proposed project improvements are to improve operational efficiency and manage congestion, provide more reliable travel times, and create a more dependable and consistent route for transit, emergency responders, and other motorists.

Existing Facility

I-35 within the proposed project limits is an access-controlled interstate highway. The facility typically has three to four, 12-foot wide general purpose mainlanes (concrete barrier separated) with 2-foot wide inside shoulders, 4-foot wide outside shoulders, and two to three, 11-foot wide frontage road lanes with 2-foot wide inside and outside shoulders in each direction. Sidewalks and shared-use paths (SUPs) exist intermittently throughout the project area between the frontage roads and adjacent businesses and around the intersections. The existing ROW width is typically 300 to 420 feet.

Proposed Facility

TxDOT is proposing the addition of two managed lanes and certain other corridor improvements on I-35 in Austin, Travis County, Texas, from US 290/SH 71 to SH 45SE. The project location is shown in Figure 1. The project would add non-tolled managed lanes to I-35. The managed lanes will be elevated from north of Stassney Lane to south of William Cannon Drive. These lanes would be designed to achieve the most efficient and reliable travel times. Access to frontage roads would be maintained and ramps would be better optimized for safety and mobility. The proposed roadway would remain controlled access. Existing access to the general-purpose lanes would remain, with some reconstruction of existing entrance and exit ramps. Additionally, all overpass/underpass and bridge locations would remain the same as existing, with some minor reconstruction to accommodate the proposed improvements. The following ingress/egress points to the proposed managed lanes would be provided:

Southbound

- Ingress
  - At SH 71
  - Between Slaughter Creek Overpass and Onion Creek Parkway
- Egress
  - Between Slaughter Creek Overpass and Onion Creek Parkway
  - At SH 45 SE

Northbound

- Ingress
  - At SH 45 SE
  - Between Slaughter Creek Overpass and Slaughter Lane
- Egress
  - At SH 71
  - Between Stassney Lane and SH 71
  - Between William Cannon Drive and Stassney Lane

Following completion of the proposed project, vehicles would access the elevated SB managed lane north of Stassney Lane via two 12-foot lanes. At I-35 and Slaughter Lane, vehicles would be able to access the elevated NB managed lanes from the NB main lanes. Vehicles traveling SB in the managed lanes would be able to access the SB main lanes at designated points. There would also be access to the NB and SB managed lanes and main lanes near SH 45SE.

There would also be new connector-distributor lanes in the following locations. North of Stassney, there would be a connector-distributor lane in the elevated section with a direct connector to SH 71/US 290. There would also be connector distributor lanes on SB I-35 north of William Cannon Drive.

Additionally, new turn lanes at Slaughter Lane and Onion Creek Parkway would allow vehicles to travel more quickly through the intersections because they would not need to wait as long at traffic lights to reach the other side of the frontage road. A proposed south to north turnaround at SH 45SE would also allow vehicles to bypass the intersection and decrease travel times.

The proposed project would add new sidewalks and shared-use paths along the I-35 NB and SB frontage roads from SH 71 to Stassney Lane, and in both NB and SB directions of the frontage road from South Boggy Creek to SH 45SE. Public transit would also be positively impacted as these vehicles would be allowed on the managed lanes and it is anticipated that this access would decrease transit commute times. This improvement will benefit transit-depended populations.

Projects Subject to a Quantitative Mobile Source Air Toxics (MSAT) Analysis

Roadway projects may be subject to a quantitative Mobile Source Air Toxics (MSAT) analysis if the project will add capacity, is a Federal Highway Administration (FHWA) and/or Federal Transit Administration (FTA) project, has a design year annual average daily traffic (AADT) greater than 140,000 vehicles per day (vpd), affects a major intermodal facility or port located in proximity to a populated area, or public concern has been raised regarding MSAT emissions. The proposed project would increase capacity and the AADT in the design year is above 140,000 vpd; therefore, a quantitative MSAT analysis is required. This assessment is based on the issues discussed and the resolutions agreed upon during a conference call with TxDOT ENV and AECOM GEC on June 18, 2019. Notes from this coordination call may be found Appendix A.

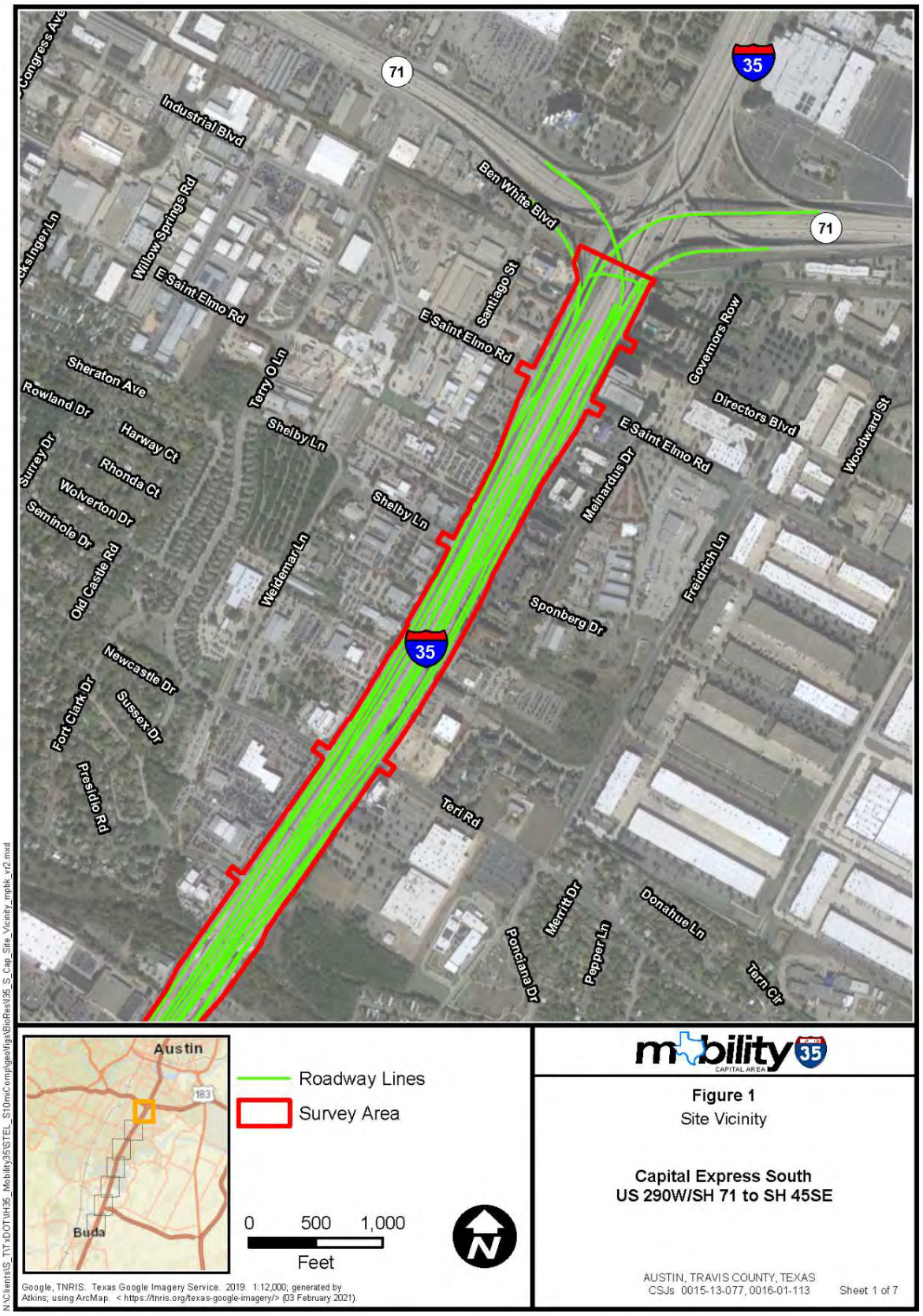

Figure 1: Project Vicinity Map

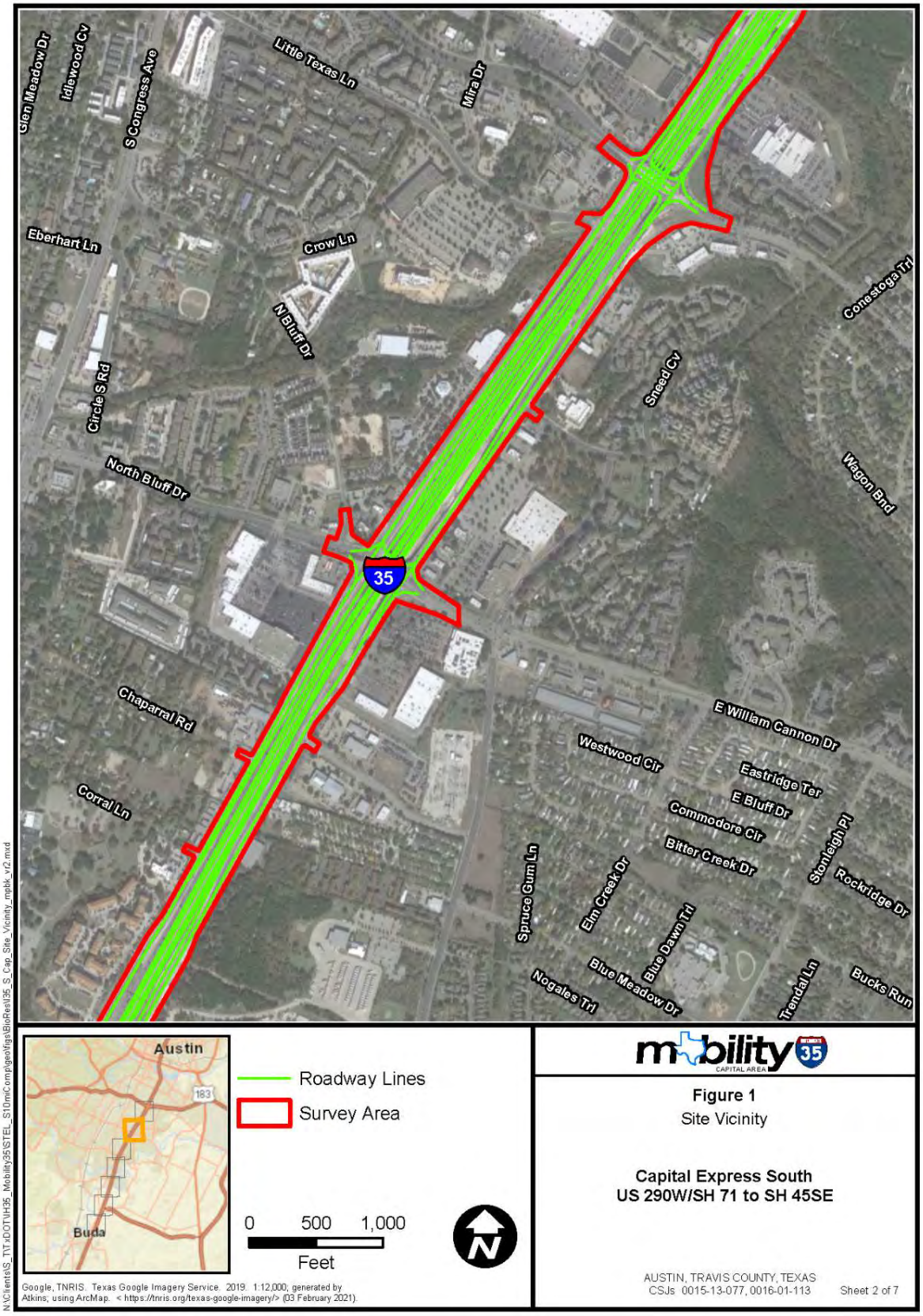

Figure 1: Project Vicinity Map (2 of 7)

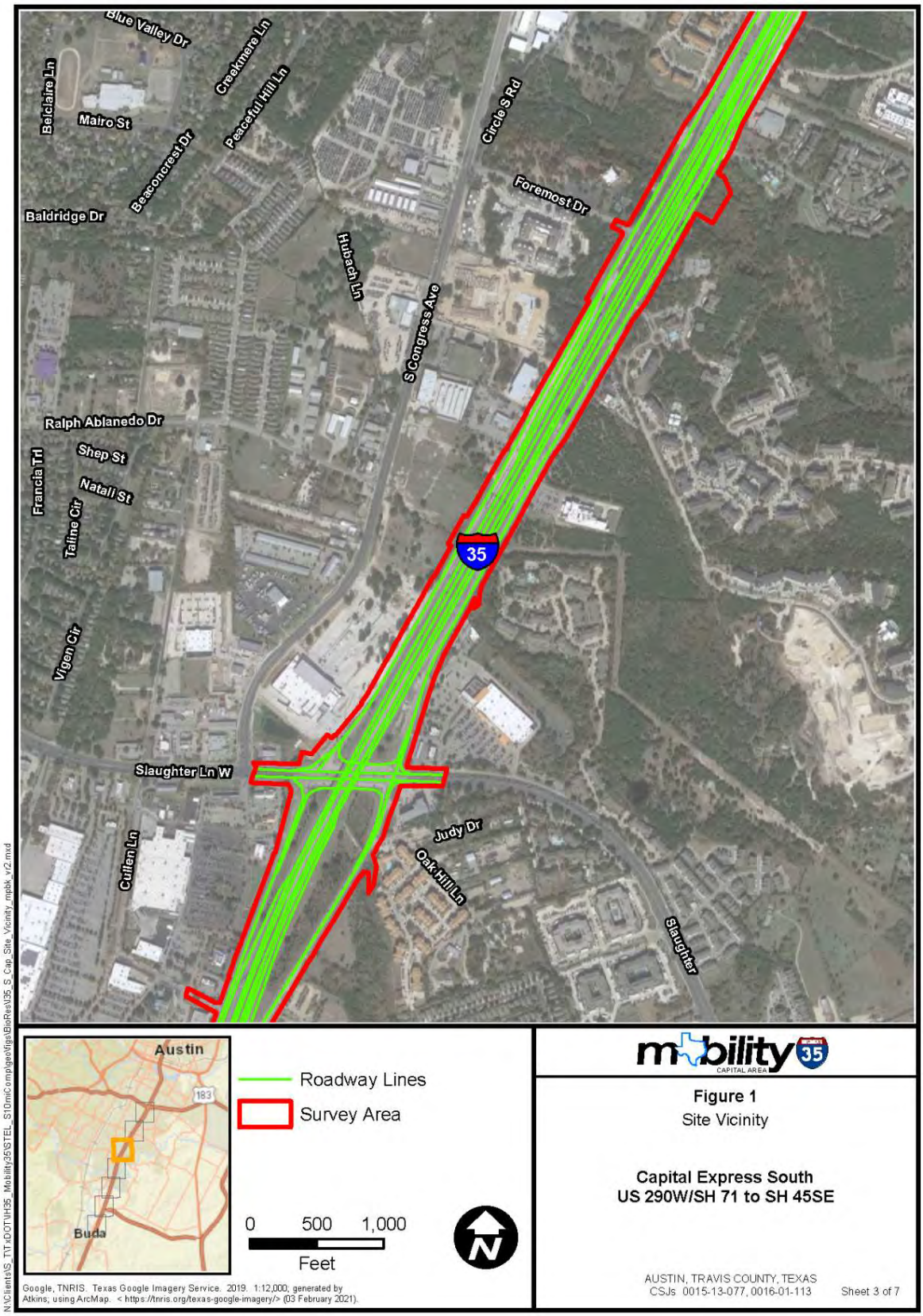

Figure 1: Project Vicinity Map (3 of 7)

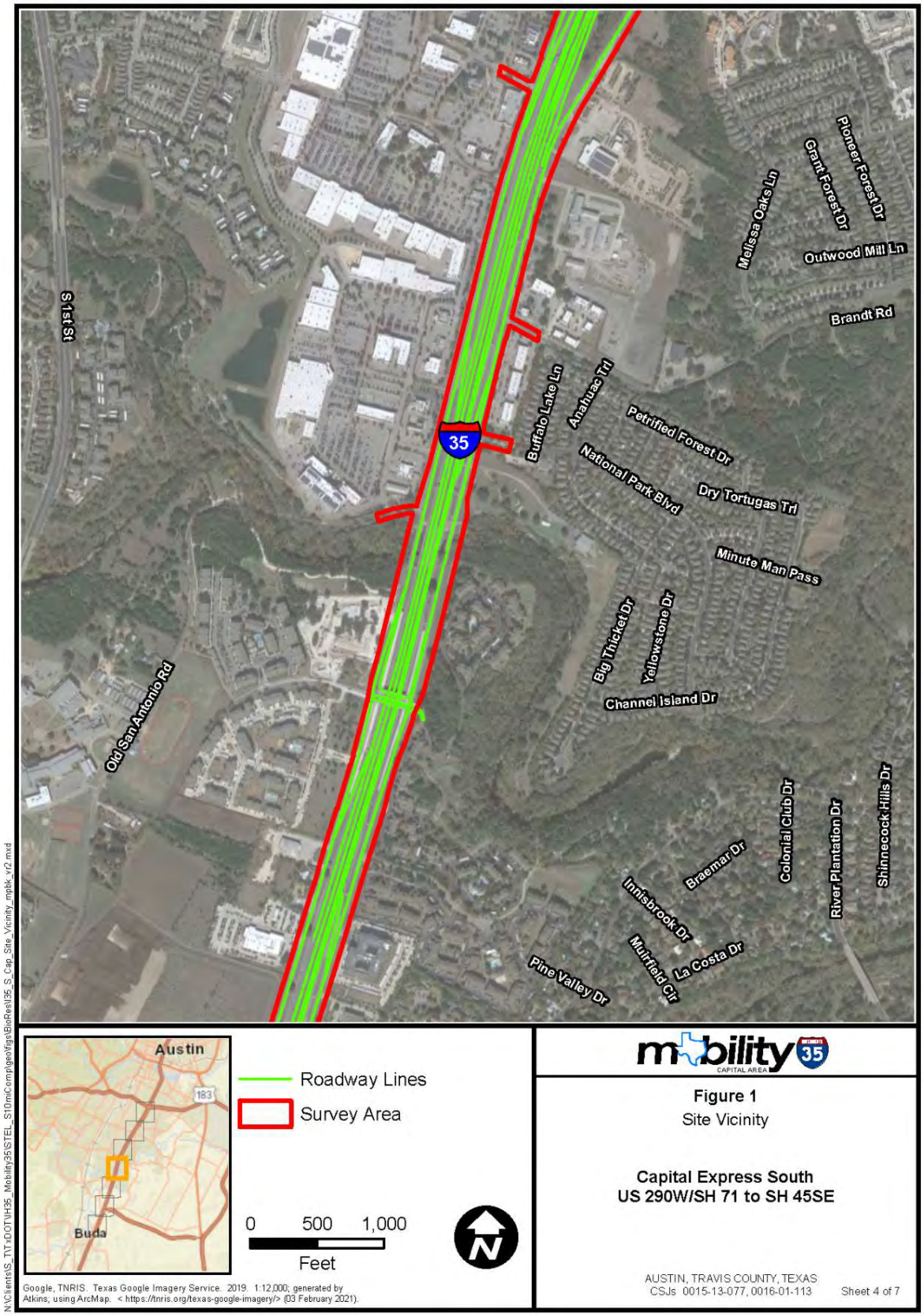

Figure 1: Project Vicinity Map (4 of 7)

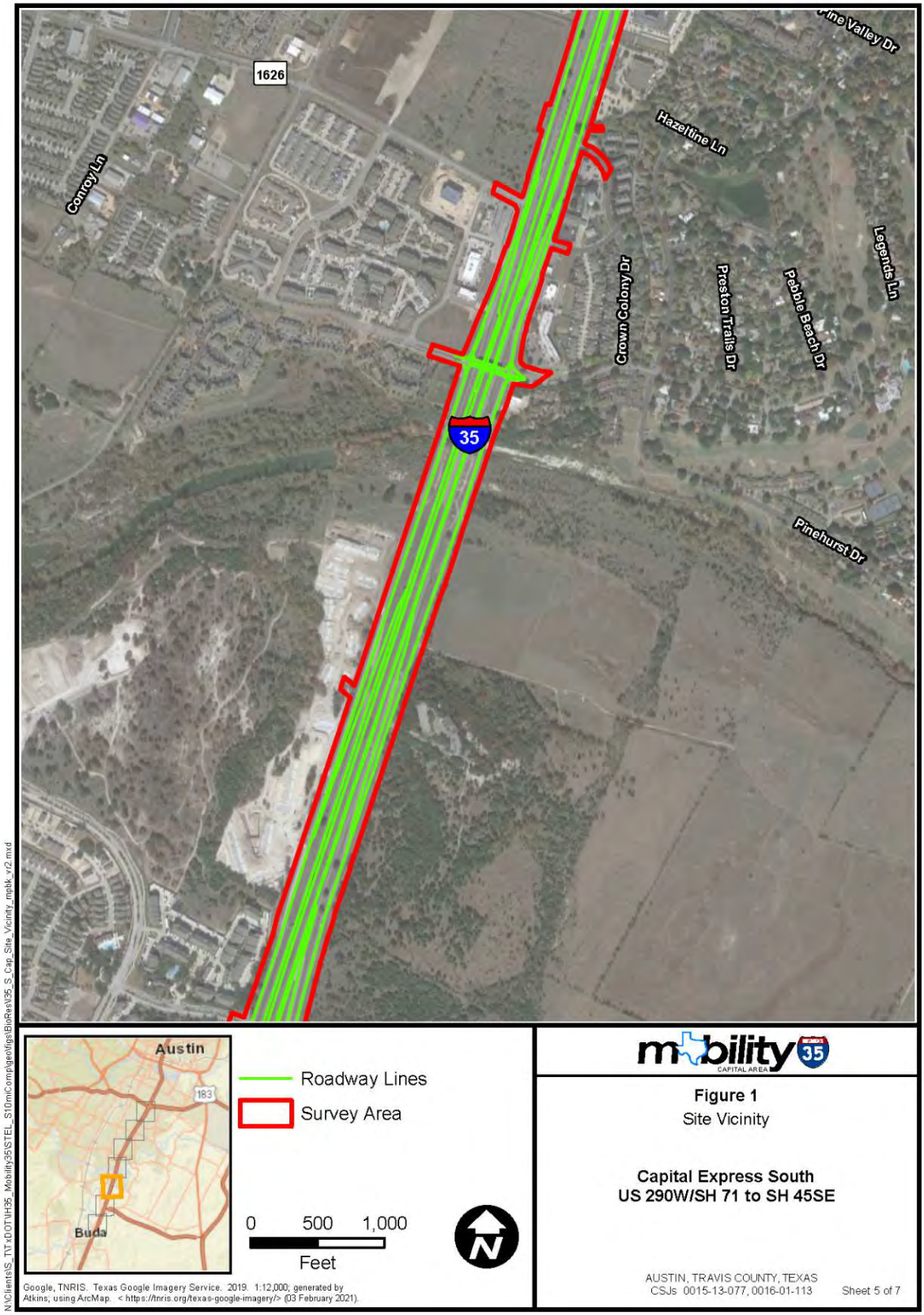

Figure 1: Project Vicinity Map (5 of 7)

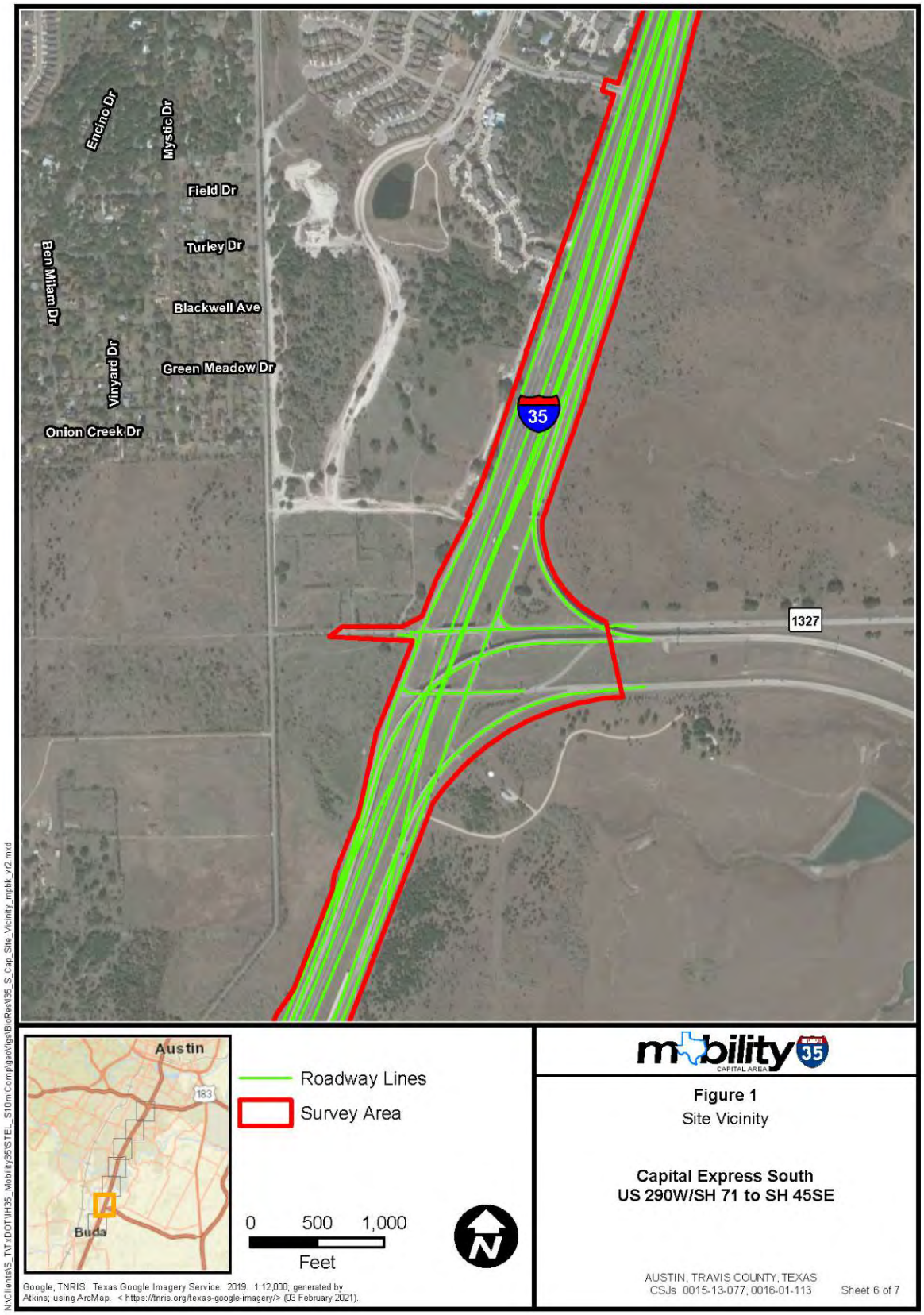

Figure 1: Project Vicinity Map (6 of 7)

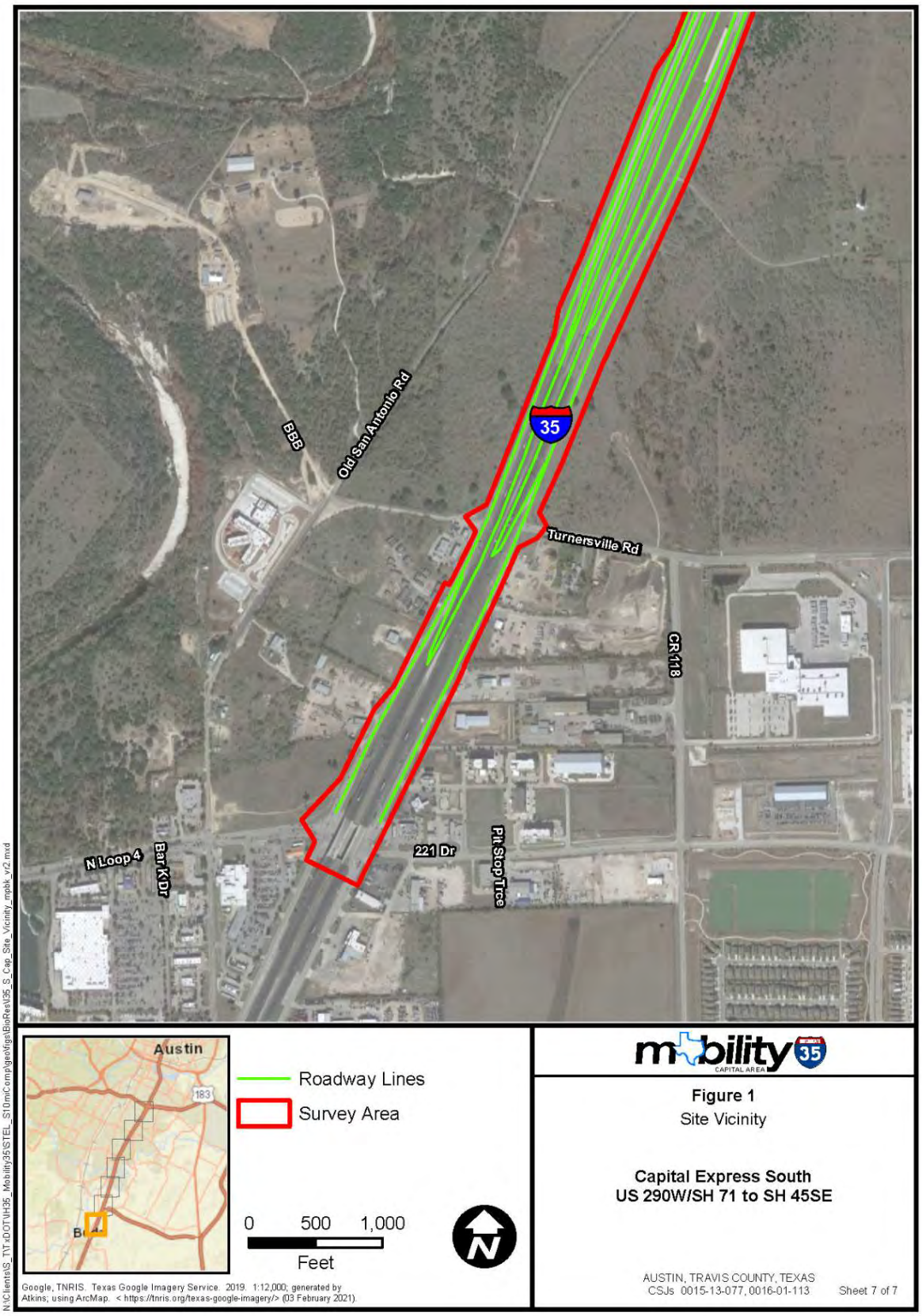

Figure 1: Project Vicinity Map (7 of 7)

QUALITATIVE MSAT ANALYSIS

Background

Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments (CAAA) of 1990, whereby Congress mandated that the U.S. Environmental Protection Agency (EPA) regulate 188 air toxics, also known as hazardous air pollutants. The EPA has assessed this expansive list in their latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (*Federal Register*, Vol. 72, No. 37, page 8430, February 26, 2007), and identified a group of 93 compounds emitted from mobile sources that are listed in their Integrated Risk Information System (IRIS).[1] In addition, EPA identified nine compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers or contributors and non-cancer hazard contributors from the 2011 National Air Toxics Assessment (NATA).[2] These are 1,3-butadiene, acetaldehyde, acrolein, benzene, diesel particulate matter (diesel PM), ethylbenzene, formaldehyde, naphthalene, and polycyclic organic matter (POM). While FHWA considers these the priority MSAT, the list is subject to change and may be adjusted in consideration of future EPA rules.

Motor Vehicle Emissions Simulator (MOVES)

According to EPA, MOVES2014 is a major revision to MOVES2010 and improves upon it in many respects. MOVES2014 includes new data, new emissions standards, and new functional improvements and features. It incorporates substantial new data for emissions, fleet, and activity developed since the release of MOVES2010. These new emissions data are for light- and heavy-duty vehicles, exhaust and evaporative emissions, and fuel effects. MOVES2014 also adds updated vehicle sales, population, age distribution, and vehicle miles traveled (VMT) data. MOVES2014 incorporates the effects of three new Federal emissions standard rules not included in MOVES2010. These new standards are all expected to impact MSAT emissions and include Tier 3 emissions and fuel standards starting in 2017 (79 FR 60344), heavy-duty greenhouse gas regulations that phase in during model years 2014-2018 (79 FR 60344), and the second phase of light duty greenhouse gas regulations that phase in during model years 2017-2025 (79 FR 60344). Since the release of MOVES2014, EPA has released MOVES2014a and MOVES2014b. In the November 2015 "MOVES2014a Questions and Answers Guide"[3], EPA states that for on-road emissions, MOVES2014a adds new options requested by users for the input of local VMT, includes minor updates to the default fuel tables, and corrects an error in MOVES2014 brake wear emissions. The change in brake wear emissions results in small decreases in PM emissions, while emissions for other criteria pollutants remain essentially the same as MOVES2014.

Using EPA's MOVES2014a model, as shown in Figure 2, FHWA estimates that even if VMT increases by 45 percent from 2010 to 2050 as forecast, a combined reduction of 91 percent in the total annual emissions for the priority MSAT is projected for the same time period.

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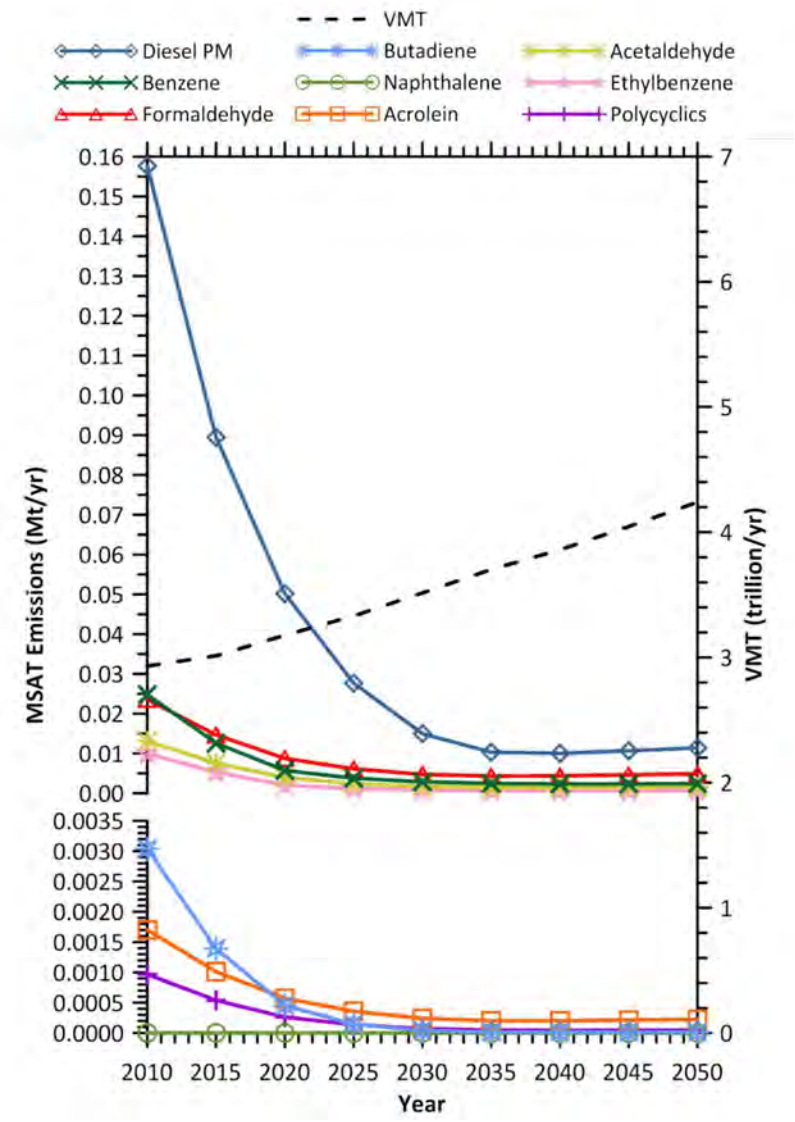
[1] http://www.epa.gov/iris/

[2] https://www.epa.gov/national-air-toxics-assessment

[3] https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100NNR0.txt),



Source: EPA MOVES2014a model runs conducted by FHWA, September 2016.

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

Figure 2: FHWA Projected National MSAT Emission Trends 2010–2050 for Vehicles Operating on Roadways Using EPA's MOVES2014a Model

Diesel PM is the dominant component of MSAT emissions, making up 50 to 70 percent of all priority MSAT pollutants by mass, depending on calendar year. Users of MOVES2014a will notice some differences in emissions compared with MOVES2010b. MOVES2014a is based on updated data on some emissions and pollutant processes compared to MOVES2010b, and also reflects the latest Federal emissions standards in place at the time of its release. In addition, MOVES2014a emissions forecasts are based on lower VMT projections than MOVES2010b, consistent with recent trends suggesting reduced nationwide VMT growth compared to historical trends.

MSAT Research

Air toxics analysis is a continuing area of research. While much work has been done to assess the overall health risk of air toxics, many questions remain unanswered. In particular, the tools and techniques for assessing project-specific health outcomes as a result of lifetime MSAT exposure remain limited. These limitations impede the ability to evaluate how potential public health risks posed by MSAT exposure should be factored into project-level decision-making within the context of NEPA. The FHWA, EPA, the Health Effects Institute, and others have funded and conducted research studies to try to more clearly define potential risks from MSAT emissions associated with highway projects. The FHWA will continue to monitor the developing research in this field.

Project Specific MSAT Information

A qualitative analysis provides a basis for identifying and comparing the potential differences among MSAT emissions, if any, from the various alternatives. The qualitative assessment presented below is derived in part from a study conducted by FHWA entitled *A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives.*[4]

Under all Build Alternatives in the design year, it is expected there would be reduced MSAT emissions in the immediate area of the project, relative to the No Build Alternative, due to the reduced VMT associated with more direct routing. Under each alternative there may be localized areas where VMT would increase, and other areas where VMT would decrease. Therefore, it is possible that localized increases and decreases in MSAT emissions may occur. The localized increases in MSAT emissions would likely be most pronounced along the new roadway sections that would be built along I-35 between SH 71 and Stassney Lane. However, the magnitude and the duration of these potential increases compared to the No Build alternative cannot be reliably quantified due to incomplete or unavailable information in forecasting project-specific MSAT health impacts. Also, regardless of the alternative chosen, emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce annual MSAT emissions by over 90 percent from 2010 to 2050.[5] Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after

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[4] https://www.fhwa.dot.gov/environment/air_quality/air_toxics/research_and_analysis/mobile_source_air_toxics/msatemissions.cfm

[5] Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents, Federal Highway Administration, October 2016 - https://www.fhwa.dot.gov/environment/air_quality/air_toxics/policy_and_guidance/msat/index.cfm

accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in virtually all locations.

Incomplete or Unavailable Information for Project-Specific MSAT Health Impacts Analysis

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action. Consistent with 40 CFR 1502.22 (regarding incomplete and unavailable information) FHWA does not conduct MSAT health impacts for the reasons described below.

The EPA is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the Clean Air Act and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the Integrated Risk Information System (IRIS), which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects".[6] Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). A number of HEI studies are summarized in Appendix D of FHWA's *Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents.*[7] Among the adverse health effects linked to MSAT compounds at high exposures are; cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations (HEI Special Report 16)[8] or in the future as vehicle emissions substantially decrease.

The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then final determination of health impacts – each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70 year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable.

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[6] EPA, https://www.epa.gov/iris

[7] http://www.fhwa.dot.gov/environment/air_quality/air_toxics/policy_and_guidance/msat/index.cfm

[8] https://www.healtheffects.org/publication/mobile-source-air-toxics-critical-review-literature-exposure-and-health-effects

It is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways; to determine the portion of time that people are actually exposed at a specific location; and to establish the extent attributable to a proposed action, especially given that some of the information needed is unavailable.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI.[9] As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA states that with respect to diesel engine exhaust, "[t]he absence of adequate data to develop a sufficiently confident dose-response relationship from the epidemiologic studies has prevented the estimation of inhalation carcinogenic risk."[10]

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the Clean Air Act to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires EPA to determine an "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA's approach to addressing risk in its two-step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than deemed acceptable.[11]

QUANTITATIVE MSAT ANALYSIS

Analysis Methodology

A quantitative MSAT analysis was conducted consistent with *TxDOT's Environmental Guide: Volume 2 Activity Instructions, July 2020* and the *Documentation Standard for a Quantitative MSAT Technical Report, July 2020.* For this project, three study scenarios, 2018 Existing, 2045 No-Build, and 2045 Build were selected for the quantitative MSAT analysis.

A project links method was used for the MSAT analysis. These links include all roadways within the project study limits along I-35 including general purpose lanes, express lanes, frontage roads, direct connectors, and

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[9] Special Report 16, https://www.healtheffects.org/publication/mobile-source-air-toxics-critical-review-literature-exposure-and-health-effects

[10] EPA IRIS database, Diesel Engine Exhaust, Section II.C. https://cfpub.epa.gov/ncea/iris/iris_documents/documents/subst/0642_summary.pdf

[11] https://www.cadc.uscourts.gov/internet/opinions.nsf/284E23FFE079CD59852578000050C9DA/$file/07-1053-1120274.pdf

ramps. The project roadway lines are shown in Figure 1. Traffic data for each analysis year and build scenario are provided in Appendix B.

Emissions factors from TxDOT's Emission Rate Look-up Tables for MSAT were used for this analysis. These tables provide emission rates in grams/vehicle mile traveled for the years 2010 through 2040 for several areas in Texas, including the Austin area. Emission factors are listed based on the year being analyzed, the type of roadway, and average vehicle speed. Separate emission factors were used for each analysis year (2018 and 2045) and build scenario. Although the look-up tables only provide emission factors through the year 2040, the emission factors for the year 2040 were utilized to represent emissions for the project year 2045. This a conservative assumption as vehicle emissions are generally reduced as newer, cleaner emitting vehicles enter the vehicle fleet each year. Only the VMT from the portions of the roadways included in the MSAT project links, as illustrated in Figure 1, were included in the MSAT analysis. The summary of the analysis tables is provided in Appendix C.

MSAT Analysis Results

MSAT emissions from this project were estimated for a base year (2018) and the project design year (2045). For the project design year, emissions were calculated for a No-Build condition and a Build condition in which the effects of the project are accounted for. The results were compared to the base year 2018 and to each other to determine the overall trend in emissions over time, as well as the emission impacts due to the project in key years. Table 1 summarizes the MSAT emissions by pollutant and total MSAT emissions in each modeled year and scenario. This table also shows the corresponding vehicle miles traveled (VMT) total associated with these emissions and summarizes the percent difference in MSAT emissions in each modeled year and scenario.

Table 1: Annual MSAT Emissions by Year, Scenario, and Pollutant

MSATs	Emissions (tons/year)				
	2018	2045		Change Between 2045 Build and 2045 No-Build	Change between 2045 Build and 2018 Existing
	Existing	No-Build	Build	Difference %	Difference %
Benzene	0.84	0.28	0.27	-3.6	-68.4
1,3- Butadiene	0.09	0.002	0.002	-0.1	-98.0
Formaldehyde	1.09	0.58	0.58	-0.7	-47.0
Acrolein	0.07	0.03	0.03	-0.7	-61.7
Naphthalene	0.12	0.05	0.05	-1.0	-60.3
Acetaldehyde	0.51	0.19	0.19	-0.8	-62.4
Ethylbenzene	0.42	0.19	0.19	-1.1	-54.7
POM	0.05	0.01	0.01	-3.0	-72.5
Diesel PM	5.71	1.09	1.08	-0.8	-81.0
Total Emissions	**8.91**	**2.43**	**2.40**	**-1.1**	**-73.1**
Annual VMT (million miles)	**605**	**929**	**901**	**-3.1**	**49.0**

The differences are shown graphically in Figures 3 and 4.

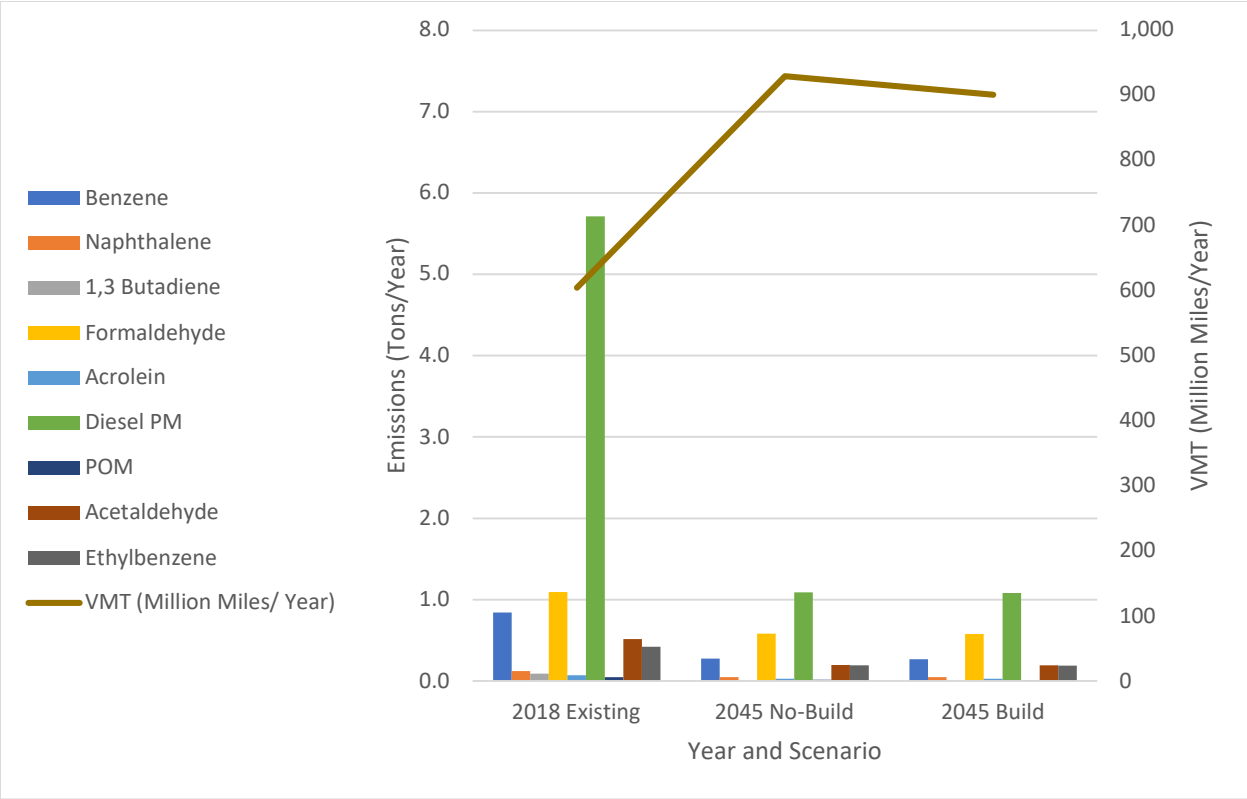


Figure 3: Primary MSAT Emissions by Year and Scenario Versus VMT

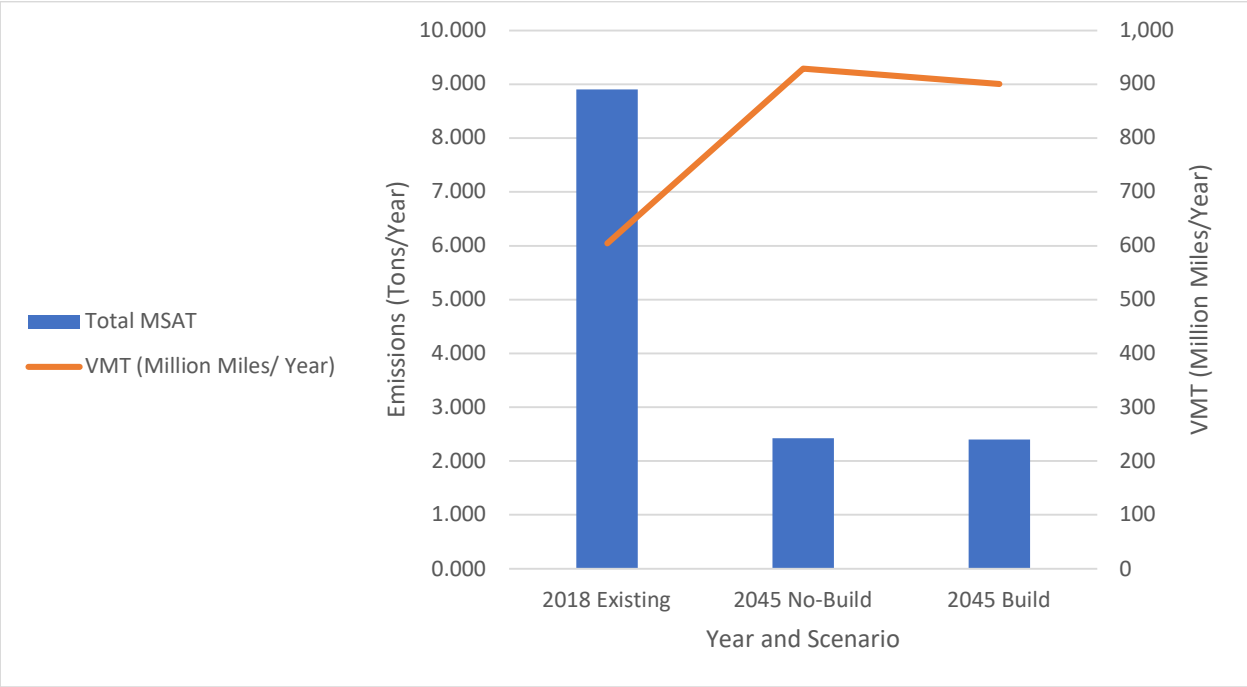


Figure 4: Total MSAT Emissions by Year and Scenario Versus VMT

As shown in Table 1, the MSAT emissions evaluated all decrease when comparing the 2045 Build scenario with No-Build scenario. In addition, when compared to the No-Build scenario, the total MSAT emissions from the project show a decrease of 1.1 percent in the 2045 Build scenario compared to the No-Build scenario. When compared to the 2018 existing conditions, the total MSAT emissions are estimated to decline by about 73 percent from 2018 to 2045 if the project is constructed. These reductions occur despite projected increases in VMT from 2018 to the 2045 Build scenarios of about 49 percent.

EPA's stringent vehicle emission and fuel regulations, combined with fleet turnover, are expected to substantially lower fleet average emission rates for MSATs in the future relative to today. Overall, best available information indicates that, nationwide, regional levels of MSATs are expected to decrease in the future due to fleet turnover and the continued implementation of more stringent emission and fuel quality regulations. Nevertheless, it is possible that some localized areas may show an increase in emissions and ambient levels of these pollutants due to locally increased traffic levels associated with the project.

MSAT Conclusion

Both the Build and No Build Alternative in the design year are expected to be associated with lower levels of MSAT emissions compared to the base year. This analysis shows an emissions reduction from the No-Build to the Build scenarios in 2045. The No-Build scenario has slightly higher emissions than the Build scenario due to the slightly reduced VMT associated with more direct routing in the Build Alternative. EPA's vehicle and fuel regulations are expected to result in substantially lower MSAT levels in the future than exist today due to cleaner engine standards coupled with fleet turnover. The magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area will be substantially lower in the future than they are today, regardless of the scenario (No-Build or Build) chosen.

Appendix A

MSAT Consultative Call Meeting Minutes

Meeting Minutes

Project Names	Capital Express North / South Projects	Job #/CSJ	0015-10-062, 0015-13-077
Meeting Location	Conference Call	Meeting Date	6/18/2019
Meeting Purpose	Air Quality Approach Discussion		

Attendees:

Tim Wood	TxDOT ENV
Bill Tillar	AECOM GEC
Ryan Ingram	AECOM GEC

The following represents the undersigned's understanding of the issues discussed and the resolutions agreed upon. Any objection to any item(s) in these minutes must be submitted in writing to the undersigned within ten (10) calendar days of the issue date of these minutes or these minutes shall become part of the permanent project record.

Discussion Topics:

1. Introductions
2. Overview
    a. Project Description
        i. Capital Express North (I-35 from SH 45N to US 290E)
            1. This project is being environmentally cleared as an Environmental Assessment (EA) and mainly consists of adding one managed lane (HOV 2+) in each direction within the limits.
        ii. Capital Express South (I-35 from US 290W /SH 71 to SH 45SE)
            1. This project is being environmentally cleared as an Environmental Assessment (EA) and mainly consists of adding two managed lanes (HOV 2+) in each direction within the limits.
    b. Reason for Call
        i. The call was held to discuss the years of analysis required for MSAT and CO TAQA. The project is added capacity and has AADT > 140,000.
    c. The project's anticipated environmental approval date: North: December 2020, South: December 2020.

i. The estimated time to completion (ETC) year: North: 2025, South: 2024 (ETC refers to the conclusion of construction and the opening year of the project.)

3. MSAT Analysis
    a. The appropriate base year and design year to analyze in the MSAT analysis (both projects).
        i. Base year: 2018
        ii. Design/horizon year: 2045
    b. An interim year would not be required for either project.
    c. Methodology for determining the affected network:
        i. If traffic data has been developed from a corridor travel demand model (TDM), then all links within the corridor analysis should be analyzed using the standard +/- 5 percent affected network method will be used for the project per TxDOT's air quality toolkit.
        ii. Otherwise, only the project links will be included in the MSAT analysis.
    d. MSAT emission rate tables are available and 2040 tables should be used since 2045 tables have not been developed.
4. CO TAQA
    a. Discuss ETC and design year for analysis
        i. ETC year would be 2025 (North) and 2024 (South)
        ii. The design/horizon year for both projects is 2045
    b. Use CAL3QHC model for analysis
5. GHG
    a. GHG analysis not required for either project since each document is an EA.

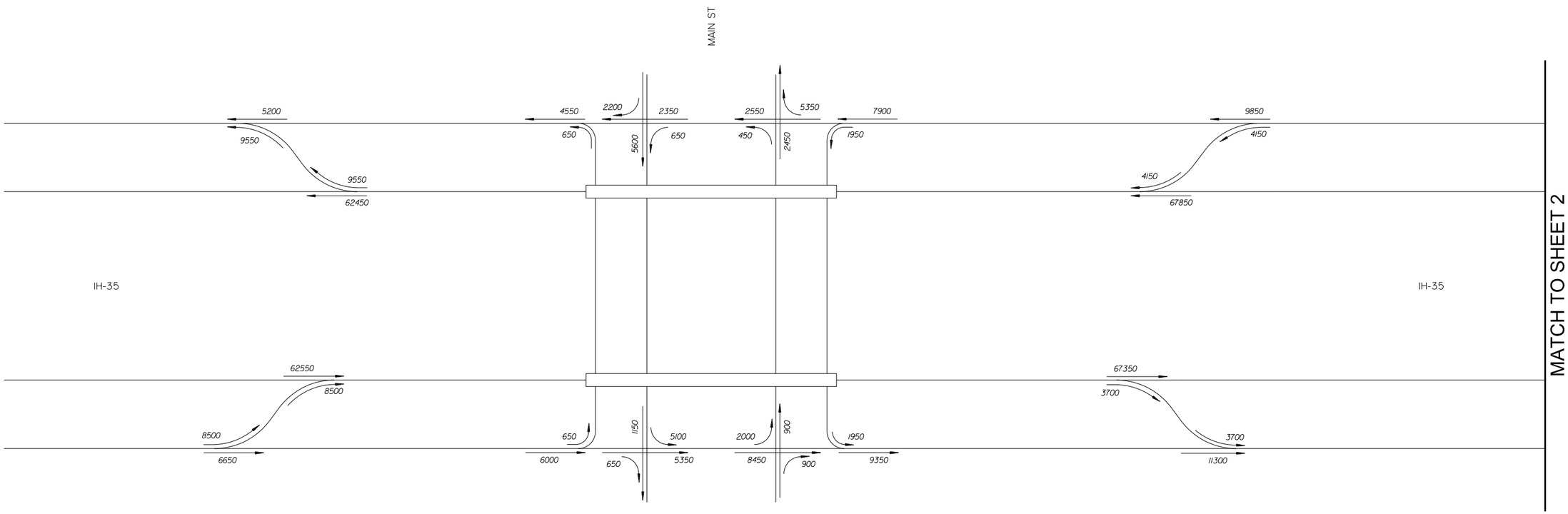
Action Items:

1. GEC will have a call with traffic consultant to determine when Build and No-Build traffic will be available for 2045. Bill/Ryan to follow-up with Tim after data is received. Analysis requirements for MSAT and CO TAQA may be revised based on comparison of 2045 No Build vs Build traffic volumes.

Appendix B

Traffic Data

2018 EXISTING CONFIGURATION



2018 FORECASTED AVERAGE DAILY TRAFFIC VOLUMES
AND TURNING MOVEMENTS AT SPECIFIED POINTS ALONG
IH-35 FROM MAIN ST TO HESTER'S CROSSING ROAD
AND US 290 FROM AIRPORT BLVD TO US 183

LEGEND

1000 - 2018 ADT
LD - LOWER DECK
UD - UPPER DECK
→ TRAVEL DIRECTION

NOT TO SCALE

ATG ALLIANCE TRANSPORTATION GROUP
TBPE Firm Registration No. F - 812

Texas Department of Transportation

CAPITAL EXPRESS
2018 EXISTING CONFIGURATION
24 HOUR VOLUMES
(SHEET 1 OF 28)

SCALE : N.T.S.		PROJECT NO.		
DWN: TH	CKD: HH			
STATE	STATE DISTRICT	FED. RD. DIV. NO.	COUNTY	
TEXAS	14	6	HAYS	
CONTROL	SECTION	JOB	HWY. NO.	SHEET NO.
5000	00	106	IH-35	1

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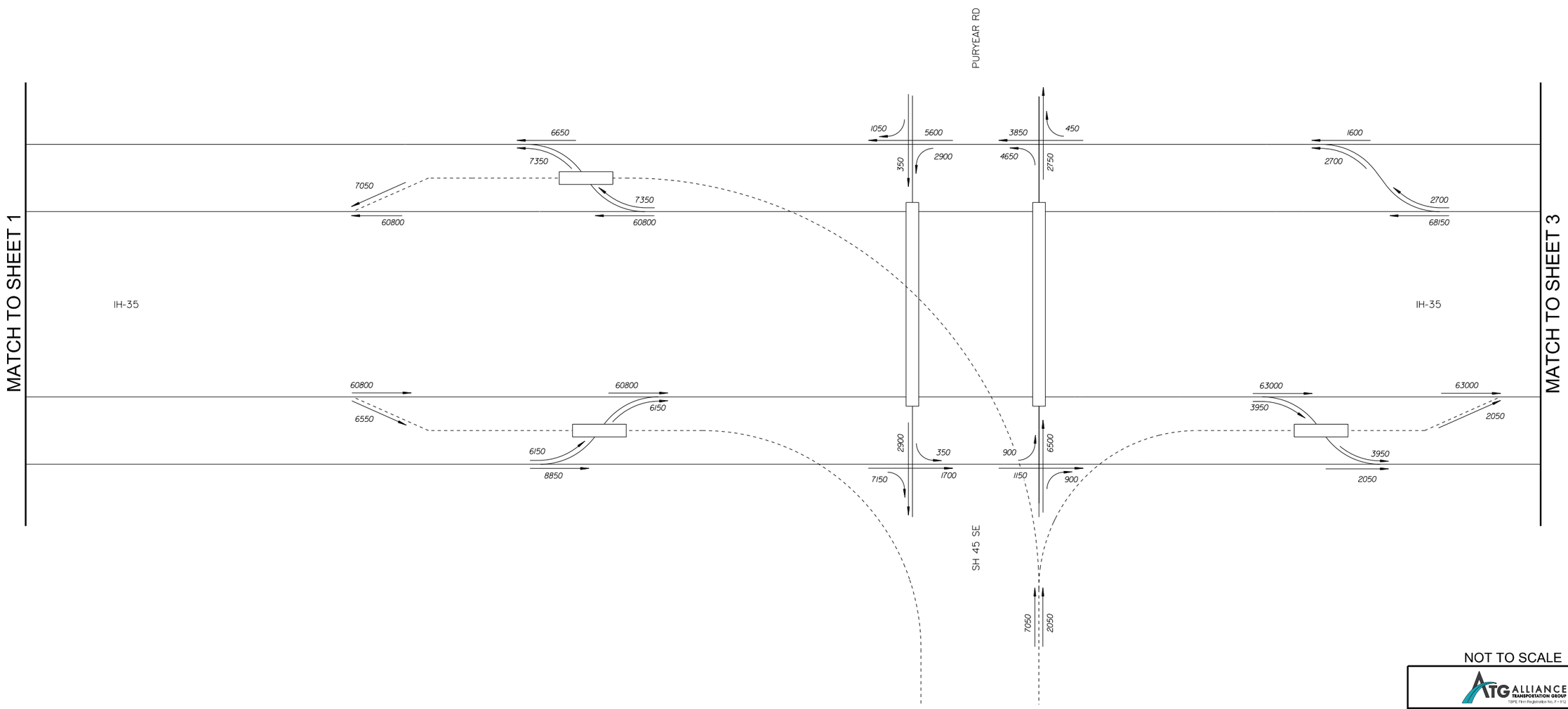
2018 EXISTING CONFIGURATION



2018 FORECASTED AVERAGE DAILY TRAFFIC VOLUMES
AND TURNING MOVEMENTS AT SPECIFIED POINTS ALONG
IH-35 FROM MAIN ST TO HESTER'S CROSSING ROAD
AND US 290 FROM AIRPORT BLVD TO US 183

LEGEND

1000 - 2018 ADT
LD - LOWER DECK
UD - UPPER DECK
→ TRAVEL DIRECTION

NOT TO SCALE

ATG ALLIANCE TRANSPORTATION GROUP
TBPE Firm Registration No. F - 812

Texas Department of Transportation

CAPITAL EXPRESS
2018 EXISTING CONFIGURATION
24 HOUR VOLUMES
(SHEET 2 OF 28)

SCALE : N.T.S.		PROJECT NO.		
DWN: TH	CKD: HH			
STATE	STATE DISTRICT	FED. RD. DIV. NO.	COUNTY	
TEXAS	14	6	TRAVIS	
CONTROL	SECTION	JOB	HWY. NO.	SHEET NO.
5000	00	106	IH-35	2

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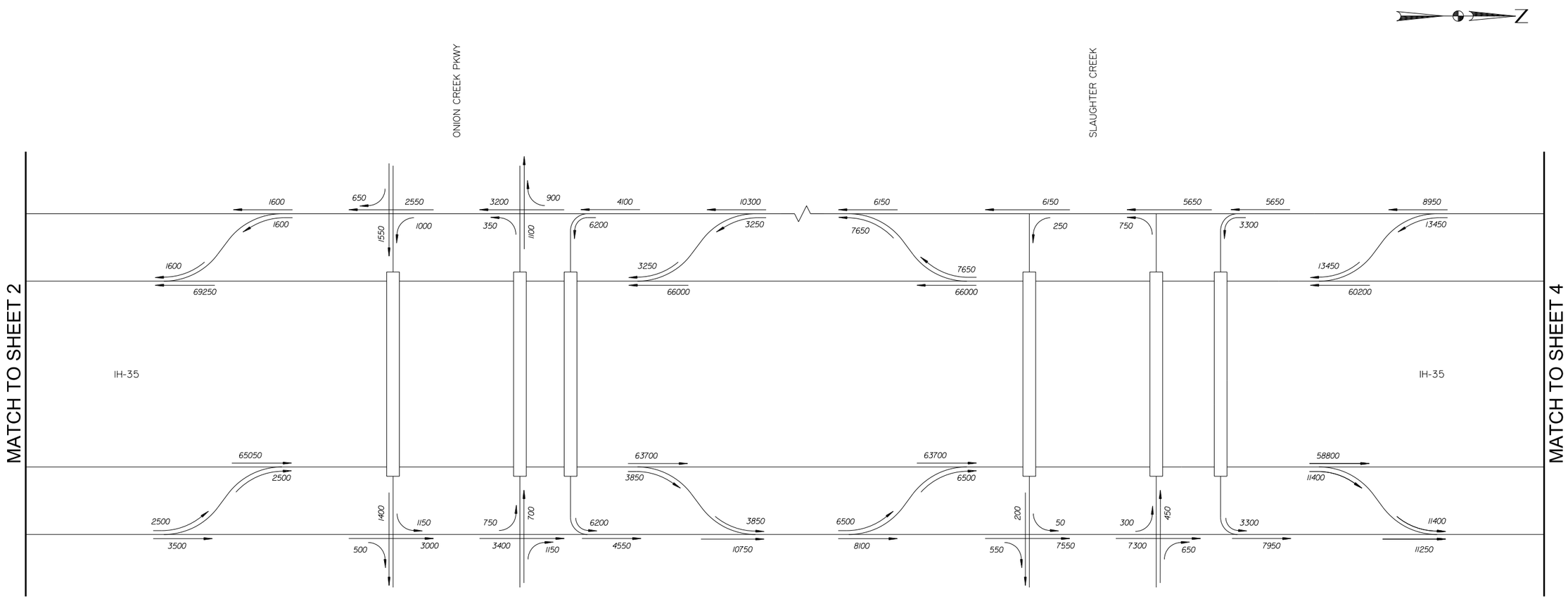


2018 FORECASTED AVERAGE DAILY TRAFFIC VOLUMES
AND TURNING MOVEMENTS AT SPECIFIED POINTS ALONG
IH-35 FROM MAIN ST TO HESTER'S CROSSING ROAD
AND US 290 FROM AIRPORT BLVD TO US 183

LEGEND

1000 - 2018 ADT
LD - LOWER DECK
UD - UPPER DECK
→ TRAVEL DIRECTION

NOT TO SCALE

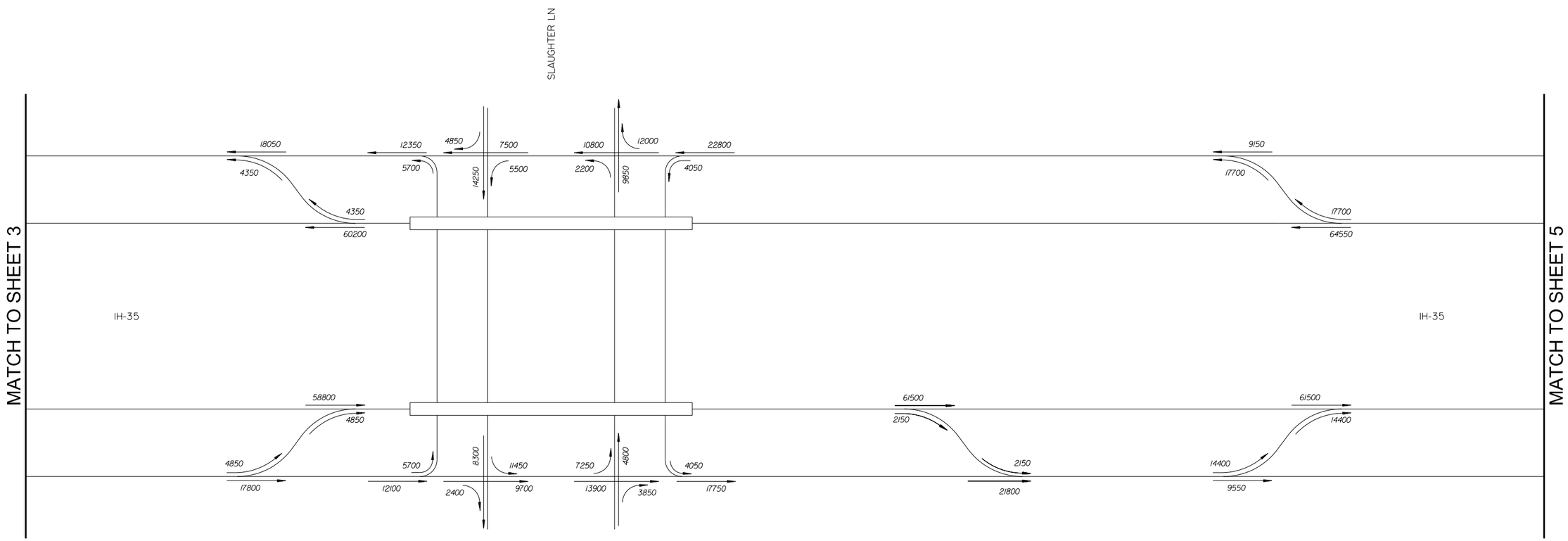
ATG ALLIANCE TRANSPORTATION GROUP
TBPE Firm Registration No. F - 512

Texas Department of Transportation

CAPITAL EXPRESS
2018 EXISTING CONFIGURATION
24 HOUR VOLUMES
(SHEET 3 OF 28)

SCALE : N.T.S.		PROJECT NO.		
DWN: TH	CKD: HH			
STATE	STATE DISTRICT	FED. RD. DIV. NO.	COUNTY	
TEXAS	14	6	TRAVIS	
CONTROL	SECTION	JOB	HWY. NO.	SHEET NO.
5000	00	106	IH-35	3

2018 EXISTING CONFIGURATION



2018 FORECASTED AVERAGE DAILY TRAFFIC VOLUMES
AND TURNING MOVEMENTS AT SPECIFIED POINTS ALONG
IH-35 FROM MAIN ST TO HESTER'S CROSSING ROAD
AND US 290 FROM AIRPORT BLVD TO US 183

LEGEND

1000 - 2018 ADT
LD - LOWER DECK
UD - UPPER DECK
→ TRAVEL DIRECTION

NOT TO SCALE

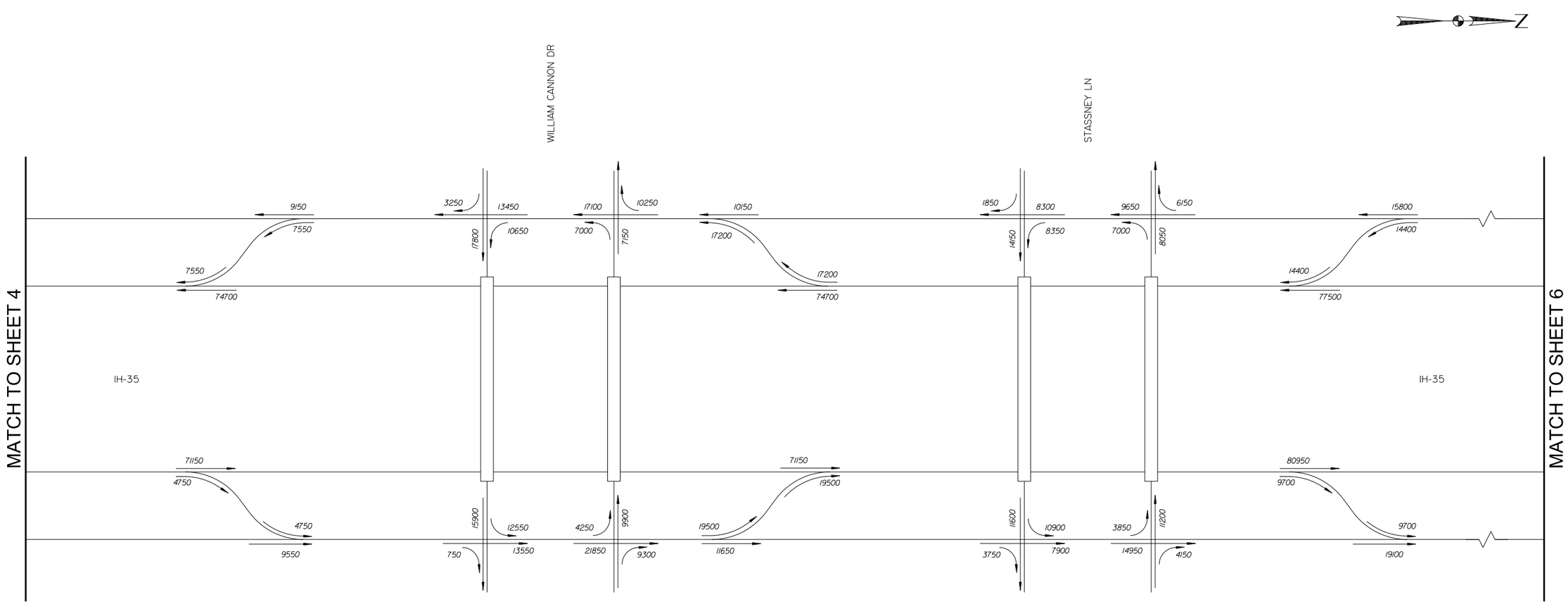
ATG ALLIANCE TRANSPORTATION GROUP
TBPE Firm Registration No. F - 512

Texas Department of Transportation

CAPITAL EXPRESS
2018 EXISTING CONFIGURATION
24 HOUR VOLUMES
(SHEET 4 OF 28)

SCALE : N.T.S.		PROJECT NO.		
DWN: TH	CKD: HH			
STATE	STATE DISTRICT	FED. RD. DIV. NO.	COUNTY	
TEXAS	14	6	TRAVIS	
CONTROL	SECTION	JOB	HWY. NO.	SHEET NO.
5000	00	106	IH-35	4

2018 EXISTING CONFIGURATION



2018 FORECASTED AVERAGE DAILY TRAFFIC VOLUMES
AND TURNING MOVEMENTS AT SPECIFIED POINTS ALONG
IH-35 FROM MAIN ST TO HESTER'S CROSSING ROAD
AND US 290 FROM AIRPORT BLVD TO US 183

LEGEND

1000 - 2018 ADT
LD - LOWER DECK
UD - UPPER DECK
→ TRAVEL DIRECTION

NOT TO SCALE

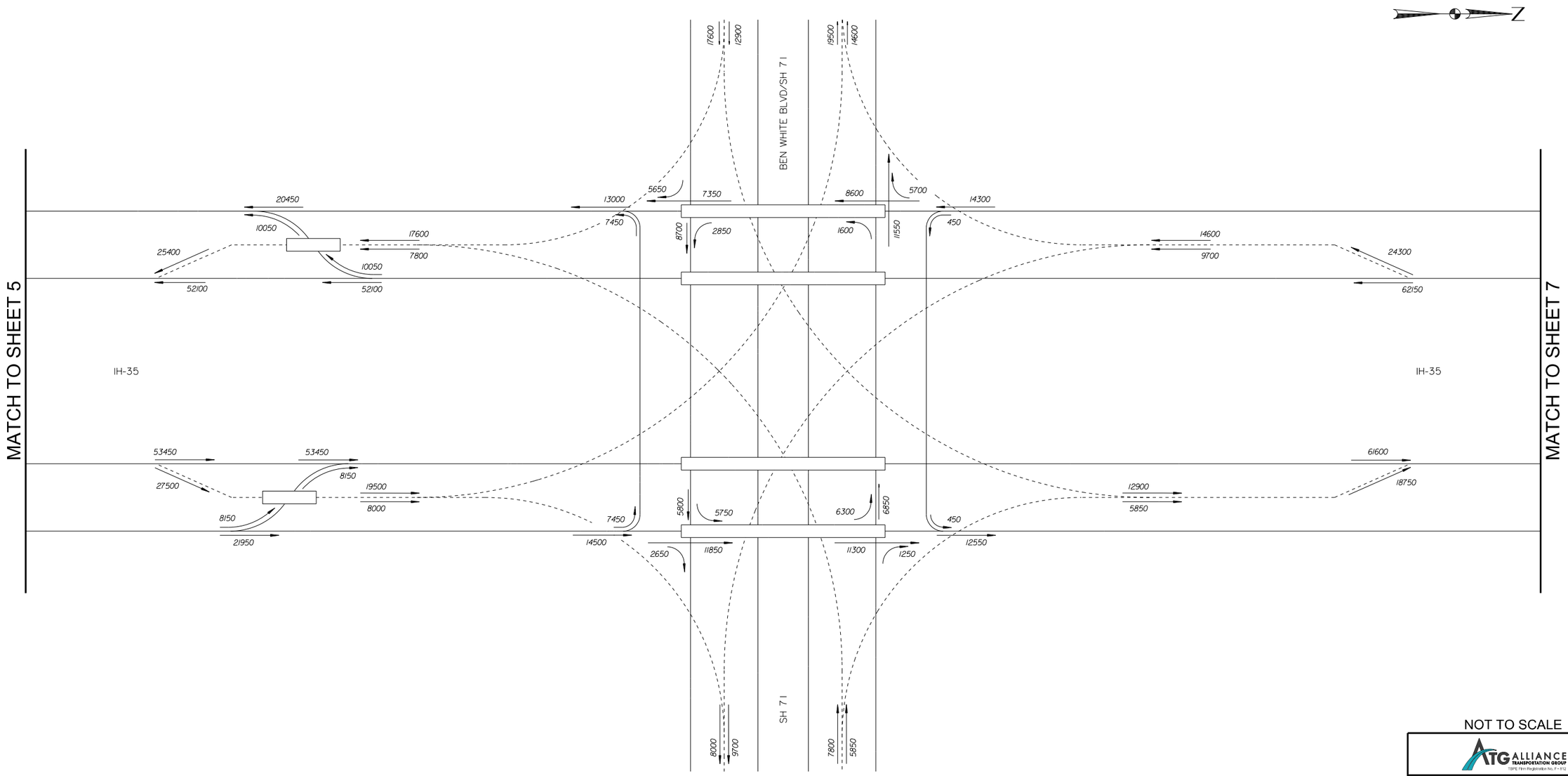
ATG ALLIANCE TRANSPORTATION GROUP
TBPE Firm Registration No. F - 512

Texas Department of Transportation

CAPITAL EXPRESS
2018 EXISTING CONFIGURATION
24 HOUR VOLUMES
(SHEET 5 OF 28)

SCALE : N.T.S.		PROJECT NO.		
DWN: TH	CKD: HH			
STATE	STATE DISTRICT	FED. RD. DIV. NO.	COUNTY	
TEXAS	14	6	TRAVIS	
CONTROL	SECTION	JOB	HWY. NO.	SHEET NO.
5000	00	106	IH-35	5

2018 EXISTING CONFIGURATION



2018 FORECASTED AVERAGE DAILY TRAFFIC VOLUMES
AND TURNING MOVEMENTS AT SPECIFIED POINTS ALONG
IH-35 FROM MAIN ST TO HESTER'S CROSSING ROAD
AND US 290 FROM AIRPORT BLVD TO US 183

LEGEND

1000 - 2018 ADT
LD - LOWER DECK
UD - UPPER DECK
→ TRAVEL DIRECTION

NOT TO SCALE

ATG ALLIANCE TRANSPORTATION GROUP
TBPE Firm Registration No. F - 812

Texas Department of Transportation

CAPITAL EXPRESS
2018 EXISTING CONFIGURATION
24 HOUR VOLUMES
(SHEET 6 OF 28)

SCALE : N.T.S.		PROJECT NO.		
DWN: TH	CKD: HH			
STATE	STATE DISTRICT	FED. RD. DIV. NO.	COUNTY	
TEXAS	14	6	TRAVIS	
CONTROL	SECTION	JOB	HWY. NO.	SHEET NO.
5000	00	106	IH-35	6

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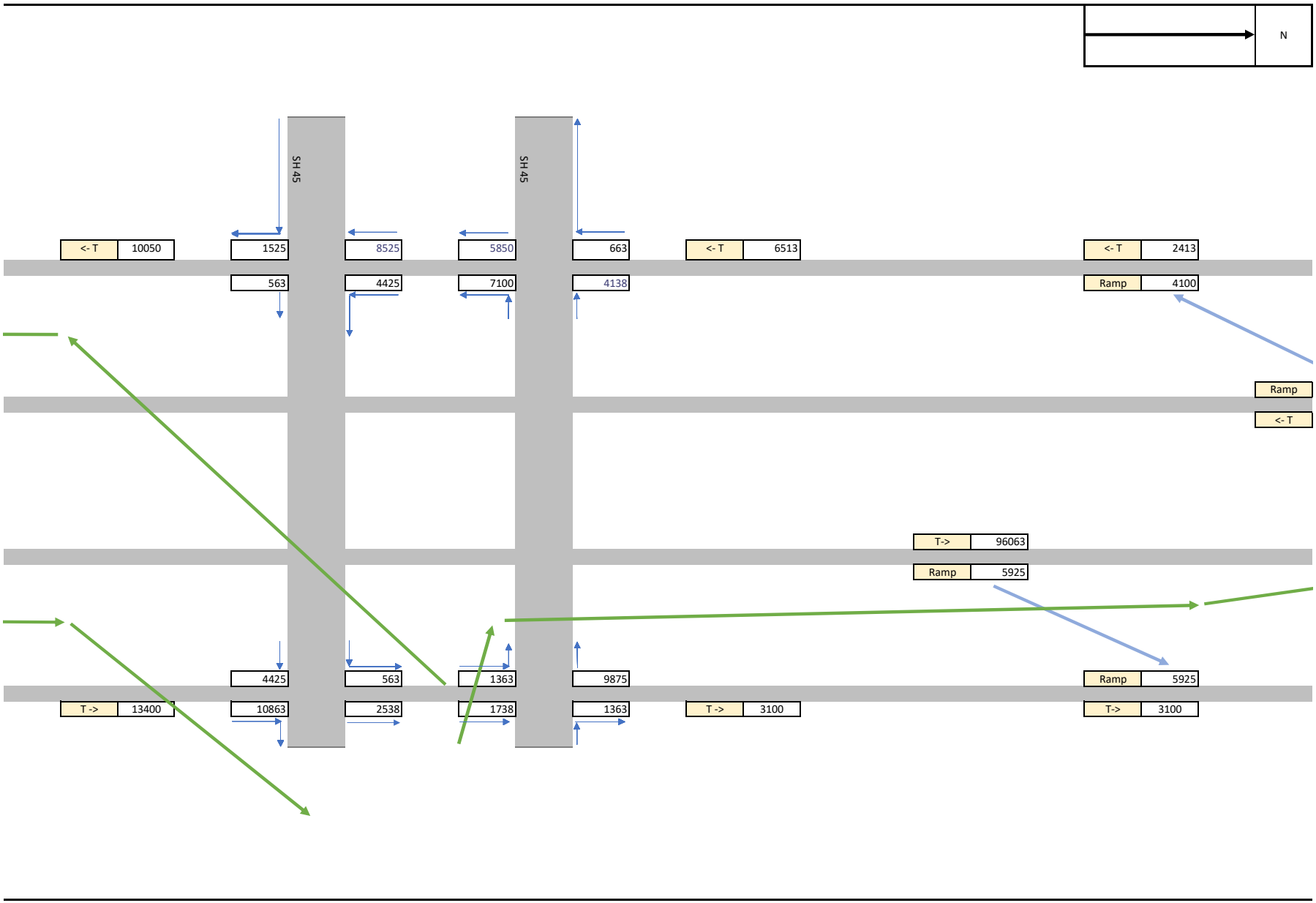

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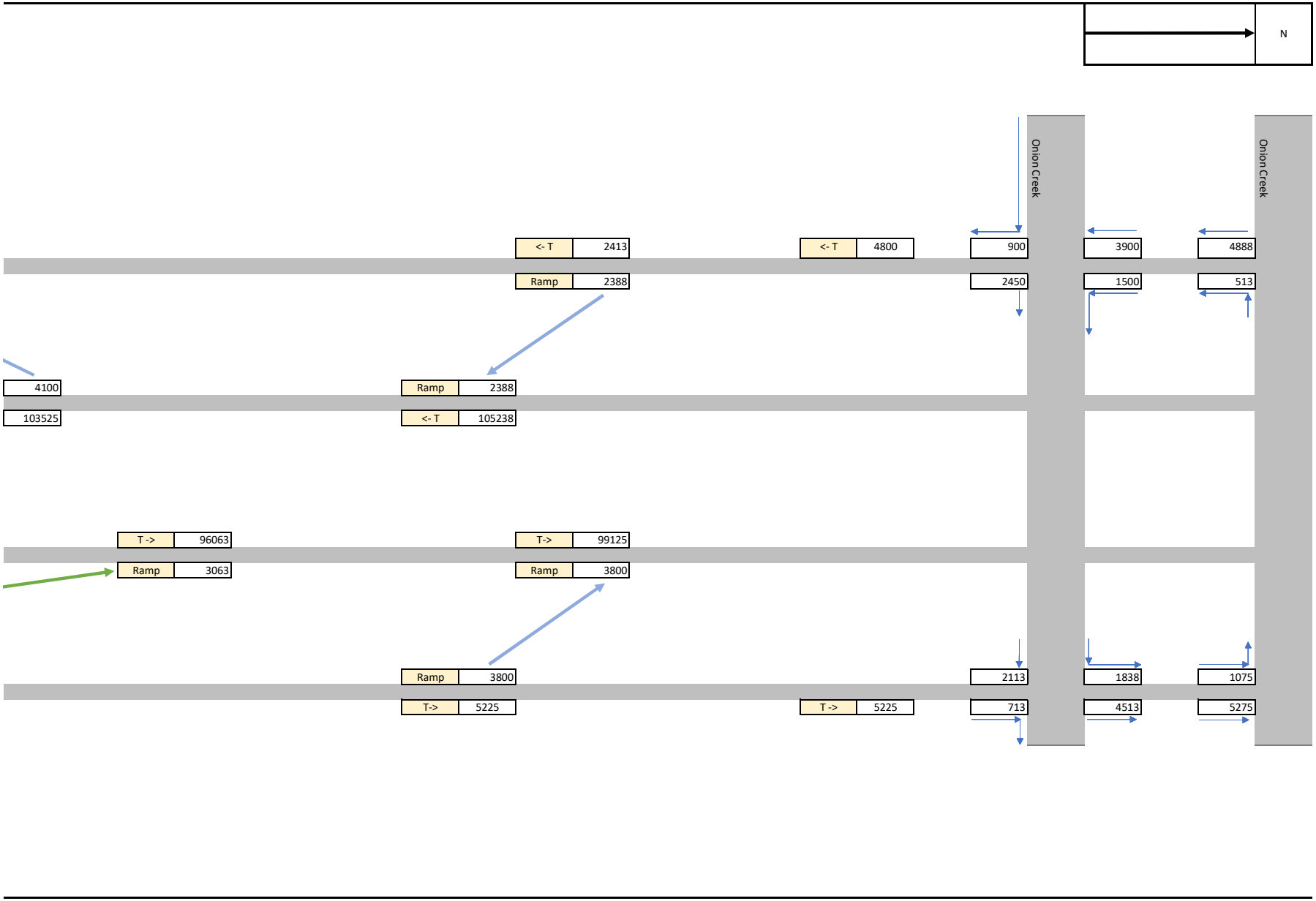

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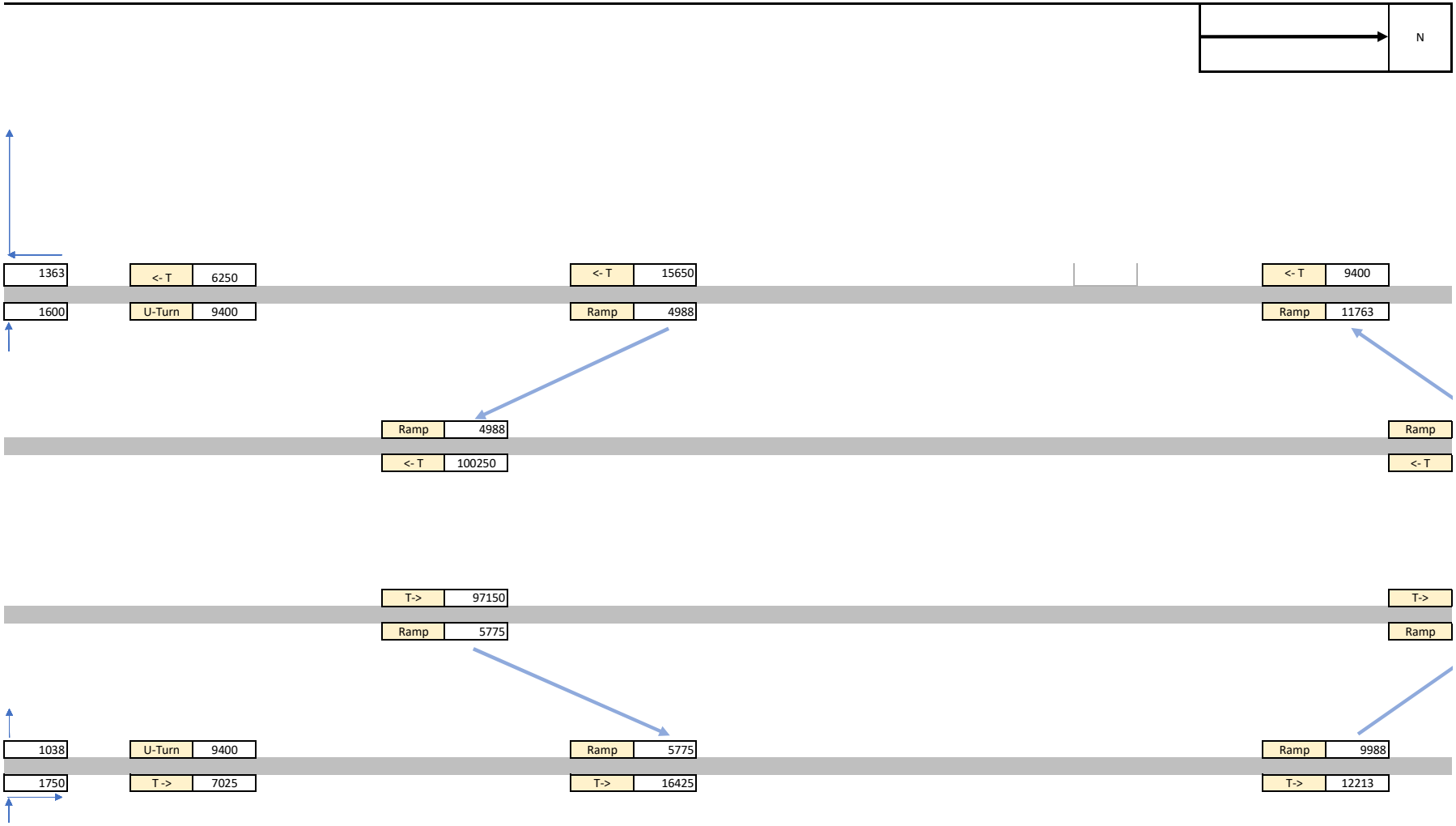

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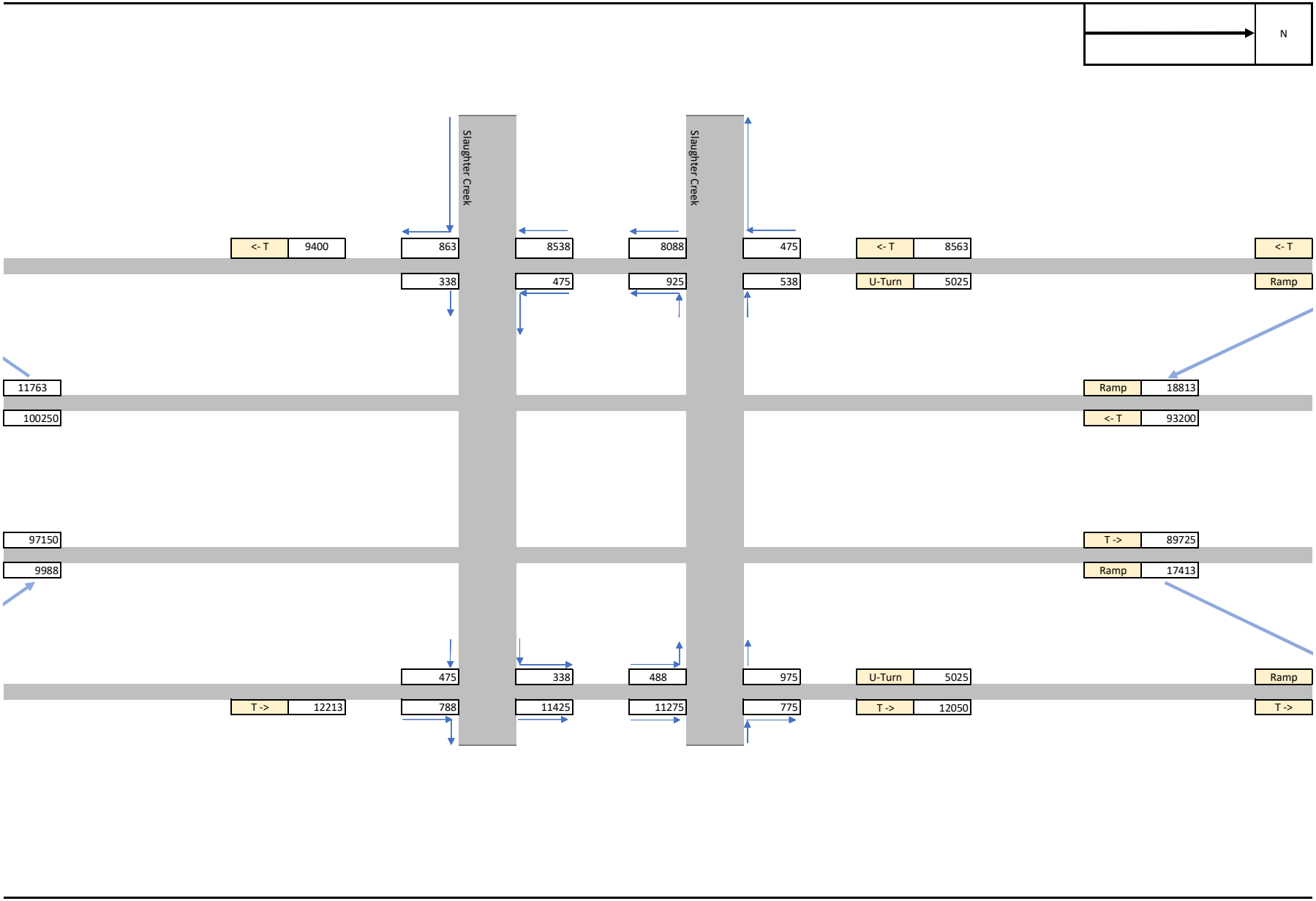

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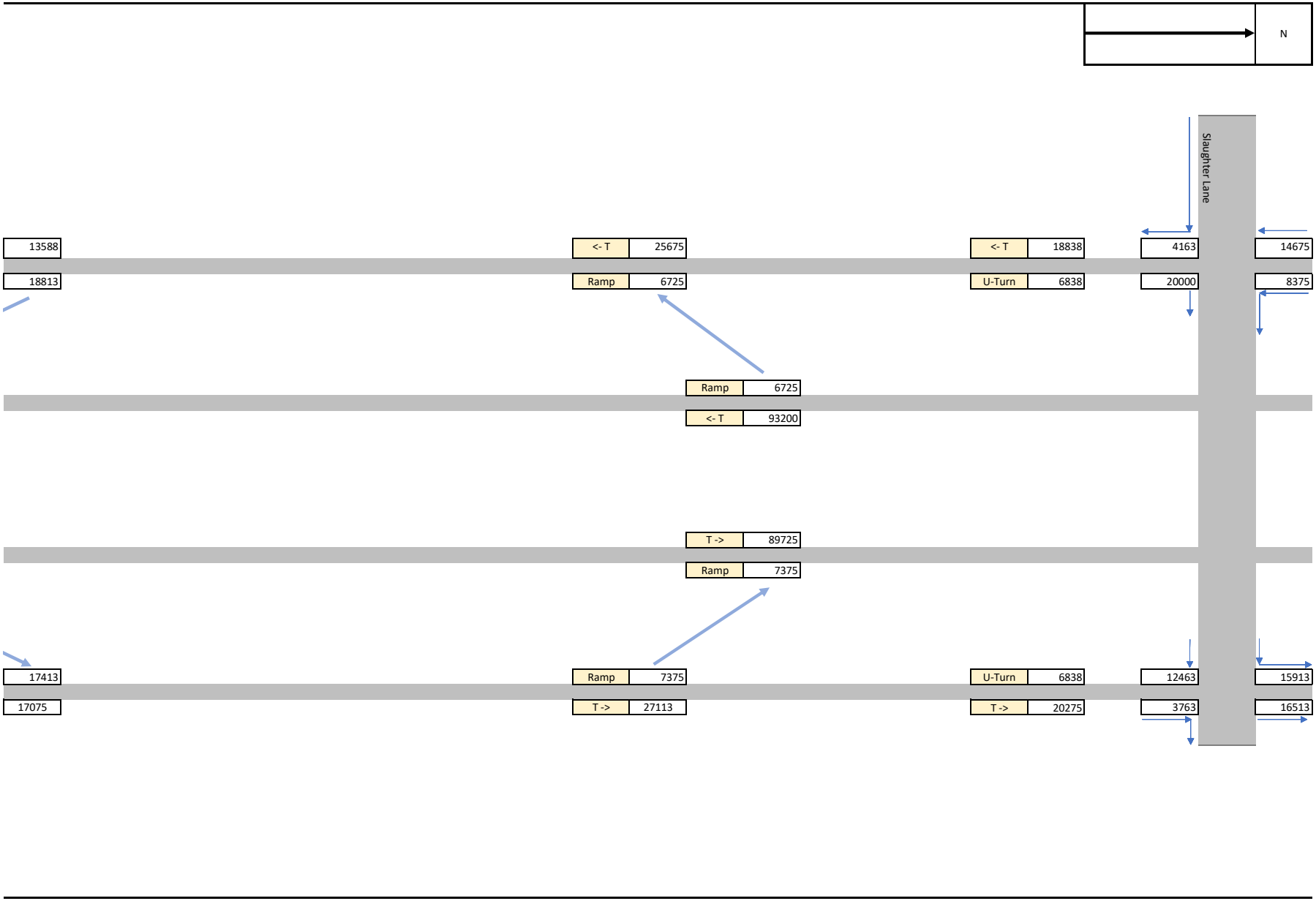

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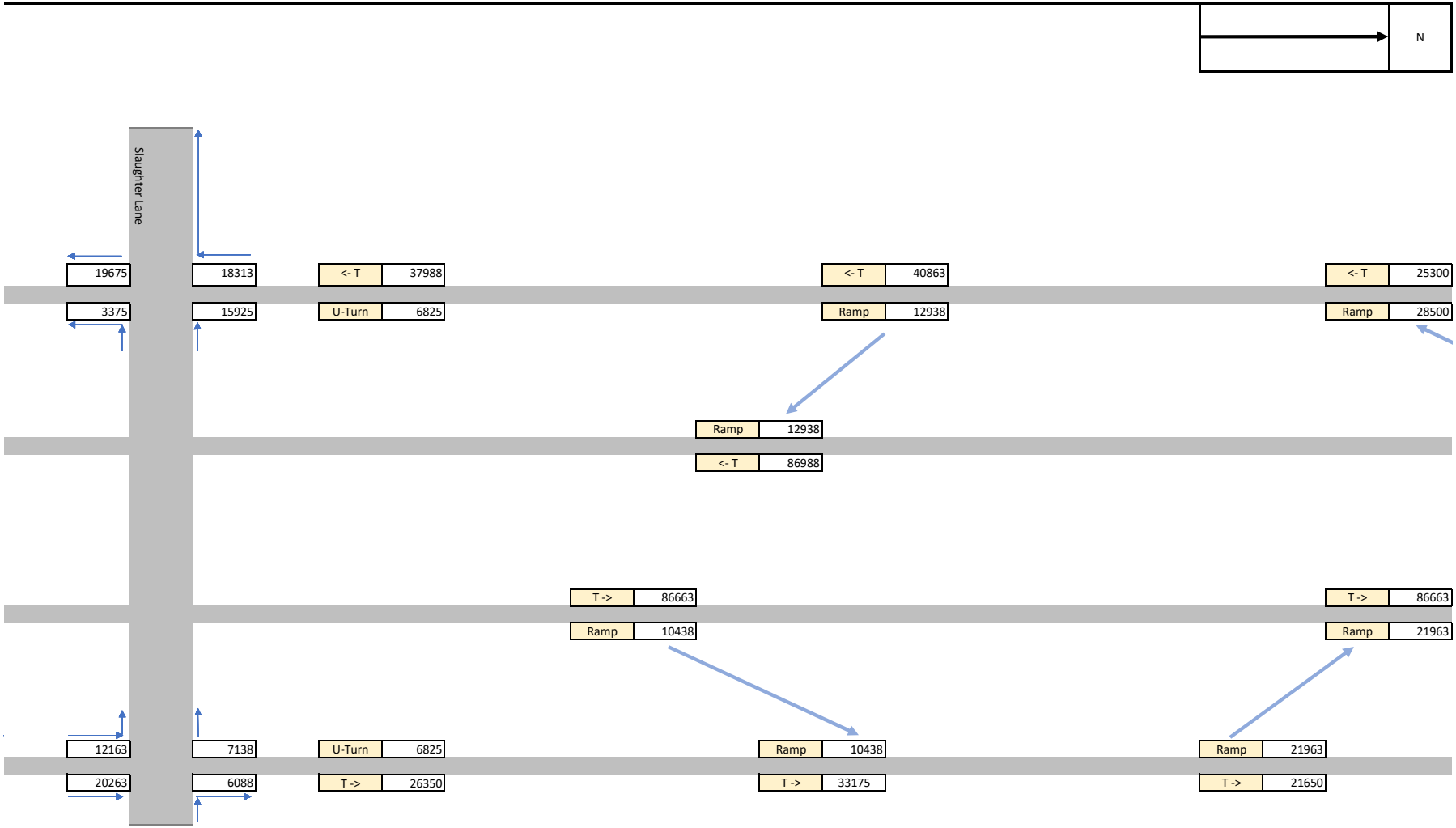

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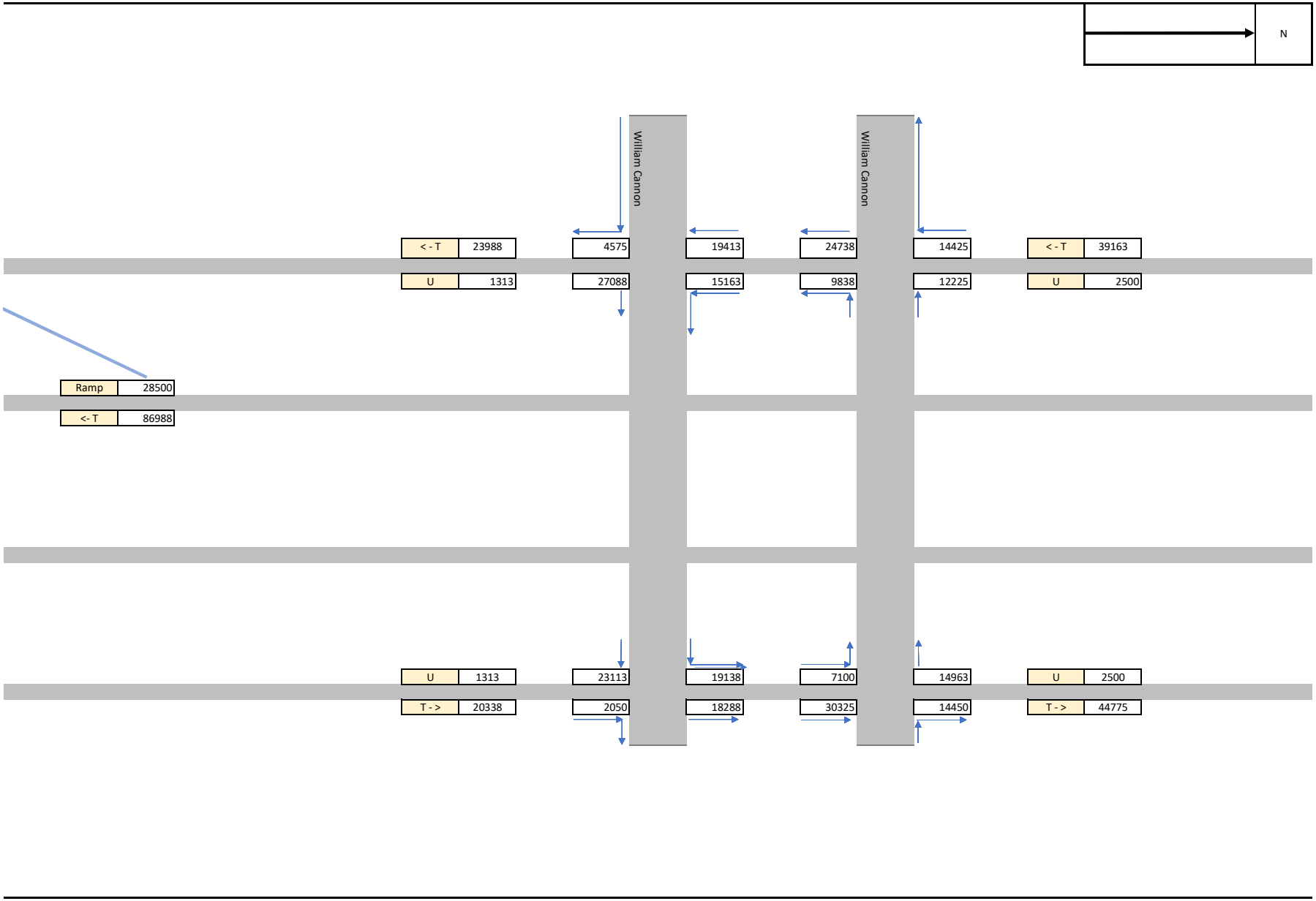

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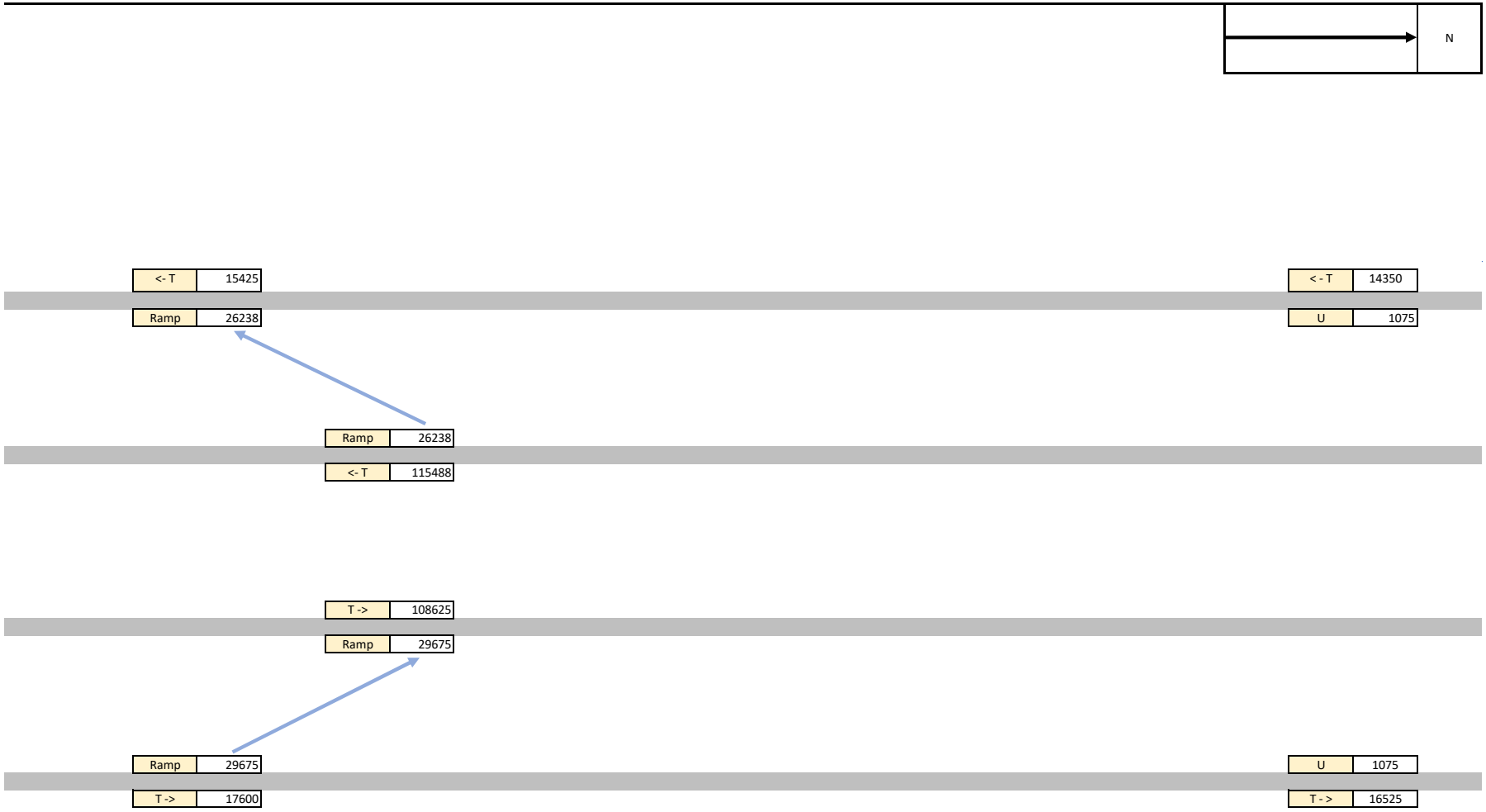

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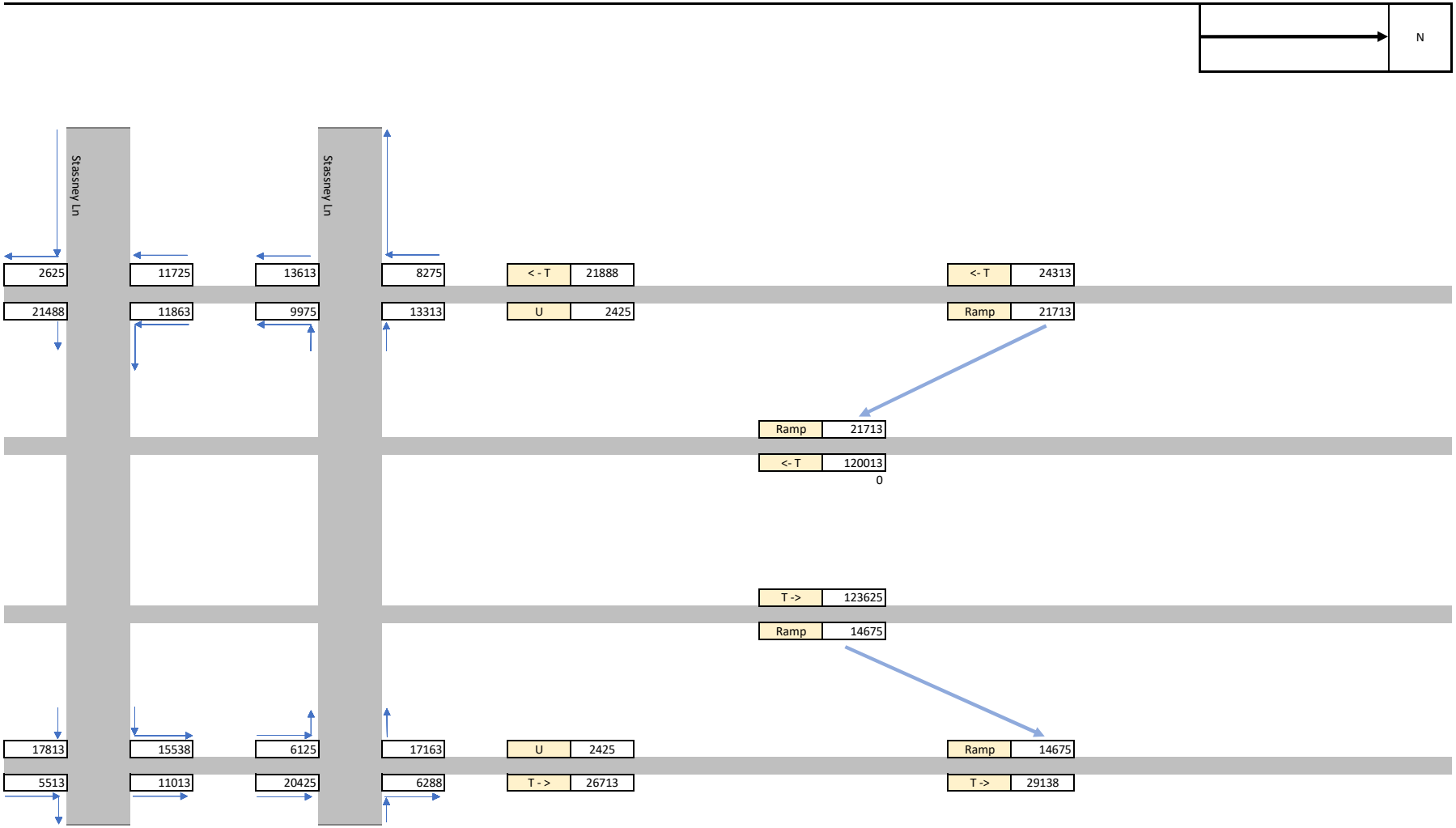

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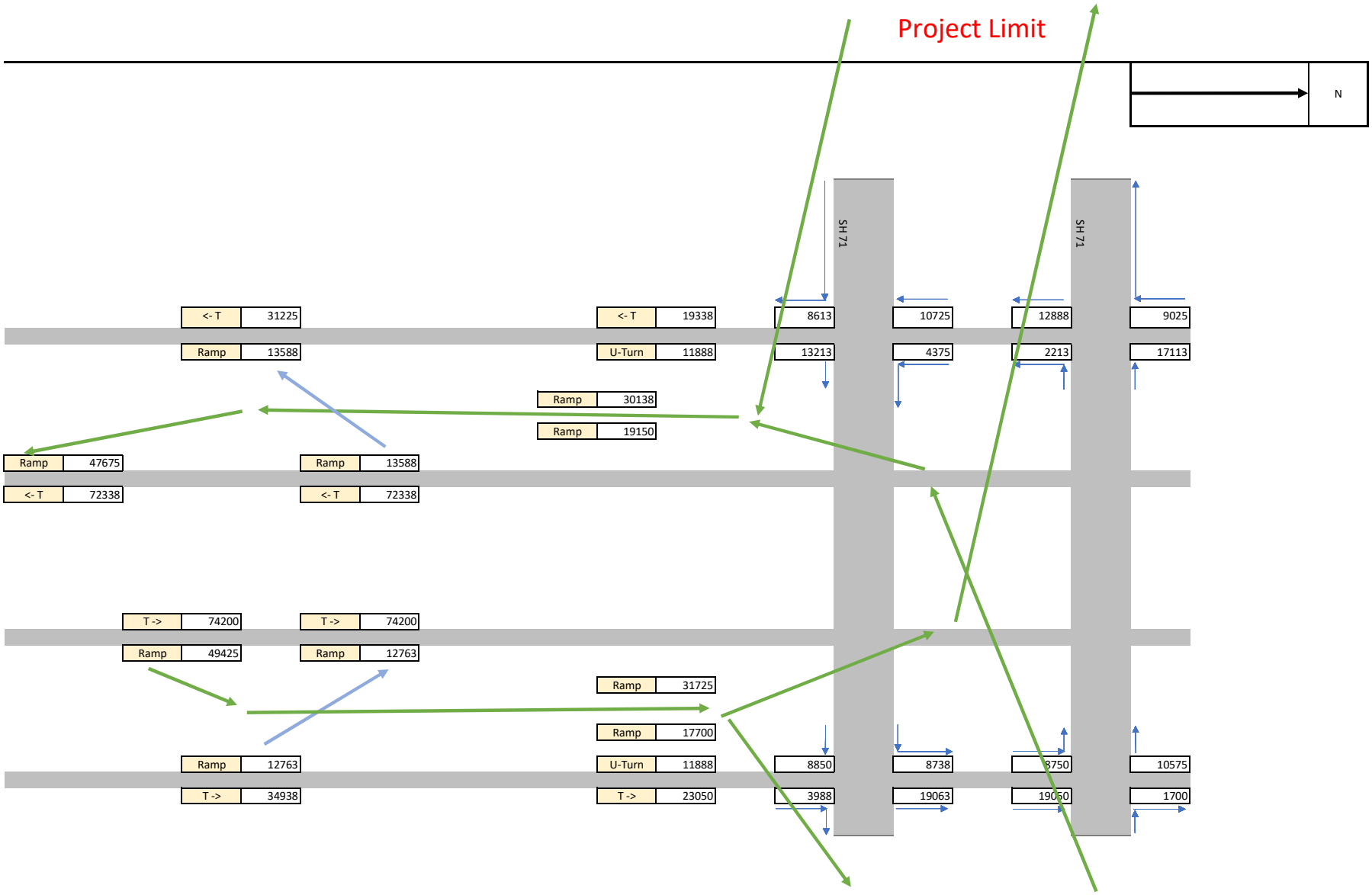

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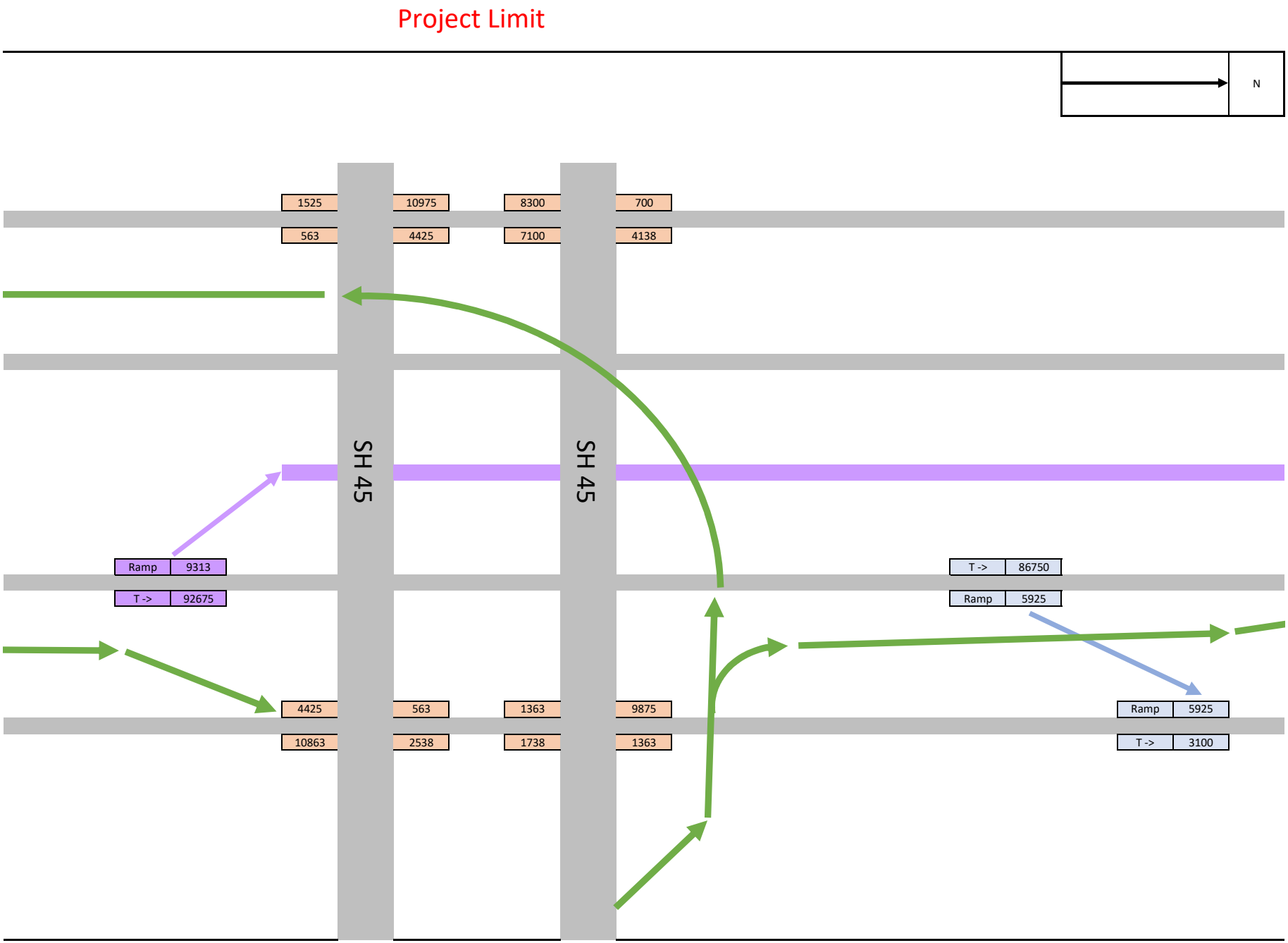

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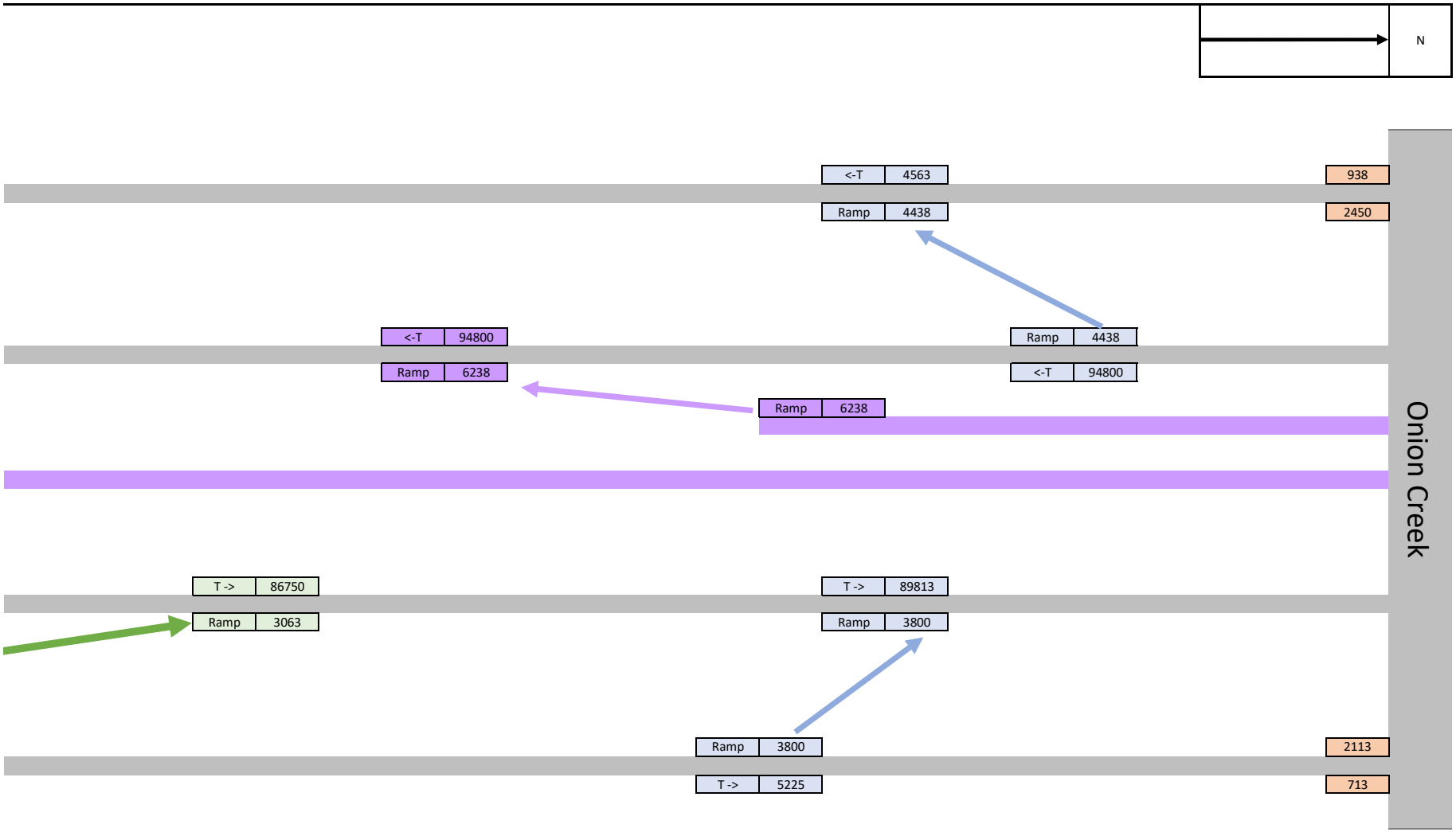
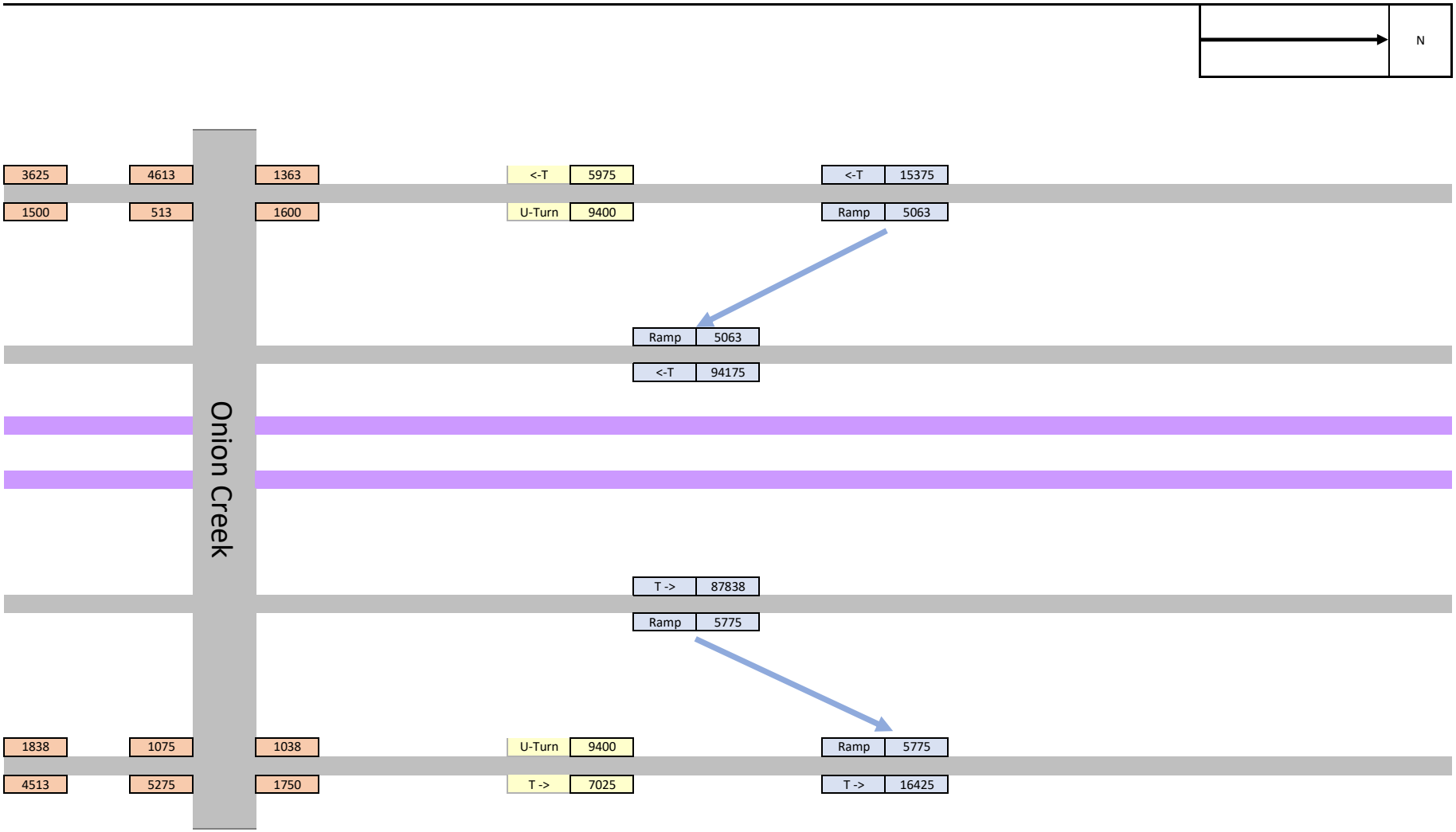


FRCL1
18025

2045 Build Average Daily Traffic



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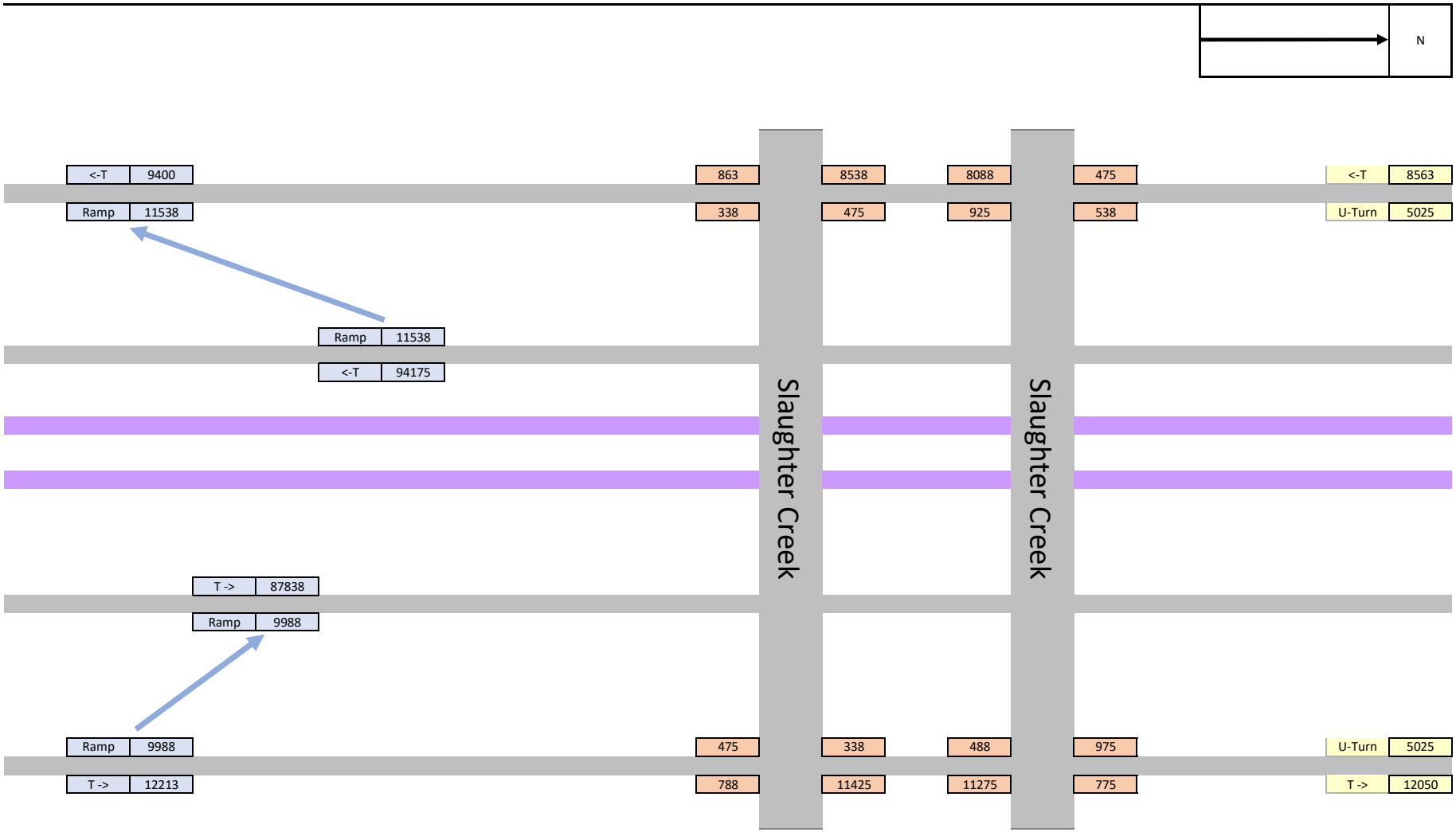

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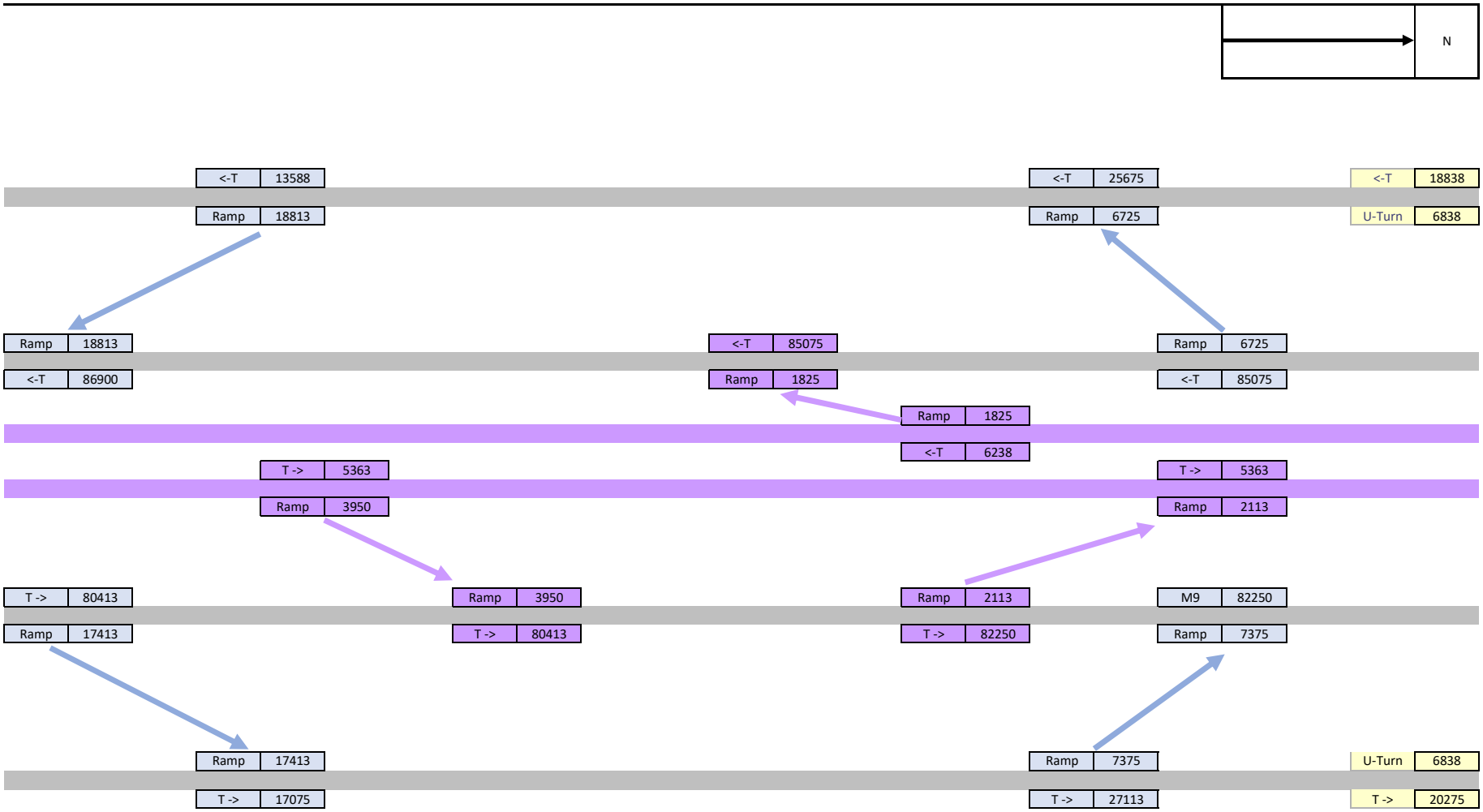

FRCL2
66888

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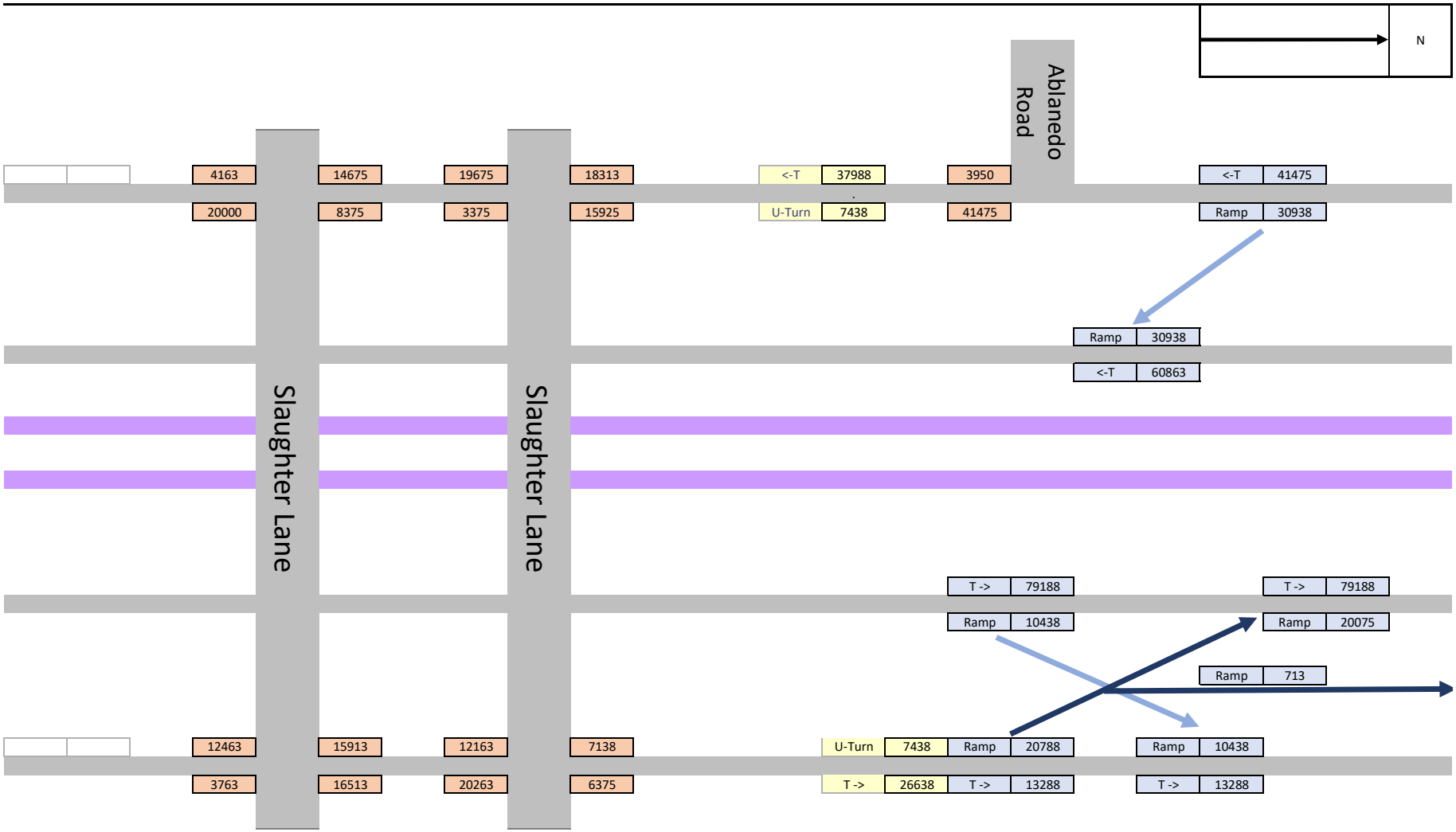

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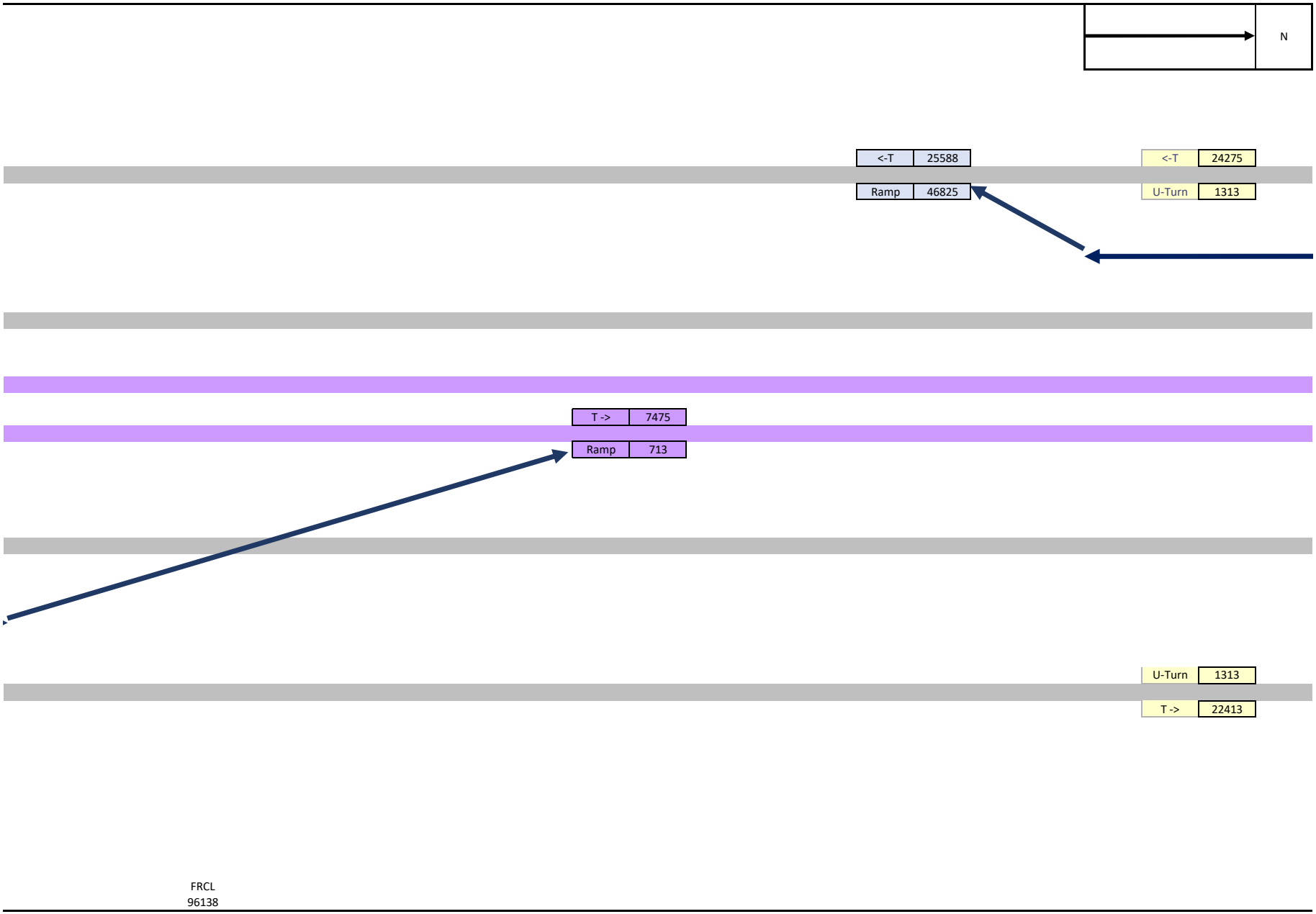

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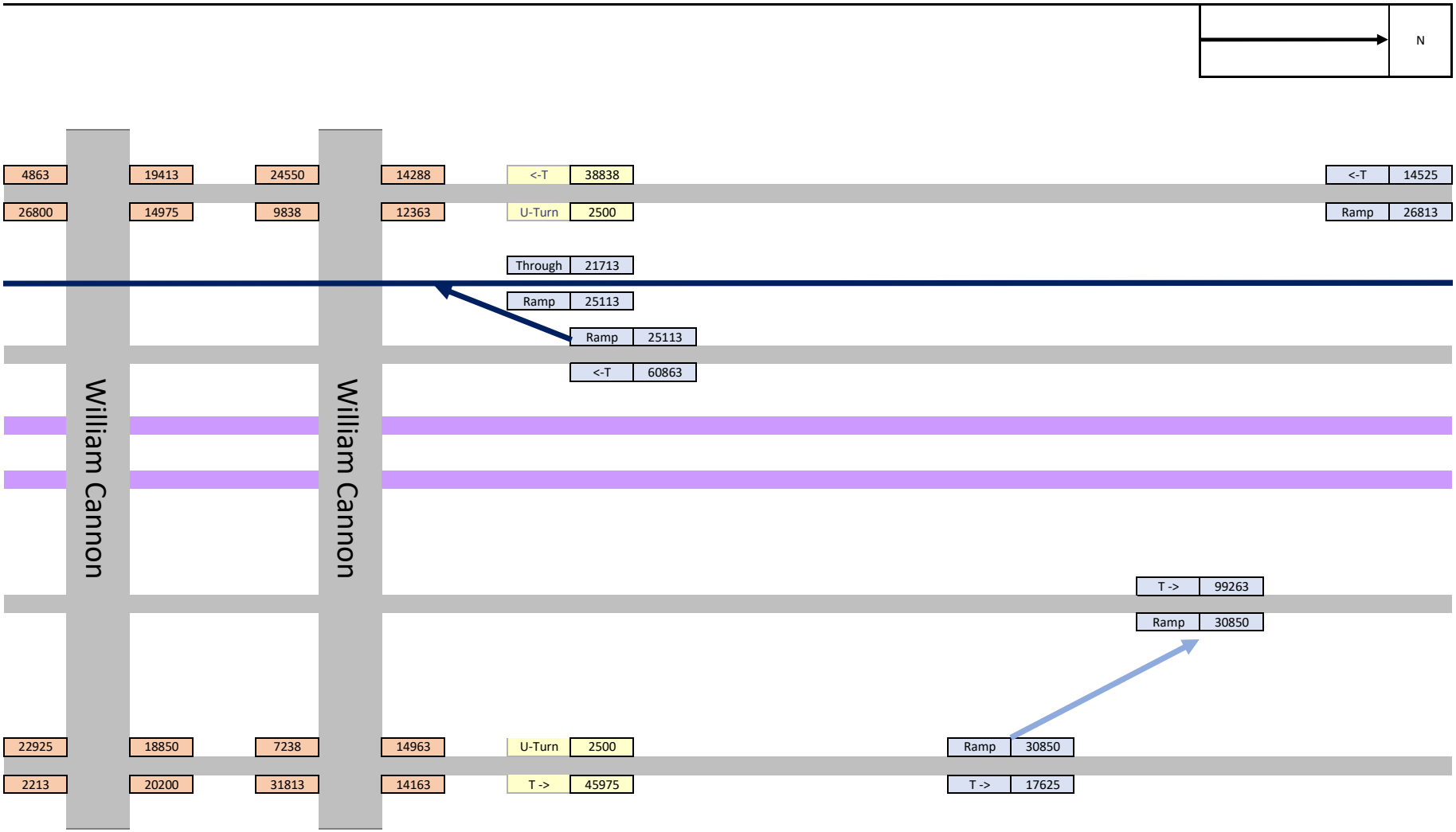

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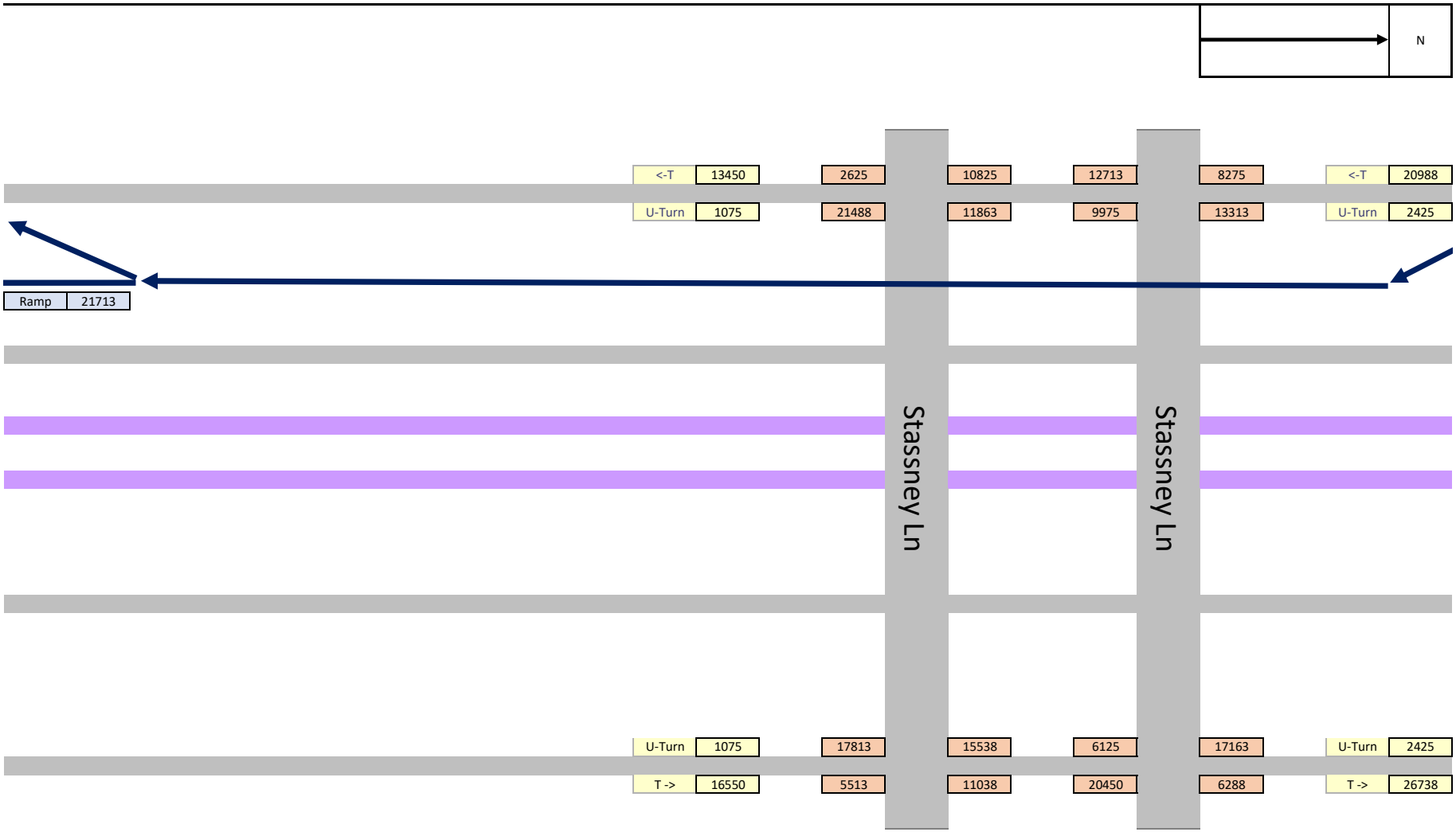
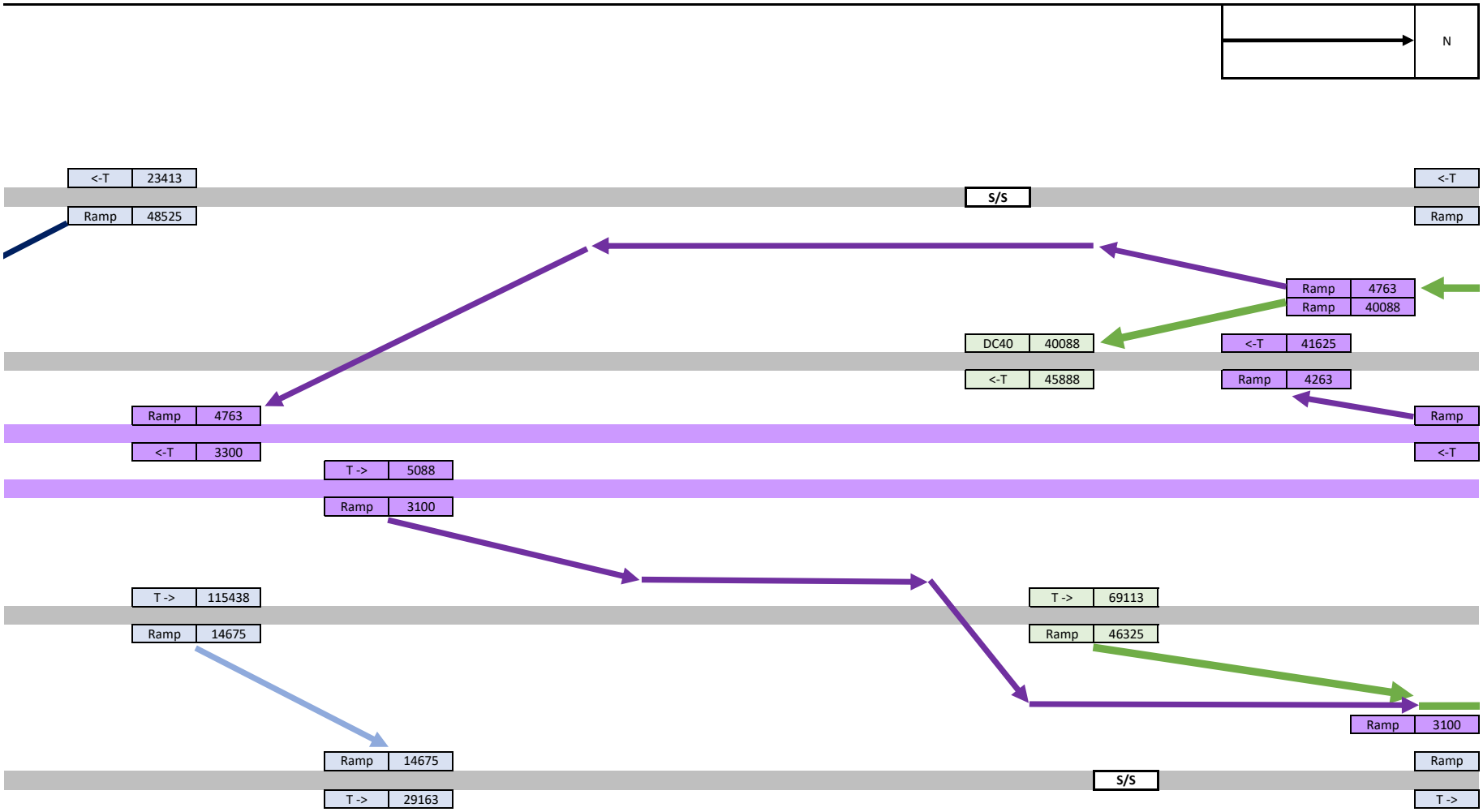
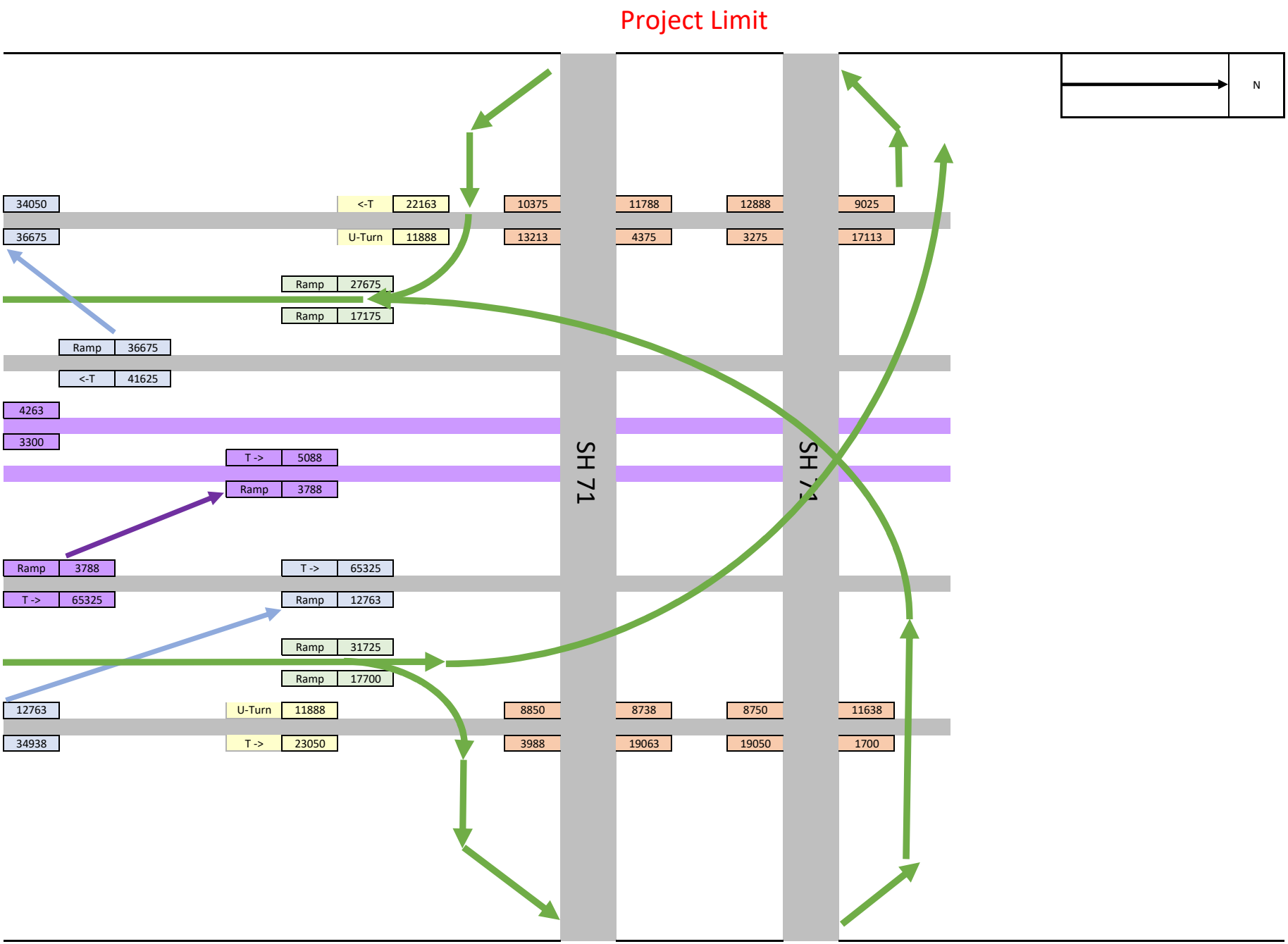


2045 Build Average Daily Traffic



2045 Build Average Daily Traffic



2045 Build Average Daily Traffic

Appendix C

MSAT Analysis Tables

Base 2018							Emission Factor from TxDOT MSAT ERLT (grams/mile) [4]									Emissions (grams) [5]								
Link	Link Description	Classification	Distance (miles)	Speed (mph) [1]	2018 Daily ADT [2] (vehicles/day)	Annual VMT [3] (miles/year)	Benzene	Naphthalene	Butadiene	Formaldehyde	Acrolein	DPM	POM	Acetaldehyde	Ethylbenzene	Benzene	Naphthalene	Butadiene	Formaldehyde	Acrolein	DPM	POM	Acetaldehyde	Ethylbenzene
1	NB I-35 mainlanes south of DC split	Urban Restricted	0.34	70	67350	8,358,135	0.001322	0.000186	0.000137	0.001682	0.000108	0.009157	0.000073	0.000790	0.000624	11052.40	1550.48	1142.00	14055.67	901.67	76535.48	608.70	6602.93	5216.69
2	NB I-35 mainlanes north of DC split	Urban Restricted	0.85	70	60800	18,863,200	0.001322	0.000186	0.000137	0.001682	0.000108	0.009157	0.000073	0.000790	0.000624	24943.79	3499.23	2577.33	31721.77	2034.96	172730.40	1373.75	14901.93	11773.37
3	NB I-35 mainlanes south of onion creek exit	Urban Restricted	0.84	70	63000	19,315,800	0.001322	0.000186	0.000137	0.001682	0.000108	0.009157	0.000073	0.000790	0.000624	25542.29	3583.19	2639.17	32482.90	2083.79	176874.86	1406.71	15259.48	12055.86
4	NB I-35 mainlanes south of FM 1327 entrance ramp north	Urban Restricted	0.44	70	65050	10,447,030	0.001322	0.000186	0.000137	0.001682	0.000108	0.009157	0.000073	0.000790	0.000624	13814.65	1937.98	1427.41	17568.51	1127.02	95663.50	760.82	8253.15	6520.46
5	NB I-35 mainlanes south of slaughter creek exit	Urban Restricted	0.46	70	67550	11,341,645	0.001322	0.000186	0.000137	0.001682	0.000108	0.009157	0.000073	0.000790	0.000624	14997.65	2103.94	1549.64	19072.96	1223.54	103855.49	825.98	8959.90	7078.83
6	NB I-35 mainlanes south of onion creek entrance	Urban Restricted	0.54	70	63700	12,555,270	0.001322	0.000186	0.000137	0.001682	0.000108	0.009157	0.000073	0.000790	0.000624	16602.49	2329.07	1715.46	21113.88	1354.46	114968.66	914.36	9918.66	7836.31
7	NB I-35 mainlanes south of slaughter exit	Urban Restricted	0.61	70	70200	15,630,030	0.001322	0.000186	0.000137	0.001682	0.000108	0.009157	0.000073	0.000790	0.000624	20668.40	2899.46	2135.57	26284.63	1686.17	143124.25	1138.29	12347.72	9755.40
8	NB I-35 mainlanes south of slaughter creek entrance	Urban Restricted	0.61	70	58800	13,091,820	0.001322	0.000186	0.000137	0.001682	0.000108	0.009157	0.000073	0.000790	0.000624	17312.00	2428.60	1788.77	22016.19	1412.34	119881.85	953.44	10342.54	8171.19
9	Nb I-35 mainlanes south of William cannon exit	Urban Restricted	0.46	70	63650	10,686,835	0.001322	0.000186	0.000137	0.001682	0.000108	0.009157	0.000073	0.000790	0.000624	14131.76	1982.47	1460.17	17971.78	1152.89	97859.39	778.29	8442.60	6670.13
12	Southbound 35 Frontage south of puryear road	Urban Unrestricted	0.34	55	6650	825,265	0.001116	0.000118	0.000119	0.001039	0.000063	0.003586	0.000051	0.000520	0.000570	921.09	97.62	98.33	857.46	52.30	2959.81	41.97	429.14	470.01
14	WB Puryear Road east of 45	Urban Unrestricted	0.03	65	6500	71,175	0.001147	0.000112	0.000115	0.000973	0.000059	0.003275	0.000049	0.000500	0.000546	81.63	7.99	8.21	69.26	4.17	233.13	3.48	35.59	38.87
16	WB Puryear Road RT	Urban Unrestricted	0.03	15	900	9,855	0.002503	0.000280	0.000285	0.002511	0.000153	0.008518	0.000116	0.001250	0.001516	24.66	2.76	2.81	24.74	1.51	83.95	1.14	12.32	14.94
17	WB Puryear straight	Urban Unrestricted	0.02	60	2750	20,075	0.001108	0.000114	0.000116	0.000996	0.000061	0.003301	0.000049	0.000500	0.000550	22.25	2.29	2.33	20.00	1.21	66.26	0.99	10.04	11.03
19	Eastbound puryear road between frontage roads	Urban Unrestricted	0.09	65	3250	106,763	0.001147	0.000112	0.000115	0.000973	0.000059	0.003275	0.000049	0.000500	0.000546	122.45	11.99	12.31	103.89	6.26	349.70	5.22	53.38	58.30
20	EB FR_45 east ofr 35	Urban Unrestricted	0.08	65	10050	293,460	0.001147	0.000112	0.000115	0.000973	0.000059	0.003275	0.000049	0.000500	0.000546	336.57	32.95	33.85	285.56	17.19	961.23	14.35	146.73	160.25
21	WBSB_DC_45	Urban Restricted	1.26	75	7050	3,242,295	0.001556	0.000192	0.000149	0.001714	0.000108	0.009447	0.000077	0.000820	0.000679	5044.25	622.63	483.84	5558.75	351.22	30628.90	249.11	2658.68	2203.09
22	WBNB_DC_45	Urban Restricted	1.08	75	2050	808,110	0.001556	0.000192	0.000149	0.001714	0.000108	0.009447	0.000077	0.000820	0.000679	1257.23	155.18	120.59	1385.46	87.54	7633.95	62.09	662.65	549.10
25	NB frontage road south of main street entrance ramp	Urban Unrestricted	0.77	45	15000	4,215,750	0.001205	0.000129	0.000132	0.001138	0.000069	0.004342	0.000055	0.000570	0.000639	5081.59	543.26	554.54	4799.08	291.46	18303.21	230.41	2402.98	2692.34
26	NB ramp exit to FM 1327	Urban Restricted	0.16	30	3700	216,080	0.001621	0.000297	0.000201	0.002787	0.000181	0.018977	0.000115	0.001260	0.000961	350.28	64.11	43.44	602.24	39.09	4100.61	24.74	272.26	207.57
27	NBEB_DC_45	Urban Restricted	1.11	75	6550	2,653,733	0.001556	0.000192	0.000149	0.001714	0.000108	0.009447	0.000077	0.000820	0.000679	4128.58	509.60	396.01	4549.69	287.46	25068.94	203.89	2176.06	1803.17
28	NB frontage south of exit ramp to FM 1327	Urban Unrestricted	0.57	55	11300	2,350,965	0.001116	0.000118	0.000119	0.001039	0.000063	0.003586	0.000051	0.000520	0.000570	2623.94	278.10	280.13	2442.67	149.00	8431.71	119.57	1222.50	1338.94
29	NB entrance ramp south of SH 45SE	Urban Restricted	0.27	30	6150	606,083	0.001621	0.000297	0.000201	0.002787	0.000181	0.018977	0.000115	0.001260	0.000961	982.50	179.82	121.85	1689.21	109.63	11501.81	69.40	763.66	582.21
30	NB frontage road north of entrance ramp south of SH 45 S	Urban Unrestricted	0.31	55	8850	1,001,378	0.001116	0.000118	0.000119	0.001039	0.000063	0.003586	0.000051	0.000520	0.000570	1117.65	118.45	119.32	1040.44	63.47	3591.43	50.93	520.72	570.31
31	NB frontage road in between FM 1327	Urban Unrestricted	0.09	55	2050	67,343	0.001116	0.000118	0.000119	0.001039	0.000063	0.003586	0.000051	0.000520	0.000570	75.16	7.97	8.02	69.97	4.27	241.52	3.43	35.02	38.35
32	NB Frontage road north of FM 1327	Urban Unrestricted	0.49	55	2050	366,643	0.001116	0.000118	0.000119	0.001039	0.000063	0.003586	0.000051	0.000520	0.000570	409.21	43.37	43.69	380.94	23.24	1314.96	18.65	190.65	208.81
33	NB exit ramp north of SH 45 (onion creek)	Urban Restricted	0.39	30	3950	562,283	0.001621	0.000297	0.000201	0.002787	0.000181	0.018977	0.000115	0.001260	0.000961	911.50	166.82	113.05	1567.14	101.71	10670.60	64.39	708.48	540.14
34	NB frontage road south of SH 45 entrance ramp	Urban Unrestricted	0.56	55	6000	1,226,400	0.001116	0.000118	0.000119	0.001039	0.000063	0.003586	0.000051	0.000520	0.000570	1368.80	145.07	146.13	1274.24	77.73	4398.47	62.37	637.73	698.47
35	NB ENtrance ramp north of SH 45SE	Urban Restricted	0.33	30	2500	301,125	0.001621	0.000297	0.000201	0.002787	0.000181	0.018977	0.000115	0.001260	0.000961	488.15	89.34	60.54	839.27	54.47	5714.54	34.48	379.42	289.26
36	Nb frontage road south of onion creek	Urban Unrestricted	0.69	55	3500	881,475	0.001116	0.000118	0.000119	0.001039	0.000063	0.003586	0.000051	0.000520	0.000570	983.83	104.27	105.03	915.86	55.87	3161.40	44.83	458.37	502.03
37	Nb frontage road north of onion creek	Urban Unrestricted	0.23	55	10750	902,463	0.001116	0.000118	0.000119	0.001039	0.000063	0.003586	0.000051	0.000520	0.000570	1007.25	106.75	107.53	937.66	57.20	3236.67	45.90	469.28	513.98
39	NB exit slaughter creek	Urban Restricted	0.15	30	3850	210,788	0.001621	0.000297	0.000201	0.002787	0.000181	0.018977	0.000115	0.001260	0.000961	341.70	62.54	42.38	587.49	38.13	4000.18	24.14	265.59	202.49
40	NB frontage road north of slaughter creek exit	Urban Unrestricted	0.29	55	14600	1,545,410	0.001116	0.000118	0.000119	0.001039	0.000063	0.003586	0.000051	0.000520	0.000570	1724.85	182.81	184.14	1605.69	97.95	5542.60	78.60	803.61	880.16
41	entrance ramp south of slaughter creek	Urban Restricted	0.11	30	6500	260,975	0.001621	0.000297	0.000201	0.002787	0.000181	0.018977	0.000115	0.001260	0.000961	423.06	77.43	52.47	727.36	47.21	4952.60	29.88	328.83	250.70
42	NB frontage road south of slaughter creek	Urban Unrestricted	0.38	55	8100	1,123,470	0.001116	0.000118	0.000119	0.001039	0.000063	0.003586	0.000051	0.000520	0.000570	1253.92	132.90	133.87	1167.29	71.20	4029.31	57.14	584.20	639.85
43	SBNB u-turn at slaughter creek	Urban Unrestricted	0.28	15	3300	337,260	0.002503	0.000280	0.000285	0.002511	0.000153	0.008518	0.000116	0.001250	0.001516	844.01	94.51	96.12	846.73	51.55	2872.83	39.10	421.57	511.37
44	NB frontage south of exit ramp to Slaughter	Urban Unrestricted	0.37	55	11250	1,519,313	0.001116	0.000118	0.000119	0.001039	0.000063	0.003586	0.000051	0.000520	0.000570	1695.73	179.72	181.03	1578.58	96.29	5449.00	77.27	790.04	865.29
45	NB exit ramp south of slaughter	Urban Restricted	0.15	30	11400	624,150	0.001621	0.000297	0.000201	0.002787	0.000181	0.018977	0.000115	0.001260	0.000961	1011.79	185.18	125.48	1739.57	112.90	11844.68	71.47	786.43	599.57
46	NB frontage road north of slaughter exit	Urban Unrestricted	0.34	45	22650	2,810,865	0.001205	0.000129	0.000132	0.001138	0.000069	0.004342	0.000055	0.000570	0.000639	3388.17	362.22	369.74	3199.80	194.33	12203.73	153.63	1602.19	1795.12
47	NB Entrance ramp south of slaughter	Urban Restricted	0.12	30	4850	212,430	0.001621	0.000297	0.000201	0.002787	0.000181	0.018977	0.000115	0.001260	0.000961	344.36	63.03	42.71	592.06	38.43	4031.35	24.32	267.66	204.06
48	NBSB Uturn slaughter	Urban Unrestricted	0.16	15	5700	332,880	0.002503	0.000280	0.000285	0.002511	0.000153	0.008518	0.000116	0.001250	0.001516	833.05	93.29	94.87	835.73	50.88	2835.52	38.59	416.10	504.73
49	NB Frontage road south of slaughter	Urban Unrestricted	0.41	45	17800	2,663,770	0.001205	0.000129	0.000132	0.001138	0.000069	0.004342	0.000055	0.000570	0.000639	3210.86	343.26	350.39	3032.36	184.16	11565.09	145.59	1518.35	1701.18
50	NB Frontage road south of slaughter north of uturn	Urban Unrestricted	0.02	45	12100	88,330	0.001205	0.000129	0.000132	0.001138	0.000069	0.004342	0.000055	0.000570	0.000639	106.47	11.38	11.62	100.55	6.11	383.50	4.83	50.35	56.41
51	NB frontage right turn at slaughter lane	Urban Unrestricted	0.04	15	2400	35,040	0.002503	0.000280	0.000285	0.002511	0.000153	0.008518	0.000116	0.001250	0.001516	87.69	9.82	9.99	87.97	5.36	298.48	4.06	43.80	53.13
54	NB frontage road north of slaughter lane sbnb uturn	Urban Unrestricted	0.26	45	21800	2,068,820	0.001205	0.000129	0.000132	0.001138	0.000069	0.004342	0.000055	0.000570	0.000639	2493.72	266.60	272.13	2355.08	143.03	8982.04	113.07	1179.23	1321.23
56	exit ramp north of slaughter lane	Urban Restricted	0.16	30	2150	125,560	0.001621	0.000297	0.000201	0.002787	0.000181	0.018977	0.000115	0.001260	0.000961	203.54	37.25	25.24	349.95	22.71	2382.79	14.38	158.21	120.61
57	NB frontange road north of WC exit ramp	Urban Unrestricted	0.14	45	23950	1,223,845	0.001205	0.000129	0.000132	0.001138	0.000069	0.004342	0.000055	0.000570	0.000639	1475.20	157.71	160.99	1393.19	84.61	5313.48	66.89	697.59	781.59
58	NB entrance ramp south of william cannon	Urban Restricted	0.18	55	14400	946,080	0.001157	0.000203	0.000139	0.001880	0.000123	0.009868	0.000078	0.000860	0.000633	1094.58	191.62	131.30	1779.01	116.15	9335.61	74.24	813.63	598.85
59	NB frontage north of Slaughter entrance	Urban Unrestricted	0.91	45	14300	4,749,745	0.001205	0.000129	0.000132	0.001138	0.000069	0.004342	0.000055	0.000570	0.000639	5725.26	612.07	624.79	5406.97	328.38	20621.62	259.60	2707.35	3033.36
60	NB william cannon right turn	Urban Unrestricted	0.03	15	750	8,213	0.002503	0.000280	0.000285	0.002511	0.000153	0.008518	0.000116	0.001250	0.001516	20.55	2.30	2.34	20.62	1.26	69.96	0.95	10.27	12.45
61	NB_SB uturn william cannon	Urban Unrestricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
62	NB frontage west of EB William Cannon	Urban Unrestricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
63	WB William Cannon RT	Urban Unrestricted	0.04	15	9300	135,780	0.002503	0.000280	0.000285	0.002511	0.000153	0.008518	0.000116	0.001250	0.001516	339.80	38.05	38.70	340.89	20.75	1156.59	15.74	169.72	205.88
64	NB I-35 frontage road north of right turn to EB William Car	Urban Unrestricted	0.02	45	13550	98,915	0.001205	0.000129	0.000132	0.001138	0.000069	0.004342	0.000055	0.000570	0.000639	119.23	12.75	13.01	112.60	6.84	429.45	5.41	56.38	63.17
65	SB exit ramp main street	Urban Restricted	0.22	30	7350	590,205	0.001621	0.000297	0.000201	0.002787	0.000181	0.018977	0.000115	0.001260	0.000961	956.77	175.11	118.66	1644.96	106.76	11200.50	67.58	743.66	566.96
66	SB frontage road south of main street exit	Urban Unrestricted	0.92	55	14000	4,701,200	0.001116	0.000118	0.000119	0.001039	0.000063	0.003586	0.000051	0.000520	0.000570	5247.07	556.11	560.17	4884.58	297.96	16860.81	239.10	2444.62	2677.47
69	RT from WB Puryear RD to SB I-35 frontage	Urban Unrestricted	0.04	15	1050	15,330	0.002503	0.000280	0.000285	0.002511	0.000153	0.008518	0.000116	0.001250	0.001516	38.36	4.30	4.37	38.49	2.34	130.58	1.78	19.16	23.24
71	SB frontage road south of 45 exit ramp	Urban Unrestricted	0.38	55	4300	596,410	0.001116	0.000118	0.000119	0.001039	0.000063	0.003586	0.000051	0.000520	0.000570	665.66	70.55	71.07	619.67	37.80	2139.02	30.33	310.13	339.67
72	SB 45 exit ramp	Urban Restricted	0.1	30	2700	98,550	0.001621	0.000297	0.000201	0.002787	0.000181	0.018977	0.000115	0.001260	0.000961	159.76	29.24	19.81	274.67	17.83	1870.21	11.28	124.17	94.67
73	SB frontage road south of Onion creek entrance ramp	Urban Unrestricted	1	55	1600	584,000	0.001116	0.000118	0.000119	0.001039	0.000063	0.003586	0.000051	0.000520	0.000570	651.81	69.08	69.59	606.78	37.01	2094.51	29.70	303.68	332.61
74	SB frontage road south of Onion creek	Urban Unrestricted	0.41	55	3200	478,880	0.001116	0.000118	0.000119	0.001039	0.000063	0.003586	0.000051	0.000520	0.000570	534.48	56.65	57.06	497.56	30.35	1717.50	24.36	249.02	272.74
75	SB to NB Uturn at onion creek	Urban Unrestricted	0.1	15	6200	226,300	0.002503	0.000280	0.000285	0.002511	0.000153	0.008518	0.000116	0.001250	0.001516	566.33	63.42	64.49	568.15	34.59	1927.65	26.24	282.87	343.13
76	WB Onion creek right turn from SB frontage road	Urban Unrestricted	0.03	15	900	9,855	0.002503	0.000280	0.000285	0.002511	0.000153	0.008518	0.000116	0.001250	0.001516	24.66	2.76	2.81	24.74	1.51	83.95	1.14	12.32	14.94
77	SB frontage road south of SB to NB Uturn at Onion Creek	Urban Unrestricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
78	NB frontage road RT to Onion creek EB	Urban Unrestricted	0.04	15	500	7,300	0.002503	0.000280	0.000285	0.002511	0.000153	0.008518	0.000116	0.001250	0.001516	18.27	2.05	2.08	18.33	1.12	62.18	0.85	9.12	11.07
79	Onion creek EB between frontage roads	Urban Unrestricted	0.06	30	2550	55,845	0.001612	0.000170	0.000177	0.001501	0.000091	0.006116	0.000071	0.000760	0.000883	90.02	9.48	9.86	83.81	5.07	341.57	3.95	42.44	49.29
80	Onion creek EB east of NB frontage road	Urban Unrestricted	0.02	30	1900	13,870	0.001612	0.000170	0.000177	0.001501	0.000091	0.006116	0.000071	0.000760	0.000883	22.36	2.36	2.45	20.82	1.26	84.84	0.98	10.54	12.24
81	Onion creek WB east of NB frontage road	Urban Unrestricted	0.02	30	700	5,110	0.001612	0.000170	0.000177	0.001501	0.000091	0.006116	0.000071	0.000760	0.000883	8.24	0.87	0.90	7.67	0.46	31.26	0.36	3.88	4.51
82	Onion creek WB between frontage roads	Urban Unrestricted	0.06	30	1450	31,755	0.001612	0.000170	0.000177	0.001501	0.000091	0.006116	0.000071	0.000760	0.000883	51.19	5.39	5.61	47.66	2.88	194.23	2.25	24.13	28.03
83	Onion creek WB west of SB frontage road	Urban Unrestricted	0.02	30	1100	8,030	0.001612	0.000170	0.000177	0.001501	0.000091	0.006116	0.000071	0.000760	0.000883	12.94	1.36	1.42	12.05	0.73	49.12	0.57	6.10	7.09
84	Onion creek RT to SB frontage road	Urban Unrestricted	0.03	15	650	7,118	0.002503	0.000280	0.000285	0.002511	0.000153	0.008518	0.000116	0.001250	0.001516	17.81	1.99	2.03	17.87	1.09	60.63	0.83	8.90	10.79
85	Onion creek Rt to NB frontage road	Urban Unrestricted	0.03	15	1150	12,593	0.002503	0.000280	0.000285	0.002511	0.000153	0.008518	0.000116	0.001250	0.001516	31.51	3.53	3.59	31.61	1.92	107.26	1.46	15.74	19.09
86	SB entrance ramp slaughter creek	Urban Restricted	0.12	30	3250	142,350	0.001621	0.000297	0.000201	0.002787	0.000181	0.018977	0.000115	0.001260	0.000961	230.76	42.23	28.62	396.74	25.75	2701.42	16.30	179.36	136.74
87	SB frontage road south of slaughter creek entrance ramp	Urban Unrestricted	0.17	55	10300	639,115	0.001116	0.000118	0.000119	0.001039	0.000063	0.003586	0.000051	0.000520	0.000570	713.32	75.60	76.15	664.04	40.51	2292.18	32.51	332.34	363.99
88	SB exit ramp onion creek	Urban Restricted	0.13	30	7650	362,993	0.001621	0.000297	0.000201	0.002787	0.000181	0.018977	0.000115	0.001260	0.000961	588.44	107.70	72.98	1011.70	65.66	6888.62	41.57	457.37	348.69
89	SB frontage road south of onion creek exit ramp	Urban Unrestricted	0.52	55	13800	2,619,240	0.001116	0.000118	0.000119	0.001039	0.000063	0.003586	0.000051	0.000520	0.000570	2923.37	309.83	312.10	2721.41	166.00	9393.88	133.21	1362.00	1491.73
90	SB frontage road south of slaughter creek one lane	Urban Unrestricted	0.2	55	6150	448,950	0.001116	0.000118	0.000119	0.001039	0.000063	0.003586	0.000051	0.000520	0.000570	501.08	53.11	53.49	466.46	28.45	1610.16	22.83	233.45	255.69
92	SB frontage road south of slaughter creek uturn	Urban Unrestricted	0.16	55	5650	329,960	0.001116	0.000118	0.000119	0.001039	0.000063	0.003586	0.000051	0.000520	0.000570	368.27	39.03	39.32	342.83	20.91	1183.40	16.78	171.58	187.92
93	WB slaughter creek east of NB frontage road	Urban Unrestricted	0.02	25	1100	8,030	0.001812	0.000193	0.000203	0.001709	0.000103	0.006581	0.000080	0.000860	0.001017	14.55	1.55	1.63	13.72	0.83	52.85	0.64	6.91	8.17
94	WB slaughter creek between frontage roads	Urban Unrestricted	0.05	25	750	13,688	0.001812	0.000193	0.000203	0.001709	0.000103	0.006581	0.000080	0.000860	0.001017	24.81	2.64	2.77	23.39	1.42	90.08	1.10	11.77	13.92
95	NB frontage RT onto EB slaughter creek	Urban Unrestricted	0.03	15	550	6,023	0.002503	0.000280	0.000285	0.002511	0.000153	0.008518	0.000116	0.001250	0.001516	15.07	1.69	1.72	15.12	0.92	51.30	0.70	7.53	9.13
96	WB slaughter creek RT onto NB frontage road	Urban Unrestricted	0.02	15	650	4,745	0.002503	0.000280	0.000285	0.002511	0.000153	0.008518	0.000116	0.001250	0.001516	11.87	1.33	1.35	11.91	0.73	40.42	0.55	5.93	7.19
98	EB slaughter creek between frontage roads	Urban Unrestricted	0.05	25	250	4,563	0.001812	0.000193	0.000203	0.001709	0.000103	0.006581	0.000080	0.000860	0.001017	8.27	0.88	0.92	7.80	0.47	30.03	0.37	3.92	4.64
99	EB slaughter creek east of NB frontage road	Urban Unrestricted	0.01	25	750	2,738	0.001812	0.000193	0.000203	0.001709	0.000103	0.006581	0.000080	0.000860	0.001017	4.96	0.53	0.55	4.68	0.28	18.02	0.22	2.35	2.78
100	EB slaughter lane between frontage roads	Urban Unrestricted	0.16	45	19750	1,153,400	0.001205	0.000129	0.000132	0.001138	0.000069	0.004342	0.000055	0.000570	0.000639	1390.29	148.63	151.72	1313.00	79.74	5007.63	63.04	657.44	736.60
101	WB slaughter RT onto NB frontage road	Urban Unrestricted	0.03	15	3850	42,158	0.002503	0.000280	0.000285	0.002511	0.000153	0.008518	0.000116	0.001250	0.001516	105.50	11.81	12.01	105.84	6.44	359.10	4.89	52.70	63.92
102	EB Slaughter west of 35 SB frontage	Urban Unrestricted	0.05	45	19100	348,575	0.001205	0.000129	0.000132	0.001138	0.000069	0.004342	0.000055	0.000570	0.000639	420.17	44.92	45.85	396.81	24.10	1513.38	19.05	198.69	222.61
104	WB Slaughter between frontage roads	Urban Unrestricted	0.17	45	12050	747,703	0.001205	0.000129	0.000132	0.001138	0.000069	0.004342	0.000055	0.000570	0.000639	901.27	96.35	98.35	851.16	51.69	3246.25	40.87	426.19	477.51
105	WB Slaughter west of SB frontage road	Urban Unrestricted	0.05	45	21850	398,763	0.001205	0.000129	0.000132	0.001138	0.000069	0.004342	0.000055	0.000570	0.000639	480.66	51.39	52.45	453.94	27.57	1731.28	21.79	227.29	254.66
106	RT from Southbound frontage to WB Slaughter	Urban Unrestricted	0.06	15	12000	262,800	0.002503	0.000280	0.000285	0.002511	0.000153	0.008518	0.000116	0.001250	0.001516	657.67	73.65	74.90	659.79	40.17	2238.57	30.47	328.50	398.47
107	Slaughter EB RT onto Sb frontage road	Urban Unrestricted	0.03	15	4850	53,108	0.002503	0.000280	0.000285	0.002511	0.000153	0.008518	0.000116	0.001250	0.001516	132.90	14.88	15.14	133.33	8.12	452.38	6.16	66.38	80.52
108	SB frontage road south of RT from EB Slaughter	Urban Unrestricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Base 2018							Emission Factor from TxDOT MSAT ERLT (grams/mile) [4]									Emissions (grams) [5]								
Link	Link Description	Classification	Distance (miles)	Speed (mph) [1]	2018 Daily ADT [2] (vehicles/day)	Annual VMT [3] (miles/year)	Benzene	Naphthalene	Butadiene	Formaldehyde	Acrolein	DPM	POM	Acetaldehyde	Ethylbenzene	Benzene	Naphthalene	Butadiene	Formaldehyde	Acrolein	DPM	POM	Acetaldehyde	Ethylbenzene
109	SB frontage road south of SB to NB Uturn at Stassney	Urban Unrestricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
110	Slaughter WB east of NB frontage road	Urban Unrestricted	0.05	45	8650	157,863	0.001205	0.000129	0.000132	0.001138	0.000069	0.004342	0.000055	0.000570	0.000639	190.28	20.34	20.77	179.71	10.91	685.38	8.63	89.98	100.82
111	Slaughter EB East of Frontage road NB	Urban Unrestricted	0.05	45	10700	195,275	0.001205	0.000129	0.000132	0.001138	0.000069	0.004342	0.000055	0.000570	0.000639	235.38	25.16	25.69	222.30	13.50	847.81	10.67	111.31	124.71
112	SBNB u-turn at slaughter lane	Urban Unrestricted	0.11	15	4050	162,608	0.002503	0.000280	0.000285	0.002511	0.000153	0.008518	0.000116	0.001250	0.001516	406.93	45.57	46.34	408.24	24.85	1385.11	18.85	203.26	246.55
113	SB Slaughter Creek Main Lane exit ramp	Urban Restricted	0.22	30	4350	349,305	0.001621	0.000297	0.000201	0.002787	0.000181	0.018977	0.000115	0.001260	0.000961	566.25	103.63	70.23	973.55	63.18	6628.86	40.00	440.12	335.55
114	SB Slaughter Lane Mainlane entrance ramp	Urban Restricted	0.13	30	13450	638,203	0.001621	0.000297	0.000201	0.002787	0.000181	0.018977	0.000115	0.001260	0.000961	1034.57	189.35	128.31	1778.73	115.44	12111.36	73.08	804.14	613.06
115	SB frontage road after Slaughter Creek exit	Urban Unrestricted	0.29	55	22400	2,371,040	0.001116	0.000118	0.000119	0.001039	0.000063	0.003586	0.000051	0.000520	0.000570	2646.35	280.47	282.52	2463.53	150.27	8503.71	120.59	1232.94	1350.38
116	SB I-35 mainlane after Slaughter Creek exit	Urban Restricted	0.63	70	60200	13,842,990	0.001322	0.000186	0.000137	0.001682	0.000108	0.009157	0.000073	0.000790	0.000624	18305.31	2567.95	1891.41	23279.41	1493.38	126760.32	1008.14	10935.96	8640.03
117	SB I-35 mainlane after Slaughter Lane entrance	Urban Restricted	0.48	70	73650	12,903,480	0.001322	0.000186	0.000137	0.001682	0.000108	0.009157	0.000073	0.000790	0.000624	17062.95	2393.67	1763.04	21699.46	1392.03	118157.22	939.72	10193.75	8053.64
118	NB I-35 mainlane after William Cannon exit	Urban Restricted	0.47	70	61500	10,550,325	0.001322	0.000186	0.000137	0.001682	0.000108	0.009157	0.000073	0.000790	0.000624	13951.25	1957.14	1441.52	17742.22	1138.17	96609.37	768.35	8334.76	6584.93
119	NB I-35 mainlane after Slaughter Lane entrance	Urban Restricted	0.52	65	75900	14,405,820	0.001171	0.000185	0.000131	0.001700	0.000110	0.009082	0.000072	0.000790	0.000597	16873.05	2669.05	1892.57	24494.26	1590.02	130831.41	1038.03	11380.60	8594.63
120	SB I-35 Slaughter Lane exit ramp to frontage	Urban Restricted	0.21	30	17700	1,356,705	0.001621	0.000297	0.000201	0.002787	0.000181	0.018977	0.000115	0.001260	0.000961	2199.32	402.52	272.76	3781.27	245.41	25746.59	155.35	1709.45	1303.27
121	SB I-35 William Cannon mainlane entrance ramp	Urban Restricted	0.15	30	7550	413,363	0.001621	0.000297	0.000201	0.002787	0.000181	0.018977	0.000115	0.001260	0.000961	670.09	122.64	83.11	1152.08	74.77	7844.50	47.33	520.84	397.08
122	SB frontage road after Slaughter Lane exit	Urban Unrestricted	0.21	45	26850	2,058,053	0.001205	0.000129	0.000132	0.001138	0.000069	0.004342	0.000055	0.000570	0.000639	2480.74	265.21	270.72	2342.83	142.28	8935.30	112.48	1173.09	1314.35
123	SB frontage road after William Cannon entrance ramp	Urban Unrestricted	0.95	45	9150	3,172,763	0.001205	0.000129	0.000132	0.001138	0.000069	0.004342	0.000055	0.000570	0.000639	3824.39	408.86	417.35	3611.78	219.35	13774.95	173.41	1808.47	2026.24
124	SB frontage road after U-Turn north of Slaughter Lane	Urban Unrestricted	0.04	45	22800	332,880	0.001205	0.000129	0.000132	0.001138	0.000069	0.004342	0.000055	0.000570	0.000639	401.25	42.90	43.79	378.94	23.01	1445.24	18.19	189.74	212.59
125	SB I-35 mainlane after Slaughter Lane exit	Urban Restricted	0.67	70	64550	15,785,703	0.001322	0.000186	0.000137	0.001682	0.000108	0.009157	0.000073	0.000790	0.000624	20874.26	2928.33	2156.84	26546.42	1702.96	144549.74	1149.62	12470.71	9852.56
126	SB I-35 mainlane after William Cannon entrance ramp	Urban Restricted	0.59	65	82250	17,712,538	0.001171	0.000185	0.000131	0.001700	0.000110	0.009082	0.000072	0.000790	0.000597	20746.10	3281.70	2326.99	30116.69	1954.99	160862.50	1276.30	13992.90	10567.44
127	SB frontage road after U-Turn south of William Cannon	Urban Unrestricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
128	EB William Cannon between frontage roads	Urban Unrestricted	0.06	45	28450	623,055	0.001205	0.000129	0.000132	0.001138	0.000069	0.004342	0.000055	0.000570	0.000639	751.02	80.29	81.96	709.27	43.08	2705.07	34.05	355.14	397.91
129	WB William Cannon between frontage roads	Urban Unrestricted	0.06	45	14150	309,885	0.001205	0.000129	0.000132	0.001138	0.000069	0.004342	0.000055	0.000570	0.000639	373.53	39.93	40.76	352.76	21.42	1345.40	16.94	176.63	197.90
130	NB frontage road between William Cannon intersection	Urban Unrestricted	0.01	45	26100	95,265	0.001205	0.000129	0.000132	0.001138	0.000069	0.004342	0.000055	0.000570	0.000639	114.83	12.28	12.53	108.45	6.59	413.61	5.21	54.30	60.84
131	NB frontage road north of William Cannon intersection	Urban Restricted	0.11	45	31150	1,250,673	0.001205	0.000129	0.000132	0.001138	0.000069	0.004342	0.000055	0.000570	0.000639	1507.54	161.17	164.51	1423.73	86.47	5429.95	68.36	712.88	798.73
132	SB frontage road north of William Cannon intersection	Urban Unrestricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
133	SB frontage road between William Cannon intersection	Urban Unrestricted	0.01	45	24100	87,965	0.001205	0.000129	0.000132	0.001138	0.000069	0.004342	0.000055	0.000570	0.000639	106.03	11.34	11.57	100.14	6.08	381.91	4.81	50.14	56.18
134	SB I-35 William Cannon mainlane exit ramp	Urban Restricted	0.1	30	17200	627,800	0.001621	0.000297	0.000201	0.002787	0.000181	0.018977	0.000115	0.001260	0.000961	1017.71	186.26	126.22	1749.74	113.56	11913.95	71.89	791.03	603.07
135	NB I-35 William Cannon mainlane entrance ramp	Urban Restricted	0.18	30	19500	1,281,150	0.001621	0.000297	0.000201	0.002787	0.000181	0.018977	0.000115	0.001260	0.000961	2076.84	380.10	257.57	3570.69	231.74	24312.76	146.70	1614.25	1230.69
136	NB frontage road after William Cannon mainlane entrance	Urban Unrestricted	0.49	45	11650	2,083,603	0.001205	0.000129	0.000132	0.001138	0.000069	0.004342	0.000055	0.000570	0.000639	2511.54	268.50	274.08	2371.91	144.05	9046.22	113.88	1187.65	1330.67
137	NB I-35 mainlane after William Cannon mainlane entrance	Urban Restricted	0.63	65	90650	20,844,968	0.001171	0.000185	0.000131	0.001700	0.000110	0.009082	0.000072	0.000790	0.000597	24415.01	3862.07	2738.51	35442.77	2300.73	189310.74	1502.01	16467.52	12436.27
138	SB I-35 mainlane after William Cannon exit ramp	Urban Restricted	1.48	65	74700	40,352,940	0.001171	0.000185	0.000131	0.001700	0.000110	0.009082	0.000072	0.000790	0.000597	47264.04	7476.42	5301.37	68612.24	4453.89	366479.11	2907.68	31878.82	24074.89
139	SB frontage road after William Cannon exit ramp	Urban Unrestricted	0.31	45	27350	3,094,653	0.001205	0.000129	0.000132	0.001138	0.000069	0.004342	0.000055	0.000570	0.000639	3730.24	398.79	407.07	3522.86	213.95	13435.83	169.14	1763.95	1976.36
140	SB to NB Uturn at William Cannon	Urban Unrestricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
141	NB to SB Uturn at Stassney	Urban Unrestricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
142	SB frontage road after NB to SB Uturn at Stassney	Urban Unrestricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
143	NB I-35 exit ramp towards SH 71	Urban Restricted	0.16	30	9700	566,480	0.001621	0.000297	0.000201	0.002787	0.000181	0.018977	0.000115	0.001260	0.000961	918.31	168.07	113.89	1578.84	102.47	10750.26	64.87	713.76	544.17
144	NB I-35 mainlane after SH 71 exit ramp	Urban Restricted	0.62	60	80950	18,318,985	0.001125	0.000192	0.000133	0.001772	0.000116	0.008995	0.000074	0.000820	0.000602	20615.98	3510.15	2430.22	32463.01	2118.39	164778.96	1356.62	15021.57	11033.34
145	SB I-35 Hwy 71 entrance ramp	Urban Restricted	0.49	30	14400	2,575,440	0.001621	0.000297	0.000201	0.002787	0.000181	0.018977	0.000115	0.001260	0.000961	4174.98	764.10	517.79	7178.00	465.86	48874.89	294.91	3245.05	2474.00
146	SB I-35 mainlane after Hwy 71 entrance ramp	Urban Restricted	0.46	65	91900	15,430,010	0.001171	0.000185	0.000131	0.001700	0.000110	0.009082	0.000072	0.000790	0.000597	18072.65	2858.81	2027.12	26235.70	1703.06	140132.94	1111.83	12189.71	9205.67
147	SB frontage road after Hwy 71 entrance ramp	Urban Unrestricted	0.67	45	15800	3,863,890	0.001205	0.000129	0.000132	0.001138	0.000069	0.004342	0.000055	0.000570	0.000639	4657.47	497.92	508.26	4398.54	267.13	16775.57	211.18	2202.42	2467.62
148	SB to NB Uturn at Stassney	Urban Unrestricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
149	NB frontage road after SB to NB Uturn at Stassney	Urban Unrestricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150	NB frontage road after SH 71 exit ramp	Urban Unrestricted	0.68	45	28800	7,148,160	0.001205	0.000129	0.000132	0.001138	0.000069	0.004342	0.000055	0.000570	0.000639	8616.27	921.14	940.28	8137.25	494.19	31034.64	390.69	4074.45	4565.08
151	NB I-35 Stassney entrance ramp	Urban Restricted	0.22	30	8150	654,445	0.001621	0.000297	0.000201	0.002787	0.000181	0.018977	0.000115	0.001260	0.000961	1060.90	194.17	131.57	1824.00	118.38	12419.60	74.94	824.60	628.67
152	NB frontage road north of Stassney entrance ramp	Urban Unrestricted	0.25	45	21950	2,002,938	0.001205	0.000129	0.000132	0.001138	0.000069	0.004342	0.000055	0.000570	0.000639	2414.31	258.11	263.47	2280.08	138.47	8696.01	109.47	1141.67	1279.15
153	SB I-35 exit ramp towards Stassney	Urban Restricted	0.23	30	10050	843,698	0.001621	0.000297	0.000201	0.002787	0.000181	0.018977	0.000115	0.001260	0.000961	1367.70	250.32	169.62	2351.47	152.61	16011.10	96.61	1063.06	810.47
154	SB frontage road after exit ramp towards Stassney	Urban Unrestricted	0.41	50	30500	4,564,325	0.001148	0.000123	0.000124	0.001081	0.000066	0.003973	0.000052	0.000540	0.000598	5241.22	559.81	566.98	4932.79	300.47	18132.95	239.28	2464.74	2730.37
155	SB I-35 mainlane after Stassney exit ramp	Urban Restricted	0.38	60	52100	7,226,270	0.001125	0.000192	0.000133	0.001772	0.000116	0.008995	0.000074	0.000820	0.000602	8132.36	1384.64	958.65	12805.65	835.64	65000.18	535.14	5925.54	4352.31
156	SB I-35 mainlane after DC Entrance Ramp	Urban Restricted	0.72	60	77500	20,367,000	0.001125	0.000192	0.000133	0.001772	0.000116	0.008995	0.000074	0.000820	0.000602	22920.79	3902.58	2701.91	36092.29	2355.22	183200.82	1508.28	16700.94	12266.84
157	SB I-35 DC Entrance Ramp Total	Urban Restricted	0.37	55	25400	3,430,270	0.001157	0.000203	0.000139	0.001880	0.000123	0.009868	0.000078	0.000860	0.000633	3968.68	694.76	476.06	6450.30	421.13	33848.80	269.16	2950.03	2171.28
158	EB SH 71 DC to SB I-35 mainlane entrance	Urban Restricted	0.2	55	17600	1,284,800	0.001157	0.000203	0.000139	0.001880	0.000123	0.009868	0.000078	0.000860	0.000633	1486.46	260.22	178.31	2415.95	157.73	12677.99	100.81	1104.93	813.25
159	WB SH 71 71 DC to SB I-35 mainlane entrance	Urban Restricted	0.42	55	7800	1,195,740	0.001157	0.000203	0.000139	0.001880	0.000123	0.009868	0.000078	0.000860	0.000633	1383.42	242.18	165.95	2248.48	146.80	11799.18	93.83	1028.34	756.88
160	NB to SB Uturn at SH 71	Urban Unrestricted	0.1	15	7450	271,925	0.002503	0.000280	0.000285	0.002511	0.000153	0.008518	0.000116	0.001250	0.001516	680.51	76.20	77.50	682.70	41.56	2316.29	31.53	339.91	412.30
161	NB frontage road north of NB to SB Uturn at SH 71	Urban Unrestricted	0.04	45	14500	211,700	0.001205	0.000129	0.000132	0.001138	0.000069	0.004342	0.000055	0.000570	0.000639	255.18	27.28	27.85	240.99	14.64	919.12	11.57	120.67	135.20
164	SB frontage road after NB to SB Uturn at SH 71	Urban Unrestricted	0.24	45	20450	1,791,420	0.001205	0.000129	0.000132	0.001138	0.000069	0.004342	0.000055	0.000570	0.000639	2159.35	230.85	235.64	2039.30	123.85	7777.68	97.91	1021.11	1144.07
165	SB frontage road south of SH 71 intersection	Urban Unrestricted	0.03	45	13000	142,350	0.001205	0.000129	0.000132	0.001138	0.000069	0.004342	0.000055	0.000570	0.000639	171.59	18.34	18.72	162.05	9.84	618.03	7.78	81.14	90.91
170	NB I-35 mainlane exit ramp to SH 71 DC	Urban Restricted	0.4	55	27500	4,015,000	0.001157	0.000203	0.000139	0.001880	0.000123	0.009868	0.000078	0.000860	0.000633	4645.19	813.20	557.21	7549.83	492.91	39618.73	315.05	3452.90	2541.40
171	NB I-35 mainlane north of exit ramp to SH 71 DC	Urban Restricted	0.43	60	53450	8,388,978	0.001125	0.000192	0.000133	0.001772	0.000116	0.008995	0.000074	0.000820	0.000602	9440.86	1607.43	1112.89	14866.08	970.09	75458.71	621.25	6878.96	5052.60
173	NB I-35 to WB SH 71 DC south of SH 71	Urban Restricted	0.28	55	19500	1,992,900	0.001157	0.000203	0.000139	0.001880	0.000123	0.009868	0.000078	0.000860	0.000633	2305.70	403.64	276.58	3747.46	244.66	19665.30	156.38	1713.89	1261.46
174	NB I-35 to EB SH 71 DC south of SH 71	Urban Restricted	0.27	55	8000	788,400	0.001157	0.000203	0.000139	0.001880	0.000123	0.009868	0.000078	0.000860	0.000633	912.15	159.68	109.42	1482.51	96.79	7779.68	61.86	678.02	499.04
182	SB I-35 entrance ramp at Onion Creek	Urban Restricted	0.16	30	1600	93,440	0.001621	0.000297	0.000201	0.002787	0.000181	0.018977	0.000115	0.001260	0.000961	151.47	27.72	18.79	260.43	16.90	1773.24	10.70	117.73	89.76
183	SB I-35 mainlane south of Onion Creek entrance ramp	Urban Restricted	0.75	70	70850	19,395,188	0.001322	0.000186	0.000137	0.001682	0.000108	0.009157	0.000073	0.000790	0.000624	25647.27	3597.91	2650.02	32616.40	2092.35	177601.81	1412.49	15322.20	12105.40
184	SB I-35 mainlane south of SH 45 exit ramp	Urban Restricted	0.69	70	68150	17,163,578	0.001322	0.000186	0.000137	0.001682	0.000108	0.009157	0.000073	0.000790	0.000624	22696.29	3183.94	2345.11	28863.56	1851.60	157166.95	1249.97	13559.23	10712.56
185	NB frontage road between Onion Creek intersection	Urban Unrestricted	0.02	55	4150	30,295	0.001116	0.000118	0.000119	0.001039	0.000063	0.003586	0.000051	0.000520	0.000570	33.81	3.58	3.61	31.48	1.92	108.65	1.54	15.75	17.25
186	SB frontage road between Onion Creek intersection	Urban Unrestricted	0.01	55	3550	12,958	0.001116	0.000118	0.000119	0.001039	0.000063	0.003586	0.000051	0.000520	0.000570	14.46	1.53	1.54	13.46	0.82	46.47	0.66	6.74	7.38
187	NB frontage road between Slaughter Creek intersection	Urban Unrestricted	0.01	55	7600	27,740	0.001116	0.000118	0.000119	0.001039	0.000063	0.003586	0.000051	0.000520	0.000570	30.96	3.28	3.31	28.82	1.76	99.49	1.41	14.42	15.80
188	SB I-35 mainlane south of Onion Creek exit ramp	Urban Restricted	0.77	70	66000	18,549,300	0.001322	0.000186	0.000137	0.001682	0.000108	0.009157	0.000073	0.000790	0.000624	24528.71	3441.00	2534.44	31193.89	2001.10	169856.02	1350.89	14653.95	11577.45
189	SB I-35 mainlane south of Slaughter Creek entrance ramp	Urban Restricted	0.64	70	69250	16,176,800	0.001322	0.000186	0.000137	0.001682	0.000108	0.009157	0.000073	0.000790	0.000624	21391.43	3000.89	2210.28	27204.12	1745.15	148131.02	1178.11	12779.67	10096.67
190	NB frontage road between Stassney intersection	Urban Unrestricted	0.01	45	18800	68,620	0.001205	0.000129	0.000132	0.001138	0.000069	0.004342	0.000055	0.000570	0.000639	82.71	8.84	9.03	78.11	4.74	297.92	3.75	39.11	43.82
191	SB frontage road between Stassney intersection	Urban Unrestricted	0.01	45	16650	60,773	0.001205	0.000129	0.000132	0.001138	0.000069	0.004342	0.000055	0.000570	0.000639	73.25	7.83	7.99	69.18	4.20	263.85	3.32	34.64	38.81
192	EB Stassney between frontage roads	Urban Unrestricted	0.1	45	22500	821,250	0.001205	0.000129	0.000132	0.001138	0.000069	0.004342	0.000055	0.000570	0.000639	989.92	105.83	108.03	934.89	56.78	3565.56	44.89	468.11	524.48
193	WB Stassney between frontage roads	Urban Unrestricted	0.1	45	15050	549,325	0.001205	0.000129	0.000132	0.001138	0.000069	0.004342	0.000055	0.000570	0.000639	662.15	70.79	72.26	625.34	37.98	2384.96	30.02	313.12	350.82
194	NB frontage road north of NB to SB Uturn at Stassney	Urban Unrestricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
195	SB frontage road north of NB to SB Uturn at Stassney	Urban Unrestricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
196	NB I-35 mainlane north of Main Street Entrance Ramp	Urban Restricted	0.27	70	66950	6,597,923	0.001322	0.000186	0.000137	0.001682	0.000108	0.009157	0.000073	0.000790	0.000624	8724.78	1223.95	901.49	11095.56	711.78	60417.20	480.51	5212.36	4118.06
197	SB I-35 mainlane south of Main Street Exit Ramp	Urban Restricted	0.79	70	60800	17,531,680	0.001322	0.000186	0.000137	0.001682	0.000108	0.009157	0.000073	0.000790	0.000624	23183.06	3252.22	2395.40	29482.59	1891.32	160537.66	1276.78	13850.03	10942.31
198	SB I-35 mainlane south of WB SH45 to SB I-35 DC	Urban Restricted	0.49	70	67850	12,134,973	0.001322	0.000186	0.000137	0.001682	0.000108	0.009157	0.000073	0.000790	0.000624	16046.71	2251.10	1658.03	20407.08	1309.12	111119.99	883.75	9586.63	7573.98
199	SB I-35 entrance ramp south of SH 45	Urban Restricted	0.14	30	4150	212,065	0.001621	0.000297	0.000201	0.002787	0.000181	0.018977	0.000115	0.001260	0.000961	343.77	62.92	42.64	591.05	38.36	4024.42	24.28	267.20	203.71
200	SB frontage road south of SH 45 entrance ramp	Urban Unrestricted	0.38	45	9850	1,366,195	0.001205	0.000129	0.000132	0.001138	0.000069	0.004342	0.000055	0.000570	0.000639	1646.79	176.05	179.71	1555.24	94.45	5931.51	74.67	778.73	872.50
201	SB frontage road in between Slaughter Creek intersection	Urban Unrestricted	0.01	55	6400	23,360	0.001116	0.000118	0.000119	0.001039	0.000063	0.003586	0.000051	0.000520	0.000570	26.07	2.76	2.78	24.27	1.48	83.78	1.19	12.15	13.30
202	NB Expressway Entrance Ramp at SH 45	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
203	NB I-35 Mainlane North of Expressway Entrance Ramp at S	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
204	NB Expressway Exit Ramp south of Slaughter Lane	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
205	NB Expressway North of Slaughter Lane Exit Ramp	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
206	NB I-35 Mainlane North of Slaughter Lane Expy Exit Ramp	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
207	NB Expressway Entrance Ramp at Slaughter Lane	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
208	NB I-35 Mainlane North of Slaughter Lane Expy Entrance R	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
209	NB Expressway North of Slaughter Lane Expy entrance ram	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
211	NB I-35 Mainlane north of SH 71 Expy entrance ramp	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
216	SB Expressway south of exit ramp towards Stassney	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
226	SB I-35 Expressway exit ramp south of Onion Creek	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
227	SB I-35 Mainlane south of Expressway exit ramp at Onion (	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Base 2018							Emission Factor from TxDOT MSAT ERLT (grams/mile) [4]									Emissions (grams) [5]								
Link	Link Description	Classification	Distance (miles)	Speed (mph) [1]	2018 Daily ADT [2] (vehicles/day)	Annual VMT [3] (miles/year)	Benzene	Naphthalene	Butadiene	Formaldehyde	Acrolein	DPM	POM	Acetaldehyde	Ethylbenzene	Benzene	Naphthalene	Butadiene	Formaldehyde	Acrolein	DPM	POM	Acetaldehyde	Ethylbenzene
228	NB I-35 Mainlane north of william cannon exit ramp	Urban Restricted	1	65	71150	25,969,750	0.001171	0.000185	0.000131	0.001700	0.000110	0.009082	0.000072	0.000790	0.000597	30417.49	4811.56	3411.78	44156.45	2866.37	235853.22	1871.28	20516.10	15493.76
229	NB I-35 exit ramp south of william cannon	Urban Restricted	0.21	30	4750	364,088	0.001621	0.000297	0.000201	0.002787	0.000181	0.018977	0.000115	0.001260	0.000961	590.21	108.02	73.20	1014.75	65.86	6909.40	41.69	458.75	349.75
230	NB frontage road north of william cannon exit ramp	Urban Unrestricted	0.49	45	14300	2,557,555	0.001205	0.000129	0.000132	0.001138	0.000069	0.004342	0.000055	0.000570	0.000639	3082.83	329.58	336.42	2911.44	176.82	11103.95	139.78	1457.81	1633.35
231	NB frontage road south of Slaughter Creek SB to NB Uturn	Urban Unrestricted	0.09	55	7950	261,158	0.001116	0.000118	0.000119	0.001039	0.000063	0.003586	0.000051	0.000520	0.000570	291.48	30.89	31.12	271.34	16.55	936.64	13.28	135.80	148.74
232	NB frontage road between Slaughter Lane intersection	Urban Unrestricted	0.02	45	21150	154,395	0.001205	0.000129	0.000132	0.001138	0.000069	0.004342	0.000055	0.000570	0.000639	186.11	19.90	20.31	175.76	10.67	670.33	8.44	88.01	98.60
233	SB frontage road north of William Cannon mainlane exit ra	Urban Unrestricted	0.32	45	10150	1,185,520	0.001205	0.000129	0.000132	0.001138	0.000069	0.004342	0.000055	0.000570	0.000639	1429.01	152.77	155.94	1349.56	81.96	5147.09	64.80	675.75	757.12
234	NB frontage road south of SH 71 mainlane exit ramp	Urban Unrestricted	0.4	45	19100	2,788,600	0.001205	0.000129	0.000132	0.001138	0.000069	0.004342	0.000055	0.000570	0.000639	3361.33	359.35	366.81	3174.46	192.79	12107.06	152.41	1589.50	1780.90
235	SB frontage road north of William Cannon mainlane entrar	Urban Unrestricted	0.64	30	16700	3,901,120	0.001612	0.000170	0.000177	0.001501	0.000091	0.006116	0.000071	0.000760	0.000883	6288.15	662.59	688.59	5854.56	354.13	23861.12	276.12	2964.85	3443.42
236	SB frontage road north of Slaughter Creek Main Lane exit r	Urban Unrestricted	0.39	45	18050	2,569,418	0.001205	0.000129	0.000132	0.001138	0.000069	0.004342	0.000055	0.000570	0.000639	3097.13	331.11	337.98	2924.95	177.64	11155.45	140.43	1464.57	1640.93
237	SB frontage road south of Slaughter Lane mainlane entran	Urban Unrestricted	0.38	55	8950	1,241,365	0.001116	0.000118	0.000119	0.001039	0.000063	0.003586	0.000051	0.000520	0.000570	1385.50	146.84	147.92	1289.79	78.68	4452.14	63.14	645.51	706.99
238	WB Puryear road in between frontage roads	Urban Unrestricted	0.1	65	7400	270,100	0.001147	0.000112	0.000115	0.000973	0.000059	0.003275	0.000049	0.000500	0.000546	309.78	30.32	31.15	262.83	15.83	884.71	13.21	135.05	147.50
239	NB frontage road RT to EB Stassney	Urban Unrestricted	0.06	15	3750	82,125	0.002503	0.000280	0.000285	0.002511	0.000153	0.008518	0.000116	0.001250	0.001516	205.52	23.01	23.40	206.18	12.55	699.55	9.52	102.66	124.52
240	NB frontage road north of RT to EB Stassney	Urban Unrestricted	0.03	45	7900	86,505	0.001205	0.000129	0.000132	0.001138	0.000069	0.004342	0.000055	0.000570	0.000639	104.27	11.15	11.38	98.47	5.98	375.57	4.73	49.31	55.25
241	WB Stassney RT to NB frontage road	Urban Unrestricted	0.05	15	4150	75,738	0.002503	0.000280	0.000285	0.002511	0.000153	0.008518	0.000116	0.001250	0.001516	189.54	21.22	21.58	190.15	11.58	645.14	8.78	94.67	114.84
242	SB frontage road RT to WB Stassney	Urban Unrestricted	0.02	15	6150	44,895	0.002503	0.000280	0.000285	0.002511	0.000153	0.008518	0.000116	0.001250	0.001516	112.35	12.58	12.79	112.71	6.86	382.42	5.21	56.12	68.07
243	SB frontage road south of RT to WB Stassney	Urban Unrestricted	0.02	45	9650	70,445	0.001205	0.000129	0.000132	0.001138	0.000069	0.004342	0.000055	0.000570	0.000639	84.91	9.08	9.27	80.19	4.87	305.85	3.85	40.15	44.99
244	NB frontage road north of WB Stassney	Urban Unrestricted	0.03	45	14950	163,703	0.001205	0.000129	0.000132	0.001138	0.000069	0.004342	0.000055	0.000570	0.000639	197.32	21.10	21.53	186.35	11.32	710.74	8.95	93.31	104.55
245	EB Stassney RT to SB frontage road	Urban Unrestricted	0.02	15	1850	13,505	0.002503	0.000280	0.000285	0.002511	0.000153	0.008518	0.000116	0.001250	0.001516	33.80	3.78	3.85	33.91	2.06	115.04	1.57	16.88	20.48
247	EB William Cannon RT to SB frontage road	Urban Unrestricted	0.04	15	3250	47,450	0.002503	0.000280	0.000285	0.002511	0.000153	0.008518	0.000116	0.001250	0.001516	118.75	13.30	13.52	119.13	7.25	404.19	5.50	59.31	71.95
248	SB frontage road RT to William Cannon	Urban Unrestricted	0.05	15	10250	187,063	0.002503	0.000280	0.000285	0.002511	0.000153	0.008518	0.000116	0.001250	0.001516	468.13	52.42	53.31	469.64	28.59	1593.42	21.69	233.83	283.63
249	NB frontage road north of WB William Cannon	Urban Unrestricted	0.02	45	21850	159,505	0.001205	0.000129	0.000132	0.001138	0.000069	0.004342	0.000055	0.000570	0.000639	192.26	20.55	20.98	181.58	11.03	692.51	8.72	90.92	101.87
250	NB frontage road north of RT to EB Slaughter	Urban Unrestricted	0.03	45	9700	106,215	0.001205	0.000129	0.000132	0.001138	0.000069	0.004342	0.000055	0.000570	0.000639	128.03	13.69	13.97	120.91	7.34	461.15	5.81	60.54	67.83
251	SB frontage road in between FM 1327	Urban Unrestricted	0.08	55	8500	248,200	0.001116	0.000118	0.000119	0.001039	0.000063	0.003586	0.000051	0.000520	0.000570	277.02	29.36	29.57	257.88	15.73	890.17	12.62	129.06	141.36
252	NB frontage road north of WB Puryear	Urban Unrestricted	0.03	55	1150	12,593	0.001116	0.000118	0.000119	0.001039	0.000063	0.003586	0.000051	0.000520	0.000570	14.05	1.49	1.50	13.08	0.80	45.16	0.64	6.55	7.17
255	NB frontage road north of Slaughter Lane first DC split	Urban Unrestricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
256	NB frontage south of William Cannon NB to SB Uturn	Urban Unrestricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
257	NB frontage Ramp to EL north of Slaughter Lane	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
258	NB Ramp to EL north of Slaughter Lane	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
259	NB frontage Ramp to I-35 Mainlane north of Slaughter	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
260	NB EL north of Slaughter Lane after frontage road ramp	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
261	NB EL off ramp north of Stassney	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
262	NB EL north of Stassney after off ramp	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
263	WB DC Ramp to SB I-35 Express Lane after split (new road)	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
264	SB frontage ramp north of Stassney	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
265	SB DC Ramp south of SH 71 total	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
266	SB exit ramp to frontage road south of Stassney	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
267	SB frontage road straight south of Stassney exit ramp	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
268	SB mainlane exit ramp to frontage road south of Stassney	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
269	SB frontage road south of mainlane exit ramp south of Sta	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
270	NB mainlane exit ramp south of SH71	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
271	NB mainlane after exit ramp south of SH71	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
272	NB DC to EB SH 71	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
273	SB Expressway north of Stassney	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
274	SB mainlane south of William Cannon Drive	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
275	SB mainlane south of Slaughter Lane, south of EL exit	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
276	SB Expressway exit south of Slaughter Lane	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
					Total VMT (miles/year)	**604,683,820**										**Total (grams/year)**	**762509.45**	**108876.26**	**82396.72**	**990385.12**	**63474.57**	**5182857.72**	**42977.78**	**466066.45**	**380272.06**
					Total VMT (million miles/year)	**605**										**Total (tons/year)**	**0.841**	**0.120**	**0.091**	**1.092**	**0.070**	**5.713**	**0.047**	**0.514**	**0.419**

[1] 2018 speeds are based on posted speeds from the statewide planning website to the extent possible. Otherwise, posted speeds located through Google Maps or design speeds were used, if available. https://www.txdot.gov/apps/statewide_mapping/StatewidePlanningMap.html

[2] Average Daily Traffic based on "Capital Express 2018 Existing Configuration 24 Hour Volumes."

[3] Annual Vehicle Miles Travelled (miles/year) = ADT (vehicles/day) * Distance travelled (miles/vehicle) * 365 days/year

[4] MSAT emission rates are based on the TxDOT Emission Rate Lookup Tables for MSAT (01/17) for the Austin area. Separate AM and PM emission rates were found for each pollutant based on AM and PM speeds.

[5] Emissions (grams/year) = AM emission rate (g/mile) * Annual VMT (miles/year) / 2 + PM emission rate (g/mile) * Annual VMT (miles/year) / 2
ADT volumes were allocated 50/50 to the AM and PM hours per TxDOT guidance.

2045 No Build							Emission Factor from TxDOT MSAT ERLT (grams/mile) [4]									Emissions (grams) [5]								
Link	Link Description	Classification	Distance (miles)	Speed (mph) [1]	2045 NB Daily ADT [2] (vehicles/day)	Annual VMT [3] (miles/year)	Benzene	Naphthalene	Butadiene	Formaldehyde	Acrolein	DPM	POM	Acetaldehyde	Ethylbenzene	Benzene	Naphthalene	Butadiene	Formaldehyde	Acrolein	DPM	POM	Acetaldehyde	Ethylbenzene
1	NB I-35 mainlanes south of DC split	Urban Restricted	0.34	70	102463	12,715,658	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	3699.01	606.90	22.82	7265.46	336.83	14345.41	176.43	2415.98	2265.90
2	NB I-35 mainlanes north of DC split	Urban Restricted	0.85	70	92675	28,752,419	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	8364.13	1372.31	51.59	16428.54	761.64	32437.59	398.94	5462.96	5123.60
3	NB I-35 mainlanes south of onion creek exit	Urban Restricted	0.84	70	96063	29,452,916	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	8567.90	1405.74	52.85	16828.78	780.20	33227.87	408.66	5596.05	5248.43
4	NB I-35 mainlanes south of FM 1327 entrance ramp north	Urban Restricted	0.44	70	99126	15,919,636	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	4631.05	759.82	28.56	9096.15	421.70	17960.04	220.89	3024.73	2836.84
5	NB I-35 mainlanes south of slaughter creek exit	Urban Restricted	0.46	70	102925	17,281,108	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	5027.10	824.80	31.01	9874.07	457.77	19496.01	239.78	3283.41	3079.45
6	NB I-35 mainlanes south of onion creek entrance	Urban Restricted	0.54	70	97150	19,148,265	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	5570.26	913.92	34.36	10940.92	507.23	21602.48	265.68	3638.17	3412.17
7	NB I-35 mainlanes south of slaughter exit	Urban Restricted	0.61	70	107138	23,854,276	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	6939.25	1138.53	42.80	13629.84	631.89	26911.66	330.98	4532.31	4250.77
8	NB I-35 mainlanes south of slaughter creek entrance	Urban Restricted	0.61	70	89725	19,977,271	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	5811.42	953.48	35.85	11414.60	529.19	22537.74	277.18	3795.68	3559.90
9	Nb I-35 mainlanes south of William cannon exit	Urban Restricted	0.46	70	97100	16,303,090	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	4742.60	778.12	29.25	9315.25	431.86	18392.64	226.21	3097.59	2905.17
12	Southbound 35 Frontage south of puryear road	Urban Unrestricted	0.34	55	10050	1,247,205	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	273.56	35.54	1.25	414.73	19.26	554.05	13.32	137.19	220.28
14	WB Puryear Road east of 45	Urban Unrestricted	0.03	65	9875	108,131	0.000238	0.000027	0.000001	0.000303	0.000014	0.000415	0.000011	0.000110	0.000166	25.69	2.89	0.09	32.74	1.52	44.85	1.20	11.89	17.97
16	WB Puryear Road RT	Urban Unrestricted	0.03	15	1363	14,925	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	6.85	1.07	0.04	12.95	0.60	15.11	0.30	4.33	7.85
17	WB Puryear straight	Urban Unrestricted	0.02	60	4138	30,207	0.000222	0.000027	0.000001	0.000315	0.000015	0.000417	0.000011	0.000110	0.000169	6.70	0.82	0.03	9.51	0.44	12.59	0.32	3.32	5.10
19	Eastbound puryear road between frontage roads	Urban Unrestricted	0.09	65	4988	163,856	0.000238	0.000027	0.000001	0.000303	0.000014	0.000415	0.000011	0.000110	0.000166	38.93	4.38	0.14	49.61	2.31	67.96	1.82	18.02	27.24
20	EB FR_45 east ofr 35	Urban Unrestricted	0.08	65	15288	446,410	0.000238	0.000027	0.000001	0.000303	0.000014	0.000415	0.000011	0.000110	0.000166	106.07	11.94	0.38	135.15	6.29	185.15	4.96	49.11	74.20
21	WBSB_DC_45	Urban Restricted	1.26	75	10750	4,943,925	0.000355	0.000049	0.000002	0.000565	0.000026	0.001164	0.000016	0.000190	0.000192	1757.27	240.11	8.32	2791.54	129.72	5752.42	79.05	939.35	949.16
22	WBNB_DC_45	Urban Restricted	1.08	75	3063	1,207,435	0.000355	0.000049	0.000002	0.000565	0.000026	0.001164	0.000016	0.000190	0.000192	429.17	58.64	2.03	681.77	31.68	1404.89	19.31	229.41	231.81
25	NB frontage road south of main street entrance ramp	Urban Unrestricted	0.77	45	22713	6,383,489	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	1465.77	202.24	7.36	2391.35	110.97	3384.97	69.65	829.85	1293.85
26	NB ramp exit to FM 1327	Urban Restricted	0.16	30	5550	324,120	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	103.74	27.29	1.18	345.17	15.94	724.73	5.21	113.44	97.19
27	NBEB_DC_45	Urban Restricted	1.11	75	9788	3,965,608	0.000355	0.000049	0.000002	0.000565	0.000026	0.001164	0.000016	0.000190	0.000192	1409.54	192.60	6.67	2239.14	104.05	4614.12	63.41	753.47	761.34
28	NB frontage south of exit ramp to FM 1327	Urban Unrestricted	0.57	55	17163	3,570,762	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	783.22	101.75	3.57	1187.37	55.15	1586.26	38.13	392.78	630.66
29	NB entrance ramp south of SH 45SE	Urban Restricted	0.27	30	9313	917,796	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	293.76	77.28	3.35	977.42	45.13	2052.18	14.74	321.23	275.22
30	NB frontage road north of entrance ramp south of SH 45 SE	Urban Unrestricted	0.31	55	13400	1,516,210	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	332.57	43.20	1.52	504.18	23.42	673.56	16.19	166.78	267.79
31	NB frontage road in between FM 1327	Urban Unrestricted	0.09	55	3101	101,868	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	22.34	2.90	0.10	33.87	1.57	45.25	1.09	11.21	17.99
32	NB Frontage road north of FM 1327	Urban Unrestricted	0.49	55	3100	554,435	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	121.61	15.80	0.55	184.36	8.56	246.30	5.92	60.99	97.92
33	NB exit ramp north of SH 45 (onion creek)	Urban Restricted	0.39	30	5925	843,424	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	269.96	71.02	3.08	898.21	41.47	1885.89	13.55	295.20	252.92
34	NB frontage road south of SH 45 entrance ramp	Urban Unrestricted	0.56	55	9025	1,844,710	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	404.62	52.56	1.84	613.41	28.49	819.49	19.70	202.92	325.81
35	NB ENtrance ramp north of SH 45SE	Urban Restricted	0.33	30	3800	457,710	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	146.50	38.54	1.67	487.44	22.50	1023.43	7.35	160.20	137.25
36	Nb frontage road south of onion creek	Urban Unrestricted	0.69	55	5225	1,315,916	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	288.64	37.50	1.32	437.58	20.33	584.58	14.05	144.75	232.42
37	Nb frontage road north of onion creek	Urban Unrestricted	0.23	55	16425	1,378,879	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	302.45	39.29	1.38	458.51	21.30	612.55	14.72	151.68	243.54
39	NB exit slaughter creek	Urban Restricted	0.15	30	5775	316,181	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	101.20	26.62	1.15	336.72	15.55	706.98	5.08	110.66	94.81
40	NB frontage road north of slaughter creek exit	Urban Unrestricted	0.29	55	22200	2,349,870	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	515.42	66.96	2.35	781.39	36.30	1043.90	25.09	258.49	415.03
41	entrance ramp south of slaughter creek	Urban Restricted	0.11	30	9988	401,018	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	128.36	33.77	1.46	427.07	19.72	896.67	6.44	140.36	120.25
42	NB frontage road south of slaughter creek	Urban Unrestricted	0.38	55	12213	1,693,943	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	371.55	48.27	1.69	563.28	26.16	752.51	18.09	186.33	299.18
43	SBNB u-turn at slaughter creek	Urban Unrestricted	0.28	15	5025	513,555	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	235.76	36.65	1.44	445.50	20.63	519.91	10.29	148.93	270.18
44	NB frontage south of exit ramp to Slaughter	Urban Unrestricted	0.37	55	17075	2,305,979	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	505.80	65.71	2.31	766.80	35.62	1024.40	24.62	253.66	407.28
45	NB exit ramp south of slaughter	Urban Restricted	0.15	30	17413	953,362	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	305.15	80.28	3.48	1015.29	46.87	2131.71	15.31	333.68	285.89
46	NB frontage road north of slaughter exit	Urban Unrestricted	0.34	45	34488	4,279,961	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	982.76	135.59	4.93	1603.34	74.40	2269.53	46.70	556.39	867.49
47	NB Entrance ramp south of slaughter	Urban Restricted	0.12	30	7375	323,025	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	103.39	27.20	1.18	344.01	15.88	722.28	5.19	113.06	96.87
48	NBSB Uturn slaughter	Urban Unrestricted	0.16	15	6838	399,339	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	183.33	28.50	1.12	346.42	16.04	404.28	8.00	115.81	210.09
49	NB Frontage road south of slaughter	Urban Unrestricted	0.41	45	27113	4,057,460	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	931.67	128.55	4.68	1519.99	70.53	2151.55	44.27	527.47	822.39
50	NB Frontage road south of slaughter north of uturn	Urban Unrestricted	0.02	45	20275	148,008	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	33.99	4.69	0.17	55.45	2.57	78.48	1.61	19.24	30.00
51	NB frontage right turn at slaughter lane	Urban Unrestricted	0.04	15	3763	54,940	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	25.22	3.92	0.15	47.66	2.21	55.62	1.10	15.93	28.90
54	NB frontage road north of slaughter lane sbnb uturn	Urban Unrestricted	0.26	45	33175	3,148,308	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	722.91	99.74	3.63	1179.41	54.73	1669.45	34.35	409.28	638.12
56	exit ramp north of slaughter lane	Urban Restricted	0.16	30	10438	609,579	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	195.11	51.33	2.22	649.18	29.97	1363.01	9.79	213.35	182.80
57	NB frontange road north of WC exit ramp	Urban Unrestricted	1	45	43613	15,918,745	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	3655.24	504.32	18.35	5963.41	276.72	8441.23	173.68	2069.44	3226.51
58	NB entrance ramp south of william cannon	Urban Restricted	0.2	55	21963	1,603,299	0.000230	0.000054	0.000002	0.000677	0.000031	0.001181	0.000012	0.000220	0.000184	368.82	86.86	3.65	1085.18	50.15	1893.47	19.95	352.73	295.03
59	NB frontage north of Slaughter entrance	Urban Unrestricted	0.42	45	21650	3,318,945	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	762.09	105.15	3.83	1243.33	57.69	1759.94	36.21	431.46	672.70
60	NB william cannon right turn	Urban Unrestricted	0.03	15	2050	22,448	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	10.31	1.60	0.06	19.47	0.90	22.73	0.45	6.51	11.81
61	NB_SB uturn william cannon	Urban Unrestricted	0.14	15	1313	67,094	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	30.80	4.79	0.19	58.20	2.70	67.93	1.34	19.46	35.30
62	NB frontage west of EB William Cannon	Urban Unrestricted	0.07	45	20338	519,636	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	119.32	16.46	0.60	194.66	9.03	275.55	5.67	67.55	105.32
63	WB William Cannon RT	Urban Unrestricted	0.04	15	14450	210,970	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	96.85	15.05	0.59	183.01	8.47	213.58	4.23	61.18	110.99
64	NB I-35 frontage road north of right turn to EB William Can	Urban Unrestricted	0.02	45	18288	133,502	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	30.65	4.23	0.15	50.01	2.32	70.79	1.46	17.36	27.06
65	SB exit ramp main street	Urban Restricted	0.22	30	11200	899,360	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	287.86	75.73	3.28	957.78	44.22	2010.96	14.44	314.78	269.69
66	SB frontage road south of main street exit	Urban Unrestricted	0.92	55	21250	7,135,750	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	1565.17	203.33	7.13	2372.82	110.22	3169.96	76.19	784.93	1260.31
69	RT from WB Puryear RD to SB I-35 frontage	Urban Unrestricted	0.04	15	1525	22,265	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	10.22	1.59	0.06	19.31	0.89	22.54	0.45	6.46	11.71
71	SB frontage road south of 45 exit ramp	Urban Unrestricted	0.38	55	6513	903,353	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	198.14	25.74	0.90	300.39	13.95	401.30	9.65	99.37	159.55
72	SB 45 exit ramp	Urban Restricted	0.1	30	4100	149,650	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	47.90	12.60	0.55	159.37	7.36	334.62	2.40	52.38	44.88
73	SB frontage road south of Onion creek entrance ramp	Urban Unrestricted	1	55	2413	880,745	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	193.18	25.10	0.88	292.87	13.60	391.26	9.40	96.88	155.56
74	SB frontage road south of Onion creek	Urban Unrestricted	0.41	55	4800	718,320	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	157.56	20.47	0.72	238.86	11.10	319.10	7.67	79.02	126.87
75	SB to NB Uturn at onion creek	Urban Unrestricted	0.1	15	9400	343,100	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	157.51	24.48	0.96	297.63	13.78	347.35	6.87	99.50	180.50
76	WB Onion creek right turn from SB frontage road	Urban Unrestricted	0.03	15	1363	14,925	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	6.85	1.07	0.04	12.95	0.60	15.11	0.30	4.33	7.85
77	SB frontage road south of SB to NB Uturn at Onion Creek	Urban Unrestricted	0.05	55	6250	114,063	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	25.02	3.25	0.11	37.93	1.76	50.67	1.22	12.55	20.15
78	NB frontage road RT to Onion creek EB	Urban Unrestricted	0.04	15	713	10,410	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	4.78	0.74	0.03	9.03	0.42	10.54	0.21	3.02	5.48
79	Onion creek EB between frontage roads	Urban Unrestricted	0.06	30	3950	86,505	0.000300	0.000042	0.000002	0.000496	0.000023	0.000745	0.000013	0.000170	0.000288	25.98	3.61	0.13	42.94	1.99	64.48	1.15	14.71	24.87
80	Onion creek EB east of NB frontage road	Urban Unrestricted	0.02	30	2826	20,630	0.000300	0.000042	0.000002	0.000496	0.000023	0.000745	0.000013	0.000170	0.000288	6.20	0.86	0.03	10.24	0.47	15.38	0.27	3.51	5.93
81	Onion creek WB east of NB frontage road	Urban Unrestricted	0.02	30	1038	7,577	0.000300	0.000042	0.000002	0.000496	0.000023	0.000745	0.000013	0.000170	0.000288	2.28	0.32	0.01	3.76	0.17	5.65	0.10	1.29	2.18
82	Onion creek WB between frontage roads	Urban Unrestricted	0.06	30	2113	46,275	0.000300	0.000042	0.000002	0.000496	0.000023	0.000745	0.000013	0.000170	0.000288	13.90	1.93	0.07	22.97	1.07	34.49	0.61	7.87	13.30
83	Onion creek WB west of SB frontage road	Urban Unrestricted	0.02	30	1600	11,680	0.000300	0.000042	0.000002	0.000496	0.000023	0.000745	0.000013	0.000170	0.000288	3.51	0.49	0.02	5.80	0.27	8.71	0.15	1.99	3.36
84	Onion creek RT to SB frontage road	Urban Unrestricted	0.03	15	900	9,855	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	4.52	0.70	0.03	8.55	0.40	9.98	0.20	2.86	5.18
85	Onion creek Rt to NB frontage road	Urban Unrestricted	0.03	15	1750	19,163	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	8.80	1.37	0.05	16.62	0.77	19.40	0.38	5.56	10.08
86	SB entrance ramp slaughter creek	Urban Restricted	0.12	30	4988	218,474	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	69.93	18.40	0.80	232.67	10.74	488.51	3.51	76.47	65.51
87	SB frontage road south of slaughter creek entrance ramp	Urban Unrestricted	0.17	55	15650	971,083	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	213.00	27.67	0.97	322.91	15.00	431.39	10.37	106.82	171.51
88	SB exit ramp onion creek	Urban Restricted	0.13	30	11763	558,154	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	178.65	47.00	2.04	594.41	27.44	1248.03	8.96	195.35	167.38
89	SB frontage road south of onion creek exit ramp	Urban Unrestricted	0.52	55	21163	4,016,737	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	881.04	114.45	4.02	1335.67	62.04	1784.38	42.89	441.84	709.43
90	SB frontage road south of slaughter creek one lane	Urban Unrestricted	0.2	55	9400	686,200	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	150.51	19.55	0.69	228.18	10.60	304.84	7.33	75.48	121.20
92	SB frontage road south of slaughter creek uturn	Urban Unrestricted	0.16	55	8563	500,079	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	109.69	14.25	0.50	166.29	7.72	222.15	5.34	55.01	88.32
93	WB slaughter creek east of NB frontage road	Urban Unrestricted	0.02	25	1750	12,775	0.000328	0.000047	0.000002	0.000569	0.000026	0.000790	0.000015	0.000190	0.000334	4.19	0.61	0.02	7.27	0.34	10.09	0.19	2.43	4.27
94	WB slaughter creek between frontage roads	Urban Unrestricted	0.05	25	1463	26,700	0.000328	0.000047	0.000002	0.000569	0.000026	0.000790	0.000015	0.000190	0.000334	8.76	1.27	0.05	15.19	0.70	21.09	0.39	5.07	8.92
95	NB frontage RT onto EB slaughter creek	Urban Unrestricted	0.03	15	788	8,629	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	3.96	0.62	0.02	7.49	0.35	8.74	0.17	2.50	4.54
96	WB slaughter creek RT onto NB frontage road	Urban Unrestricted	0.02	15	775	5,658	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	2.60	0.40	0.02	4.91	0.23	5.73	0.11	1.64	2.98
98	EB slaughter creek between frontage roads	Urban Unrestricted	0.05	25	813	14,837	0.000328	0.000047	0.000002	0.000569	0.000026	0.000790	0.000015	0.000190	0.000334	4.87	0.70	0.03	8.44	0.39	11.72	0.22	2.82	4.95
99	EB slaughter creek east of NB frontage road	Urban Unrestricted	0.01	25	1263	4,610	0.000328	0.000047	0.000002	0.000569	0.000026	0.000790	0.000015	0.000190	0.000334	1.51	0.22	0.01	2.62	0.12	3.64	0.07	0.88	1.54
100	EB slaughter lane between frontage roads	Urban Unrestricted	0.16	45	28375	1,657,100	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	380.50	52.50	1.91	620.78	28.81	878.71	18.08	215.42	335.87
101	WB slaughter RT onto NB frontage road	Urban Unrestricted	0.03	15	6088	66,664	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	30.60	4.76	0.19	57.83	2.68	67.49	1.34	19.33	35.07
102	EB Slaughter west of 35 SB frontage	Urban Unrestricted	0.05	45	24163	440,975	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	101.26	13.97	0.51	165.20	7.67	233.84	4.81	57.33	89.38
104	WB Slaughter between frontage roads	Urban Unrestricted	0.17	45	19301	1,197,627	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	275.00	37.94	1.38	448.65	20.82	635.07	13.07	155.69	242.74
105	WB Slaughter west of SB frontage road	Urban Unrestricted	0.05	45	34238	624,844	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	143.48	19.80	0.72	234.08	10.86	331.34	6.82	81.23	126.65
106	RT from Southbound frontage to WB Slaughter	Urban Unrestricted	0.06	15	18313	401,055	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	184.12	28.62	1.12	347.90	16.11	406.02	8.04	116.31	210.99
107	Slaughter EB RT onto Sb frontage road	Urban Unrestricted	0.03	15	4163	45,585	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	20.93	3.25	0.13	39.54	1.83	46.15	0.91	13.22	23.98

2045 No Build							Emission Factor from TxDOT MSAT ERLT (grams/mile) [4]									Emissions (grams) [5]								
Link	Link Description	Classification	Distance (miles)	Speed (mph) [1]	2045 NB Daily ADT [2] (vehicles/day)	Annual VMT [3] (miles/year)	Benzene	Naphthalene	Butadiene	Formaldehyde	Acrolein	DPM	POM	Acetaldehyde	Ethylbenzene	Benzene	Naphthalene	Butadiene	Formaldehyde	Acrolein	DPM	POM	Acetaldehyde	Ethylbenzene
108	SB frontage road south of RT from EB Slaughter	Urban Unrestricted	0.11	45	18838	756,346	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	173.67	23.96	0.87	283.34	13.15	401.07	8.25	98.32	153.30
109	SB frontage road south of SB to NB Uturn at Stassney	Urban Unrestricted	0.07	45	21888	559,238	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	128.41	17.72	0.64	209.50	9.72	296.55	6.10	72.70	113.35
110	Slaughter WB east of NB frontage road	Urban Unrestricted	0.05	45	13226	241,375	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	55.42	7.65	0.28	90.42	4.20	127.99	2.63	31.38	48.92
111	Slaughter EB East of Frontage road NB	Urban Unrestricted	0.05	45	16226	296,125	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	68.00	9.38	0.34	110.93	5.15	157.03	3.23	38.50	60.02
112	SBNB u-turn at slaughter lane	Urban Unrestricted	0.11	15	6825	274,024	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	125.80	19.55	0.77	237.71	11.01	277.42	5.49	79.47	144.16
113	SB Slaughter Creek Main Lane exit ramp	Urban Restricted	0.22	30	6725	540,018	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	172.85	45.47	1.97	575.10	26.55	1207.47	8.67	189.01	161.94
114	SB Slaughter Lane Mainlane entrance ramp	Urban Restricted	0.13	30	18813	892,677	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	285.72	75.17	3.26	950.66	43.89	1996.02	14.34	312.44	267.69
115	SB frontage road after Slaughter Creek exit	Urban Unrestricted	0.29	55	32400	3,429,540	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	752.24	97.72	3.43	1140.41	52.97	1523.53	36.62	377.25	605.72
116	SB I-35 mainlane after Slaughter Creek exit	Urban Restricted	0.63	70	93200	21,431,340	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	6234.41	1022.88	38.45	12245.42	567.71	24178.18	297.36	4071.95	3819.01
117	SB I-35 mainlane after Slaughter Lane entrance	Urban Restricted	0.48	70	112013	19,624,678	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	5708.85	936.65	35.21	11213.13	519.85	22139.96	272.29	3728.69	3497.07
118	NB I-35 mainlane after William Cannon exit	Urban Restricted	1.41	70	86663	44,601,113	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	12974.54	2128.74	80.03	25484.15	1181.47	50317.60	618.84	8474.21	7947.80
119	NB I-35 mainlane after Slaughter Lane entrance	Urban Restricted	0.82	65	108626	32,511,762	0.000245	0.000048	0.000002	0.000591	0.000027	0.001116	0.000013	0.000200	0.000171	7957.66	1567.87	62.79	19219.17	889.38	36295.21	410.55	6502.35	5560.06
120	SB I-35 Slaughter Lane exit ramp to frontage	Urban Restricted	0.45	30	28500	4,681,125	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	1498.32	394.17	17.08	4985.21	230.16	10466.94	75.18	1638.39	1403.74
121	SB I-35 William Cannon mainlane entrance ramp	Urban Restricted	0.29	30	12938	1,369,487	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	438.34	115.32	5.00	1458.45	67.33	3062.16	21.99	479.32	410.67
122	SB frontage road after Slaughter Lane exit	Urban Unrestricted	0.55	45	53800	10,800,350	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	2479.96	342.17	12.45	4045.98	187.75	5727.10	117.84	1404.05	2189.08
123	SB frontage road after William Cannon entrance ramp	Urban Unrestricted	0.75	45	40863	11,186,246	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	2568.57	354.39	12.90	4190.54	194.45	5931.73	122.05	1454.21	2267.30
124	SB frontage road after U-Turn north of Slaughter Lane	Urban Unrestricted	0.04	45	37988	554,625	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	127.35	17.57	0.64	207.77	9.64	294.10	6.05	72.10	112.41
125	SB I-35 mainlane after Slaughter Lane exit	Urban Restricted	1.29	70	86988	40,958,300	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	11914.84	1954.87	73.49	23402.72	1084.97	46207.89	568.30	7782.08	7298.66
126	SB I-35 mainlane after William Cannon entrance ramp	Urban Restricted	0.73	65	99926	26,625,283	0.000245	0.000048	0.000002	0.000591	0.000027	0.001116	0.000013	0.000200	0.000171	6516.87	1284.00	51.42	15739.41	728.35	29723.71	336.22	5325.06	4553.37
127	SB frontage road after U-Turn south of William Cannon	Urban Unrestricted	0.49	45	25301	4,525,084	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	1039.04	143.36	5.22	1695.17	78.66	2399.51	49.37	588.26	917.17
128	EB William Cannon between frontage roads	Urban Unrestricted	0.06	45	42251	925,297	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	212.47	29.31	1.07	346.63	16.08	490.66	10.10	120.29	187.55
129	WB William Cannon between frontage roads	Urban Unrestricted	0.06	45	22063	483,180	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	110.95	15.31	0.56	181.01	8.40	256.22	5.27	62.81	97.93
130	NB frontage road between William Cannon intersection	Urban Unrestricted	0.01	45	37426	136,605	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	31.37	4.33	0.16	51.17	2.37	72.44	1.49	17.76	27.69
131	NB frontage road north of William Cannon intersection	Urban Unrestricted	0.11	45	47275	1,898,091	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	435.84	60.13	2.19	711.05	32.99	1006.50	20.71	246.75	384.72
132	SB frontage road north of William Cannon intersection	Urban Unrestricted	0.03	45	39163	428,835	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	98.47	13.59	0.49	160.65	7.45	227.40	4.68	55.75	86.92
133	SB frontage road between William Cannon intersection	Urban Unrestricted	0.01	45	34576	126,202	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	28.98	4.00	0.15	47.28	2.19	66.92	1.38	16.41	25.58
134	SB I-35 William Cannon mainlane exit ramp	Urban Restricted	1.76	30	26238	16,855,291	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	5394.97	1419.28	61.50	17950.19	828.73	37688.24	270.70	5899.35	5054.44
135	NB I-35 William Cannon mainlane entrance ramp	Urban Restricted	0.37	30	29675	4,007,609	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	1282.74	337.46	14.62	4267.94	197.04	8960.97	64.36	1402.66	1201.77
136	NB frontage road after William Cannon mainlane entrance	Urban Unrestricted	0.47	45	17600	3,019,280	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	693.28	95.65	3.48	1131.07	52.48	1601.03	32.94	392.51	611.97
137	NB I-35 mainlane after William Cannon mainlane entrance	Urban Restricted	0.44	65	138300	22,210,980	0.000245	0.000048	0.000002	0.000591	0.000027	0.001116	0.000013	0.000200	0.000171	5436.42	1071.12	42.90	13129.91	607.60	24795.71	280.47	4442.20	3798.45
138	SB I-35 mainlane after William Cannon exit ramp	Urban Restricted	0.54	65	115488	22,762,685	0.000245	0.000048	0.000002	0.000591	0.000027	0.001116	0.000013	0.000200	0.000171	5571.45	1097.73	43.96	13456.05	622.69	25411.62	287.44	4552.54	3892.80
139	SB frontage road after William Cannon exit ramp	Urban Unrestricted	0.2	45	41663	3,041,399	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	698.36	96.36	3.51	1139.36	52.87	1612.76	33.18	395.38	616.45
140	SB to NB Uturn at William Cannon	Urban Unrestricted	0.1	15	2500	91,250	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	41.89	6.51	0.26	79.16	3.67	92.38	1.83	26.46	48.01
141	NB to SB Uturn at Stassney	Urban Unrestricted	0.08	15	1075	31,390	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	14.41	2.24	0.09	27.23	1.26	31.78	0.63	9.10	16.51
142	SB frontage road after NB to SB Uturn at Stassney	Urban Unrestricted	0.42	45	15425	2,364,653	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	542.97	74.91	2.73	885.84	41.11	1253.90	25.80	307.40	479.28
143	NB I-35 exit ramp towards SH 71	Urban Restricted	0.16	30	14675	857,020	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	274.31	72.16	3.13	912.69	42.14	1916.29	13.76	299.96	257.00
144	NB I-35 mainlane after SH 71 exit ramp	Urban Restricted	0.62	60	123625	27,976,338	0.000226	0.000050	0.000002	0.000628	0.000029	0.001104	0.000012	0.000210	0.000173	6324.04	1412.69	58.61	17556.21	811.58	30877.54	338.98	5875.03	4850.78
145	SB I-35 Hwy 71 entrance ramp	Urban Restricted	0.5	30	21713	3,962,623	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	1268.34	333.67	14.46	4220.03	194.83	8860.38	63.64	1386.92	1188.28
146	SB I-35 mainlane after Hwy 71 entrance ramp	Urban Restricted	0.41	65	141726	21,209,296	0.000245	0.000048	0.000002	0.000591	0.000027	0.001116	0.000013	0.000200	0.000171	5191.24	1022.81	40.96	12537.77	580.19	23677.46	267.82	4241.86	3627.15
147	SB frontage road after Hwy 71 entrance ramp	Urban Unrestricted	0.64	45	24313	5,679,517	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	1304.12	179.93	6.55	2127.64	98.73	3011.67	61.97	738.34	1151.16
148	SB to NB Uturn at Stassney	Urban Unrestricted	0.15	15	2425	132,769	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	60.95	9.47	0.37	115.17	5.33	134.41	2.66	38.50	69.85
149	NB frontage road after SB to NB Uturn at Stassney	Urban Unrestricted	0.4	45	29138	4,254,148	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	976.83	134.78	4.90	1593.67	73.95	2255.85	46.41	553.04	862.26
150	NB frontage road after SH 71 exit ramp	Urban Unrestricted	0.68	45	43813	10,874,387	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	2496.96	344.51	12.54	4073.71	189.03	5766.36	118.64	1413.67	2204.09
151	NB I-35 Stassney entrance ramp	Urban Restricted	0.22	30	12763	1,024,869	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	328.04	86.30	3.74	1091.44	50.39	2291.60	16.46	358.70	307.33
152	NB frontage road north of Stassney entrance ramp	Urban Unrestricted	0.25	45	34938	3,188,093	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	732.04	101.00	3.68	1194.31	55.42	1690.55	34.78	414.45	646.18
153	SB I-35 exit ramp towards Stassney	Urban Restricted	0.23	30	13588	1,140,713	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	365.11	96.05	4.16	1214.81	56.09	2550.62	18.32	399.25	342.07
154	SB frontage road after exit ramp towards Stassney	Urban Unrestricted	0.37	50	44813	6,051,996	0.000222	0.000030	0.000001	0.000351	0.000016	0.000488	0.000011	0.000120	0.000188	1343.56	180.59	6.47	2123.06	98.56	2953.94	65.00	726.24	1136.10
155	SB I-35 mainlane after Stassney exit ramp	Urban Restricted	0.38	60	72338	10,033,281	0.000226	0.000050	0.000002	0.000628	0.000029	0.001104	0.000012	0.000210	0.000173	2268.02	506.64	21.02	6296.26	291.06	11073.75	121.57	2106.99	1739.66
156	SB I-35 mainlane after DC Entrance Ramp	Urban Restricted	0.72	60	120013	31,539,416	0.000226	0.000050	0.000002	0.000628	0.000029	0.001104	0.000012	0.000210	0.000173	7129.48	1592.61	66.08	19792.18	914.94	34810.12	382.16	6623.28	5468.58
157	SB I-35 DC Entrance Ramp Total	Urban Restricted	0.37	55	47675	6,438,509	0.000230	0.000054	0.000002	0.000677	0.000031	0.001181	0.000012	0.000220	0.000184	1481.10	348.80	14.67	4357.87	201.37	7603.78	80.12	1416.47	1184.78
158	EB SH 71 DC to SB I-35 mainlane entrance	Urban Restricted	0.2	55	30138	2,200,074	0.000230	0.000054	0.000002	0.000677	0.000031	0.001181	0.000012	0.000220	0.000184	506.10	119.19	5.01	1489.11	68.81	2598.25	27.38	484.02	404.85
159	WB SH 71 71 DC to SB I-35 mainlane entrance	Urban Restricted	0.42	55	19150	2,935,695	0.000230	0.000054	0.000002	0.000677	0.000031	0.001181	0.000012	0.000220	0.000184	675.32	159.04	6.69	1987.01	91.82	3467.01	36.53	645.85	540.21
160	NB to SB Uturn at SH 71	Urban Unrestricted	0.1	15	11888	433,912	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	199.20	30.96	1.21	376.41	17.43	439.29	8.69	125.83	228.28
161	NB frontage road north of NB to SB Uturn at SH 71	Urban Unrestricted	0.04	45	23050	336,530	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	77.27	10.66	0.39	126.07	5.85	178.45	3.67	43.75	68.21
164	SB frontage road after NB to SB Uturn at SH 71	Urban Unrestricted	0.24	45	31226	2,735,398	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	628.10	86.66	3.15	1024.72	47.55	1450.50	29.84	355.60	554.43
165	SB frontage road south of SH 71 intersection	Urban Unrestricted	0.03	45	19338	211,751	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	48.62	6.71	0.24	79.33	3.68	112.29	2.31	27.53	42.92
170	NB I-35 mainlane exit ramp to SH 71 DC	Urban Restricted	0.4	55	49425	7,216,050	0.000230	0.000054	0.000002	0.000677	0.000031	0.001181	0.000012	0.000220	0.000184	1659.97	390.93	16.44	4884.15	225.69	8522.04	89.79	1587.53	1327.86
171	NB I-35 mainlane north of exit ramp to SH 71 DC	Urban Restricted	0.43	60	74200	11,645,690	0.000226	0.000050	0.000002	0.000628	0.000029	0.001104	0.000012	0.000210	0.000173	2632.50	588.06	24.40	7308.11	337.84	12853.37	141.11	2445.59	2019.23
173	NB I-35 to WB SH 71 DC south of SH 71	Urban Restricted	0.28	55	31725	3,242,295	0.000230	0.000054	0.000002	0.000677	0.000031	0.001181	0.000012	0.000220	0.000184	745.85	175.65	7.39	2194.53	101.41	3829.10	40.35	713.30	596.63
174	NB I-35 to EB SH 71 DC south of SH 71	Urban Restricted	0.27	55	17700	1,744,335	0.000230	0.000054	0.000002	0.000677	0.000031	0.001181	0.000012	0.000220	0.000184	401.26	94.50	3.97	1180.64	54.56	2060.03	21.71	383.75	320.98
182	SB I-35 entrance ramp at Onion Creek	Urban Restricted	0.16	30	2388	139,459	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	44.64	11.74	0.51	148.52	6.86	311.83	2.24	48.81	41.82
183	SB I-35 mainlane south of Onion Creek entrance ramp	Urban Restricted	0.75	70	107626	29,462,618	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	8570.72	1406.20	52.87	16834.33	780.45	33238.82	408.79	5597.90	5250.16
184	SB I-35 mainlane south of SH 45 exit ramp	Urban Restricted	0.69	70	103525	26,072,771	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	7584.61	1244.41	46.78	14897.44	690.66	29414.50	361.76	4953.83	4646.10
185	NB frontage road between Onion Creek intersection	Urban Unrestricted	0.02	55	6351	46,362	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	10.17	1.32	0.05	15.42	0.72	20.60	0.50	5.10	8.19
186	SB frontage road between Onion Creek intersection	Urban Unrestricted	0.01	55	5401	19,714	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	4.32	0.56	0.02	6.56	0.30	8.76	0.21	2.17	3.48
187	NB frontage road between Slaughter Creek intersection	Urban Unrestricted	0.01	55	11763	42,935	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	9.42	1.22	0.04	14.28	0.66	19.07	0.46	4.72	7.58
188	SB I-35 mainlane south of Onion Creek exit ramp	Urban Restricted	0.77	70	100250	28,175,263	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	8196.23	1344.76	50.56	16098.76	746.35	31786.46	390.93	5353.30	5020.76
189	SB I-35 mainlane south of Slaughter Creek entrance ramp	Urban Restricted	0.64	70	105238	24,583,597	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	7151.41	1173.33	44.11	14046.56	651.21	27734.45	341.10	4670.88	4380.73
190	NB frontage road between Stassney intersection	Urban Unrestricted	0.01	45	26551	96,911	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	22.25	3.07	0.11	36.30	1.68	51.39	1.06	12.60	19.64
191	SB frontage road between Stassney intersection	Urban Unrestricted	0.01	45	23588	86,096	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	19.77	2.73	0.10	32.25	1.50	45.65	0.94	11.19	17.45
192	EB Stassney between frontage roads	Urban Unrestricted	0.1	45	33351	1,217,312	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	279.52	38.57	1.40	456.02	21.16	645.50	13.28	158.25	246.73
193	WB Stassney between frontage roads	Urban Unrestricted	0.1	45	23288	850,012	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	195.18	26.93	0.98	318.43	14.78	450.74	9.27	110.50	172.29
194	NB frontage road north of NB to SB Uturn at Stassney	Urban Unrestricted	0.03	45	16525	180,949	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	41.55	5.73	0.21	67.79	3.15	95.95	1.97	23.52	36.68
195	SB frontage road north of NB to SB Uturn at Stassney	Urban Unrestricted	0.01	45	14350	52,378	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	12.03	1.66	0.06	19.62	0.91	27.77	0.57	6.81	10.62
196	NB I-35 mainlane north of Main Street Entrance Ramp	Urban Restricted	0.27	70	101988	10,050,917	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	2923.83	479.71	18.03	5742.89	266.24	11339.13	139.46	1909.67	1791.05
197	SB I-35 mainlane south of Main Street Exit Ramp	Urban Restricted	0.79	70	92325	26,621,914	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	7744.36	1270.62	47.77	15211.21	705.20	30034.02	369.38	5058.16	4743.95
198	SB I-35 mainlane south of WB SH45 to SB I-35 DC	Urban Restricted	0.49	70	103075	18,434,964	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	5362.76	879.87	33.08	10533.36	488.33	20797.76	255.79	3502.64	3285.06
199	SB I-35 entrance ramp south of SH 45	Urban Restricted	0.14	30	6300	321,930	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	103.04	27.11	1.17	342.84	15.83	719.83	5.17	112.68	96.54
200	SB frontage road south of SH 45 entrance ramp	Urban Unrestricted	0.38	45	14950	2,073,565	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	476.13	65.69	2.39	776.79	36.05	1099.55	22.62	269.56	420.28
201	SB frontage road in between Slaughter Creek intersection	Urban Unrestricted	0.01	55	9013	32,897	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	7.22	0.94	0.03	10.94	0.51	14.61	0.35	3.62	5.81
202	NB Expressway Entrance Ramp at SH 45	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
203	NB I-35 Mainlane North of Expressway Entrance Ramp at S	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
204	NB Expressway Exit Ramp south of Slaughter Lane	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
205	NB Expressway North of Slaughter Lane Exit Ramp	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
206	NB I-35 Mainlane North of Slaughter Lane Expy Exit Ramp	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
207	NB Expressway Entrance Ramp at Slaughter Lane	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
208	NB I-35 Mainlane North of Slaughter Lane Expy Entrance R	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
209	NB Expressway North of Slaughter Lane Expy entrance ram	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
211	NB I-35 Mainlane north of SH 71 Expy entrance ramp	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
216	SB Expressway south of exit ramp towards Stassney	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

2045 No Build							Emission Factor from TxDOT MSAT ERLT (grams/mile) [4]									Emissions (grams) [5]								
Link	Link Description	Classification	Distance (miles)	Speed (mph) [1]	2045 NB Daily ADT [2] (vehicles/day)	Annual VMT [3] (miles/year)	Benzene	Naphthalene	Butadiene	Formaldehyde	Acrolein	DPM	POM	Acetaldehyde	Ethylbenzene	Benzene	Naphthalene	Butadiene	Formaldehyde	Acrolein	DPM	POM	Acetaldehyde	Ethylbenzene
226	SB I-35 Expressway exit ramp south of Onion Creek	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
227	SB I-35 Mainlane south of Expressway exit ramp at Onion (	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
228	NB I-35 Mainlane north of william cannon exit ramp	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
229	NB I-35 exit ramp south of william cannon	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
230	NB frontage road north of william cannon exit ramp	Urban Unrestricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
231	NB frontage road south of Slaughter Creek SB to NB Uturn	Urban Unrestricted	0.09	55	12050	395,843	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	86.82	11.28	0.40	131.63	6.11	175.85	4.23	43.54	69.91
232	NB frontage road between Slaughter Lane intersection	Urban Unrestricted	0.02	45	32426	236,710	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	54.35	7.50	0.27	88.68	4.11	125.52	2.58	30.77	47.98
233	SB frontage road north of William Cannon mainlane exit ra	Urban Unrestricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
234	NB frontage road south of SH 71 mainlane exit ramp	Urban Unrestricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
235	SB frontage road north of William Cannon mainlane entrar	Urban Unrestricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
236	SB frontage road north of Slaughter Creek Main Lane exit r	Urban Unrestricted	0.39	45	25676	3,654,979	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	839.25	115.79	4.21	1369.21	63.54	1938.12	39.88	475.15	740.81
237	SB frontage road south of Slaughter Lane mainlane entran	Urban Unrestricted	0.38	55	13588	1,884,656	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	413.38	53.70	1.88	626.70	29.11	837.23	20.12	207.31	332.87
238	WB Puryear road in between frontage roads	Urban Unrestricted	0.1	65	11238	410,187	0.000238	0.000027	0.000001	0.000303	0.000014	0.000415	0.000011	0.000110	0.000166	97.47	10.97	0.35	124.18	5.78	170.12	4.56	45.12	68.18
239	NB frontage road RT to EB Stassney	Urban Unrestricted	0.1	15	5513	201,225	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	92.38	14.36	0.56	174.56	8.08	203.72	4.03	58.36	105.86
240	NB frontage road north of RT to EB Stassney	Urban Unrestricted	0.03	45	11013	120,592	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	27.69	3.82	0.14	45.18	2.10	63.95	1.32	15.68	24.44
241	WB Stassney RT to NB frontage road	Urban Unrestricted	0.1	15	6288	229,512	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	105.37	16.38	0.64	199.10	9.22	232.35	4.60	66.56	120.75
242	SB frontage road RT to WB Stassney	Urban Unrestricted	0.02	15	8275	60,408	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	27.73	4.31	0.17	52.40	2.43	61.16	1.21	17.52	31.78
243	SB frontage road south of RT to WB Stassney	Urban Unrestricted	0.02	45	13613	99,375	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	22.82	3.15	0.11	37.23	1.73	52.70	1.08	12.92	20.14
244	NB frontage road north of WB Stassney	Urban Unrestricted	0.03	45	20425	223,654	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	51.35	7.09	0.26	83.78	3.89	118.60	2.44	29.07	45.33
245	EB Stassney RT to SB frontage road	Urban Unrestricted	0.02	15	2625	19,163	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	8.80	1.37	0.05	16.62	0.77	19.40	0.38	5.56	10.08
247	EB William Cannon RT to SB frontage road	Urban Unrestricted	0.04	15	4575	66,795	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	30.66	4.77	0.19	57.94	2.68	67.62	1.34	19.37	35.14
248	SB frontage road RT to William Cannon	Urban Unrestricted	0.05	15	14425	263,256	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	120.86	18.79	0.74	228.37	10.57	266.52	5.27	76.34	138.50
249	NB frontage road north of WB William Cannon	Urban Unrestricted	0.02	45	30325	221,373	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	50.83	7.01	0.26	82.93	3.85	117.39	2.42	28.78	44.87
250	NB frontage road north of RT to EB Slaughter	Urban Unrestricted	0.03	45	16513	180,817	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	41.52	5.73	0.21	67.74	3.14	95.88	1.97	23.51	36.65
251	SB frontage road in between FM 1327	Urban Unrestricted	0.08	55	12950	378,140	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	82.94	10.77	0.38	125.74	5.84	167.98	4.04	41.60	66.79
252	NB frontage road north of WB Puryear	Urban Unrestricted	0.03	55	1738	19,031	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	4.17	0.54	0.02	6.33	0.29	8.45	0.20	2.09	3.36
255	NB frontage road north of Slaughter Lane first DC split	Urban Unrestricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
256	NB frontage south of William Cannon NB to SB Uturn	Urban Unrestricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
257	NB frontage Ramp to EL north of Slaughter Lane	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
258	NB Ramp to EL north of Slaughter Lane	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
259	NB frontage Ramp to I-35 Mainlane north of Slaughter	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
260	NB EL north of Slaughter Lane after frontage road ramp	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
261	NB EL off ramp north of Stassney	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
262	NB EL north of Stassney after off ramp	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
263	WB DC Ramp to SB I-35 Express Lane after split (new road)	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
264	SB frontage ramp north of Stassney	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
265	SB DC Ramp south of SH 71 total	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
266	SB exit ramp to frontage road south of Stassney	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
267	SB frontage road straight south of Stassney exit ramp	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
268	SB mainlane exit ramp to frontage road south of Stassney	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
269	SB frontage road south of mainlane exit ramp south of Sta	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
270	NB mainlane exit ramp south of SH71	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
271	NB mainlane after exit ramp south of SH71	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
272	NB DC to EB SH 71	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
273	SB Expressway north of Stassney	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
274	SB mainlane south of William Cannon Drive	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
275	SB mainlane south of Slaughter Lane, south of EL exit	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
276	SB Expressway exit south of Slaughter Lane	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
					Total VMT (miles/year)	**929,476,690**										**Total (grams/year)**	**249692.69**	**43651.00**	**1689.72**	**528243.39**	**24469.03**	**989970.90**	**12195.47**	**176575.87**	**174175.18**
					Total VMT (million miles/year)	**929**										**Total (tons/year)**	**0.275**	**0.048**	**0.002**	**0.582**	**0.027**	**1.091**	**0.013**	**0.195**	**0.192**

[1] 2045 speeds are based on posted speeds from the statewide planning website to the extent possible. Otherwise, posted speeds located through Google Maps or design speeds were used, if available. https://www.txdot.gov/apps/statewide_mapping/StatewidePlanningMap.html

[2] Average Daily Traffic based on "0015-10-062 0015-13-077 I-35 North South_No Build ADT_Interpolation.xlsx" for the year 2045.

[3] Annual Vehicle Miles Travelled (miles/year) = ADT (vehicles/day) * Distance travelled (miles/vehicle) * 365 days/year

[4] MSAT emission rates are based on the TxDOT Emission Rate Lookup Tables for MSAT (01/17) for the Austin area. Separate AM and PM emission rates were found for each pollutant based on AM and PM speeds.
2040 Emission Factors were used to represent 2045.

[5] Emissions (grams/year) = AM emission rate (g/mile) * Annual VMT (miles/year) / 2 + PM emission rate (g/mile) * Annual VMT (miles/year) / 2
ADT volumes were allocated 50/50 to the AM and PM hours per TxDOT guidance.

2045 Build							Emission Factor from TxDOT MSAT ERLT (grams/mile) [4]									Emissions (grams) [5]								
Link	Link Description	Classification	Distance (miles)	Speed (mph) [1]	2045 B Daily ADT [2] (vehicles/day)	Annual VMT [3] (miles/year)	Benzene	Naphthalene	Butadiene	Formaldehyde	Acrolein	DPM	POM	Acetaldehyde	Ethylbenzene	Benzene	Naphthalene	Butadiene	Formaldehyde	Acrolein	DPM	POM	Acetaldehyde	Ethylbenzene
1	NB I-35 mainlanes south of DC split	Urban Restricted	0.34	70	102463	12,715,658	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	3699.01	606.90	22.82	7265.46	336.83	14345.41	176.43	2415.98	2265.90
2	NB I-35 mainlanes north of DC split	Urban Restricted	0.83	70	92675	28,075,891	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	8167.32	1340.02	50.38	16041.98	743.72	31674.35	389.55	5334.42	5003.05
3	NB I-35 mainlanes south of onion creek exit	Urban Restricted	0.84	70	86750	26,597,550	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	7737.27	1269.46	47.72	15197.29	704.56	30006.53	369.04	5053.53	4739.61
4	NB I-35 mainlanes south of FM 1327 entrance ramp north of DC	Urban Restricted	0.44	70	89813	14,423,968	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	4195.96	688.43	25.88	8241.56	382.09	16272.68	200.13	2740.55	2570.31
5	NB I-35 mainlanes south of slaughter creek exit	Urban Restricted	0.46	70	93613	15,717,623	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	4572.28	750.18	28.20	8980.72	416.35	17732.14	218.08	2986.35	2800.84
6	NB I-35 mainlanes south of onion creek entrance	Urban Restricted	0.54	70	87838	17,312,870	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	5036.34	826.31	31.06	9892.21	458.61	19531.85	240.22	3289.45	3085.11
7	NB I-35 mainlanes south of slaughter exit	Urban Restricted	0.61	70	97826	21,780,959	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	6336.12	1039.57	39.08	12445.19	576.97	24572.61	302.21	4138.38	3881.31
8	NB I-35 mainlanes south of slaughter creek entrance	Urban Restricted	0.18	70	80413	5,283,134	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	1536.87	252.16	9.48	3018.67	139.95	5960.27	73.30	1003.80	941.44
9	Nb I-35 mainlanes south of William cannon exit	Urban Restricted	0.92	70	89625	30,096,075	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	8755.00	1436.44	54.00	17196.27	797.23	33953.46	417.58	5718.25	5363.04
12	Southbound 35 Frontage south of puryear road	Urban Unrestricted	0.34	55	12500	1,551,250	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	340.25	44.20	1.55	515.83	23.96	689.12	16.56	170.64	273.98
14	WB Puryear Road east of 45	Urban Unrestricted	0.03	65	9875	108,131	0.000238	0.000027	0.000001	0.000303	0.000014	0.000415	0.000011	0.000110	0.000166	25.69	2.89	0.09	32.74	1.52	44.85	1.20	11.89	17.97
16	WB Puryear Road RT	Urban Unrestricted	0.03	15	1363	14,925	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	6.85	1.07	0.04	12.95	0.60	15.11	0.30	4.33	7.85
17	WB Puryear straight	Urban Unrestricted	0.02	60	4138	30,207	0.000222	0.000027	0.000001	0.000315	0.000015	0.000417	0.000011	0.000110	0.000169	6.70	0.82	0.03	9.51	0.44	12.59	0.32	3.32	5.10
19	Eastbound puryear road between frontage roads	Urban Unrestricted	0.09	65	4988	163,856	0.000238	0.000027	0.000001	0.000303	0.000014	0.000415	0.000011	0.000110	0.000166	38.93	4.38	0.14	49.61	2.31	67.96	1.82	18.02	27.24
20	EB FR_45 east ofr 35	Urban Unrestricted	0.08	65	15288	446,410	0.000238	0.000027	0.000001	0.000303	0.000014	0.000415	0.000011	0.000110	0.000166	106.07	11.94	0.38	135.15	6.29	185.15	4.96	49.11	74.20
21	WBSB_DC_45	Urban Restricted	1.26	75	10788	4,961,401	0.000355	0.000049	0.000002	0.000565	0.000026	0.001164	0.000016	0.000190	0.000192	1763.48	240.96	8.35	2801.41	130.18	5772.75	79.33	942.67	952.52
22	WBNB_DC_45	Urban Restricted	1.08	75	3063	1,207,435	0.000355	0.000049	0.000002	0.000565	0.000026	0.001164	0.000016	0.000190	0.000192	429.17	58.64	2.03	681.77	31.68	1404.89	19.31	229.41	231.81
25	NB frontage road south of main street entrance ramp	Urban Unrestricted	0.77	45	22713	6,383,489	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	1465.77	202.24	7.36	2391.35	110.97	3384.97	69.65	829.85	1293.85
26	NB ramp exit to FM 1327	Urban Restricted	0.16	30	5550	324,120	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	103.74	27.29	1.18	345.17	15.94	724.73	5.21	113.44	97.19
27	NBEB_DC_45	Urban Restricted	1.11	75	9788	3,965,608	0.000355	0.000049	0.000002	0.000565	0.000026	0.001164	0.000016	0.000190	0.000192	1409.54	192.60	6.67	2239.14	104.05	4614.12	63.41	753.47	761.34
28	NB frontage south of exit ramp to FM 1327	Urban Unrestricted	0.57	55	17163	3,570,762	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	783.22	101.75	3.57	1187.37	55.15	1586.26	38.13	392.78	630.66
29	NB entrance ramp south of SH 45SE	Urban Restricted	0.25	30	9313	849,811	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	272.00	71.56	3.10	905.01	41.78	1900.17	13.65	297.43	254.84
30	NB frontage road north of entrance ramp south of SH 45 SE	Urban Unrestricted	0.31	55	13400	1,516,210	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	332.57	43.20	1.52	504.18	23.42	673.56	16.19	166.78	267.79
31	NB frontage road in between FM 1327	Urban Unrestricted	0.09	55	3101	101,868	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	22.34	2.90	0.10	33.87	1.57	45.25	1.09	11.21	17.99
32	NB Frontage road north of FM 1327	Urban Unrestricted	0.49	55	3100	554,435	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	121.61	15.80	0.55	184.36	8.56	246.30	5.92	60.99	97.92
33	NB exit ramp north of SH 45 (onion creek)	Urban Restricted	0.38	30	5925	821,798	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	263.04	69.20	3.00	875.18	40.41	1837.53	13.20	287.63	246.43
34	NB frontage road south of SH 45 entrance ramp	Urban Restricted	0.56	55	9025	1,844,710	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	404.62	52.56	1.84	613.41	28.49	819.49	19.70	202.92	325.81
35	NB ENtrance ramp north of SH 45SE	Urban Restricted	0.33	30	3800	457,710	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	146.50	38.54	1.67	487.44	22.50	1023.43	7.35	160.20	137.25
36	Nb frontage road south of onion creek	Urban Unrestricted	0.69	55	5225	1,315,916	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	288.64	37.50	1.32	437.58	20.33	584.58	14.05	144.75	232.42
37	Nb frontage road north of onion creek	Urban Unrestricted	0.25	55	16425	1,498,781	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	328.75	42.71	1.50	498.38	23.15	665.81	16.00	164.87	264.71
39	NB exit slaughter creek	Urban Restricted	0.16	30	5775	337,260	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	107.95	28.40	1.23	359.17	16.58	754.11	5.42	118.04	101.14
40	NB frontage road north of slaughter creek exit	Urban Unrestricted	0.25	55	22200	2,025,750	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	444.33	57.72	2.03	673.61	31.29	899.91	21.63	222.83	357.79
41	entrance ramp south of slaughter creek	Urban Restricted	0.12	30	9988	437,474	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	140.02	36.84	1.60	465.89	21.51	978.19	7.03	153.12	131.19
42	NB frontage road south of slaughter creek	Urban Unrestricted	0.4	55	12213	1,783,098	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	391.11	50.81	1.78	592.92	27.54	792.12	19.04	196.14	314.93
43	SBNB u-turn at slaughter creek	Urban Unrestricted	0.28	15	5025	513,555	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	235.76	36.65	1.44	445.50	20.63	519.91	10.29	148.93	270.18
44	NB frontage south of exit ramp to Slaughter	Urban Unrestricted	0.37	55	17075	2,305,979	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	505.80	65.71	2.31	766.80	35.62	1024.40	24.62	253.66	407.28
45	NB exit ramp south of slaughter	Urban Restricted	0.15	30	17413	953,362	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	305.15	80.28	3.48	1015.29	46.87	2131.71	15.31	333.68	285.89
46	NB frontage road north of slaughter exit	Urban Restricted	0.31	45	34488	3,902,317	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	896.04	123.63	4.50	1461.87	67.83	2069.28	42.58	507.30	790.95
47	NB Entrance ramp south of slaughter	Urban Restricted	0.42	30	7375	1,130,588	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	361.87	95.20	4.13	1204.03	55.59	2527.98	18.16	395.71	339.03
48	NBSB Uturn slaughter	Urban Unrestricted	0.34	15	6838	848,596	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	389.58	60.56	2.37	736.14	34.09	859.10	17.00	246.09	446.44
49	NB Frontage road south of slaughter	Urban Unrestricted	0.36	45	27113	3,562,648	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	818.05	112.87	4.11	1334.62	61.93	1889.16	38.87	463.14	722.10
50	NB Frontage road south of slaughter north of uturn	Urban Unrestricted	0.11	45	20275	814,041	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	186.92	25.79	0.94	304.95	14.15	431.66	8.88	105.83	165.00
51	NB frontage right turn at slaughter lane	Urban Unrestricted	0.04	15	3763	54,940	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	25.22	3.92	0.15	47.66	2.21	55.62	1.10	15.93	28.90
54	NB frontage road north of slaughter lane sbnb uturn	Urban Unrestricted	0.68	45	34076	8,457,663	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	1942.03	267.95	9.75	3168.37	147.02	4484.84	92.28	1099.50	1714.25
56	exit ramp north of slaughter lane	Urban Restricted	0.25	30	10438	952,468	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	304.86	80.20	3.48	1014.34	46.83	2129.71	15.30	333.36	285.62
57	NB frontange road north of WC exit ramp	Urban Unrestricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
58	NB entrance ramp south of william cannon	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
59	NB frontage north of Slaughter entrance	Urban Unrestricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
60	NB william cannon right turn	Urban Unrestricted	0.03	15	2213	24,232	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	11.12	1.73	0.07	21.02	0.97	24.53	0.49	7.03	12.75
61	NB_SB uturn william cannon	Urban Unrestricted	0.14	15	1313	67,094	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	30.80	4.79	0.19	58.20	2.70	67.93	1.34	19.46	35.30
62	NB frontage west of EB William Cannon	Urban Unrestricted	0.07	45	22413	572,652	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	131.49	18.14	0.66	214.52	9.95	303.66	6.25	74.44	116.07
63	WB William Cannon RT	Urban Unrestricted	0.04	15	14450	210,970	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	96.85	15.05	0.59	183.01	8.47	213.58	4.23	61.18	110.99
64	NB I-35 frontage road north of right turn to EB William Cannon	Urban Unrestricted	0.02	45	20200	147,460	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	33.86	4.67	0.17	55.24	2.56	78.19	1.61	19.17	29.89
65	SB exit ramp main street	Urban Restricted	0.22	30	11238	902,411	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	288.84	75.99	3.29	961.03	44.37	2017.78	14.49	315.84	270.61
66	SB frontage road south of main street exit	Urban Unrestricted	0.92	55	23738	7,971,220	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	1748.42	227.13	7.97	2650.63	123.12	3541.11	85.12	876.83	1407.87
69	RT from WB Puryear RD to SB I-35 frontage	Urban Unrestricted	0.04	15	1525	22,265	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	10.22	1.59	0.06	19.31	0.89	22.54	0.45	6.46	11.71
71	SB frontage road south of 45 exit ramp	Urban Unrestricted	1.1	55	9001	3,613,902	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	792.68	102.97	3.61	1201.71	55.82	1605.43	38.59	397.53	638.28
72	SB 45 exit ramp	Urban Restricted	0.37	30	4438	599,352	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	191.84	50.47	2.19	638.29	29.47	1340.14	9.63	209.77	179.73
73	SB frontage road south of Onion creek entrance ramp	Urban Unrestricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
74	SB frontage road south of Onion creek	Urban Unrestricted	0.91	55	4563	1,515,600	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	332.43	43.19	1.52	503.98	23.41	673.29	16.18	166.72	267.68
75	SB to NB Uturn at onion creek	Urban Unrestricted	0.12	15	9400	411,720	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	189.01	29.38	1.15	357.16	16.54	416.82	8.25	119.40	216.60
76	WB Onion creek right turn from SB frontage road	Urban Unrestricted	0.03	15	1363	14,925	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	6.85	1.07	0.04	12.95	0.60	15.11	0.30	4.33	7.85
77	SB frontage road south of SB to NB Uturn at Onion Creek	Urban Unrestricted	0.05	55	5975	109,044	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	23.92	3.11	0.11	36.26	1.68	48.44	1.16	11.99	19.26
78	NB frontage road RT to Onion creek EB	Urban Unrestricted	0.04	15	713	10,410	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	4.78	0.74	0.03	9.03	0.42	10.54	0.21	3.02	5.48
79	Onion creek EB between frontage roads	Urban Unrestricted	0.06	30	3950	86,505	0.000300	0.000042	0.000002	0.000496	0.000023	0.000745	0.000013	0.000170	0.000288	25.98	3.61	0.13	42.94	1.99	64.48	1.15	14.71	24.87
80	Onion creek EB east of NB frontage road	Urban Unrestricted	0.02	30	2826	20,630	0.000300	0.000042	0.000002	0.000496	0.000023	0.000745	0.000013	0.000170	0.000288	6.20	0.86	0.03	10.24	0.47	15.38	0.27	3.51	5.93
81	Onion creek WB east of NB frontage road	Urban Unrestricted	0.02	30	1038	7,577	0.000300	0.000042	0.000002	0.000496	0.000023	0.000745	0.000013	0.000170	0.000288	2.28	0.32	0.01	3.76	0.17	5.65	0.10	1.29	2.18
82	Onion creek WB between frontage roads	Urban Unrestricted	0.06	30	2113	46,275	0.000300	0.000042	0.000002	0.000496	0.000023	0.000745	0.000013	0.000170	0.000288	13.90	1.93	0.07	22.97	1.07	34.49	0.61	7.87	13.30
83	Onion creek WB west of SB frontage road	Urban Unrestricted	0.02	30	1600	11,680	0.000300	0.000042	0.000002	0.000496	0.000023	0.000745	0.000013	0.000170	0.000288	3.51	0.49	0.02	5.80	0.27	8.71	0.15	1.99	3.36
84	Onion creek RT to SB frontage road	Urban Unrestricted	0.03	15	938	10,271	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	4.72	0.73	0.03	8.91	0.41	10.40	0.21	2.98	5.40
85	Onion creek Rt to NB frontage road	Urban Unrestricted	0.03	15	1750	19,163	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	8.80	1.37	0.05	16.62	0.77	19.40	0.38	5.56	10.08
86	SB entrance ramp slaughter creek	Urban Restricted	0.24	30	5063	443,519	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	141.96	37.35	1.62	472.33	21.81	991.70	7.12	155.23	133.00
87	SB frontage road south of slaughter creek entrance ramp	Urban Unrestricted	0.24	55	15375	1,346,850	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	295.42	38.38	1.35	447.86	20.80	598.32	14.38	148.15	237.88
88	SB exit ramp onion creek	Urban Restricted	0.13	30	11538	547,478	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	175.23	46.10	2.00	583.04	26.92	1224.15	8.79	191.62	164.17
89	SB frontage road south of onion creek exit ramp	Urban Unrestricted	0.4	55	20938	3,056,948	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	670.52	87.11	3.06	1016.51	47.22	1358.01	32.64	336.26	539.91
90	SB frontage road south of slaughter creek one lane	Urban Unrestricted	0.2	55	9400	686,200	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	150.51	19.55	0.69	228.18	10.60	304.84	7.33	75.48	121.20
92	SB frontage road south of slaughter creek uturn	Urban Unrestricted	0.16	55	8563	500,079	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	109.69	14.25	0.50	166.29	7.72	222.15	5.34	55.01	88.32
93	WB slaughter creek east of NB frontage road	Urban Unrestricted	0.02	25	1750	12,775	0.000328	0.000047	0.000002	0.000569	0.000026	0.000790	0.000015	0.000190	0.000334	4.19	0.61	0.02	7.27	0.34	10.09	0.19	2.43	4.27
94	WB slaughter creek between frontage roads	Urban Unrestricted	0.05	25	1463	26,700	0.000328	0.000047	0.000002	0.000569	0.000026	0.000790	0.000015	0.000190	0.000334	8.76	1.27	0.05	15.19	0.70	21.09	0.39	5.07	8.92
95	NB frontage RT onto EB slaughter creek	Urban Unrestricted	0.03	15	788	8,629	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	3.96	0.62	0.02	7.49	0.35	8.74	0.17	2.50	4.54
96	WB slaughter creek RT onto NB frontage road	Urban Unrestricted	0.02	15	775	5,658	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	2.60	0.40	0.02	4.91	0.23	5.73	0.11	1.64	2.98
98	EB slaughter creek between frontage roads	Urban Unrestricted	0.05	25	813	14,837	0.000328	0.000047	0.000002	0.000569	0.000026	0.000790	0.000015	0.000190	0.000334	4.87	0.70	0.03	8.44	0.39	11.72	0.22	2.82	4.95
99	EB slaughter creek east of NB frontage road	Urban Unrestricted	0.01	25	1263	4,610	0.000328	0.000047	0.000002	0.000569	0.000026	0.000790	0.000015	0.000190	0.000334	1.51	0.22	0.01	2.62	0.12	3.64	0.07	0.88	1.54
100	EB slaughter lane between frontage roads	Urban Unrestricted	0.16	45	28375	1,657,100	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	380.50	52.50	1.91	620.78	28.81	878.71	18.08	215.42	335.87
101	WB slaughter RT onto NB frontage road	Urban Unrestricted	0.08	15	6375	186,150	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	85.46	13.28	0.52	161.48	7.48	188.46	3.73	53.98	97.93
102	EB Slaughter west of 35 SB frontage	Urban Unrestricted	0.05	45	24163	440,975	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	101.26	13.97	0.51	165.20	7.67	233.84	4.81	57.33	89.38
104	WB Slaughter between frontage roads	Urban Unrestricted	0.17	45	19301	1,197,627	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	275.00	37.94	1.38	448.65	20.82	635.07	13.07	155.69	242.74
105	WB Slaughter west of SB frontage road	Urban Unrestricted	0.05	45	34238	624,844	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	143.48	19.80	0.72	234.08	10.86	331.34	6.82	81.23	126.65
106	RT from Southbound frontage to WB Slaughter	Urban Unrestricted	0.1	15	18313	668,425	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	306.86	47.70	1.87	579.84	26.85	676.70	13.39	193.84	351.66
107	Slaughter EB RT onto Sb frontage road	Urban Unrestricted	0.03	15	4163	45,585	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	20.93	3.25	0.13	39.54	1.83	46.15	0.91	13.22	23.98
108	SB frontage road south of RT from EB Slaughter	Urban Unrestricted	0.11	45	18838	756,346	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	173.67	23.96	0.87	283.34	13.15	401.07	8.25	98.32	153.30
109	SB frontage road south of SB to NB Uturn at Stassney	Urban Unrestricted	0.07	45	20988	536,243	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	123.13	16.99	0.62	200.89	9.32	284.35	5.85	69.71	108.69
110	Slaughter WB east of NB frontage road	Urban Unrestricted	0.05	45	13513	246,612	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	56.63	7.81	0.28	92.38	4.29	130.77	2.69	32.06	49.98

2045 Build							Emission Factor from TxDOT MSAT ERLT (grams/mile) [4]									Emissions (grams) [5]								
Link	Link Description	Classification	Distance (miles)	Speed (mph) [1]	2045 B Daily ADT [2] (vehicles/day)	Annual VMT [3] (miles/year)	Benzene	Naphthalene	Butadiene	Formaldehyde	Acrolein	DPM	POM	Acetaldehyde	Ethylbenzene	Benzene	Naphthalene	Butadiene	Formaldehyde	Acrolein	DPM	POM	Acetaldehyde	Ethylbenzene
111	Slaughter EB East of Frontage road NB	Urban Unrestricted	0.05	45	16226	296,125	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	68.00	9.38	0.34	110.93	5.15	157.03	3.23	38.50	60.02
112	SBNB u-turn at slaughter lane	Urban Unrestricted	0.16	15	7438	434,379	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	199.42	31.00	1.21	376.81	17.45	439.76	8.70	125.97	228.53
113	SB Slaughter Creek Main Lane exit ramp	Urban Restricted	0.29	30	6725	711,841	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	227.84	59.94	2.60	758.08	35.00	1591.67	11.43	249.14	213.46
114	SB Slaughter Lane Mainlane entrance ramp	Urban Restricted	0.13	30	18813	892,677	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	285.72	75.17	3.26	950.66	43.89	1996.02	14.34	312.44	267.69
115	SB frontage road after Slaughter Creek exit	Urban Unrestricted	0.29	55	32400	3,429,540	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	752.24	97.72	3.43	1140.41	52.97	1523.53	36.62	377.25	605.72
116	SB I-35 mainlane after Slaughter Creek exit	Urban Restricted	0.24	70	85075	7,452,570	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	2167.96	355.70	13.37	4258.24	197.42	8407.76	103.40	1415.99	1328.03
117	SB I-35 mainlane after Slaughter Lane entrance	Urban Restricted	0.48	70	105713	18,520,918	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	5387.77	883.97	33.23	10582.47	490.61	20894.73	256.98	3518.97	3300.38
118	NB I-35 mainlane after William Cannon exit	Urban Restricted	0.59	70	79188	17,053,136	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	4960.79	813.92	30.60	9743.81	451.73	19238.82	236.61	3240.10	3038.82
119	NB I-35 mainlane after Slaughter Lane entrance	Urban Restricted	0.92	65	99263	33,332,515	0.000245	0.000048	0.000002	0.000591	0.000027	0.001116	0.000013	0.000200	0.000171	8158.55	1607.46	64.37	19704.35	911.83	37211.47	420.91	6666.50	5700.42
120	SB I-35 Slaughter Lane exit ramp to frontage	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
121	SB I-35 William Cannon mainlane entrance ramp	Urban Restricted	0.29	30	30938	3,274,787	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	1048.18	275.75	11.95	3487.51	161.01	7322.39	52.59	1146.18	982.02
122	SB frontage road after Slaughter Lane exit	Urban Unrestricted	0.55	45	72413	14,536,910	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	3337.94	460.55	16.76	5445.75	252.70	7708.48	158.60	1889.80	2946.43
123	SB frontage road after William Cannon entrance ramp	Urban Unrestricted	0.75	45	41475	11,353,781	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	2607.04	359.70	13.09	4253.30	197.37	6020.56	123.87	1475.99	2301.26
124	SB frontage road after U-Turn north of Slaughter Lane	Urban Unrestricted	0.1	45	37988	1,386,562	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	318.38	43.93	1.60	519.43	24.10	735.25	15.13	180.25	281.04
125	SB I-35 mainlane after Slaughter Lane exit	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
126	SB I-35 mainlane after William Cannon entrance ramp	Urban Restricted	0.66	65	91801	22,114,861	0.000245	0.000048	0.000002	0.000591	0.000027	0.001116	0.000013	0.000200	0.000171	5412.89	1066.49	42.71	13073.09	604.97	24688.40	279.26	4422.97	3782.02
127	SB frontage road after U-Turn south of William Cannon	Urban Unrestricted	0.49	45	25588	4,576,414	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	1050.83	144.99	5.28	1714.40	79.55	2426.73	49.93	594.93	927.58
128	EB William Cannon between frontage roads	Urban Unrestricted	0.06	45	41775	914,873	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	210.07	28.98	1.05	342.73	15.90	485.13	9.98	118.93	185.43
129	WB William Cannon between frontage roads	Urban Unrestricted	0.06	45	22201	486,202	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	111.64	15.40	0.56	182.14	8.45	257.82	5.30	63.21	98.55
130	NB frontage road between William Cannon intersection	Urban Unrestricted	0.01	45	39050	142,533	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	32.73	4.52	0.16	53.39	2.48	75.58	1.56	18.53	28.89
131	NB frontage road north of William Cannon intersection	Urban Unrestricted	0.11	45	48475	1,946,271	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	446.90	61.66	2.24	729.10	33.83	1032.05	21.23	253.02	394.48
132	SB frontage road north of William Cannon intersection	Urban Unrestricted	0.03	45	38838	425,276	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	97.65	13.47	0.49	159.32	7.39	225.51	4.64	55.29	86.20
133	SB frontage road between William Cannon intersection	Urban Unrestricted	0.01	45	34388	125,516	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	28.82	3.98	0.14	47.02	2.18	66.56	1.37	16.32	25.44
134	SB I-35 William Cannon mainlane exit ramp	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
135	NB I-35 William Cannon mainlane entrance ramp	Urban Restricted	0.37	30	30850	4,166,293	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	1333.53	350.82	15.20	4436.93	204.85	9315.78	66.91	1458.20	1249.36
136	NB frontage road after William Cannon mainlane entrance ramp	Urban Unrestricted	0.47	45	17625	3,023,569	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	694.27	95.79	3.49	1132.68	52.56	1603.31	32.99	393.06	612.84
137	NB I-35 mainlane after William Cannon mainlane entrance ramp	Urban Unrestricted	0.34	65	130113	16,147,023	0.000245	0.000048	0.000002	0.000591	0.000027	0.001116	0.000013	0.000200	0.000171	3952.19	778.69	31.18	9545.23	441.71	18026.08	203.90	3229.40	2761.41
138	SB I-35 mainlane after William Cannon exit ramp	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
139	SB frontage road after William Cannon exit ramp	Urban Restricted	0.18	45	41338	2,715,907	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	623.62	86.04	3.13	1017.42	47.21	1440.16	29.63	353.07	550.48
140	SB to NB Uturn at William Cannon	Urban Unrestricted	0.1	15	2500	91,250	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	41.89	6.51	0.26	79.16	3.67	92.38	1.83	26.46	48.01
141	NB to SB Uturn at Stassney	Urban Unrestricted	0.08	15	1075	31,390	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	14.41	2.24	0.09	27.23	1.26	31.78	0.63	9.10	16.51
142	SB frontage road after NB to SB Uturn at Stassney	Urban Unrestricted	0.42	45	14525	2,226,683	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	511.29	70.54	2.57	834.15	38.71	1180.74	24.29	289.47	451.32
143	NB I-35 exit ramp towards SH 71	Urban Restricted	0.31	30	14675	1,660,476	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	531.48	139.82	6.06	1768.34	81.64	3712.81	26.67	581.17	497.93
144	NB I-35 mainlane after SH 71 exit ramp	Urban Restricted	0.72	60	115438	30,337,106	0.000226	0.000050	0.000002	0.000628	0.000029	0.001104	0.000012	0.000210	0.000173	6857.69	1531.90	63.56	19037.68	880.06	33483.13	367.59	6370.79	5260.12
145	SB I-35 Hwy 71 entrance ramp	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
146	SB I-35 mainlane after Hwy 71 entrance ramp	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
147	SB frontage road after Hwy 71 entrance ramp	Urban Unrestricted	0.64	45	24313	5,679,517	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	1304.12	179.93	6.55	2127.64	98.73	3011.67	61.97	738.34	1151.16
148	SB to NB Uturn at Stassney	Urban Unrestricted	0.15	15	2425	132,769	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	60.95	9.47	0.37	115.17	5.33	134.41	2.66	38.50	69.85
149	NB frontage road after SB to NB Uturn at Stassney	Urban Unrestricted	0.45	45	29163	4,790,023	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	1099.88	151.75	5.52	1794.42	83.27	2540.00	52.26	622.70	970.87
150	NB frontage road after SH 71 exit ramp	Urban Unrestricted	0.63	45	43838	10,080,548	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	2314.68	319.36	11.62	3776.33	175.23	5345.41	109.98	1310.47	2043.19
151	NB I-35 Stassney entrance ramp	Urban Restricted	0.22	30	12763	1,024,869	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	328.04	86.30	3.74	1091.44	50.39	2291.60	16.46	358.70	307.33
152	NB frontage road north of Stassney entrance ramp	Urban Restricted	0.25	45	34938	3,188,093	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	732.04	101.00	3.68	1194.31	55.42	1690.55	34.78	414.45	646.18
153	SB I-35 exit ramp towards Stassney	Urban Restricted	0.23	30	36675	3,078,866	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	985.47	259.25	11.23	3278.87	151.38	6884.31	49.45	1077.60	923.27
154	SB frontage road after exit ramp towards Stassney	Urban Restricted	0.37	50	70725	9,551,411	0.000222	0.000030	0.000001	0.000351	0.000016	0.000488	0.000011	0.000120	0.000188	2120.45	285.01	10.21	3350.66	155.55	4661.98	102.58	1146.17	1793.02
155	SB I-35 mainlane after Stassney exit ramp	Urban Restricted	0.49	60	45888	8,207,069	0.000226	0.000050	0.000002	0.000628	0.000029	0.001104	0.000012	0.000210	0.000173	1855.21	414.42	17.19	5150.25	238.08	9058.16	99.44	1723.48	1423.01
156	SB I-35 mainlane after DC Entrance Ramp	Urban Restricted	1.1	60	85976	34,519,364	0.000226	0.000050	0.000002	0.000628	0.000029	0.001104	0.000012	0.000210	0.000173	7803.09	1743.09	72.32	21662.21	1001.39	38099.10	418.26	7249.07	5985.27
157	SB I-35 DC Entrance Ramp Total	Urban Restricted	0.16	55	40088	2,341,139	0.000230	0.000054	0.000002	0.000677	0.000031	0.001181	0.000012	0.000220	0.000184	538.55	126.83	5.33	1584.59	73.22	2764.85	29.13	515.05	430.80
158	EB SH 71 DC to SB I-35 mainlane entrance	Urban Restricted	0.2	55	27675	2,020,275	0.000230	0.000054	0.000002	0.000677	0.000031	0.001181	0.000012	0.000220	0.000184	464.74	109.45	4.60	1367.41	63.19	2385.91	25.14	444.46	371.76
159	WB SH 71 71 DC to SB I-35 mainlane entrance	Urban Restricted	0.42	55	17175	2,632,928	0.000230	0.000054	0.000002	0.000677	0.000031	0.001181	0.000012	0.000220	0.000184	605.67	142.64	6.00	1782.08	82.35	3109.44	32.76	579.24	484.50
160	NB to SB Uturn at SH 71	Urban Unrestricted	0.1	15	11888	433,912	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	199.20	30.96	1.21	376.41	17.43	439.29	8.69	125.83	228.28
161	NB frontage road north of NB to SB Uturn at SH 71	Urban Unrestricted	0.04	45	23050	336,530	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	77.27	10.66	0.39	126.07	5.85	178.45	3.67	43.75	68.21
164	SB frontage road after NB to SB Uturn at SH 71	Urban Unrestricted	0.24	45	34051	2,982,868	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	684.92	94.50	3.44	1117.43	51.85	1581.72	32.54	387.77	604.59
165	SB frontage road south of SH 71 intersection	Urban Unrestricted	0.03	45	22163	242,685	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	55.72	7.69	0.28	90.91	4.22	128.69	2.65	31.55	49.19
170	NB I-35 mainlane exit ramp to SH 71 DC	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
171	NB I-35 mainlane north of exit ramp to SH 71 DC	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
173	NB I-35 to WB SH 71 DC south of SH 71	Urban Restricted	0.28	55	31725	3,242,295	0.000230	0.000054	0.000002	0.000677	0.000031	0.001181	0.000012	0.000220	0.000184	745.85	175.65	7.39	2194.53	101.41	3829.10	40.35	713.30	596.63
174	NB I-35 to EB SH 71 DC south of SH 71	Urban Restricted	0.27	55	17700	1,744,335	0.000230	0.000054	0.000002	0.000677	0.000031	0.001181	0.000012	0.000220	0.000184	401.26	94.50	3.97	1180.64	54.56	2060.03	21.71	383.75	320.98
182	SB I-35 entrance ramp at Onion Creek	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
183	SB I-35 mainlane south of Onion Creek entrance ramp	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
184	SB I-35 mainlane south of SH 45 exit ramp	Urban Restricted	1	70	94800	34,602,000	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	10065.78	1651.50	62.09	19770.86	916.59	39036.91	480.10	6574.38	6165.98
185	NB frontage road between Onion Creek intersection	Urban Unrestricted	0.02	55	6351	46,362	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	10.17	1.32	0.05	15.42	0.72	20.60	0.50	5.10	8.19
186	SB frontage road between Onion Creek intersection	Urban Unrestricted	0.02	55	5126	37,420	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	8.21	1.07	0.04	12.44	0.58	16.62	0.40	4.12	6.61
187	NB frontage road between Slaughter Creek intersection	Urban Unrestricted	0.01	55	11763	42,935	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	9.42	1.22	0.04	14.28	0.66	19.07	0.46	4.72	7.58
188	SB I-35 mainlane south of Onion Creek exit ramp	Urban Restricted	0.28	70	94175	9,624,685	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	2799.84	459.37	17.27	5499.35	254.95	10858.27	133.54	1828.69	1715.09
189	SB I-35 mainlane south of Slaughter Creek entrance ramp	Urban Restricted	0.41	70	99238	14,850,967	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	4320.17	708.81	26.65	8485.53	393.40	16754.40	206.06	2821.68	2646.40
190	NB frontage road between Stassney intersection	Urban Unrestricted	0.01	45	26576	97,002	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	22.27	3.07	0.11	36.34	1.69	51.44	1.06	12.61	19.66
191	SB frontage road between Stassney intersection	Urban Unrestricted	0.01	45	22688	82,811	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	19.01	2.62	0.10	31.02	1.44	43.91	0.90	10.77	16.78
192	EB Stassney between frontage roads	Urban Unrestricted	0.1	45	33351	1,217,312	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	279.52	38.57	1.40	456.02	21.16	645.50	13.28	158.25	246.73
193	WB Stassney between frontage roads	Urban Unrestricted	0.1	45	23288	850,012	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	195.18	26.93	0.98	318.43	14.78	450.74	9.27	110.50	172.29
194	NB frontage road north of NB to SB Uturn at Stassney	Urban Unrestricted	0.03	45	16550	181,223	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	41.61	5.74	0.21	67.89	3.15	96.10	1.98	23.56	36.73
195	SB frontage road north of NB to SB Uturn at Stassney	Urban Unrestricted	0.01	45	13450	49,093	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	11.27	1.56	0.06	18.39	0.85	26.03	0.54	6.38	9.95
196	NB I-35 mainlane north of Main Street Entrance Ramp	Urban Restricted	0.02	70	101988	744,512	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	216.58	35.53	1.34	425.40	19.72	839.94	10.33	141.46	132.67
197	SB I-35 mainlane south of Main Street Exit Ramp	Urban Restricted	0.79	70	89800	25,893,830	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	7532.56	1235.87	46.46	14795.20	685.92	29212.62	359.28	4919.83	4614.21
198	SB I-35 mainlane south of WB SH45 to SB I-35 DC	Urban Restricted	0.49	70	100588	17,990,164	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	5233.37	858.64	32.28	10279.21	476.55	20295.95	249.61	3418.13	3205.80
199	SB I-35 entrance ramp south of SH 45	Urban Restricted	0.14	30	8788	449,067	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	143.74	37.81	1.64	478.24	22.08	1004.11	7.21	157.17	134.66
200	SB frontage road south of SH 45 entrance ramp	Urban Unrestricted	0.38	45	14950	2,073,565	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	476.13	65.69	2.39	776.79	36.05	1099.55	22.62	269.56	420.28
201	SB frontage road in between Slaughter Creek intersection	Urban Unrestricted	0.01	55	9013	32,897	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	7.22	0.94	0.03	10.94	0.51	14.61	0.35	3.62	5.81
202	NB Expressway Entrance Ramp at SH 45	Urban Restricted	3.34	30	9313	11,353,478	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	3633.97	956.01	41.43	12090.99	558.22	25386.25	182.34	3973.72	3404.60
203	NB I-35 Mainlane North of Expressway Entrance Ramp at SH 45	Urban Restricted	0.28	70	92675	9,471,385	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	2755.24	452.05	16.99	5411.75	250.89	10685.32	131.42	1799.56	1687.78
204	NB Expressway Exit Ramp south of Slaughter Lane	Urban Restricted	0.1	30	3950	144,175	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	46.15	12.14	0.53	153.54	7.09	322.37	2.32	50.46	43.23
205	NB Expressway North of Slaughter Lane Exit Ramp	Urban Restricted	0.55	70	5363	1,076,622	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	313.19	51.39	1.93	615.16	28.52	1214.61	14.94	204.56	191.85
206	NB I-35 Mainlane North of Slaughter Lane Expy Exit Ramp	Urban Restricted	0.36	70	84363	11,085,298	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	3224.73	529.08	19.89	6333.91	293.65	12506.09	153.81	2106.21	1975.37
207	NB Expressway Entrance Ramp at Slaughter Lane	Urban Restricted	0.1	30	2113	77,125	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	24.69	6.49	0.28	82.13	3.79	172.45	1.24	26.99	23.13
208	NB I-35 Mainlane North of Slaughter Lane Expy Entrance Ramp	Urban Restricted	0.34	65	82250	10,207,225	0.000245	0.000048	0.000002	0.000591	0.000027	0.001116	0.000013	0.000200	0.000171	2498.35	492.24	19.71	6033.95	279.22	11395.06	128.89	2041.44	1745.61
209	NB Expressway North of Slaughter Lane Expy entrance ramp	Urban Restricted	1.48	70	7476	4,038,535	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	1174.82	192.75	7.25	2307.54	106.98	4556.15	56.03	767.32	719.66
211	NB I-35 Mainlane north of SH 71 Expy entrance ramp	Urban Restricted	0.05	60	74201	1,354,168	0.000226	0.000050	0.000002	0.000628	0.000029	0.001104	0.000012	0.000210	0.000173	306.11	68.38	2.84	849.79	39.28	1494.60	16.41	284.38	234.80
216	SB Expressway south of exit ramp towards Stassney	Urban Restricted	0.64	70	3300	770,880	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	224.25	36.79	1.38	440.46	20.42	869.68	10.70	146.47	137.37
226	SB I-35 Expressway exit ramp south of Onion Creek	Urban Restricted	3.24	30	6238	7,377,059	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	2361.22	621.18	26.92	7856.26	362.71	16495.02	118.48	2581.97	2212.18
227	SB I-35 Mainlane south of Expressway exit ramp at Onion Creek	Urban Restricted	0.64	70	101038	23,602,477	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	6866.00	1126.51	42.35	13485.97	625.22	26627.59	327.48	4484.47	4205.90
228	NB I-35 Mainlane north of william cannon exit ramp	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
229	NB I-35 exit ramp south of william cannon	Urban Restricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
230	NB frontage road north of william cannon exit ramp	Urban Unrestricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
231	NB frontage road south of Slaughter Creek SB to NB Uturn	Urban Unrestricted	0.09	55	12050	395,843	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	86.82	11.28	0.40	131.63	6.11	175.85	4.23	43.54	69.91

2045 Build							Emission Factor from TxDOT MSAT ERLT (grams/mile) [4]									Emissions (grams) [5]								
Link	Link Description	Classification	Distance (miles)	Speed (mph) [1]	2045 B Daily ADT [2] (vehicles/day)	Annual VMT [3] (miles/year)	Benzene	Naphthalene	Butadiene	Formaldehyde	Acrolein	DPM	POM	Acetaldehyde	Ethylbenzene	Benzene	Naphthalene	Butadiene	Formaldehyde	Acrolein	DPM	POM	Acetaldehyde	Ethylbenzene
232	NB frontage road between Slaughter Lane intersection	Urban Unrestricted	0.08	45	32426	946,839	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	217.41	30.00	1.09	354.70	16.46	502.08	10.33	123.09	191.91
233	SB frontage road north of William Cannon mainlane exit ramp	Urban Unrestricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
234	NB frontage road south of SH 71 mainlane exit ramp	Urban Unrestricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
235	SB frontage road north of William Cannon mainlane entrance ramp	Urban Unrestricted	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
236	SB frontage road north of Slaughter Creek Main Lane exit ramp	Urban Unrestricted	0.28	45	25676	2,624,087	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	602.54	83.13	3.03	983.02	45.62	1391.47	28.63	341.13	531.87
237	SB frontage road south of Slaughter Lane mainlane entrance ramp	Urban Unrestricted	0.38	55	13588	1,884,656	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	413.38	53.70	1.88	626.70	29.11	837.23	20.12	207.31	332.87
238	WB Puryear road in between frontage roads	Urban Unrestricted	0.1	65	11238	410,187	0.000238	0.000027	0.000001	0.000303	0.000014	0.000415	0.000011	0.000110	0.000166	97.47	10.97	0.35	124.18	5.78	170.12	4.56	45.12	68.18
239	NB frontage road RT to EB Stassney	Urban Unrestricted	0.1	15	5513	201,225	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	92.38	14.36	0.56	174.56	8.08	203.72	4.03	58.36	105.86
240	NB frontage road north of RT to EB Stassney	Urban Unrestricted	0.03	45	11038	120,866	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	27.75	3.83	0.14	45.28	2.10	64.09	1.32	15.71	24.50
241	WB Stassney RT to NB frontage road	Urban Unrestricted	0.1	15	6288	229,512	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	105.37	16.38	0.64	199.10	9.22	232.35	4.60	66.56	120.75
242	SB frontage road RT to WB Stassney	Urban Unrestricted	0.02	15	8275	60,408	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	27.73	4.31	0.17	52.40	2.43	61.16	1.21	17.52	31.78
243	SB frontage road south of RT to WB Stassney	Urban Unrestricted	0.02	45	12713	92,805	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	21.31	2.94	0.11	34.77	1.61	49.21	1.01	12.06	18.81
244	NB frontage road north of WB Stassney	Urban Unrestricted	0.03	45	20450	223,928	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	51.42	7.09	0.26	83.89	3.89	118.74	2.44	29.11	45.39
245	EB Stassney RT to SB frontage road	Urban Unrestricted	0.02	15	2625	19,163	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	8.80	1.37	0.05	16.62	0.77	19.40	0.38	5.56	10.08
247	EB William Cannon RT to SB frontage road	Urban Unrestricted	0.04	15	4863	71,000	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	32.59	5.07	0.20	61.59	2.85	71.88	1.42	20.59	37.35
248	SB frontage road RT to William Cannon	Urban Unrestricted	0.05	15	14288	260,756	0.000459	0.000071	0.000003	0.000867	0.000040	0.001012	0.000020	0.000290	0.000526	119.71	18.61	0.73	226.20	10.47	263.99	5.22	75.62	137.18
249	NB frontage road north of WB William Cannon	Urban Unrestricted	0.02	45	31813	232,235	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	53.33	7.36	0.27	87.00	4.04	123.15	2.53	30.19	47.07
250	NB frontage road north of RT to EB Slaughter	Urban Unrestricted	0.03	45	16513	180,817	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	41.52	5.73	0.21	67.74	3.14	95.88	1.97	23.51	36.65
251	SB frontage road in between FM 1327	Urban Unrestricted	0.08	55	15400	449,680	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	98.63	12.81	0.45	149.53	6.95	199.76	4.80	49.46	79.42
252	NB frontage road north of WB Puryear	Urban Unrestricted	0.03	55	1738	19,031	0.000219	0.000028	0.000001	0.000333	0.000015	0.000444	0.000011	0.000110	0.000177	4.17	0.54	0.02	6.33	0.29	8.45	0.20	2.09	3.36
255	NB frontage road north of Slaughter Lane first DC split	Urban Unrestricted	0.34	45	13288	1,649,041	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	378.65	52.24	1.90	617.76	28.67	874.44	17.99	214.38	334.24
256	NB frontage south of William Cannon NB to SB Uturn	Urban Unrestricted	0.65	45	23726	5,628,994	0.000230	0.000032	0.000001	0.000375	0.000017	0.000530	0.000011	0.000130	0.000203	1292.52	178.33	6.49	2108.71	97.85	2984.88	61.41	731.77	1140.92
257	NB frontage Ramp to EL north of Slaughter Lane	Urban Restricted	0.17	30	20788	1,289,895	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	412.86	108.61	4.71	1373.69	63.42	2884.19	20.72	451.46	386.80
258	NB Ramp to EL north of Slaughter Lane	Urban Restricted	0.23	30	713	59,856	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	19.16	5.04	0.22	63.74	2.94	133.84	0.96	20.95	17.95
259	NB frontage Ramp to I-35 Mainlane north of Slaughter	Urban Restricted	0.5	30	20075	3,663,688	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	1172.66	308.50	13.37	3901.68	180.13	8191.96	58.84	1282.29	1098.64
260	NB EL north of Slaughter Lane after frontage road ramp	Urban Restricted	1.77	70	8188	5,289,857	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	1538.83	252.48	9.49	3022.51	140.13	5967.85	73.40	1005.07	942.64
261	NB EL off ramp north of Stassney	Urban Restricted	0.66	30	3100	746,790	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	239.03	62.88	2.72	795.30	36.72	1669.81	11.99	261.38	223.94
262	NB EL north of Stassney after off ramp	Urban Restricted	0.87	70	5088	1,615,694	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	470.01	77.11	2.90	923.17	42.80	1822.78	22.42	306.98	287.91
263	WB DC Ramp to SB I-35 Express Lane after split (new road)	Urban Restricted	0.55	55	4763	956,172	0.000230	0.000054	0.000002	0.000677	0.000031	0.001181	0.000012	0.000220	0.000184	219.96	51.80	2.18	647.18	29.91	1129.22	11.90	210.36	175.95
264	SB frontage ramp north of Stassney	Urban Restricted	0.97	45	48525	17,180,276	0.000256	0.000063	0.000003	0.000792	0.000037	0.001521	0.000014	0.000260	0.000216	4402.02	1084.56	46.15	13615.09	628.92	26124.37	236.26	4466.87	3712.68
265	SB DC Ramp south of SH 71 total	Urban Restricted	0.32	55	44850	5,238,480	0.000230	0.000054	0.000002	0.000677	0.000031	0.001181	0.000012	0.000220	0.000184	1205.05	283.79	11.93	3545.64	163.84	6186.56	65.19	1152.47	963.96
266	SB exit ramp to frontage road south of Stassney	Urban Restricted	0.22	30	26813	2,153,084	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	689.15	181.30	7.86	2292.95	105.86	4814.27	34.58	753.58	645.65
267	SB frontage road straight south of Stassney exit ramp	Urban Restricted	0.4	45	21713	3,170,098	0.000256	0.000063	0.000003	0.000792	0.000037	0.001521	0.000014	0.000260	0.000216	812.26	200.12	8.52	2512.25	116.05	4820.46	43.59	824.23	685.06
268	SB mainlane exit ramp to frontage road south of Stassney	Urban Restricted	0.35	30	25113	3,208,186	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	1026.86	270.14	11.71	3416.59	157.74	7173.47	51.52	1122.86	962.05
269	SB frontage road south of mainlane exit ramp south of Stassney	Urban Restricted	0.57	45	46826	9,742,149	0.000256	0.000063	0.000003	0.000792	0.000037	0.001521	0.000014	0.000260	0.000216	2496.19	615.00	26.17	7720.49	356.63	14813.94	133.97	2532.96	2105.29
270	NB mainlane exit ramp south of SH71	Urban Restricted	0.18	30	46325	3,043,553	0.000320	0.000084	0.000004	0.001065	0.000049	0.002236	0.000016	0.000350	0.000300	974.17	256.28	11.11	3241.26	149.64	6805.35	48.88	1065.24	912.68
271	NB mainlane after exit ramp south of SH71	Urban Restricted	0.39	60	69113	9,838,236	0.000226	0.000050	0.000002	0.000628	0.000029	0.001104	0.000012	0.000210	0.000173	2223.93	496.79	20.61	6173.87	285.40	10858.48	119.21	2066.03	1705.84
272	NB DC to EB SH 71	Urban Restricted	0.22	55	49425	3,968,828	0.000230	0.000054	0.000002	0.000677	0.000031	0.001181	0.000012	0.000220	0.000184	912.98	215.01	9.04	2686.28	124.13	4687.12	49.39	873.14	730.32
273	SB Expressway north of Stassney	Urban Restricted	3.26	70	8063	9,594,164	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	2790.96	457.91	17.21	5481.91	254.15	10823.84	133.12	1822.89	1709.65
274	SB mainlane south of William Cannon Drive	Urban Restricted	1.76	65	60863	39,098,391	0.000245	0.000048	0.000002	0.000591	0.000027	0.001116	0.000013	0.000200	0.000171	9569.82	1885.51	75.51	23112.82	1069.56	43648.34	493.72	7819.68	6686.49
275	SB mainlane south of Slaughter Lane, south of EL exit	Urban Restricted	0.46	70	86900	14,590,510	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	4244.40	696.38	26.18	8336.71	386.50	16460.56	202.44	2772.20	2599.99
276	SB Expressway exit south of Slaughter Lane	Urban Restricted	0.08	70	1825	53,290	0.000291	0.000048	0.000002	0.000571	0.000026	0.001128	0.000014	0.000190	0.000178	15.50	2.54	0.10	30.45	1.41	60.12	0.74	10.13	9.50
					Total VMT (miles/year)	**900,845,273**									**Total (grams/year)**	**240823.90**	**43203.41**	**1688.37**	**524703.39**	**24298.35**	**982321.86**	**11824.36**	**175235.39**	**172293.68**
					Total VMT (million miles/year)	**901**									**Total (tons/year)**	**0.265**	**0.048**	**0.002**	**0.578**	**0.027**	**1.083**	**0.013**	**0.193**	**0.190**

[1] 2045 Build speeds are based on posted speeds from the statewide planning website to the extent possible. Otherwise, posted speeds located through Google Maps or design speeds were used, if available. https://www.txdot.gov/apps/statewide_mapping/StatewidePlanningMap.html

[2] Average Daily Traffic based on "0015-13-077 I-35 South_Build ADT_Interpolation.xlsx" for the year 2045.

[3] Annual Vehicle Miles Travelled (miles/year) = ADT (vehicles/day) * Distance travelled (miles/vehicle) * 365 days/year

[4] MSAT emission rates are based on the TxDOT Emission Rate Lookup Tables for MSAT (01/17) for the Austin area. Separate AM and PM emission rates were found for each pollutant based on AM and PM speeds.
2040 Emission Factors were used to represent 2045.

[5] Emissions (grams/year) = AM emission rate (g/mile) * Annual VMT (miles/year) / 2 + PM emission rate (g/mile) * Annual VMT (miles/year) / 2
ADT volumes were allocated 50/50 to the AM and PM hours per TxDOT guidance.

Carbon Monoxide Traffic Air Quality Analysis Technical Report

I-35 Capital Express South from US 290/SH 71 to SH 45 Southeast

TxDOT Austin District

CSJs: 0016-01-113 and 0015-13-077

March 2021

The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried-out by TxDOT pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated 12-9-2019, and executed by FHWA and TxDOT.

Table of Contents

List of Figures

Page

List of Tables

Acronyms and Abbreviations

AADT	Average Annual Daily Traffic
ADT	Average daily traffic
AECOM GEC	AECOM General Engineering Consultant on Mobility35 Program
CALINE3	California Line Source Model
CO	Carbon monoxide
EPA	U.S. Environmental Protection Agency
ETC	Estimated Time of Completion
FHWA	Federal Highway Administration
I-35	Interstate Highway 35
LOS	Level of Service
NAAQS	National Ambient Air Quality Standards
ppm	Parts per million
ROW	Right of way
RTP	Regional Transportation Plan
SH 45	State Highway 45
SH 45SE	State Highway 45 Southeast
SIP	State Implementation Plan
SO_2	Sulfur dioxide
SUP	Shared-use path
TAQA	Traffic Air Quality Analysis
TP&P	TxDOT Transportation Planning and Programming
TxDOT	Texas Department of Transportation
US 290	U.S. Highway 290
US 71	U.S. Highway 71
VMT	Vehicle miles traveled
vpd	Vehicles per day

INTRODUCTION

The Texas Department of Transportation (TxDOT), is assessing the environmental impacts associated with the Capital Express South project which proposes improvements to Interstate Highway (I-35) South in Austin, Travis County, Texas, from U.S. Highway 290 (US 290)/State Highway 71 (SH 71) to SH 45 Southeast (SH 45SE), with a transition area extending to Main Street in Buda, Hays County. The primary objectives of the proposed project improvements are to improve operational efficiency and manage congestion, provide more reliable travel times, and create a more dependable and consistent route for transit, emergency responders, and other motorists.

Current Facility

I-35 within the proposed project limits is an access-controlled interstate highway. The facility typically has three to four, 12-foot wide general purpose mainlanes (concrete barrier separated) with 2-foot wide inside shoulders, 4-foot wide outside shoulders, and two to three, 11-foot wide frontage road lanes with 2-foot wide inside and outside shoulders in each direction. Sidewalks and shared-use paths (SUPs) exist intermittently throughout the project area between the frontage roads and adjacent businesses and around the intersections. The existing ROW width is typically 300 to 420 feet.

Proposed Facility

TxDOT is proposing the addition of two managed lanes and certain other corridor improvements on I-35 in Austin, Travis County, Texas, from US 290/SH 71 to SH 45SE. The project location is shown in Figure 1. The project would add non-tolled managed lanes to I-35. The managed lanes will be elevated from north of Stassney Lane to south of William Cannon Drive. These lanes would be designed to achieve the most efficient and reliable travel times. Access to frontage roads would be maintained and ramps would be better optimized for safety and mobility. The proposed roadway would remain controlled access. Existing access to the general-purpose lanes would remain, with some reconstruction of existing entrance and exit ramps. Additionally, all overpass/underpass and bridge locations would remain the same as existing, with some minor reconstruction to accommodate the proposed improvements. The following ingress/egress points to the proposed managed lanes would be provided:

Southbound

- Ingress
  - At SH 71
  - Between Slaughter Creek Overpass and Onion Creek Parkway
- Egress
  - Between Slaughter Creek Overpass and Onion Creek Parkway
  - At SH 45 SE

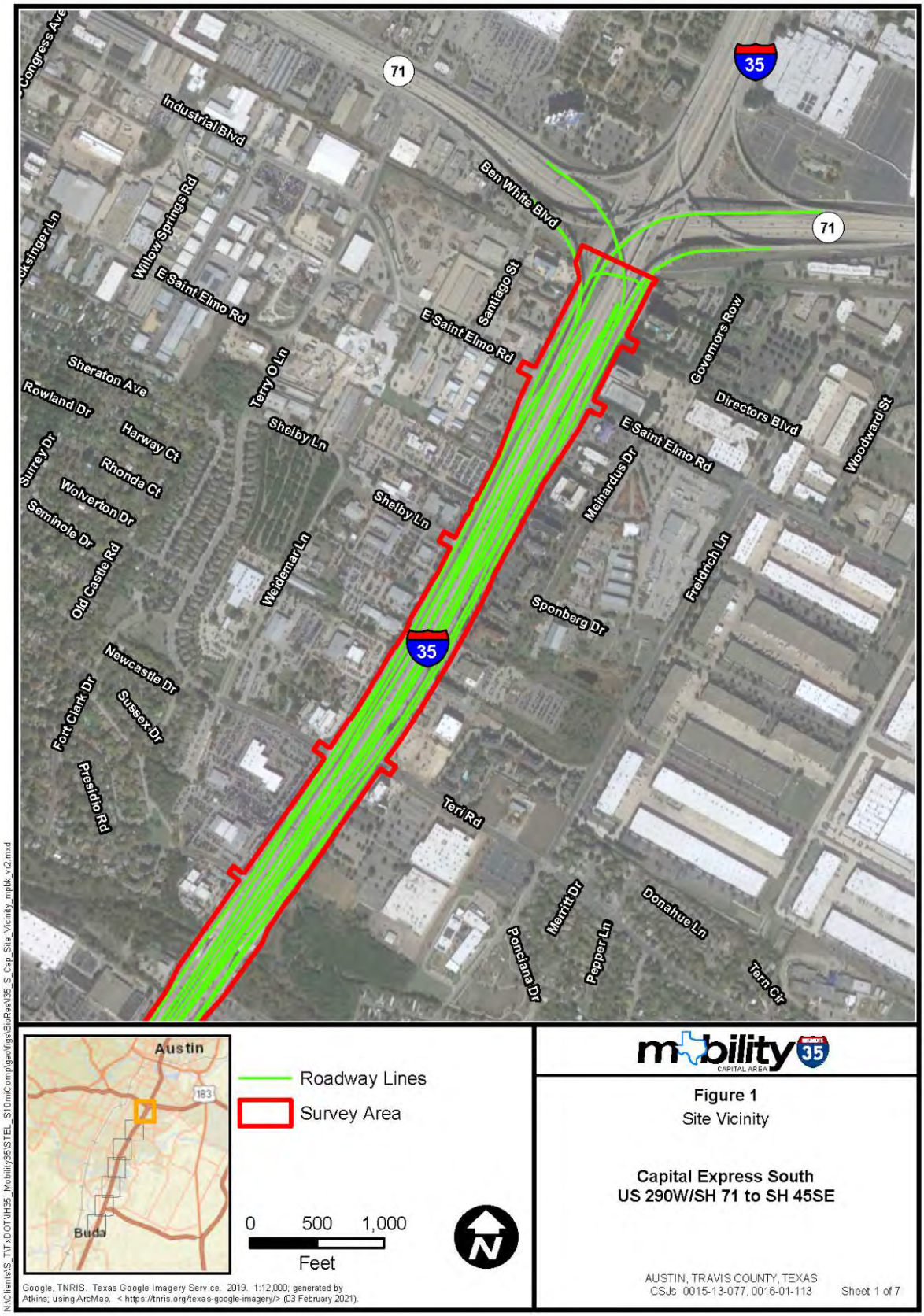


Figure 1: Project Vicinity Map

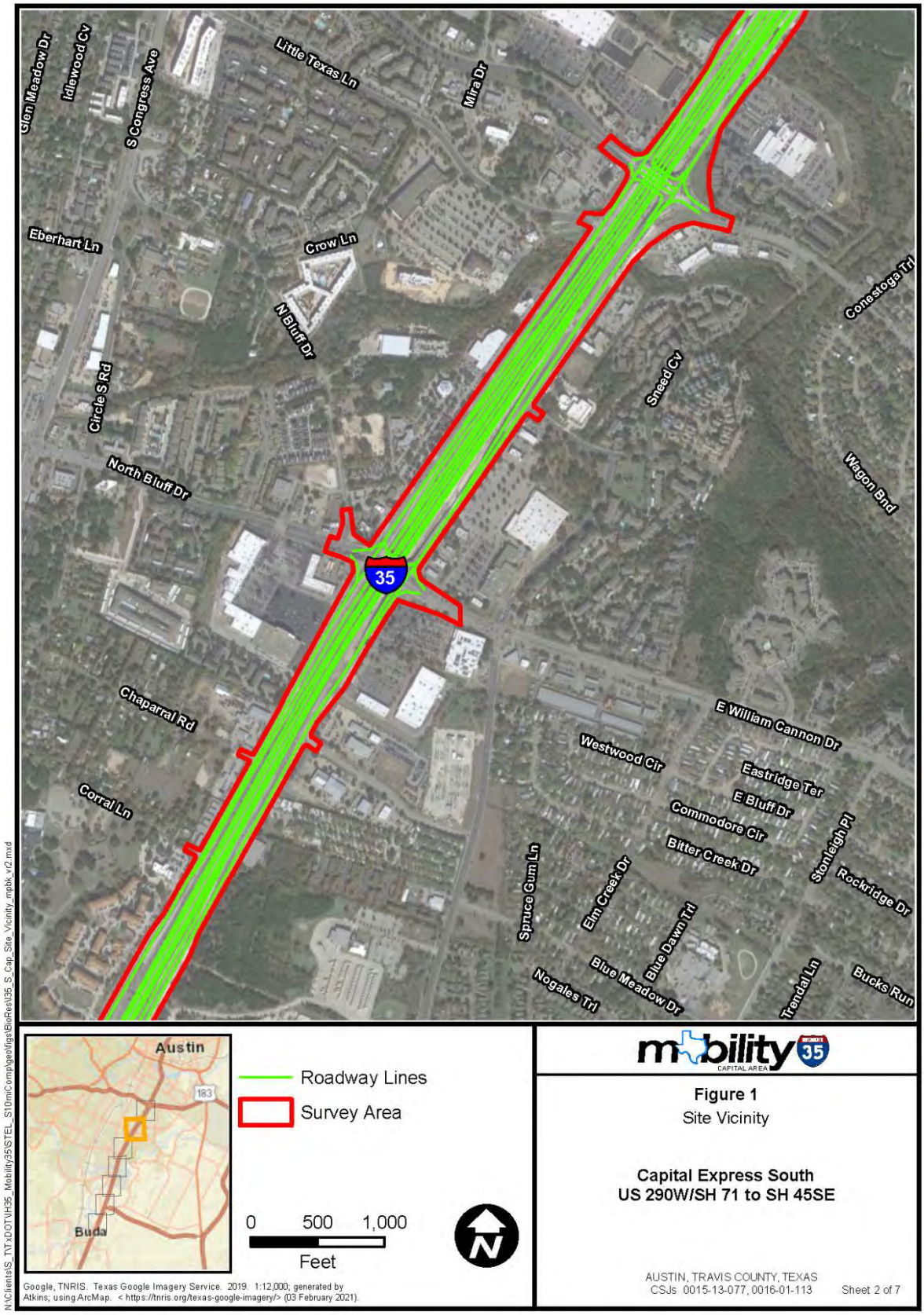


Figure 1: Project Vicinity Map (2 of 7)

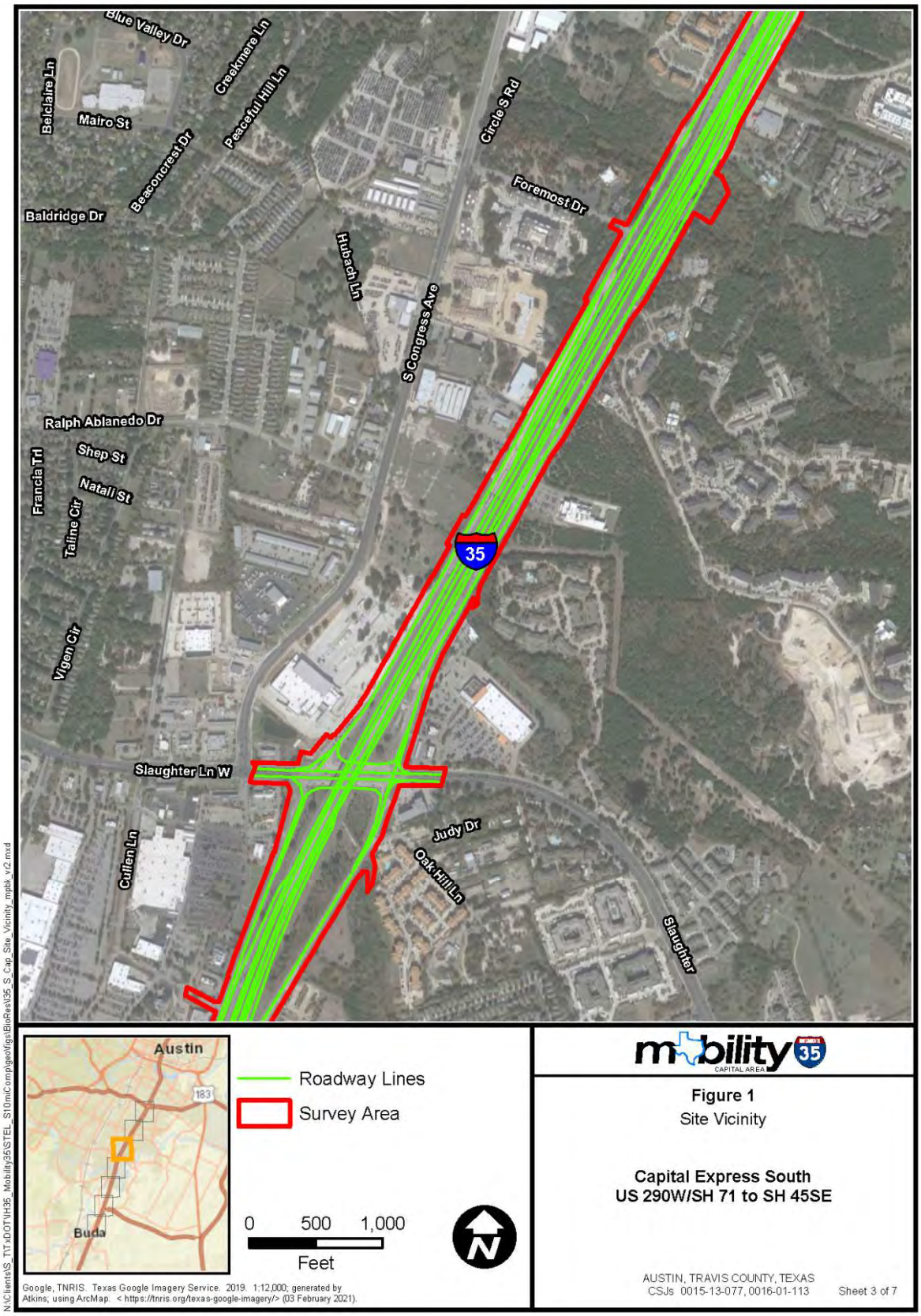


Figure 1: Project Vicinity Map (3 of 7)

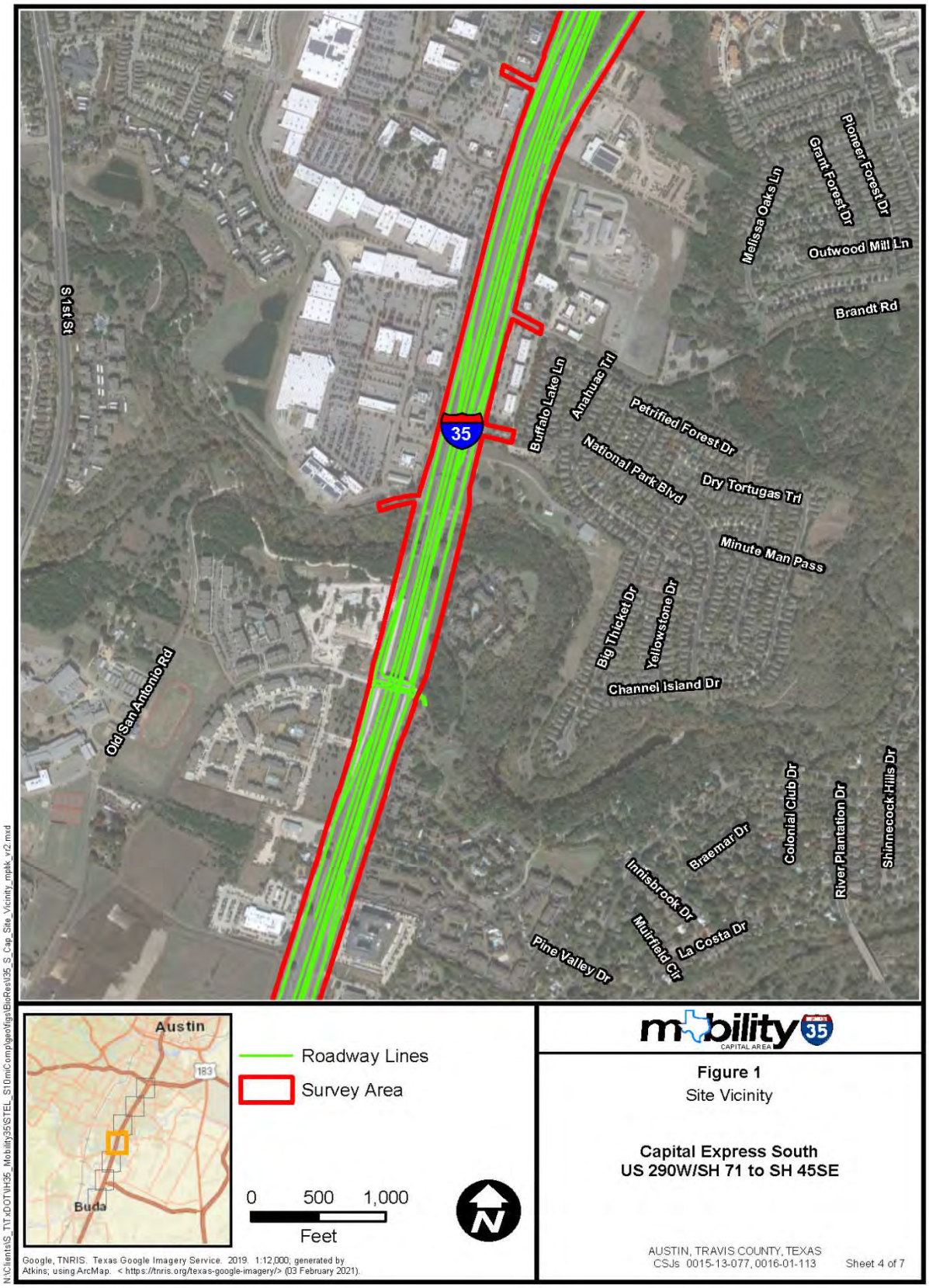


Figure 1: Project Vicinity Map (4 of 7)

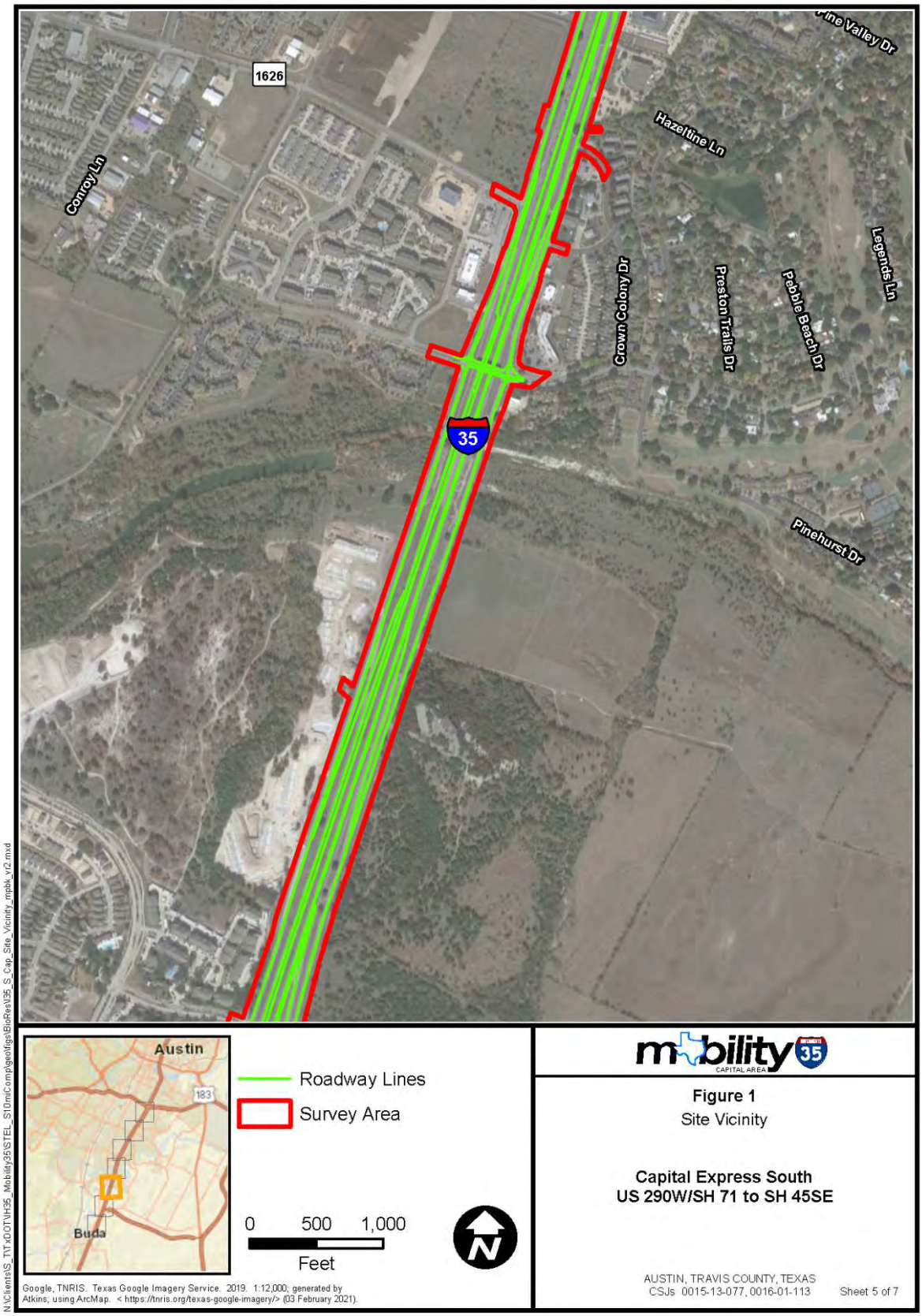


Figure 1: Project Vicinity Map (5 of 7)

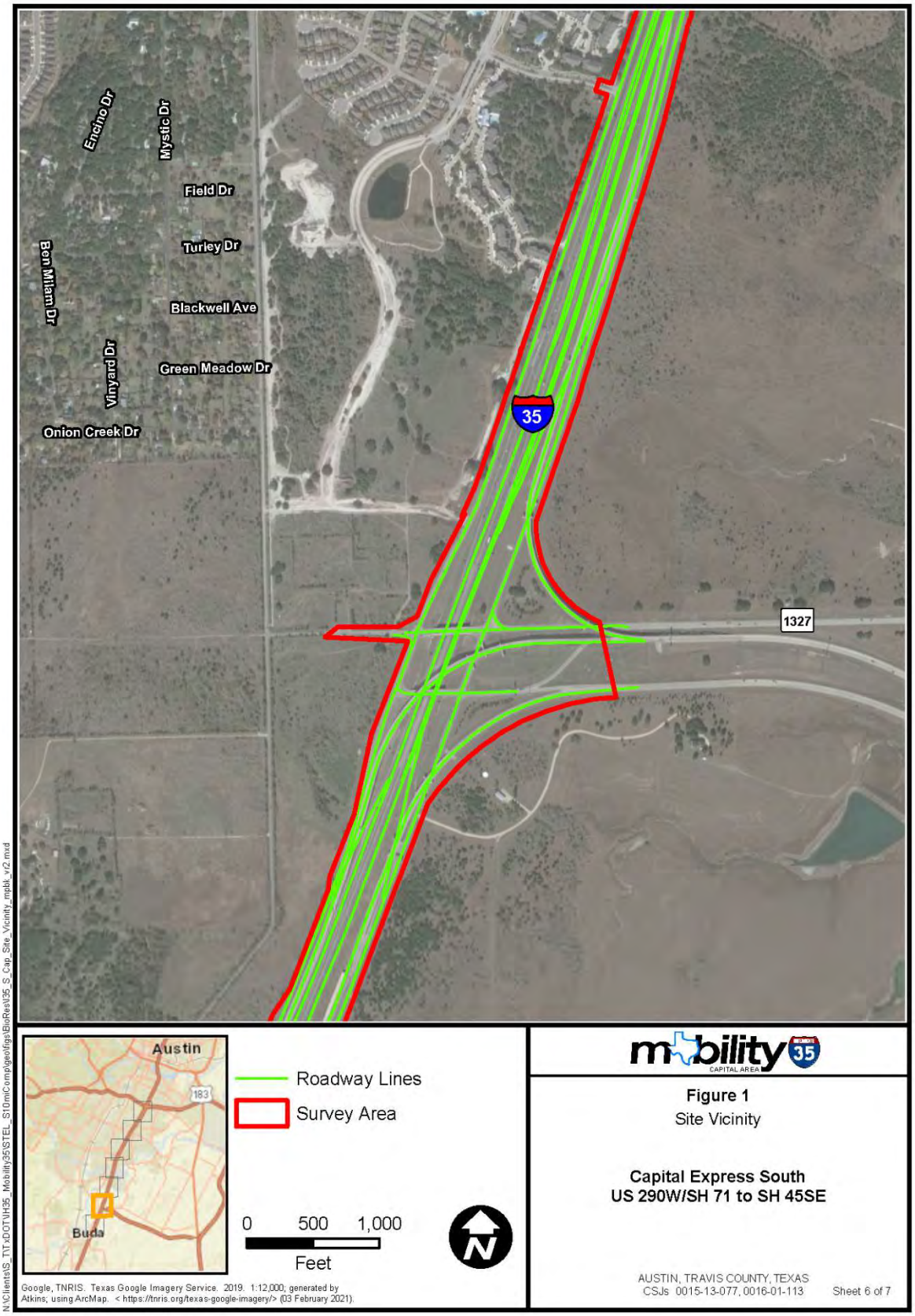


Figure 1: Project Vicinity Map (6 of 7)

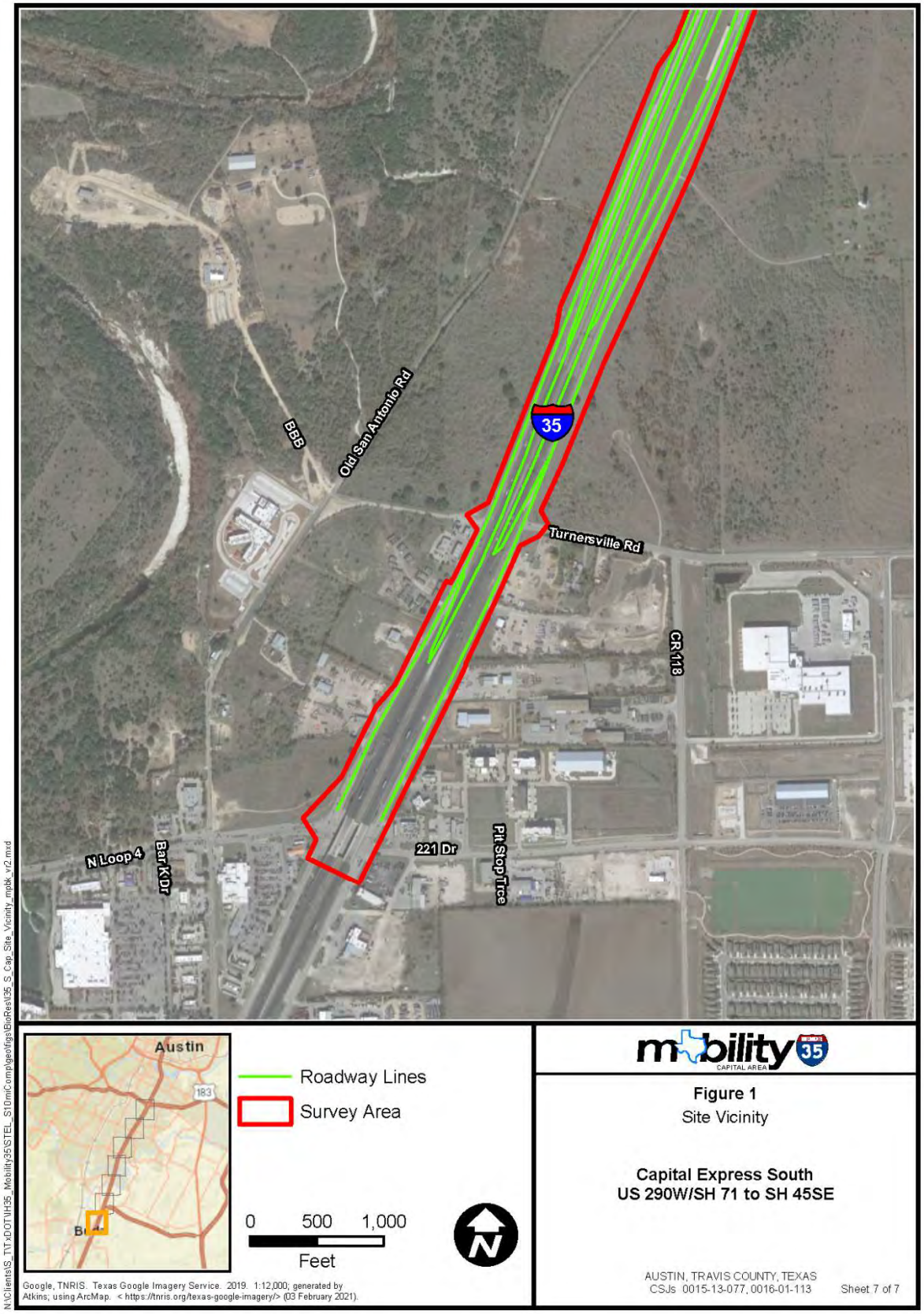


Figure 1: Project Vicinity Map (7 of 7)

Northbound

- Ingress
  - At SH 45 SE
  - Between Slaughter Creek Overpass and Slaughter Lane
- Egress
  - At SH 71
  - Between Stassney Lane and SH 71
  - Between William Cannon Drive and Stassney Lane

Following completion of the proposed project, vehicles would access the elevated SB managed lane north of Stassney Lane via two 12-foot lanes. At I-35 and Slaughter Lane, vehicles would be able to access the elevated NB managed lanes from the NB main lanes. Vehicles traveling SB in the managed lanes would be able to access the SB main lanes at designated points. There would also be access to the NB and SB managed lanes and main lanes near SH 45SE.

There would also be new connector-distributor lanes in the following locations. North of Stassney, there would be a connector-distributor lane in the elevated section with a direct connector to SH 71/US 290. There would also be connector distributor lanes on SB I-35 north of William Cannon Drive.

Additionally, new turn lanes at Slaughter Lane and Onion Creek Parkway would allow vehicles to travel more quickly through the intersections because they would not need to wait as long at traffic lights to reach the other side of the frontage road. A proposed south to north turnaround at SH 45SE would also allow vehicles to bypass the intersection and decrease travel times.

The proposed project would add new sidewalks and shared-use paths along the I-35 NB and SB frontage roads from SH 71 to Stassney Lane, and in both NB and SB directions of the frontage road from South Boggy Creek to SH 45SE. Public transit would also be positively impacted as these vehicles would be allowed on the managed lanes, and it is anticipated that this access would decrease transit commute times. This improvement will benefit transit-depended populations. Traffic projections used for the air quality analyses were determined using a base year of 2018, and the projected Build Alternatives with an estimated time of completion (ETC) year of 2024 and a design year of 2045.

Background Information

The U.S. Environmental Protection Agency (EPA) first set National Ambient Air Quality Standards (NAAQS) for CO in 1971. For protection of both public health and welfare, EPA set an 8-hour primary standard at 9 parts per million (ppm) and a 1-hour primary standard at 35 ppm. Nationally and, particularly in urban areas, the majority of CO emissions to ambient air come from mobile sources. Currently, there are no areas within the State of Texas that are classified as nonattainment or maintenance for CO, and no regional or project-level conformity requirements for CO are in effect for the State of Texas.

Roadway projects may be subject to a Carbon Monoxide (CO) Traffic Air Quality Analysis (TAQA) if the project adds capacity or has an ETC or design year annual average daily traffic (AADT) greater than 140,000 vehicles

per day (vpd). The highest annual average daily traffic along the I-35 Project Corridor for the ETC year (2024) and design year (2045) is estimated to be 246,445 vehicles per day and 333,441 vehicles per day, respectively; therefore, triggering the need for a CO TAQA. This assessment is based on the issues discussed and the resolutions agreed upon during a conference call with TxDOT ENV and AECOM GEC on June 18, 2019. Notes from this coordination call may be found Appendix A.

TRAFFIC AIR QUALITY ANALYSIS (TAQA)

The traffic data used in the analysis were obtained from AECOM GEC and were based on methodologies accepted by the TxDOT Transportation Planning and Programming (TP&P) Division. Traffic for the ETC year (2024) and design year (2045) are shown in Table 1. Traffic diagrams are available in Appendices B and C.

Table 1: Projected Average Daily Traffic Along I-35

Location	Nearest Cross Street	ADT (vpd)	
		2024 (ETC Year)	2045 (Design Year)
STA 3500 + 00	Between St. Elmo Rd and Shelby Ln	244,970	332,228
STA 3511 + 00	Between Shelby Ln and Colonial Park Blvd	244,970	332,228
STA 3524 + 00	Colonial Park Blvd	246,445	333,441
STA 3535 + 00	Battle Bend Blvd	246,445	333,441
STA 3540 + 00	Between Battle Bend Blvd and Stassney Ln	246,445	333,441
STA 3554 + 00	Stassney Ln	223,240	305,353
STA 3580 + 00	Between William Cannon and Stassney Ln	229,695	313,016
STA 3589 + 00	William Cannon	218,885	296,591
STA 3632 + 00	Foremost Dr	200,325	272,516
STA 3680 + 00	Slaughter Ln	200,325	272,516
STA 3720 + 00	Taft Ln	183,600	249,752
STA 3742 + 00	Old San Antonio Rd	183,600	249,753
STA 3754 + 00	Brezza Ln	161,075	219,090
STA 3767 + 00	Between Brezza Ln and 1626	168,315	229,162
STA 3780 + 00	FM 1626	168,315	240,702
STA 3802 + 50	Onion Creek	152,750	208,392
STA 3810 + 00	South of Onion Creek	160,175	218,190
STA 3897 + 00	Puryear Rd	157,900	221,527
STA 3902 + 00	SH 45	167,920	228,926

Source: AECOM GEC, August 2020
Note: Volumes are maximum traffic forecast along segments.

Analysis Methodology

While Travis County is in attainment for CO, CO is also a concern in areas where signalized intersections (due to idling vehicles) are operating at a Level-of-Service D, E, or F in the project design year; however, this project does not include physical improvements to or additions of new intersections that would result in a deterioration of the LOS at existing intersections. As such, a CO analysis at signalized intersections is not required, and a CO

TAQA was performed based on the free flow roadway section with the highest AADT and most narrow right-of-way (ROW).

To verify there is no exceedance of either the 1-hour or 8-hour CO standards, the CO concentrations for the Build Alternative were modeled using the CAL3QHC model for the ETC and design years, 2024 and 2045, respectively, factoring in adverse meteorological conditions and sensitive receptors at the ROW line in accordance with the TxDOT Standard Operating Procedure for Complying with CO TAQA Requirements (2015). Two stations were modeled in this analysis because of high AADT and narrowest ROW: STA 3500 + 00 and STA 3524 + 00. The modeled sections include the traffic volumes from all lanes within 1,000 feet of each receptor location in either direction. Figure 2 shows the locations of these sections. It is assumed topography and meteorology of the area in which the project is located would not seriously restrict dispersion of the air pollutants.

The CAL3QHC model combines the California Line Source Model (CALINE3) developed by the California Department of Transportation, with an algorithm for estimating queue lengths at signalized intersections. The CALINE3 and CAL3QHC models are accepted by the EPA and the Federal Highway Administration (FHWA) as techniques for assessing the air quality impacts that may occur from the operation of motor vehicles on roadways.

CO Model Input Parameters

Adverse meteorological conditions were the input parameters used to model a worst-case analysis. These conditions include: lowest realistic wind speed, worst reasonable stability class, lowest reasonable temperature, highest expected traffic volumes, emissions associated with peak speeds, and closest reasonable receptor locations. If the “worst case” concentration does not violate air quality standards, it can be reasonably assumed that under any future set of actual meteorological conditions, the actual air quality will be better than the standards.

The following assumptions and input parameters were used in accordance with TxDOT’s Environmental Compliance Toolkit and TxDOT’s Environmental Guide, Volume 2, Activity Instructions (2020):

- 1-hour CO background concentration of 1.6 ppm
- 8-hour CO background concentration of 1.3 ppm
- Neutral atmospheric conditions – Stability Class of 4
- Mixing height of 1,000 meters
- Wind speed of 1 meter per second
- Wind directions modeled every 10 degrees, starting at 10 degrees and ending at 360 degrees

The design hour volume was calculated using the average daily traffic (ADT) for the specified locations multiplied by the proportion of the 24-hour volume that occurs during the design hour, or K-factor. Design hour volumes (DHV) were provided for each roadway link by AECOM GEC.

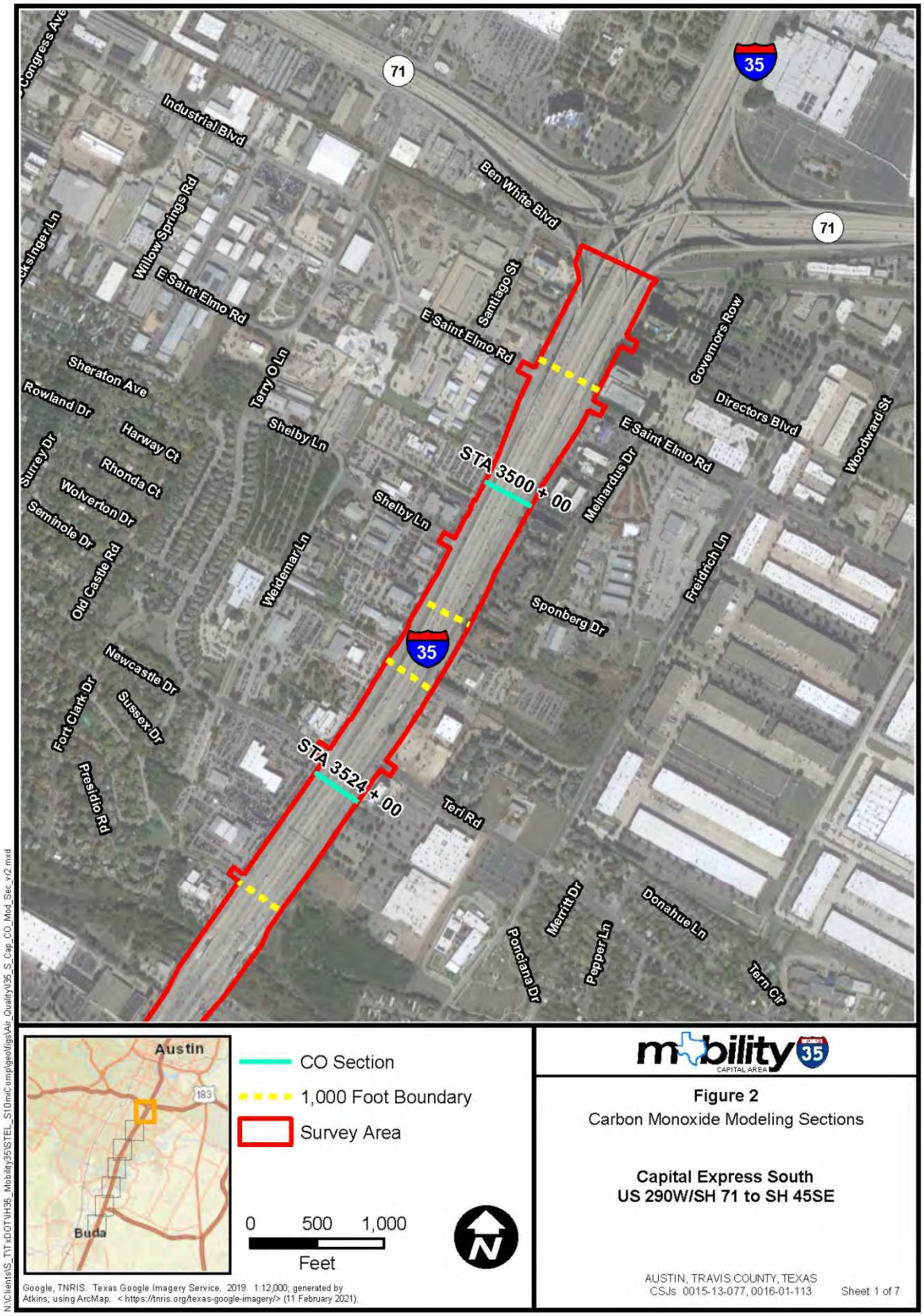


Figure 2: Carbon Monoxide Modeling Sections

Traffic data provided by AECOM GEC was used to determine the sections of each build alternative with the highest AADT, and project schematics were used to identify the areas of these high AADT sections with the narrowest ROW. Two sections were identified as having the highest AADT and the narrowest ROW, both located on I-35 south of the SH 71 intersection. A summary of the AADT, DHVs, and ROW distance for each of the areas is provided in Table 2.

Table 2: Traffic Data for CO TAQA Sections

Section	ROW Width	Roadway Segment	2024 AADT	2024 DHV	2045 AADT	2045 DHV
I-35, South of SH 71 Inter-change STA 3500+00	East ROW: 15 ft	NB Frontage	32,655	2,959	43,838	3,978
		NB SH 71/US 290 DC	2,260	305	3,100	463
		NB Main lane Exit Ramp	25,010	2,660	46,325	3,290
	West ROW: 10 ft	NB General Purpose Lane	59,715	2,422	69,113	3,010
		NB Managed Lane	3,775	661	5,088	903
		SB Managed Lane	2,460	155	3,300	208
		SB General Purpose Lane	35,545	2,626	45,888	3,550
		SB SH 71/US 290 DC	31,200	1,563	44,851	1,868
		SB Frontage	52,350	2,384	70,725	3,140
		Total AADT	**244,970**		**332,228**	
I-35, South of SH 71 Inter-change STA 3524+00	East ROW: 20 ft	NB Frontage	32,655	2,959	43,838	3,978
		NB Ramp (Bridge)	2,260	305	3,100	463
		NB General Purpose	84,725	5,082	115,438	6,300
	West ROW: 20 ft	NB Managed Lane (Bridge)	3,775	661	5,088	903
		SB Managed Lane (Bridge)	2,460	155	3,300	208
		SB General Purpose	63,400	4,139	85,976	5,368
		SB Ramp (Bridge)	3,345	50	4,763	50
		SB Lane	35,610	1,682	48,525	2,165
		SB Frontage	18,215	725	23,413	988
		Total AADT	**246,445**		**333,441**	

DHV = Design hourly volume in vehicles per hour
NB = North bound
SB = South Bound

The CO emission rates for each road segment are based on the TxDOT Emission Rate Lookup Tables for the Austin area for Urban Arterial and Urban Freeway road types. Although the table only provides emission factors through the year 2040, the emission factors for the year 2040 were conservatively utilized to represent emissions for the project year 2045. The posted speeds were used to represent the free flow movement of vehicles. A summary of the emission factors and posted speeds for each roadway segment included in the model are summarized in Table 3.

Table 3: Emission Rates and Vehicle Speeds

Roadway Type	Roadway Description	Posted Speed (mph)	Emission Rates (grams/mile) 2024	2045
Expressway	Urban Freeway	70	1.4302	0.6639
Mainlane	Urban Freeway	60	1.0774	0.4660
Direct Connector	Urban Freeway	55	1.0775	0.4595
Collector-Distributor	Urban Arterial	45	1.1388	0.4705
Frontage	Urban Arterial	45	1.1388	0.4705
Ramp	Urban Freeway	30	1.2997	0.5086

Receptor Locations

Receptors were placed on the East and West ROW for each of the sections. Aerial maps showing the receptor location for each section are provided in Appendix D. Table 4 provides a summary of the DHV, distance to the receptors, speed, and ROW width used in modeling of each roadway segment. Both the East and West receptors were included in the model.

CO Model Analysis Results

The EPA has set the NAAQS for CO at 35 ppm for a 1-hour period and 9 ppm for a continuous eight-hour period. Local concentrations of CO are not expected to exceed national standards at any time. As shown in Table 5, the maximum modeled 1-hour concentration is 1.9 ppm in 2024 and 1.7 ppm in 2045. The maximum modeled 8-hour concentration is 1.51 ppm in 2024 and 1.37 ppm in 2045. The CO concentrations are expected to decrease from 2024 to 2045 due to the decline in emission rates in future years as a result of more-stringent vehicle and fuel regulations and cleaner-engine standards.

The results of the CAL3QHC analysis for the project area demonstrated that CO concentrations would not exceed state or federal air quality standards through the predicted design year traffic estimates. It is concluded that this project is consistent with region wide air quality goals and is consistent with the State Implementation Plan for air quality. The CAL3QHC model input and output files have been submitted to the District for inclusion in the project file.

Table 4: Receptor Descriptions

Receptor	Roadway Section	Distance to Roadway (ft)	ROW Width (ft)	2024 Total DHV	2045 Total DHV	2024 Total AADT	2045 Total AADT	Speed (mph)
Receptor 1 East ROW (R1 3500)	STA 3500 + 00	15	375	15,735	20,410	244,970	332,228	EL: 70 ML: 60 DC: 55 FR: 45 Ramp: 30
Receptor 2 West ROW (R2 3500)	STA 3500 + 00	10	375	15,735	20,410	244,970	332,228	EL: 70 ML: 60 DC: 55 FR: 45 Ramp: 30
Receptor 1 East ROW (R1 3524)	STA 3524 + 00	20	375	15,758	20,423	246,445	333,441	EL: 70 ML: 60 DC: 55 CD: 45 FR: 45 Ramp: 30
Receptor 2 West ROW (R2 3524)	STA 3524 + 00	20	375	15,758	20,423	246,445	333,441	EL: 70 ML: 60 DC: 55 CD: 45 FR: 45 Ramp: 30

EL = Express Lane
ML = Main Lane
DC = Direct Connector
CD = Collector-Distributor
FR = Frontage Road

Table 5: Predicted CO Concentrations at Each Receptor (ppm)

Location	Year	Receptor	1-hour CO Concentration (ppm)	% of 1-hour CO NAAQS	8-hour CO Concentration (ppm)	% of 8-hour CO NAAQS
I-35, South of SH 71 Inter-change STA 3500+00	2024	R1 3500	1.9	5.43	1.51	16.78
		R2 3500	1.8	5.14	1.44	16.00
	2045	R1 3500	1.7	4.86	1.37	15.22
		R2 3500	1.7	4.86	1.37	15.22
I-35, South of SH 71 Inter-change STA 3524+00	2024	R1 3524	1.8	5.14	1.44	16.00
		R2 3524	1.8	5.14	1.44	16.00
	2045	R1 3524	1.7	4.86	1.37	15.22
		R2 3524	1.6	4.57	1.30	14.44

Appendix A

CO TAQA Consultative Call Meeting Minutes

Meeting Minutes

Project Names	Capital Express North / South Projects	Job #/CSJ	0015-10-062, 0015-13-077
Meeting Location	Conference Call	Meeting Date	6/18/2019
Meeting Purpose	Air Quality Approach Discussion		

Attendees:

Tim Wood	TxDOT ENV
Bill Tillar	AECOM GEC
Ryan Ingram	AECOM GEC

The following represents the undersigned's understanding of the issues discussed and the resolutions agreed upon. Any objection to any item(s) in these minutes must be submitted in writing to the undersigned within ten (10) calendar days of the issue date of these minutes or these minutes shall become part of the permanent project record.

Discussion Topics:

1. Introductions
2. Overview
    a. Project Description
        i. Capital Express North (I-35 from SH 45N to US 290E)
            1. This project is being environmentally cleared as an Environmental Assessment (EA) and mainly consists of adding one managed lane (HOV 2+) in each direction within the limits.
        ii. Capital Express South (I-35 from US 290W /SH 71 to SH 45SE)
            1. This project is being environmentally cleared as an Environmental Assessment (EA) and mainly consists of adding two managed lanes (HOV 2+) in each direction within the limits.
    b. Reason for Call
        i. The call was held to discuss the years of analysis required for MSAT and CO TAQA. The project is added capacity and has AADT > 140,000.
    c. The project's anticipated environmental approval date: North: December 2020, South: December 2020.

i. The estimated time to completion (ETC) year: North: 2025, South: 2024 (ETC refers to the conclusion of construction and the opening year of the project.)

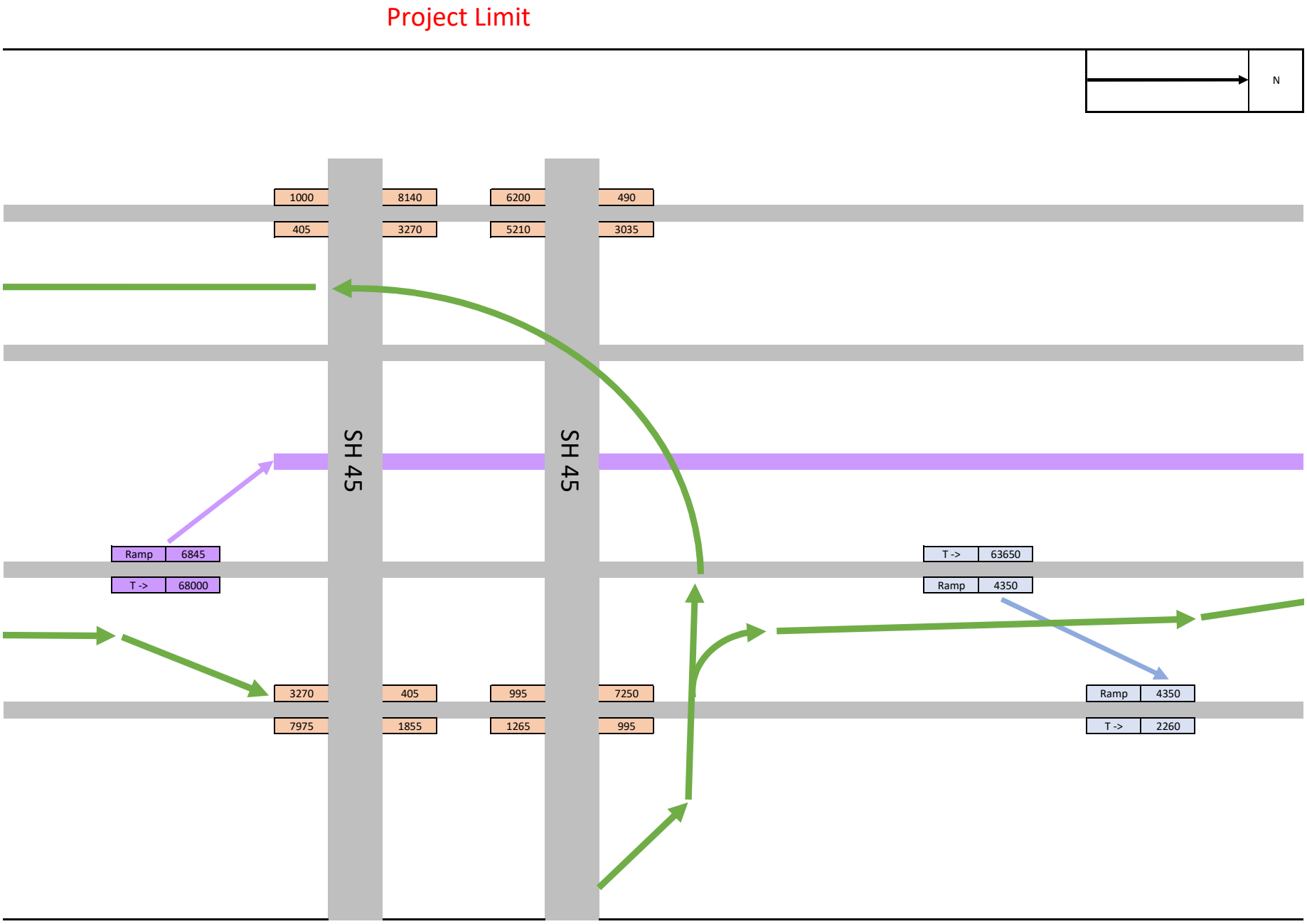
3. MSAT Analysis
    a. The appropriate base year and design year to analyze in the MSAT analysis (both projects).
        i. Base year: 2018
        ii. Design/horizon year: 2045
    b. An interim year would not be required for either project.
    c. Methodology for determining the affected network:
        i. If traffic data has been developed from a corridor travel demand model (TDM), then all links within the corridor analysis should be analyzed using the standard +/- 5 percent affected network method will be used for the project per TxDOT's air quality toolkit.
        ii. Otherwise, only the project links will be included in the MSAT analysis.
    d. MSAT emission rate tables are available and 2040 tables should be used since 2045 tables have not been developed.
4. CO TAQA
    a. Discuss ETC and design year for analysis
        i. ETC year would be 2025 (North) and 2024 (South)
        ii. The design/horizon year for both projects is 2045
    b. Use CAL3QHC model for analysis
5. GHG
    a. GHG analysis not required for either project since each document is an EA.

Action Items:

1. GEC will have a call with traffic consultant to determine when Build and No-Build traffic will be available for 2045. Bill/Ryan to follow-up with Tim after data is received. Analysis requirements for MSAT and CO TAQA may be revised based on comparison of 2045 No Build vs Build traffic volumes.

Appendix B

Average Daily Traffic Data



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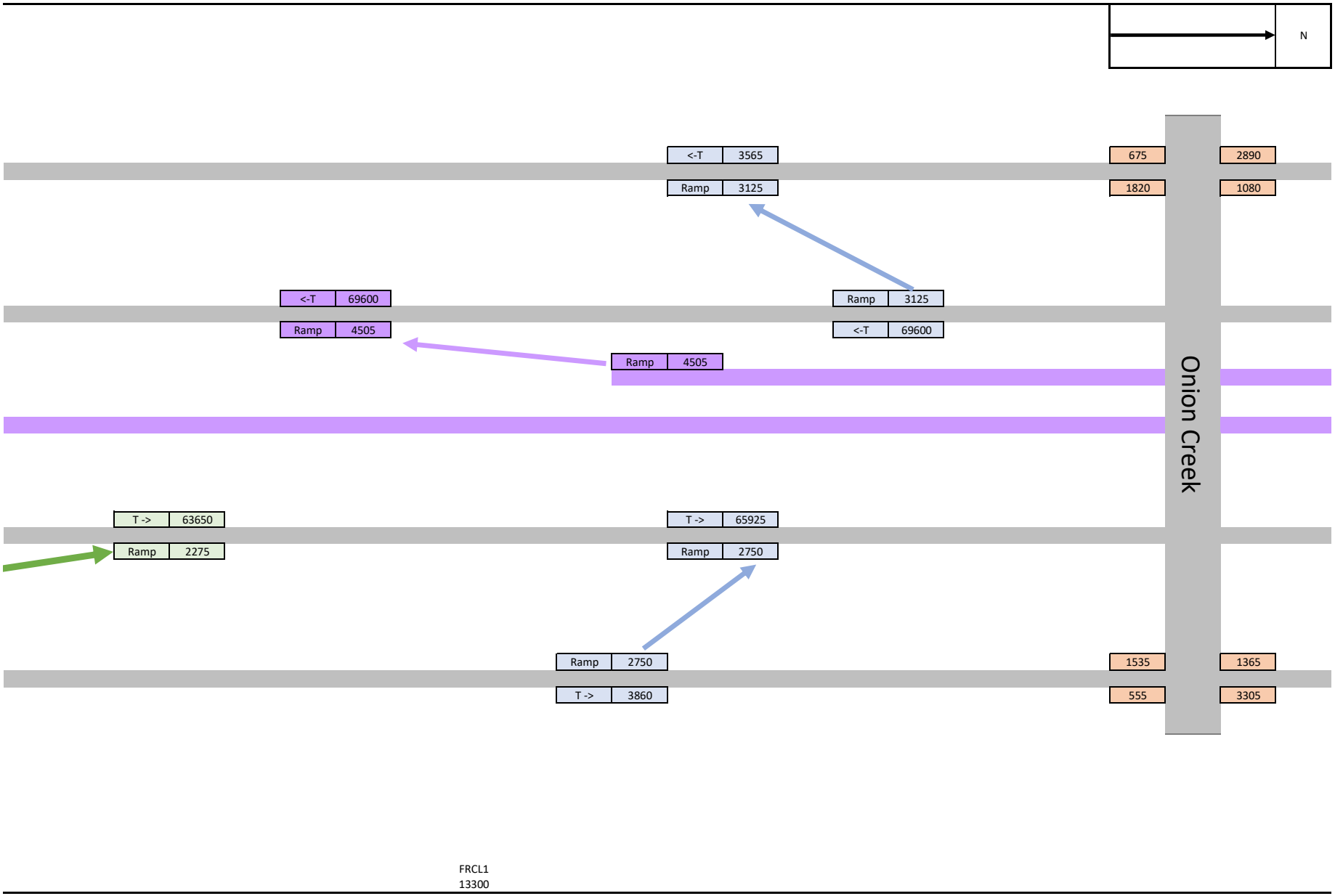

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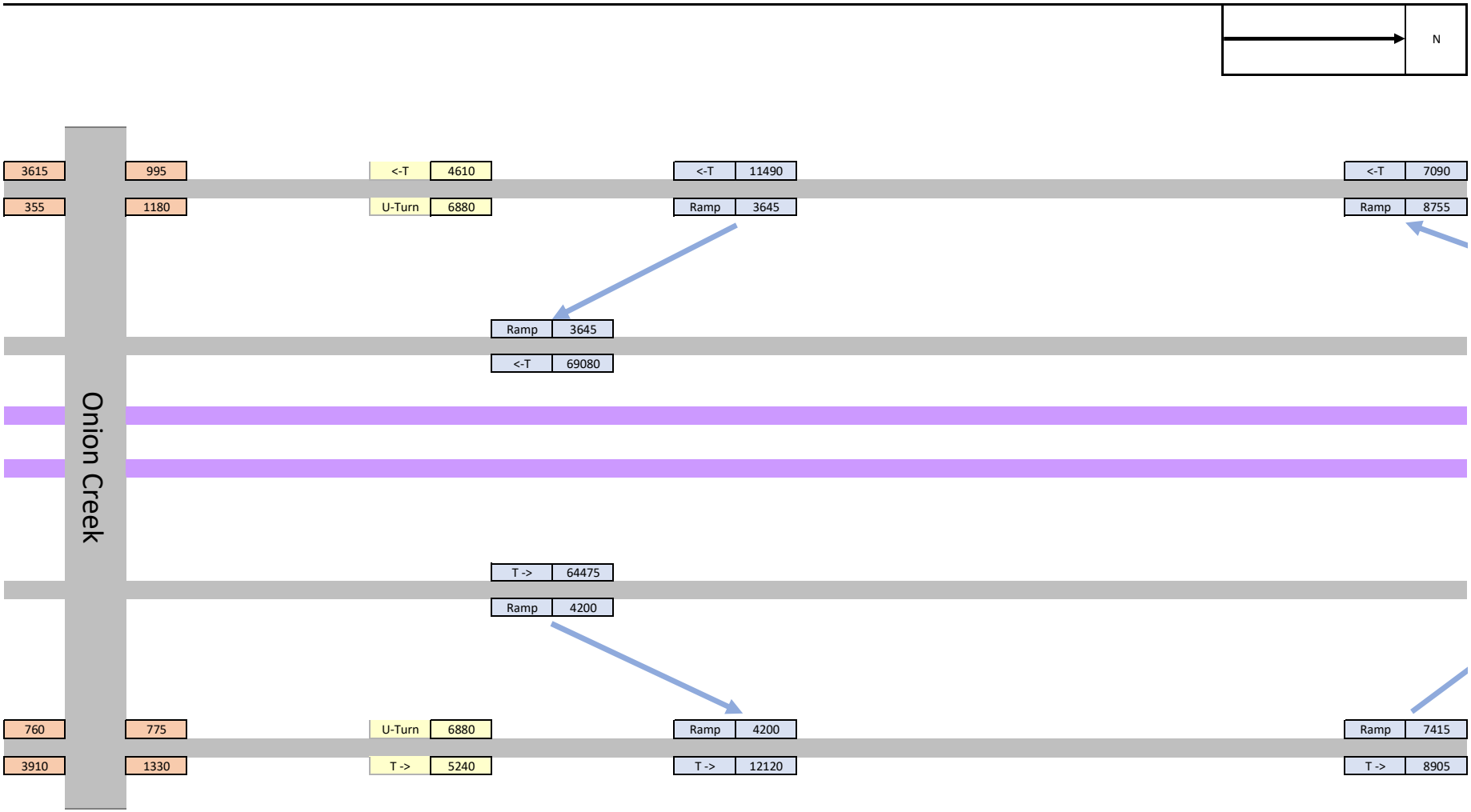

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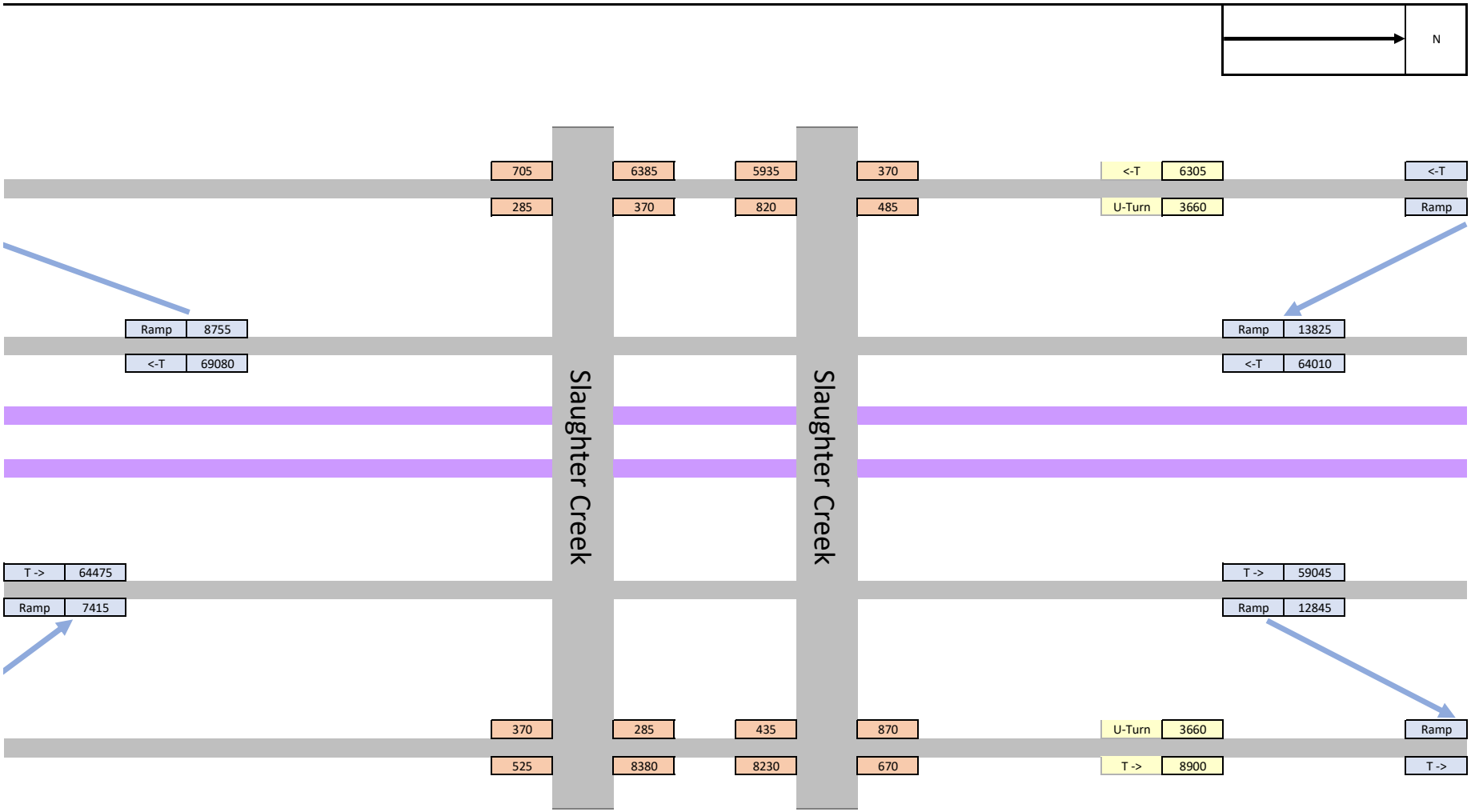

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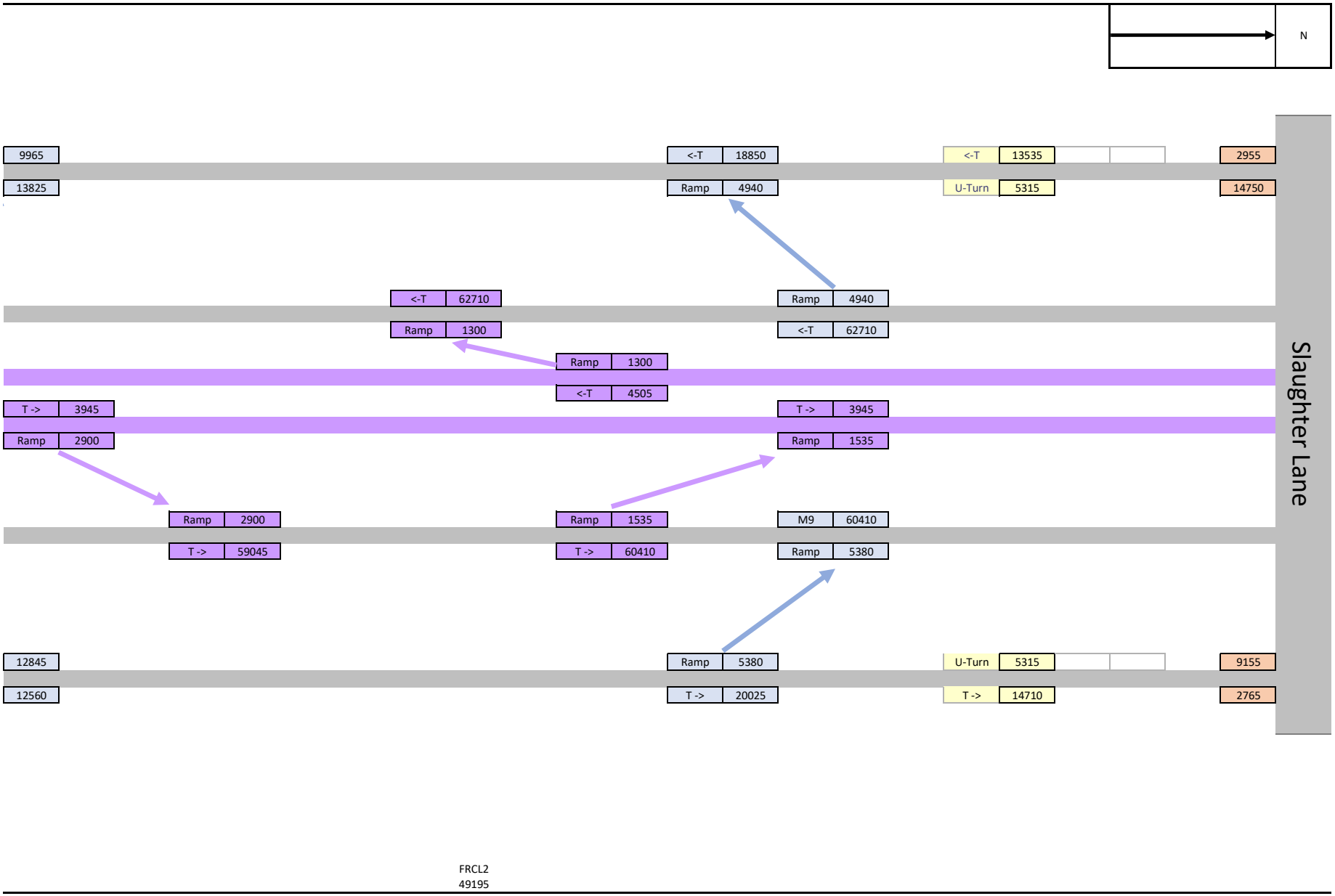

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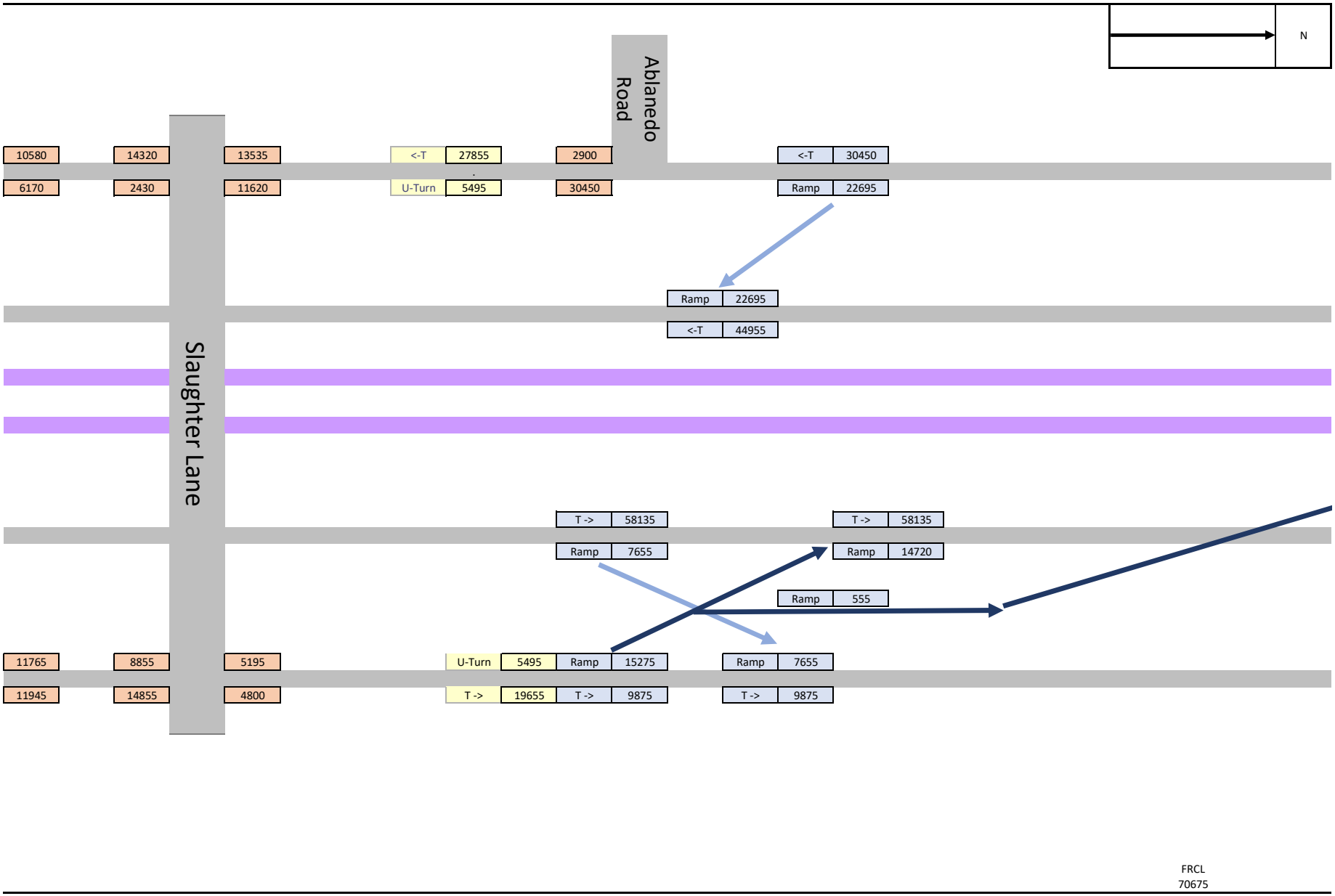

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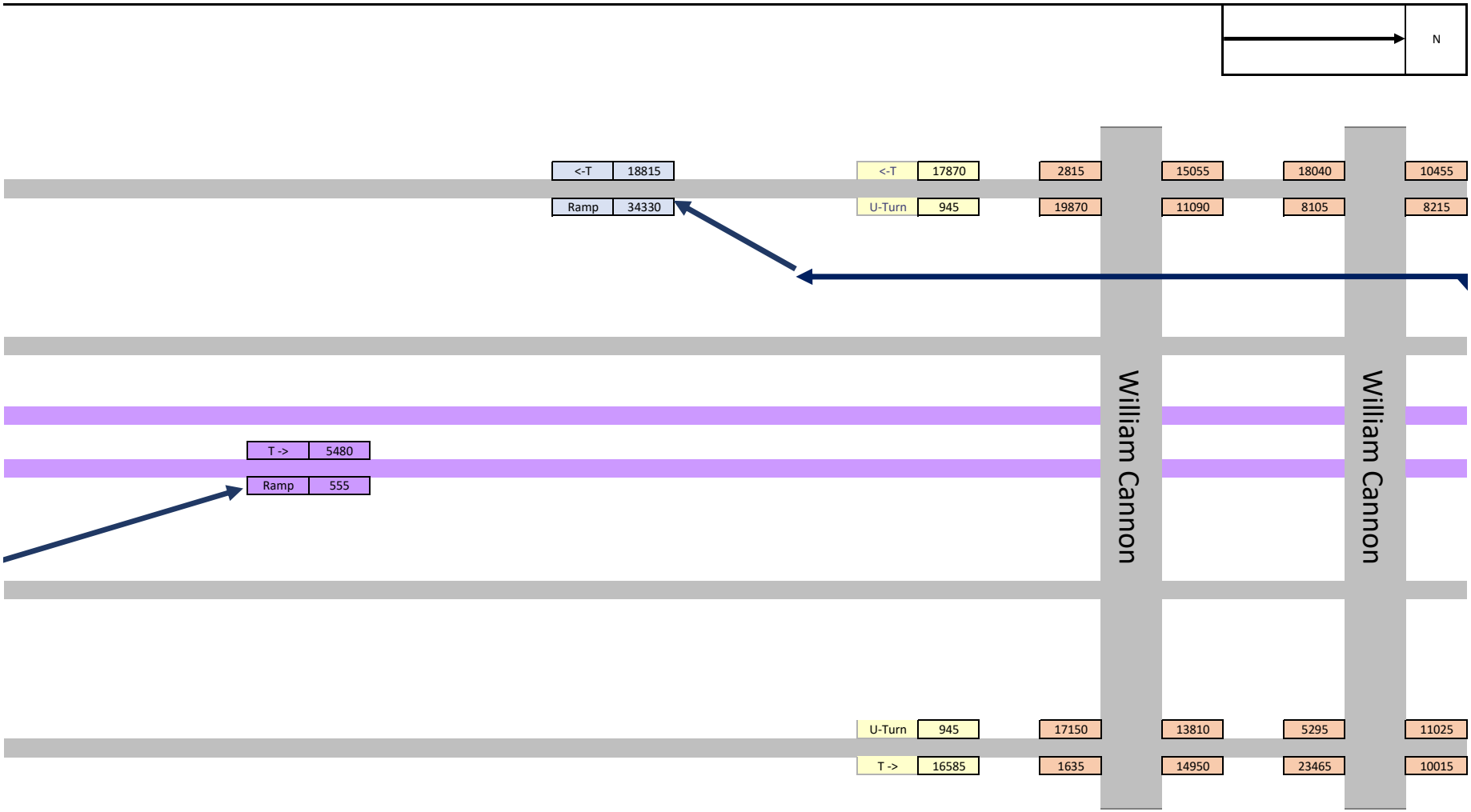

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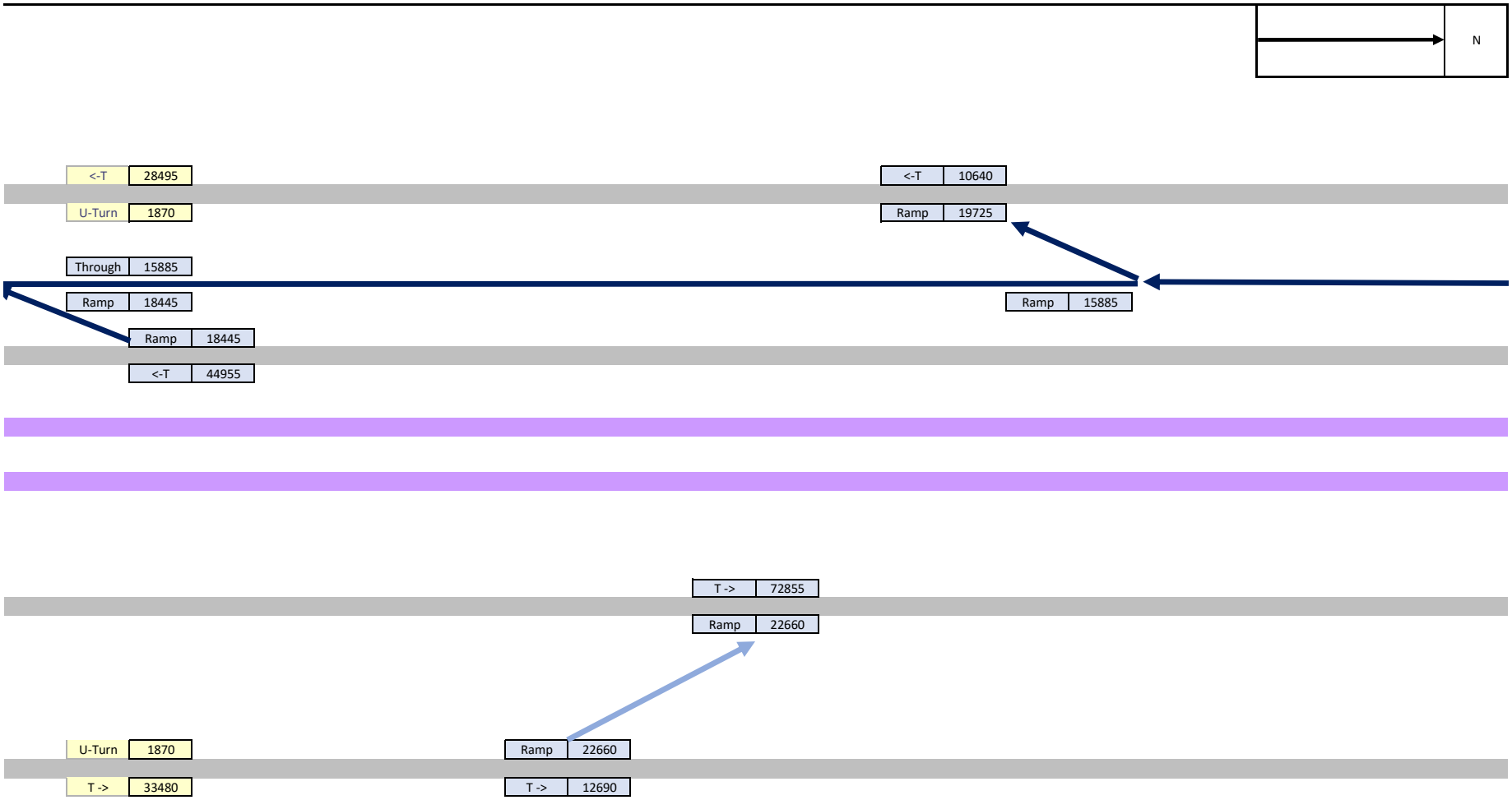

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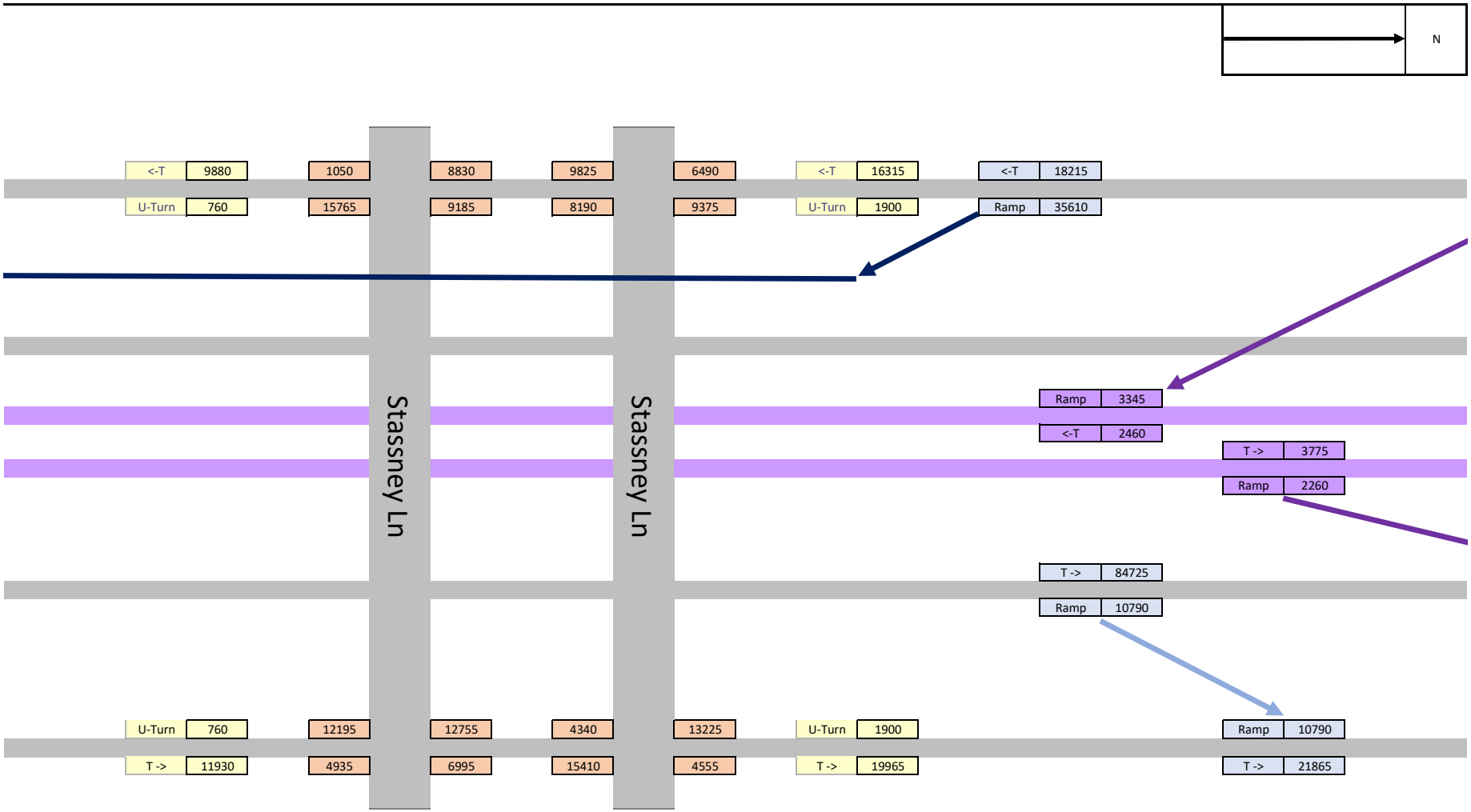

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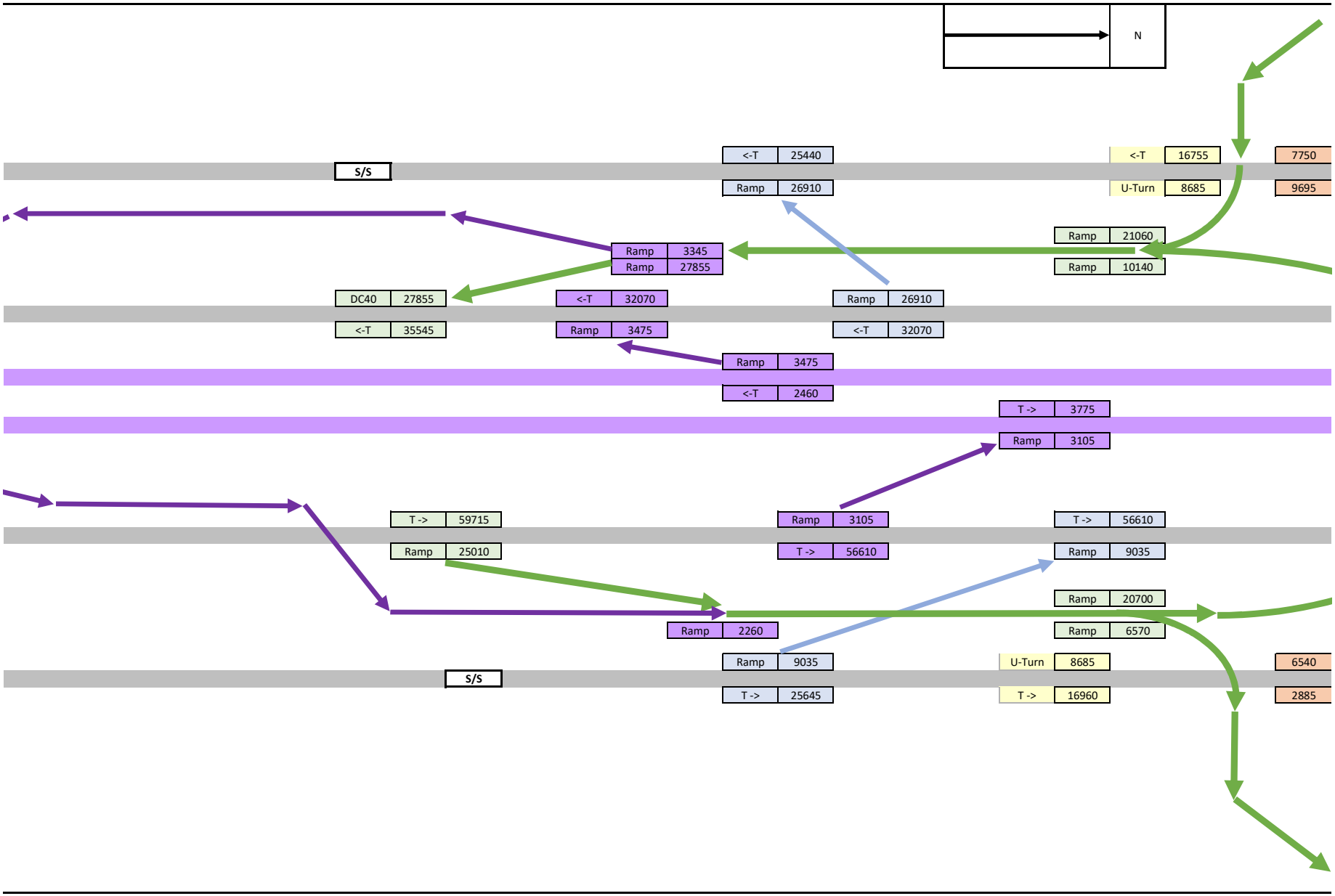

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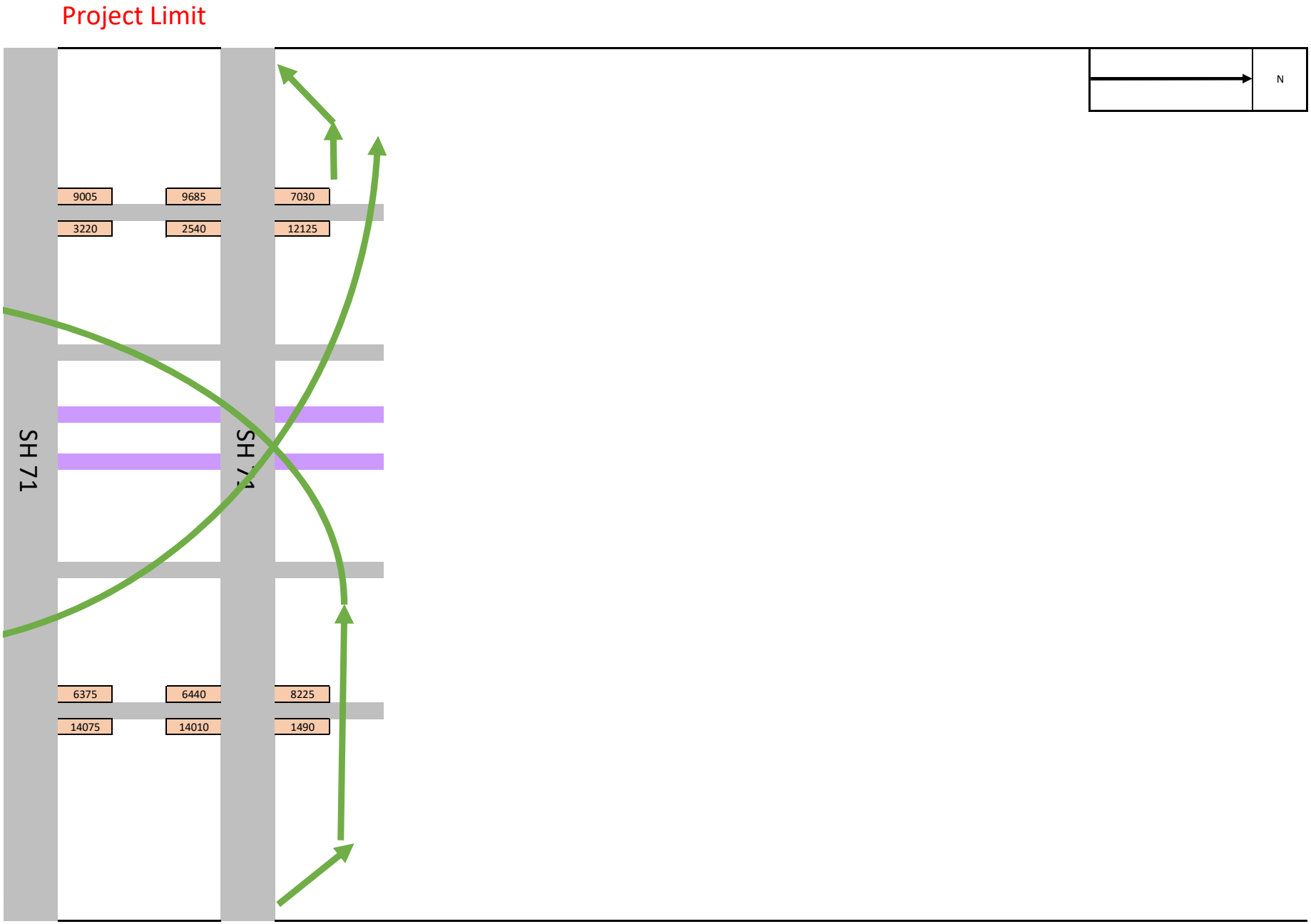

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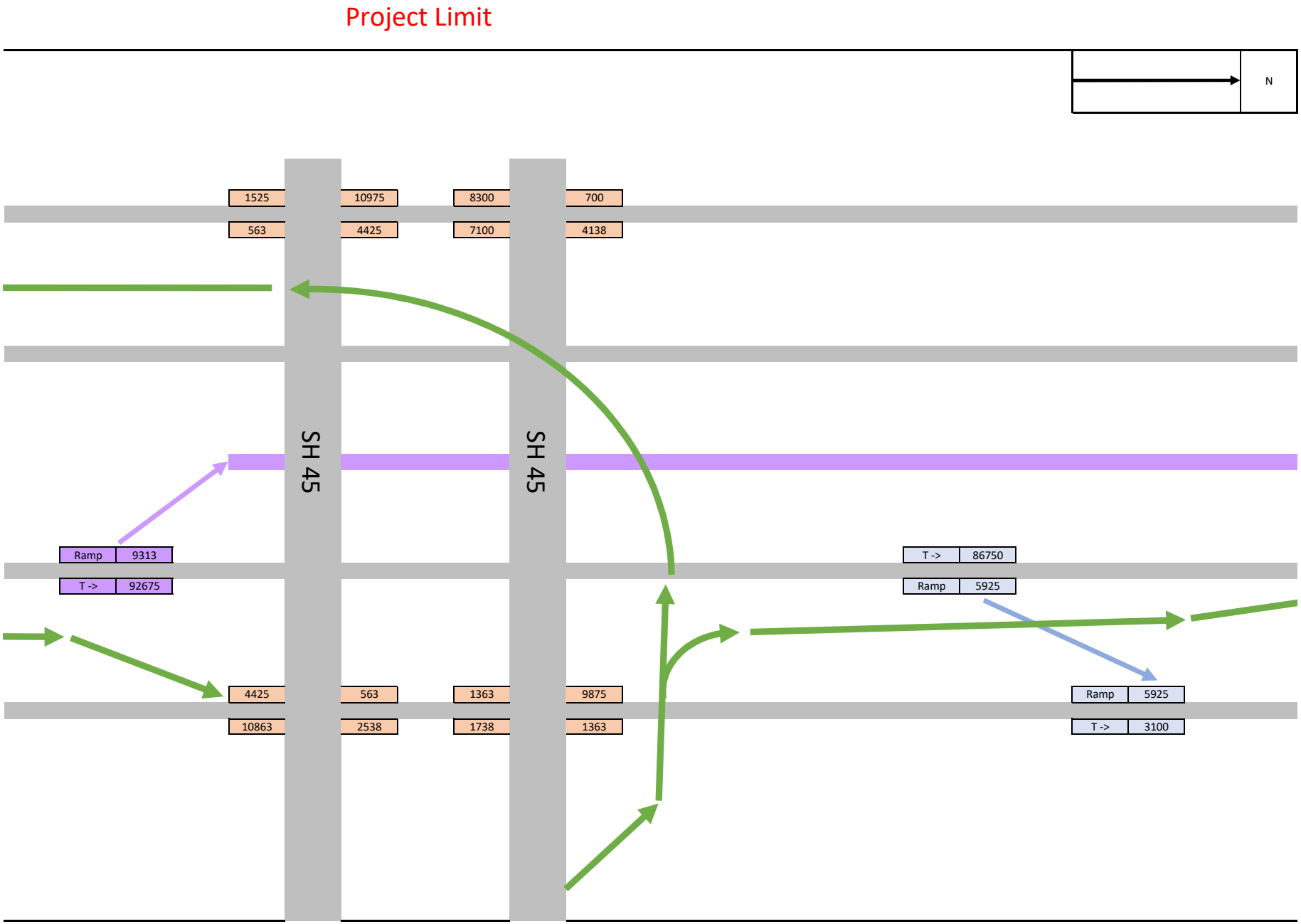

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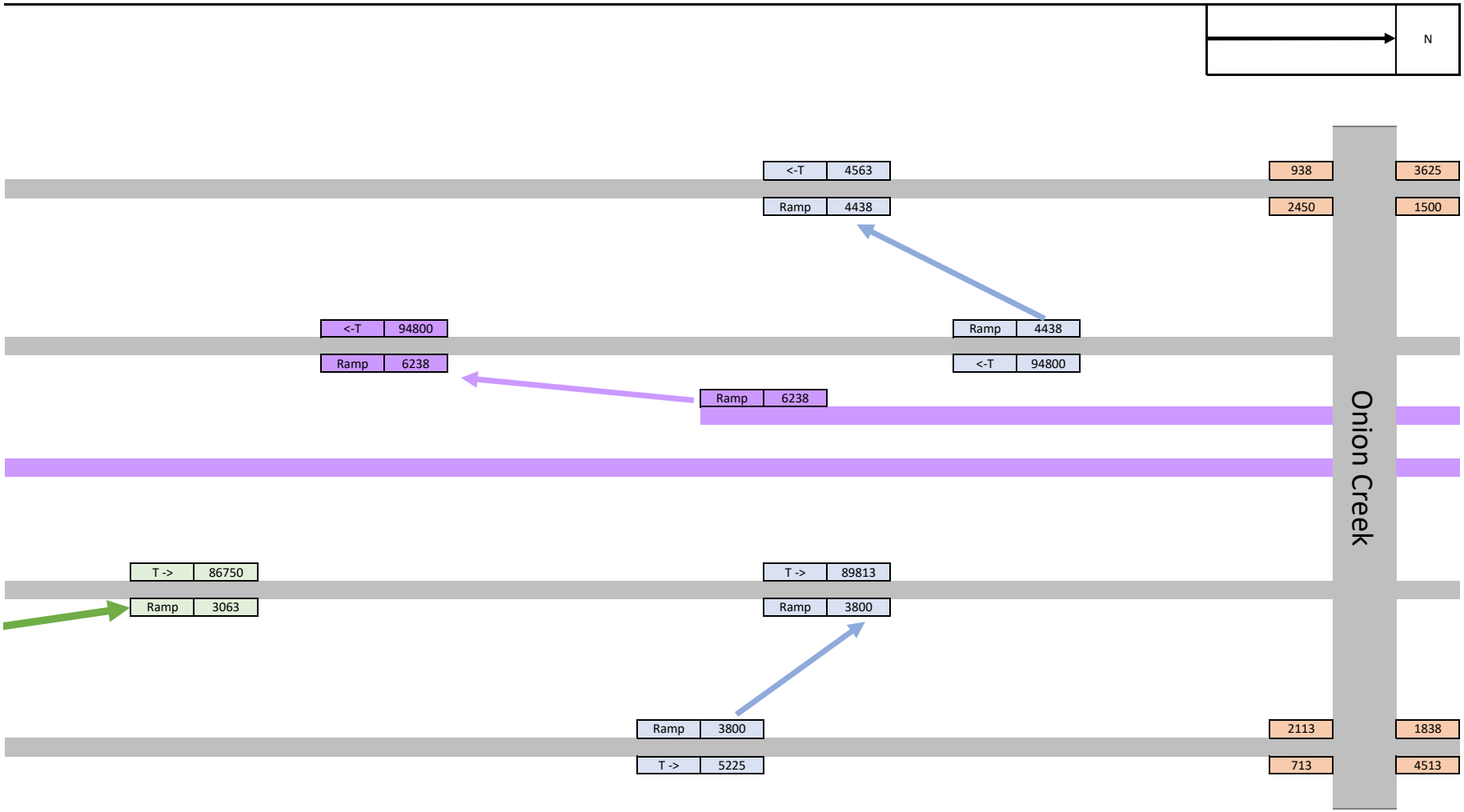

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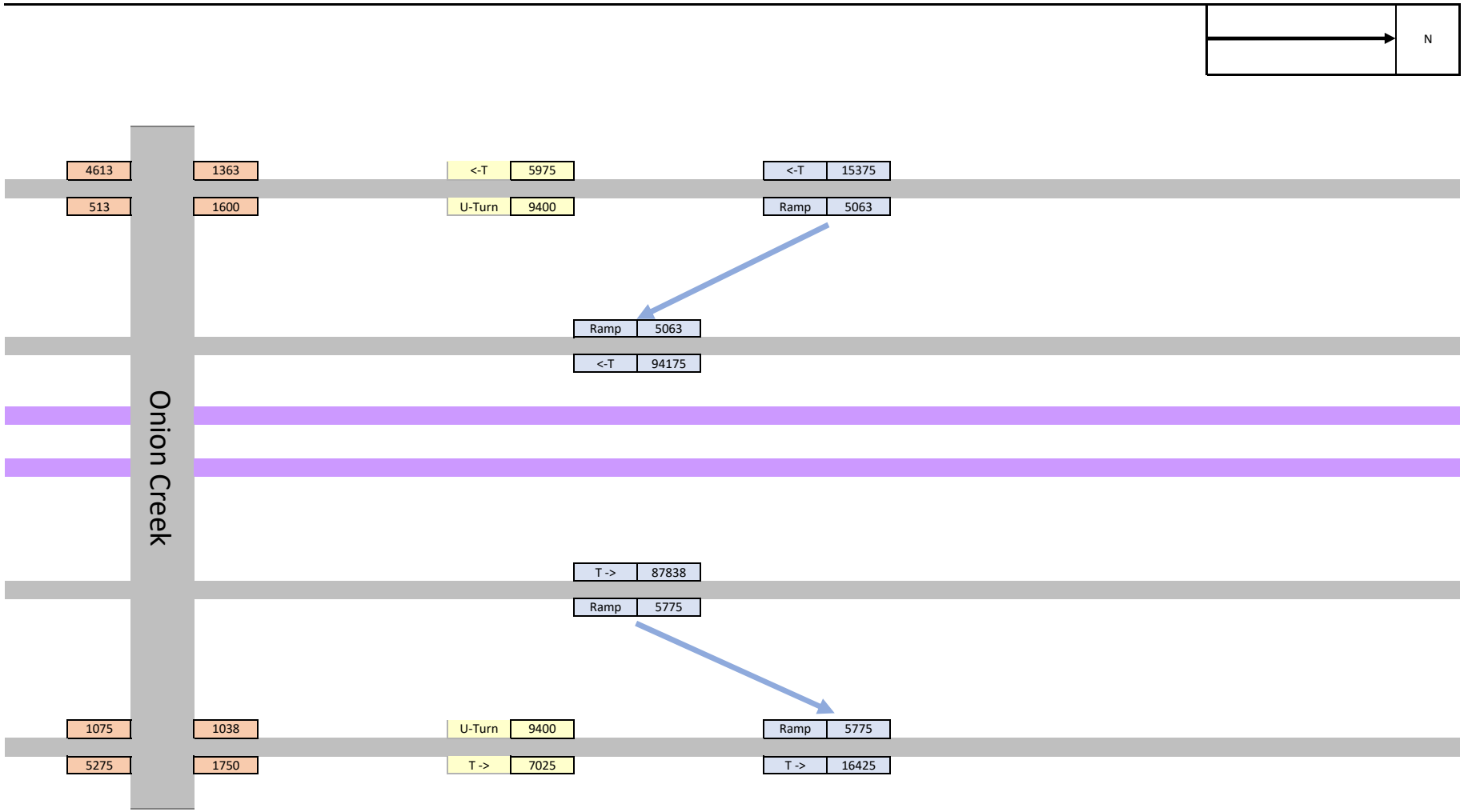
2045 Average Daily Traffic



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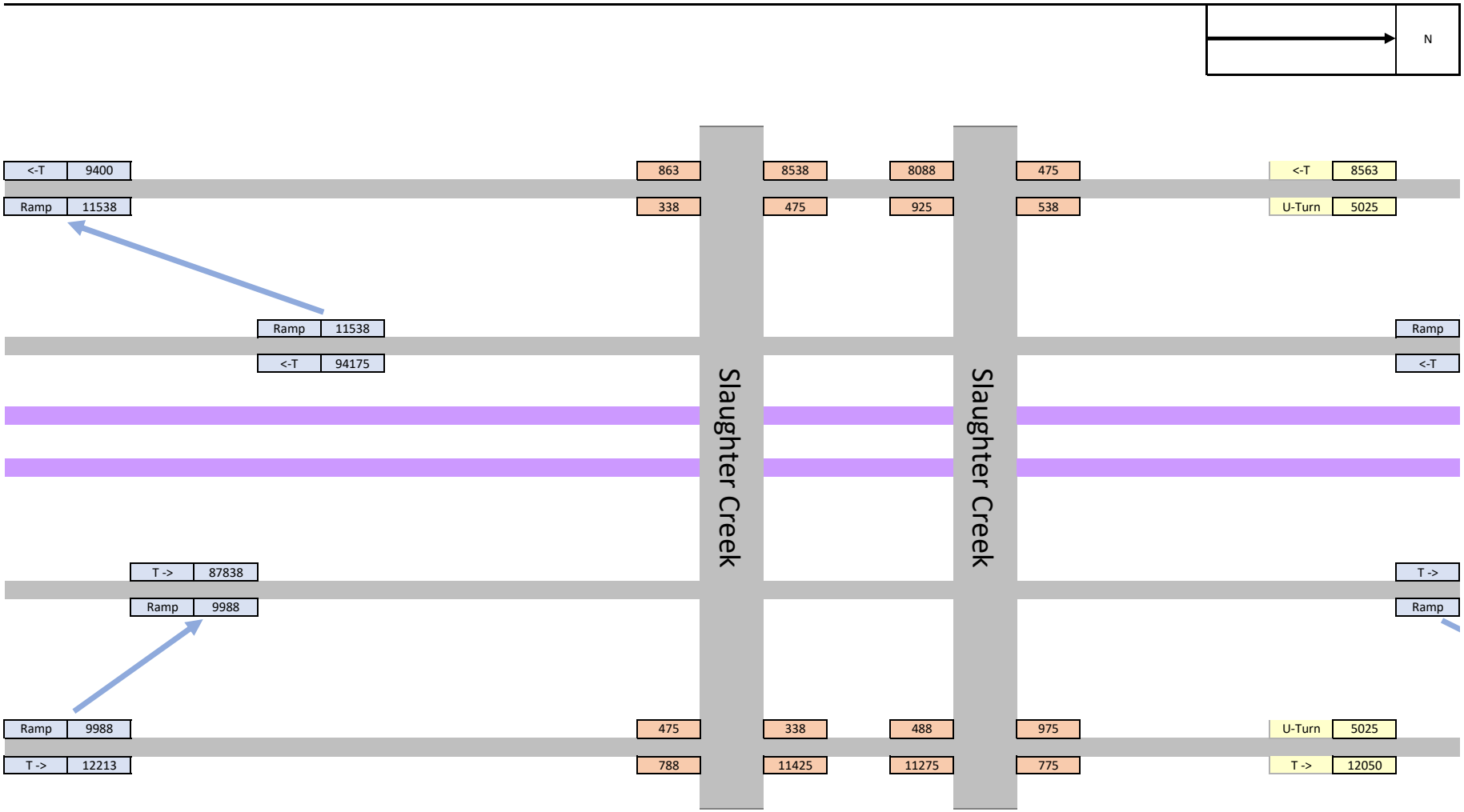

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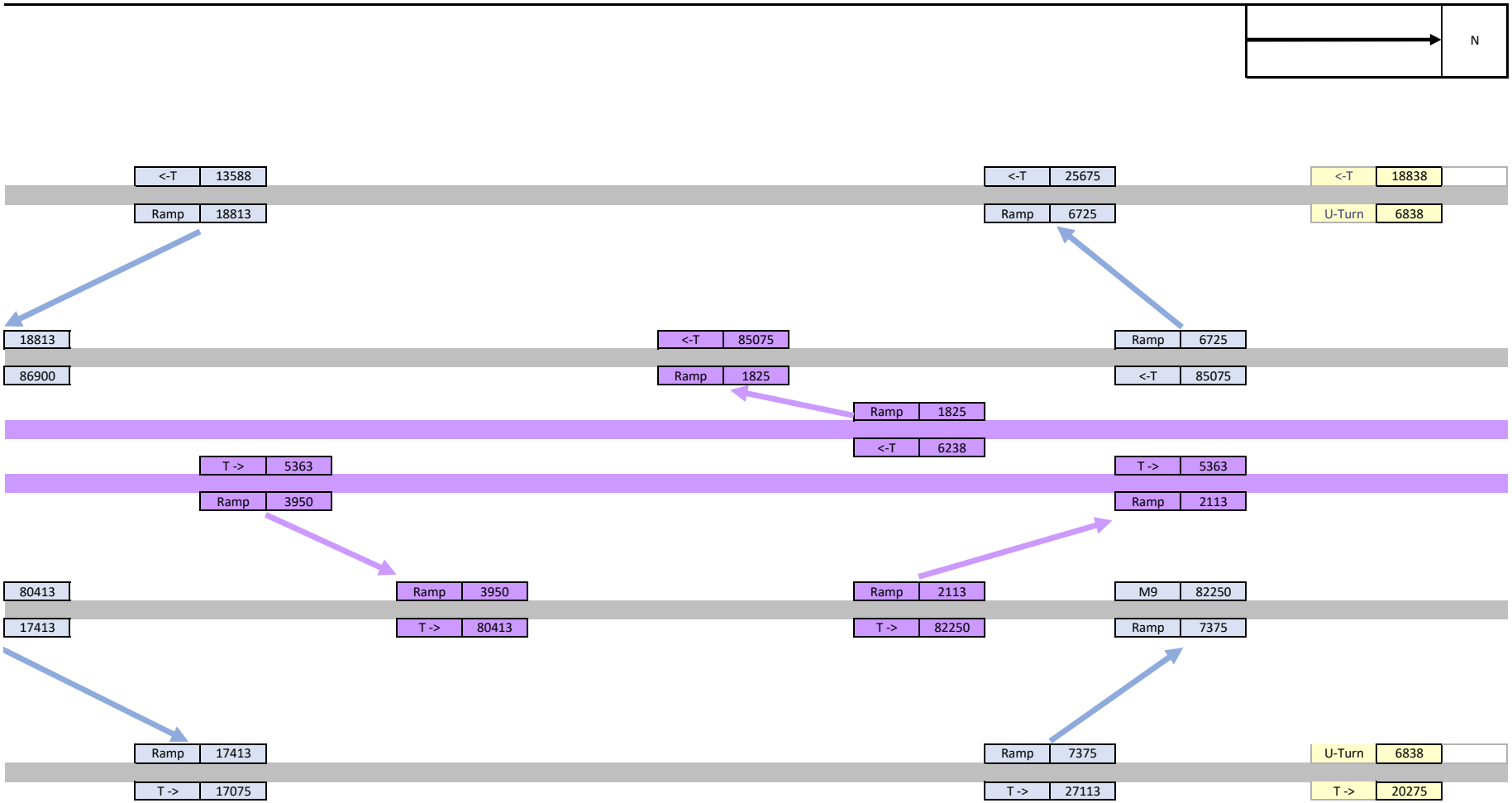

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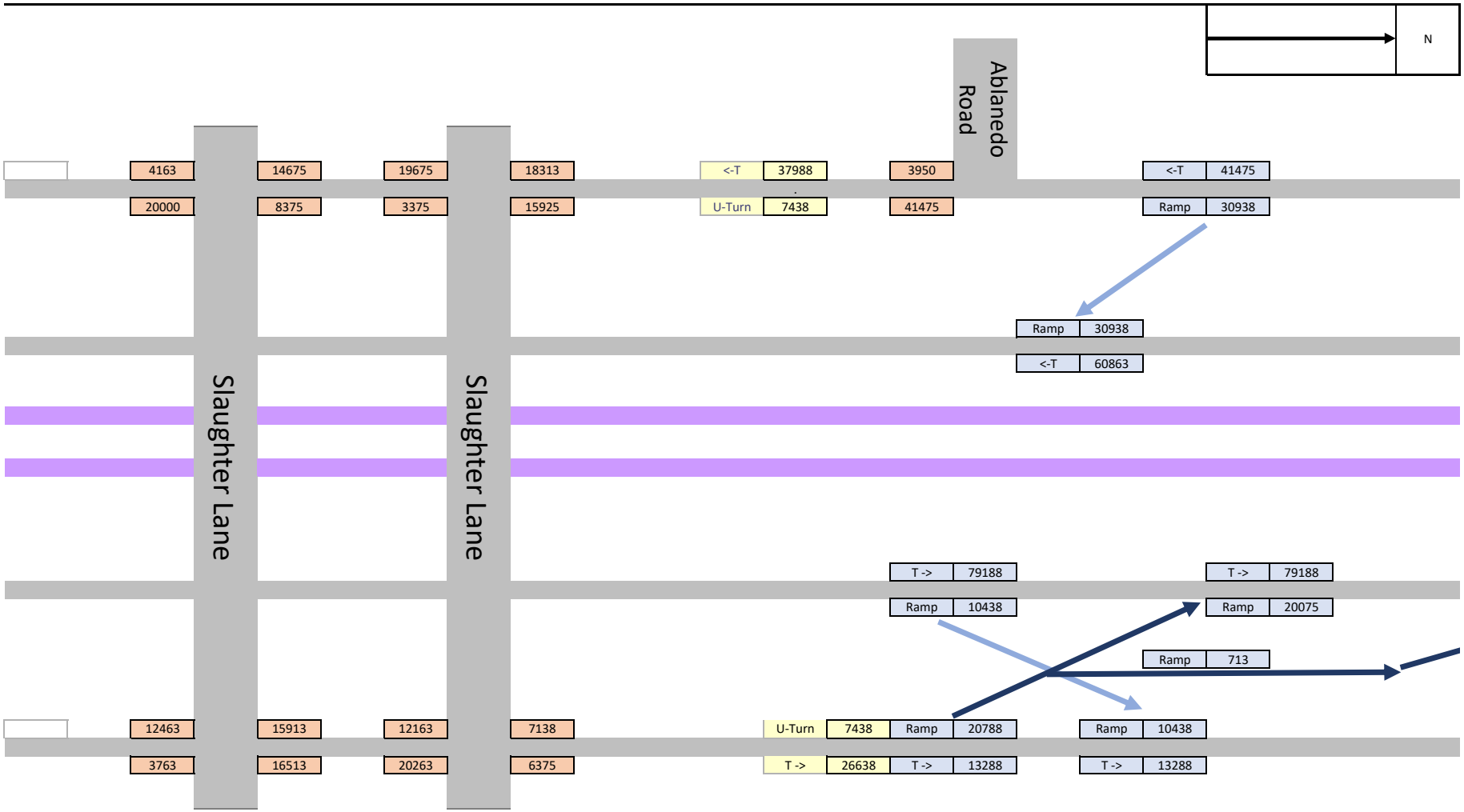
2045 Average Daily Traffic



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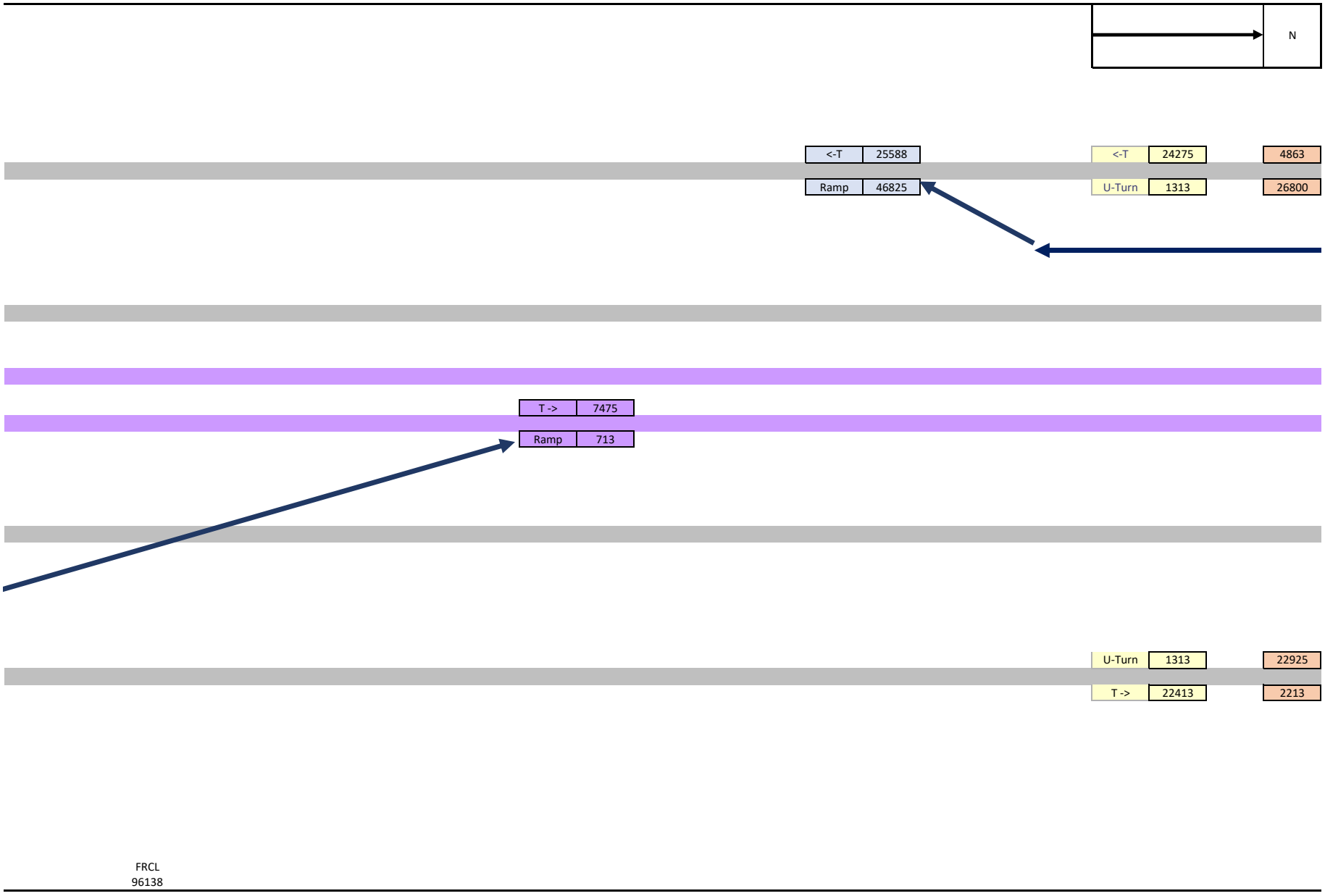

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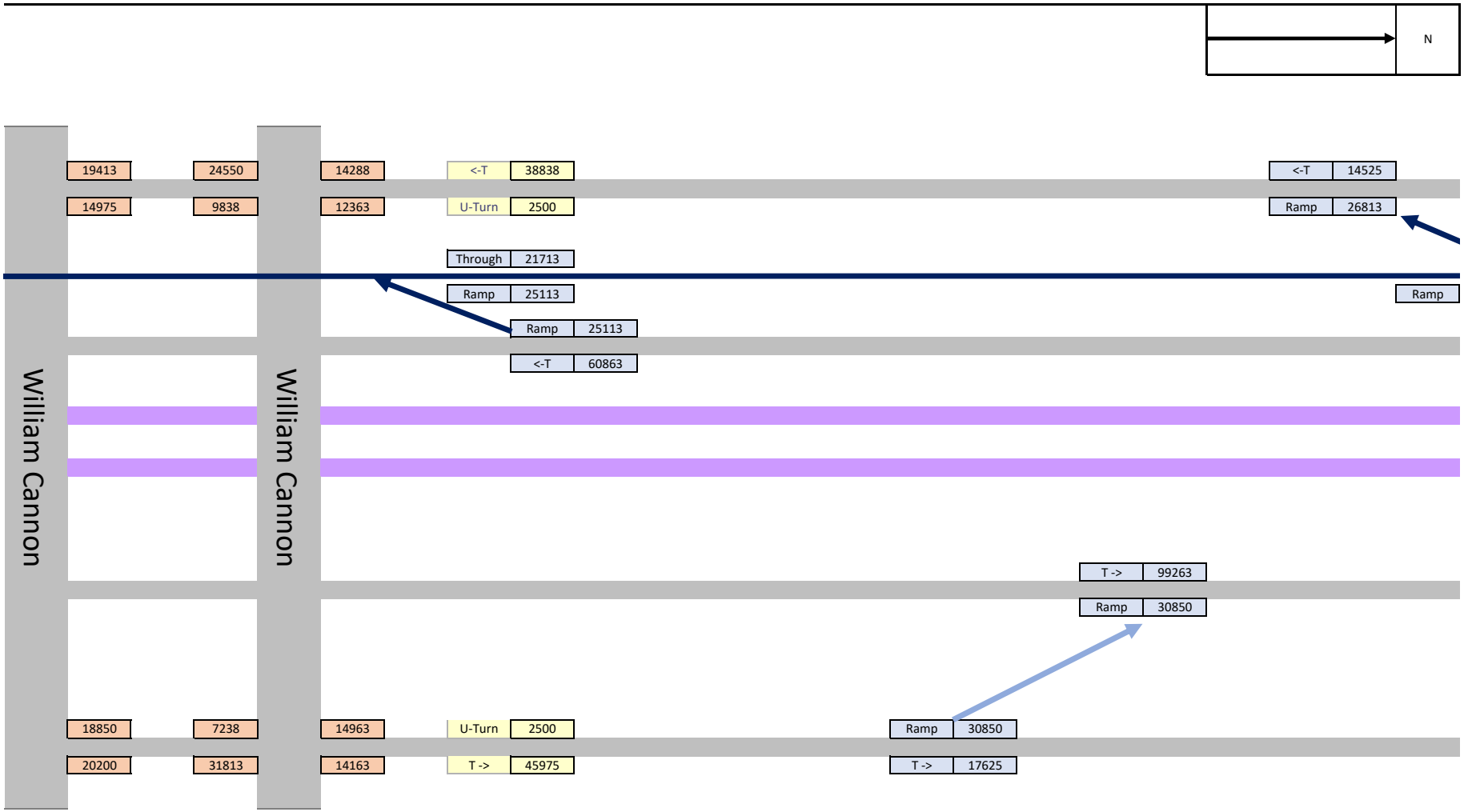

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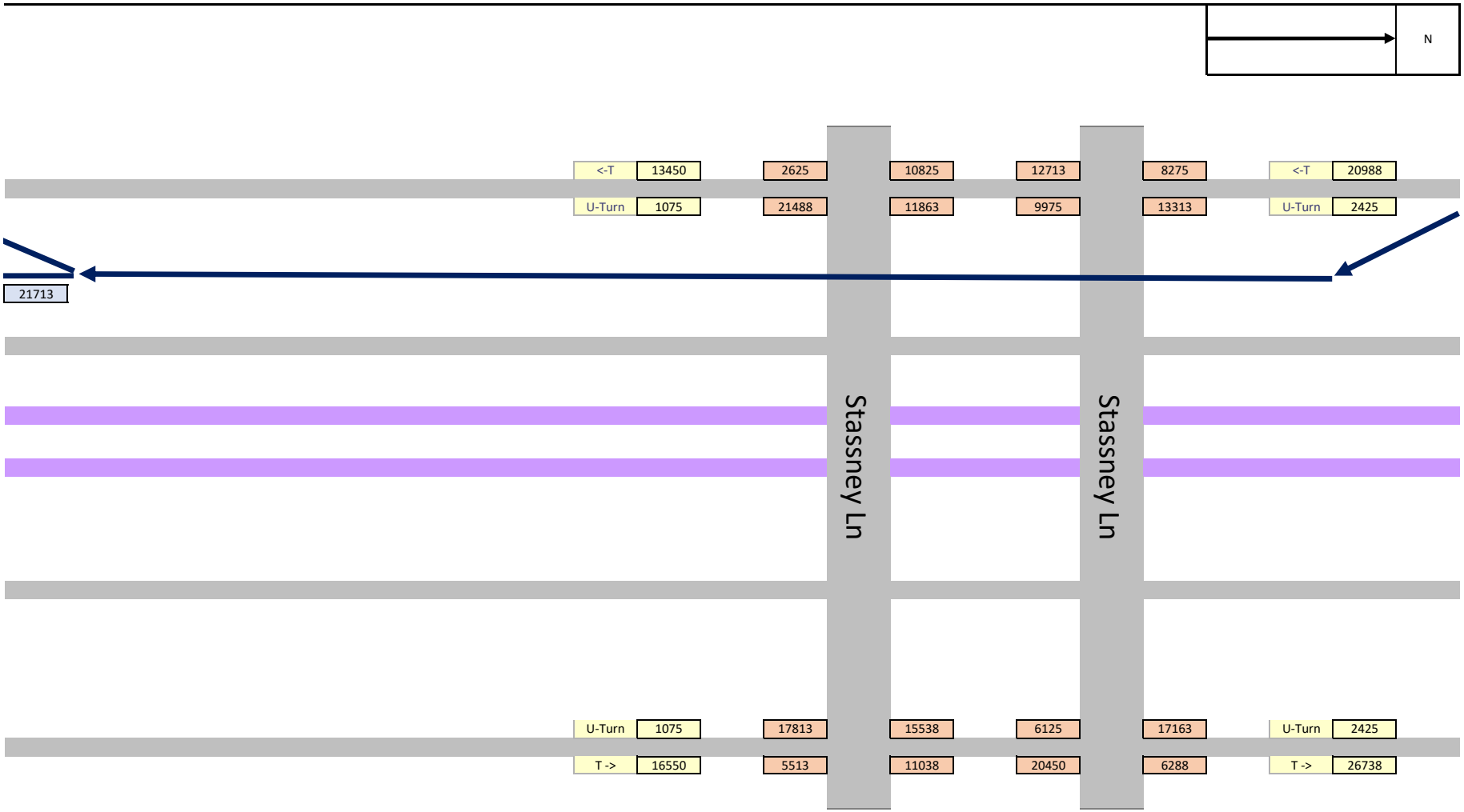

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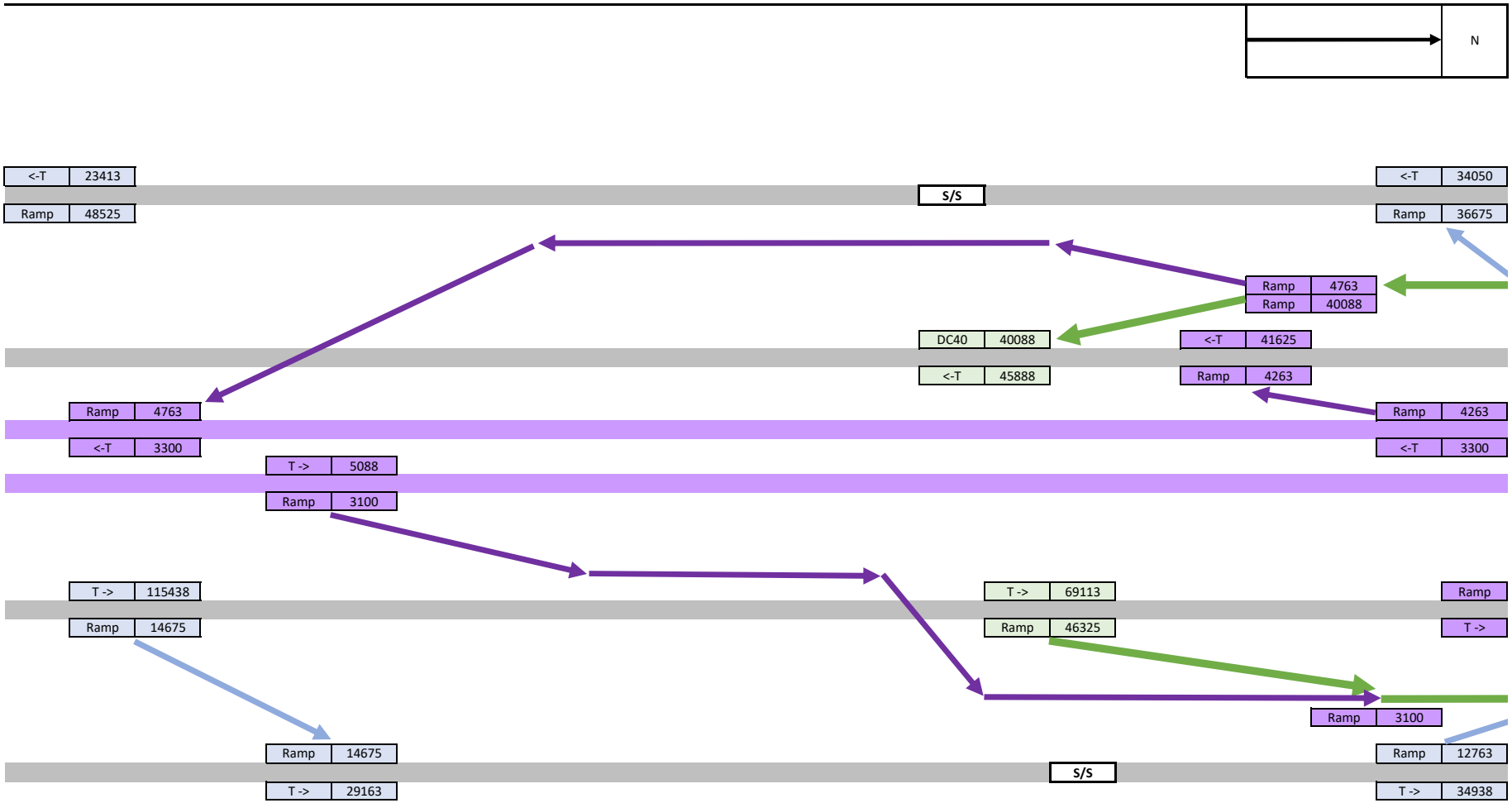

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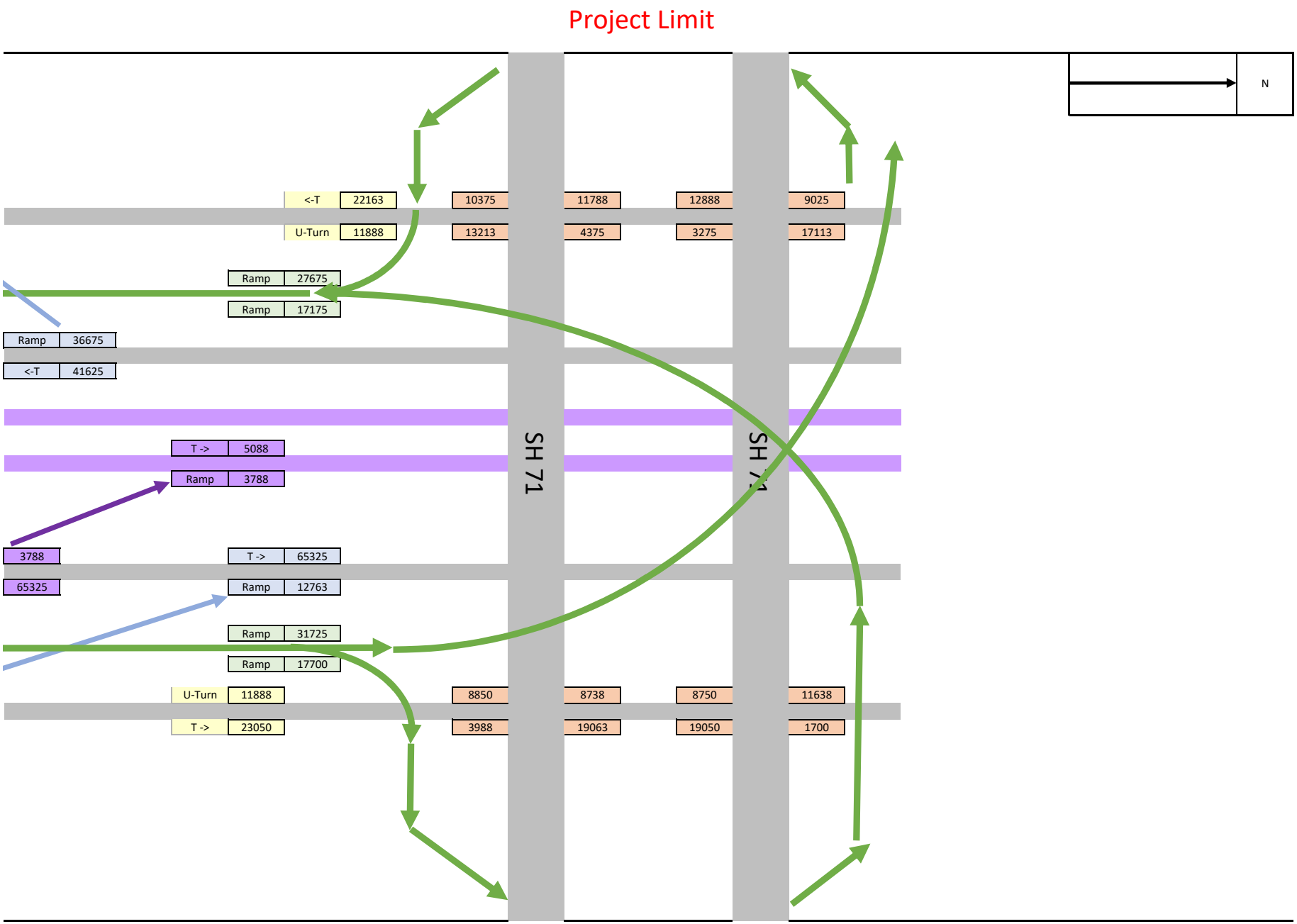
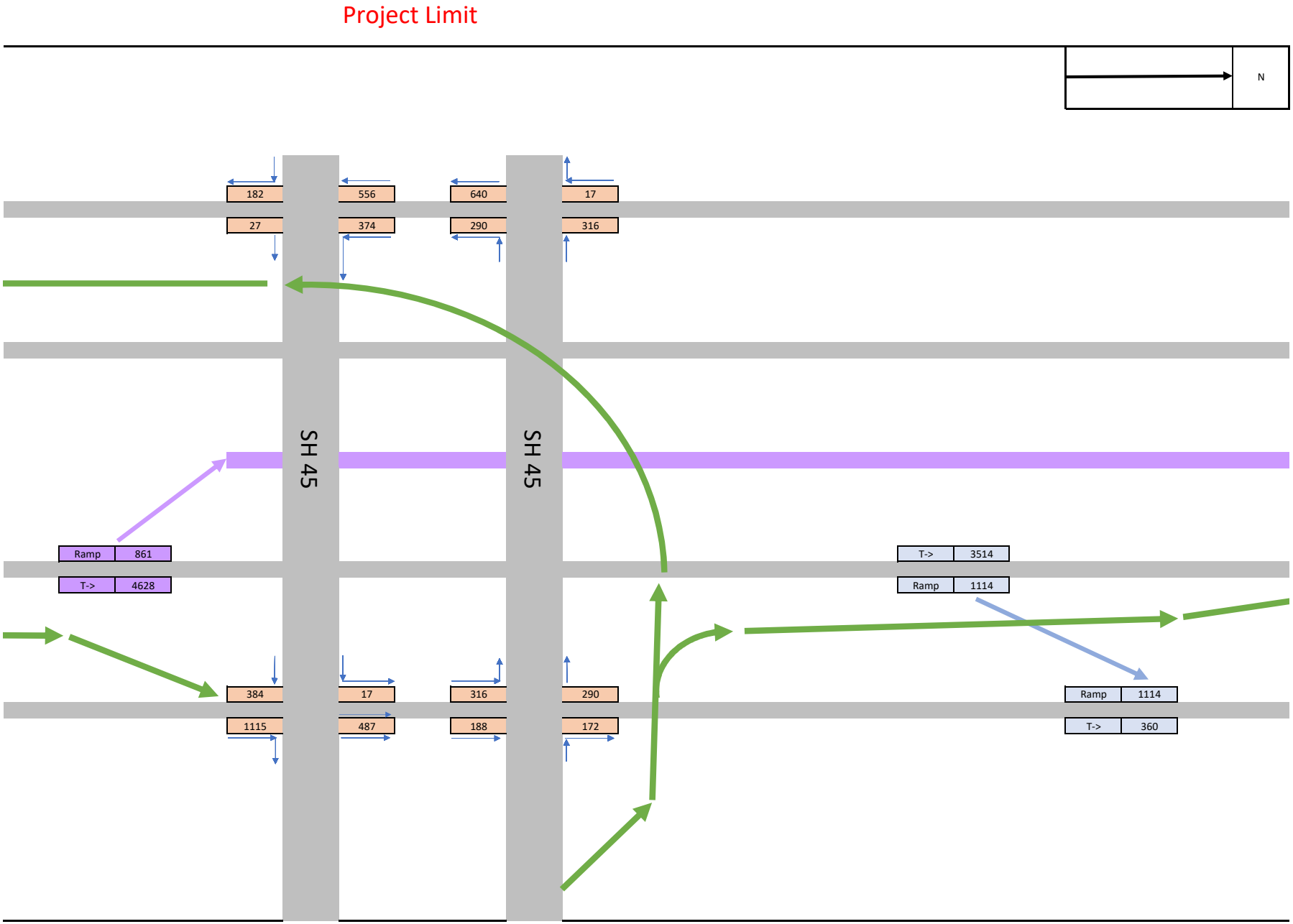


2045 Average Daily Traffic

Appendix C

Design Hour Volume Traffic Data



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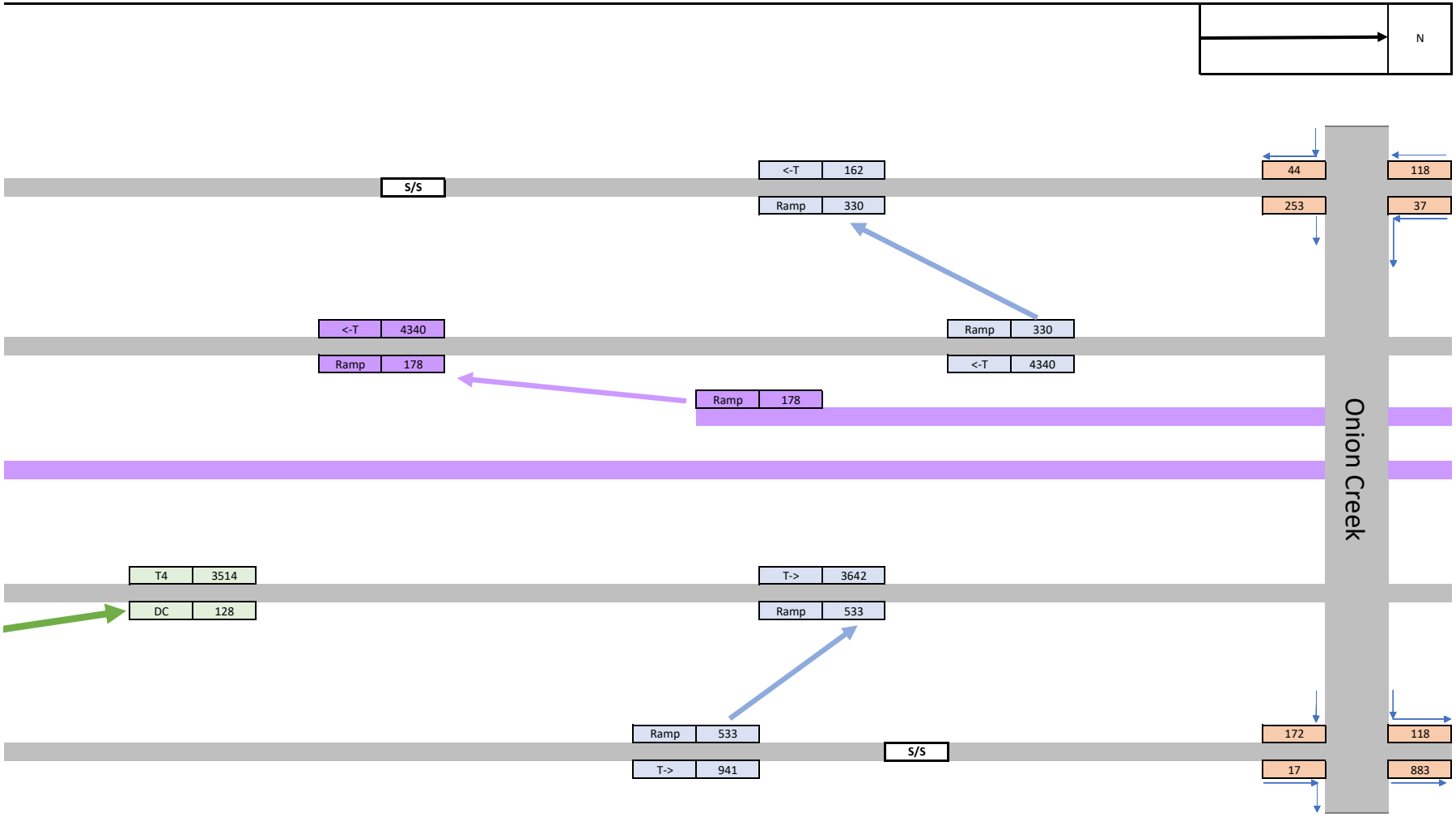

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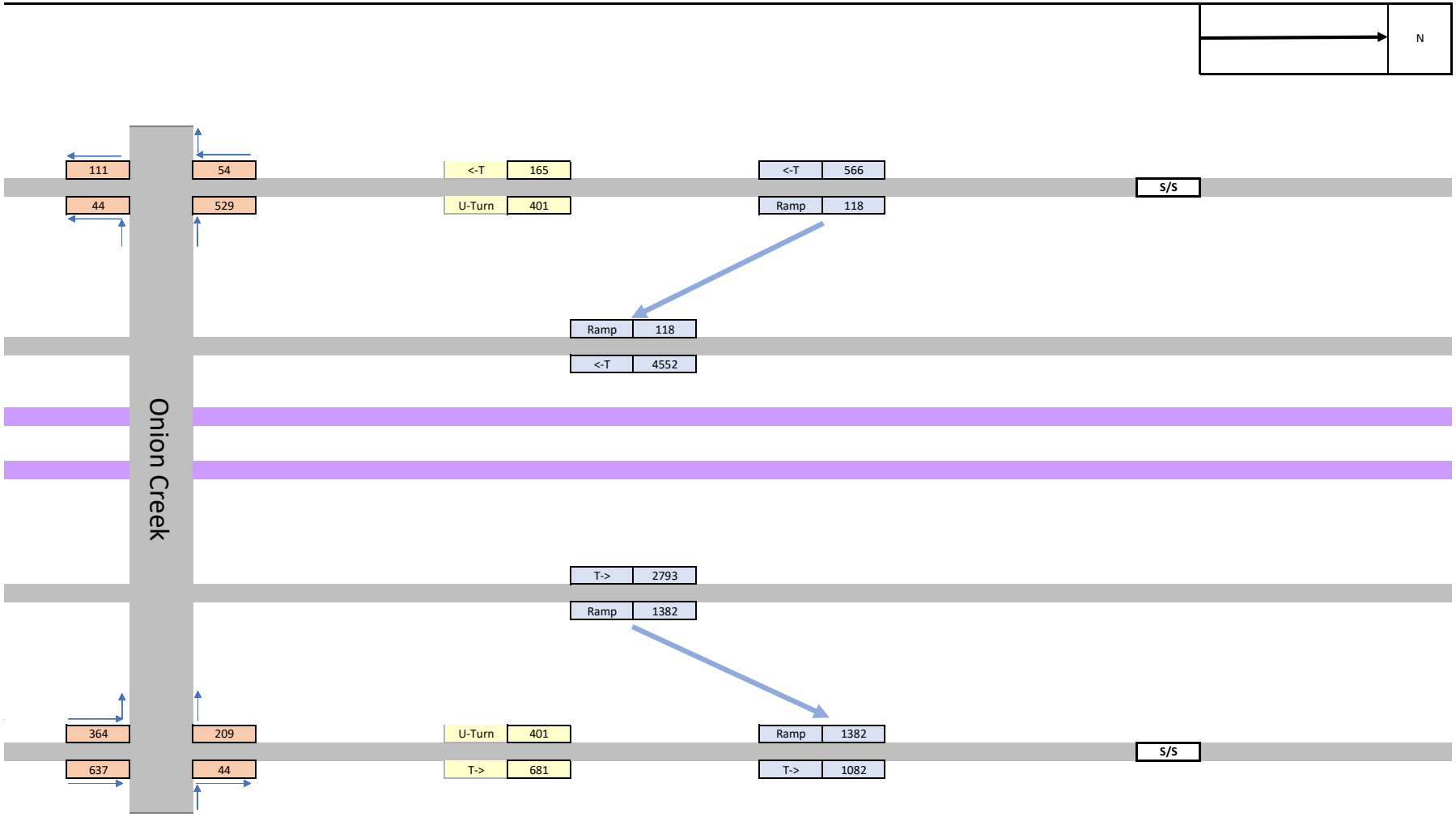

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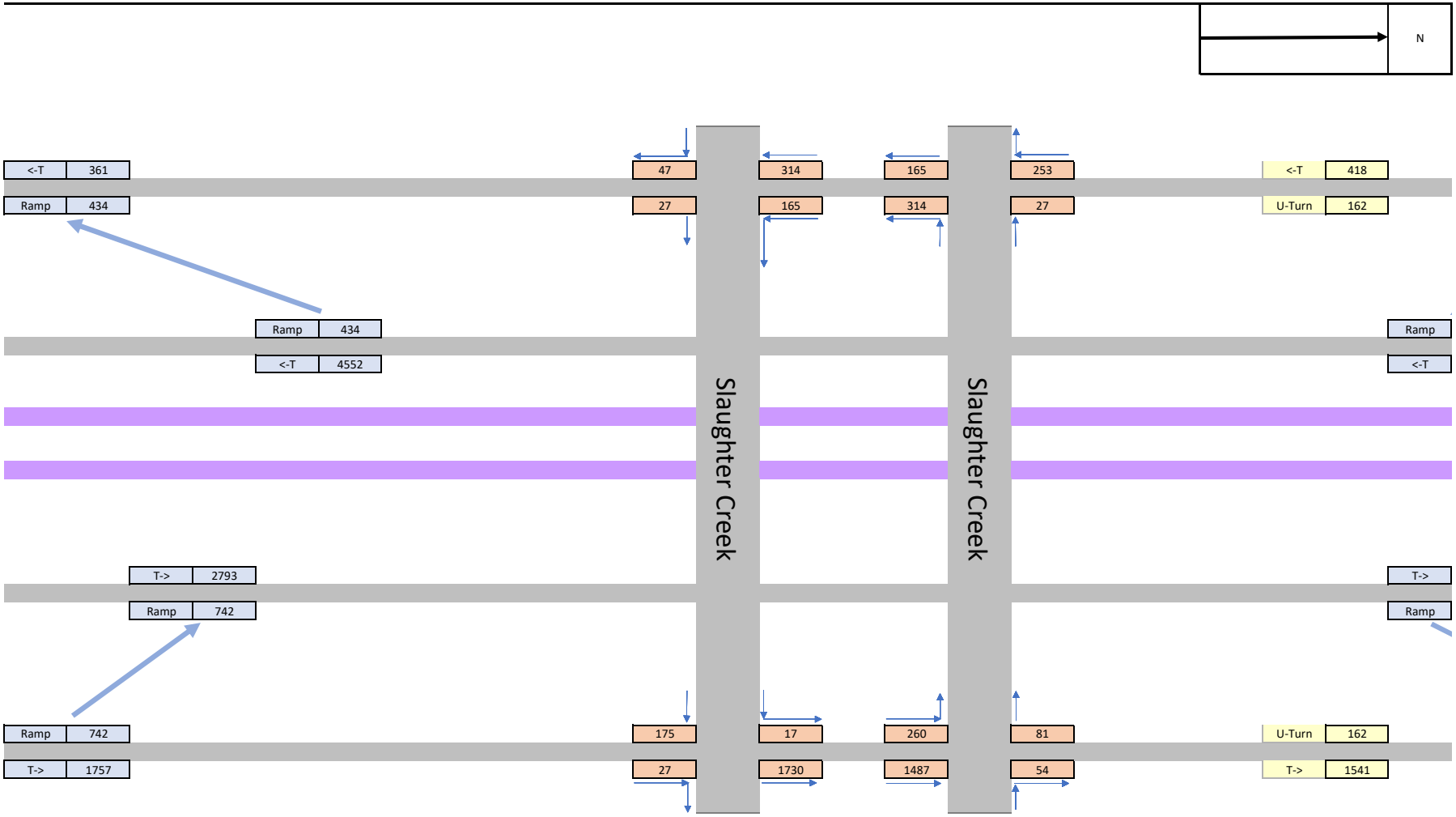

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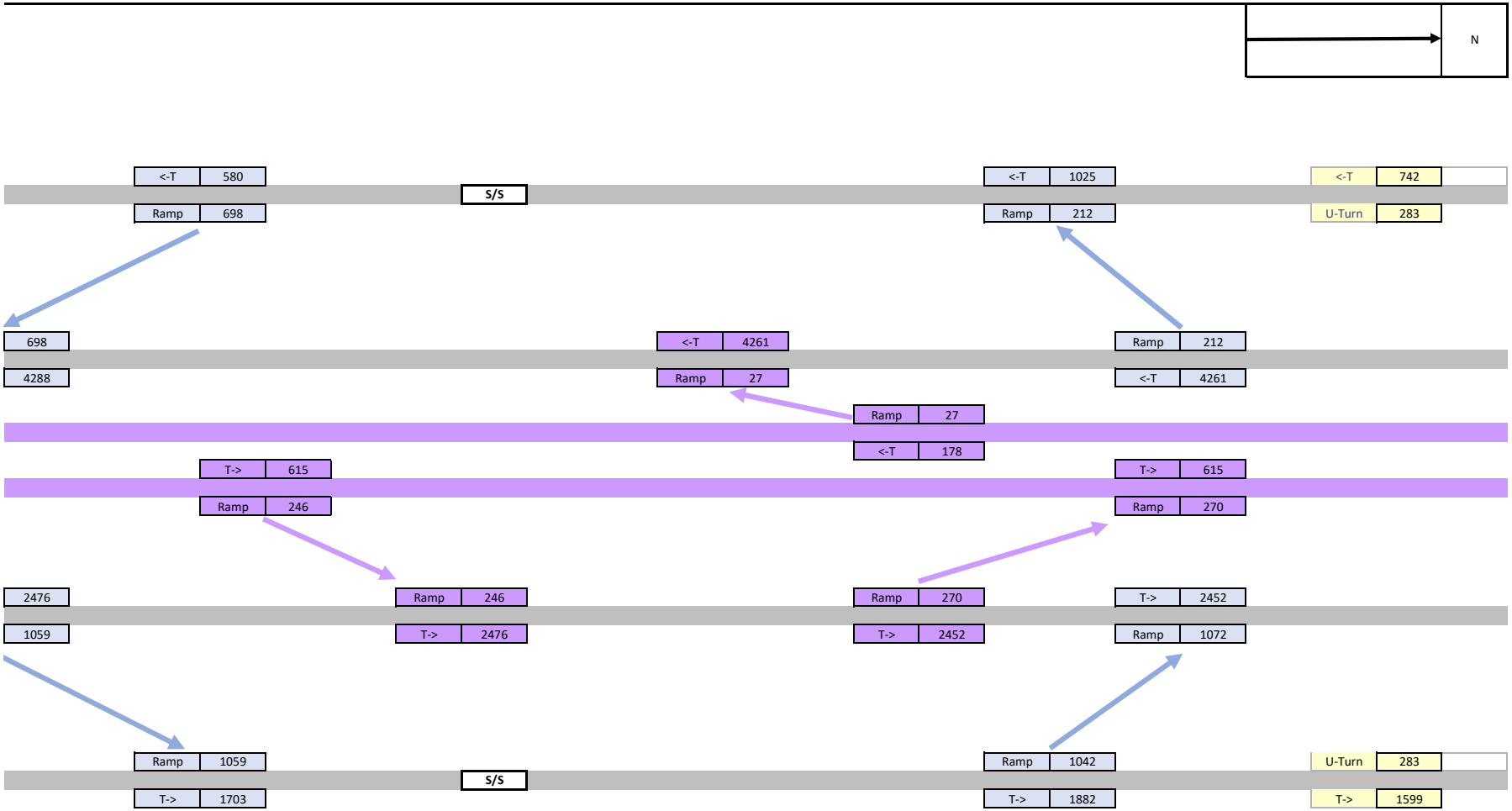

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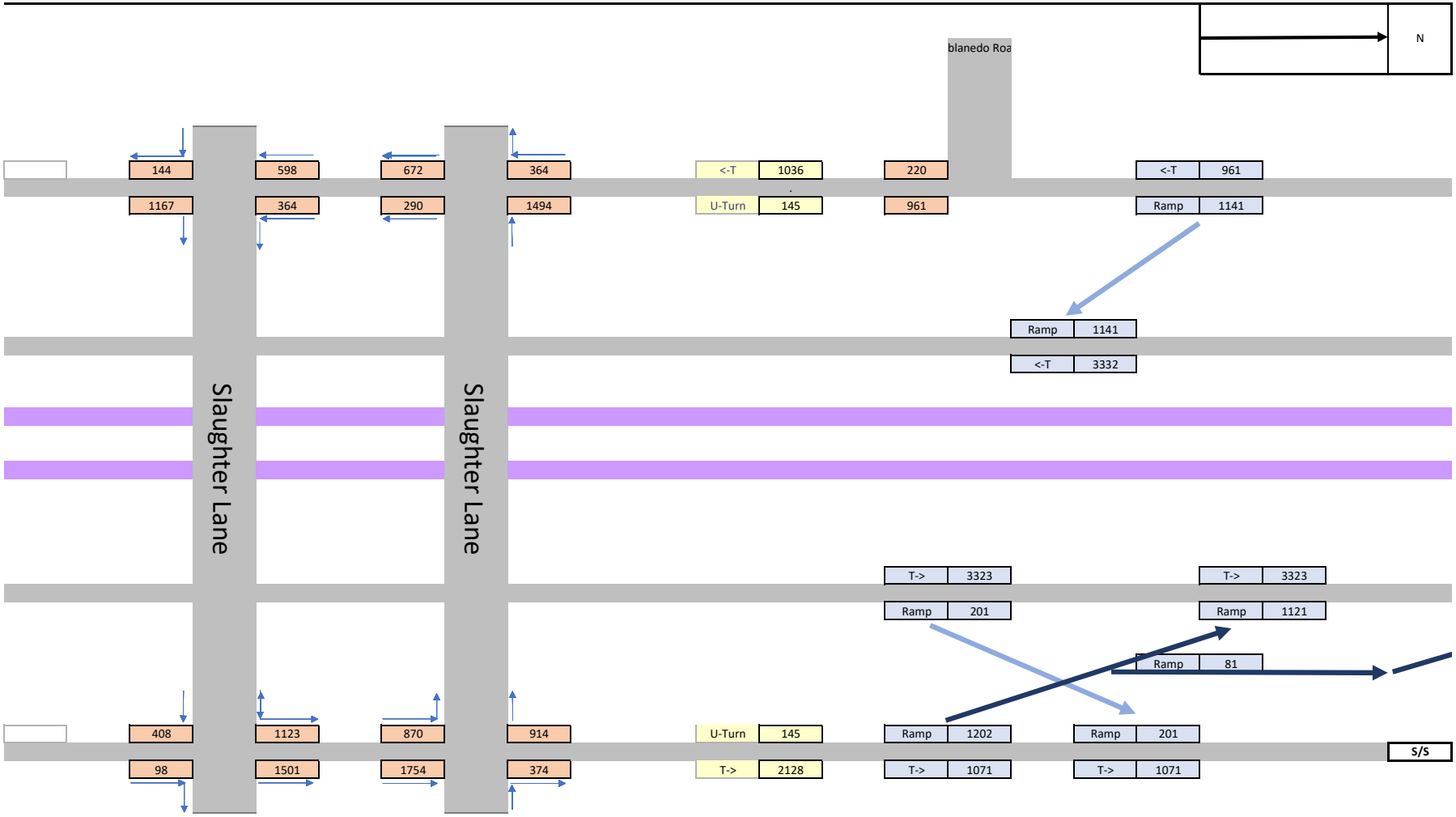

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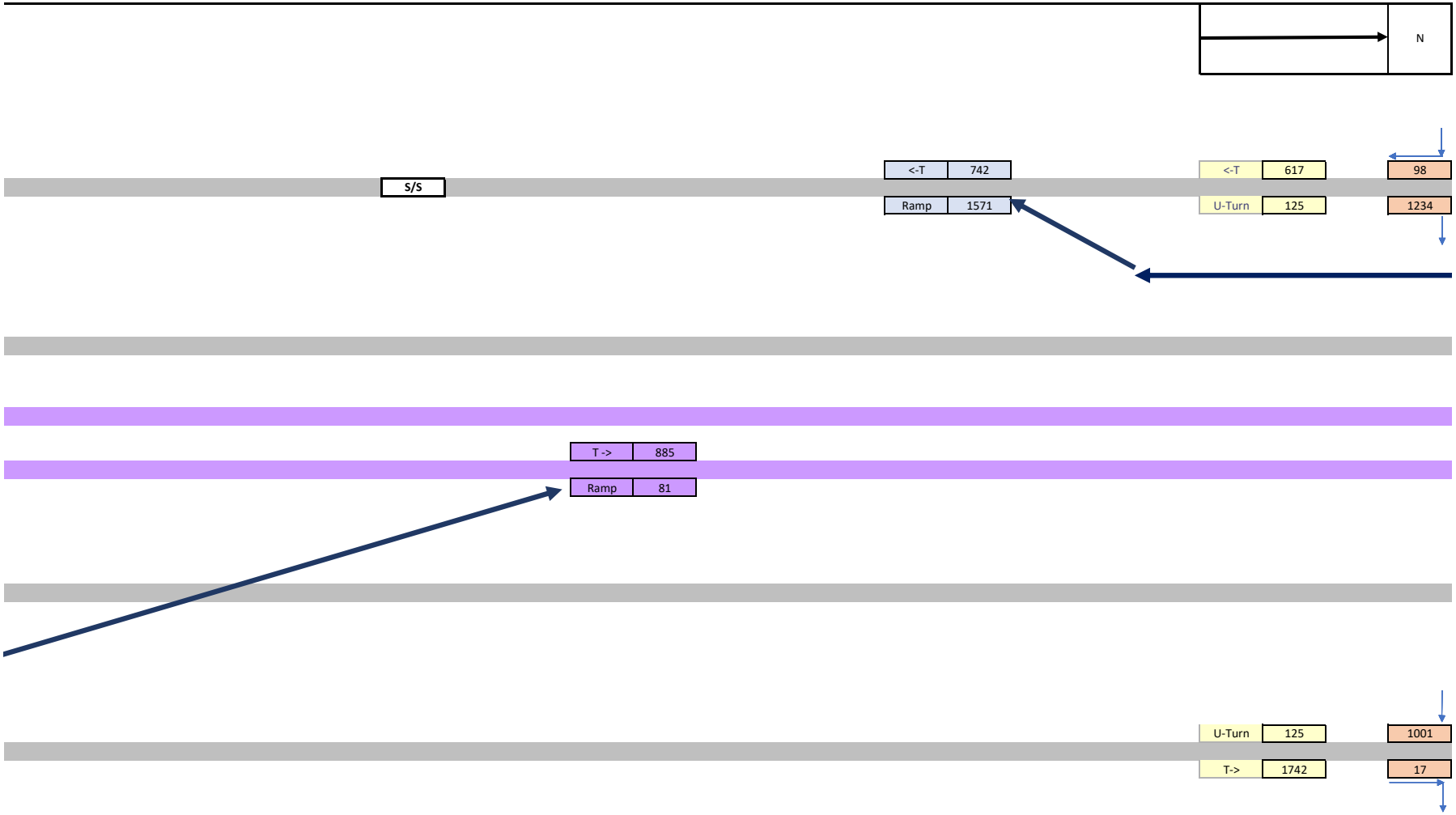

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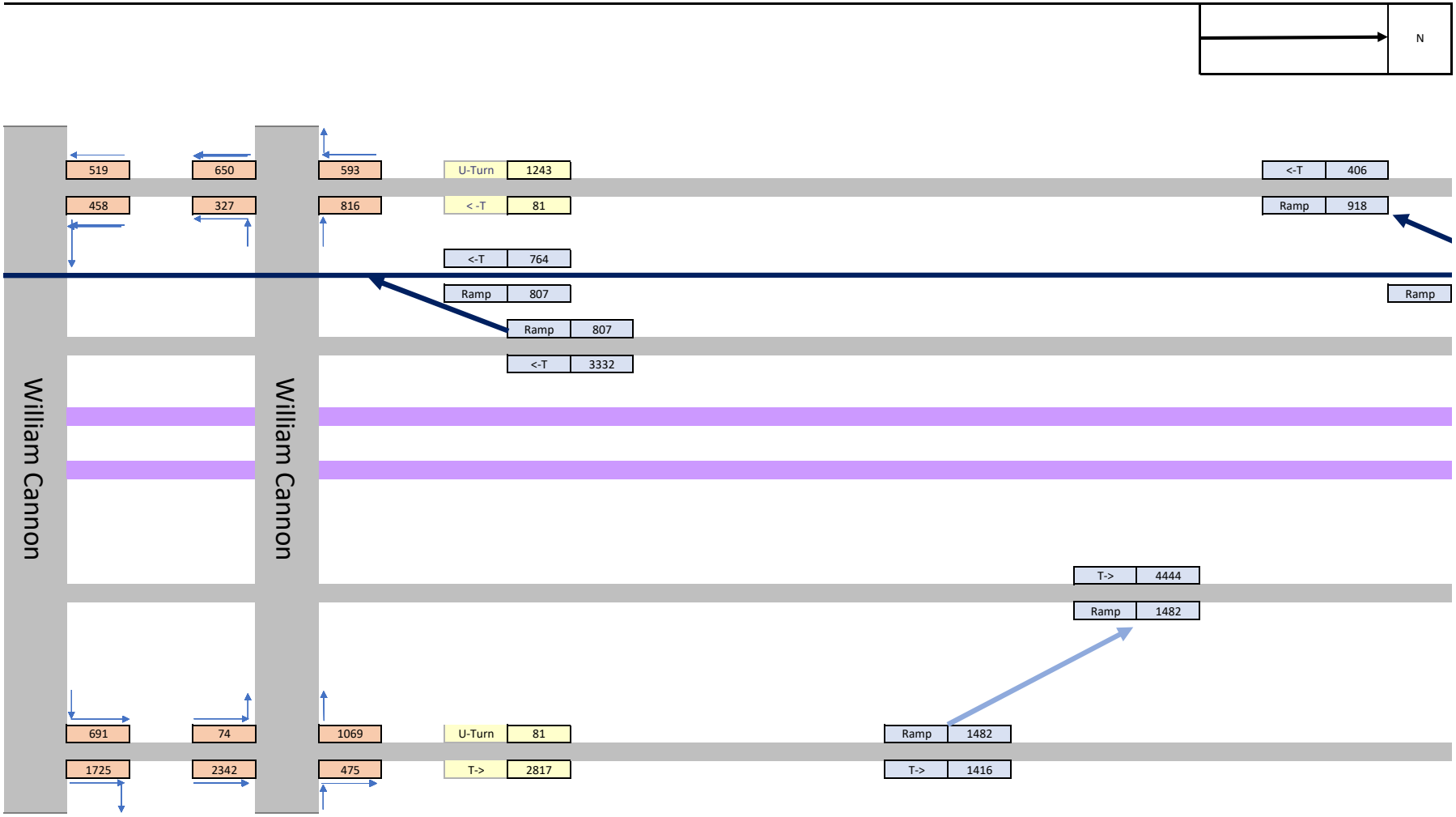
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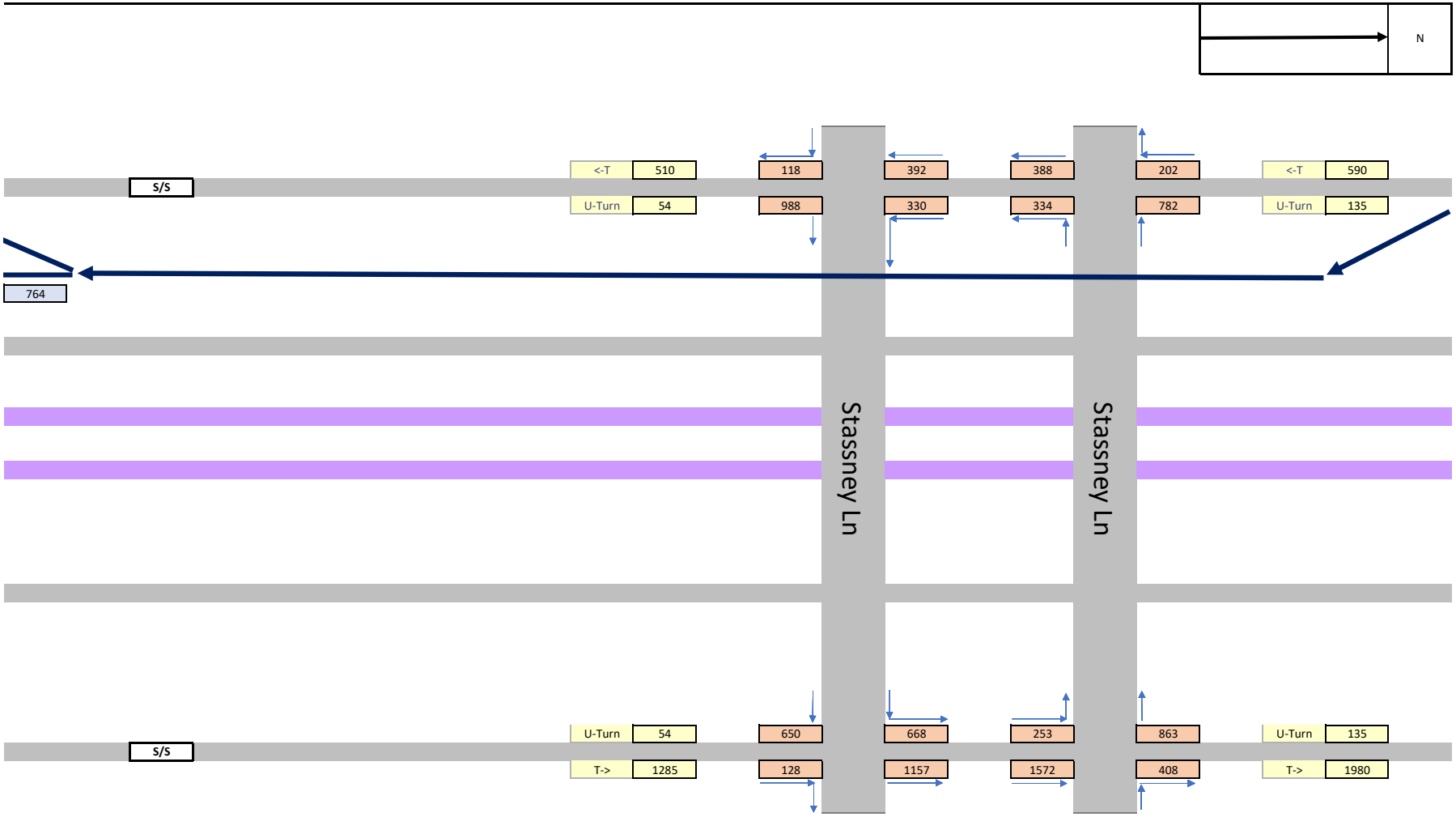

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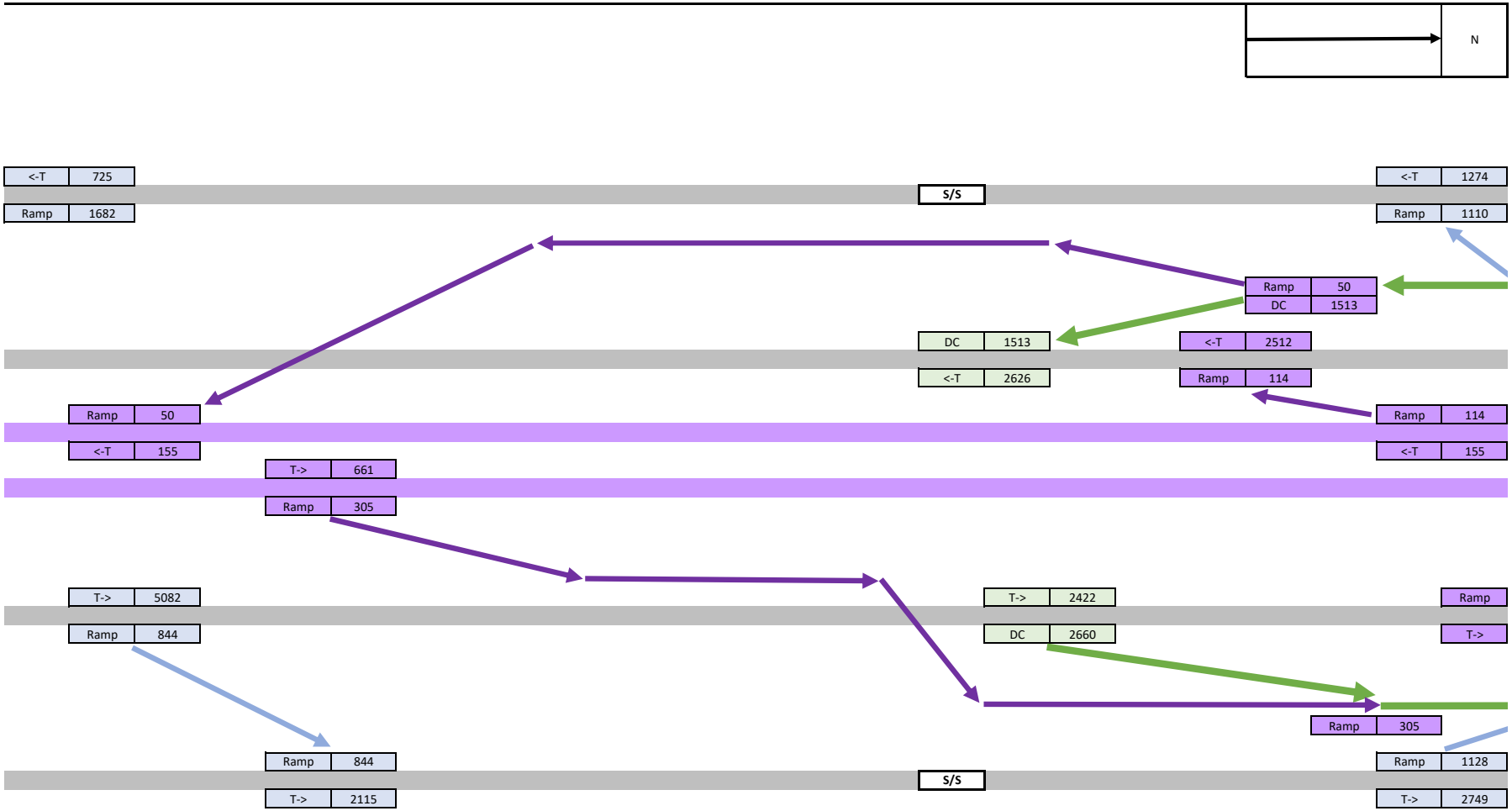

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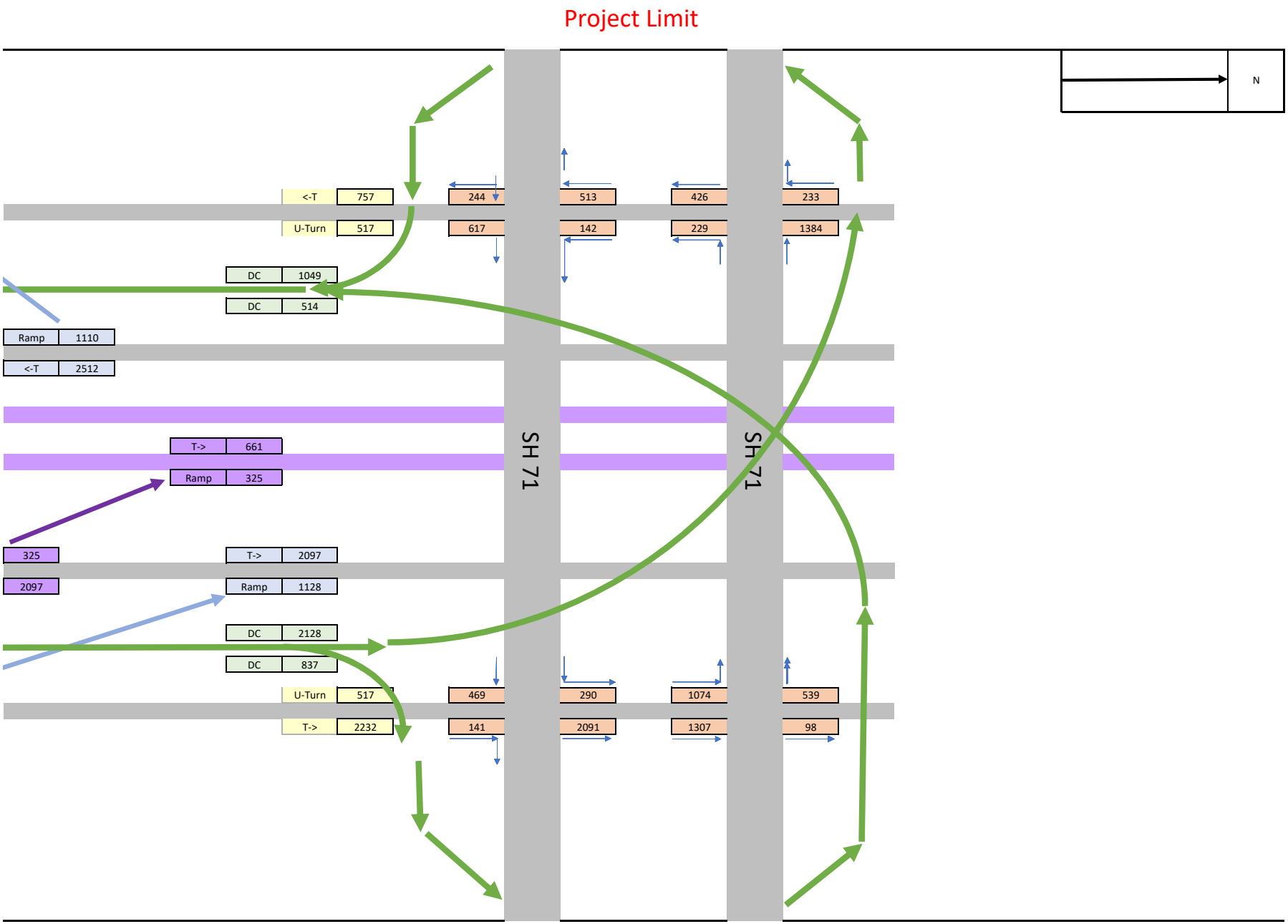

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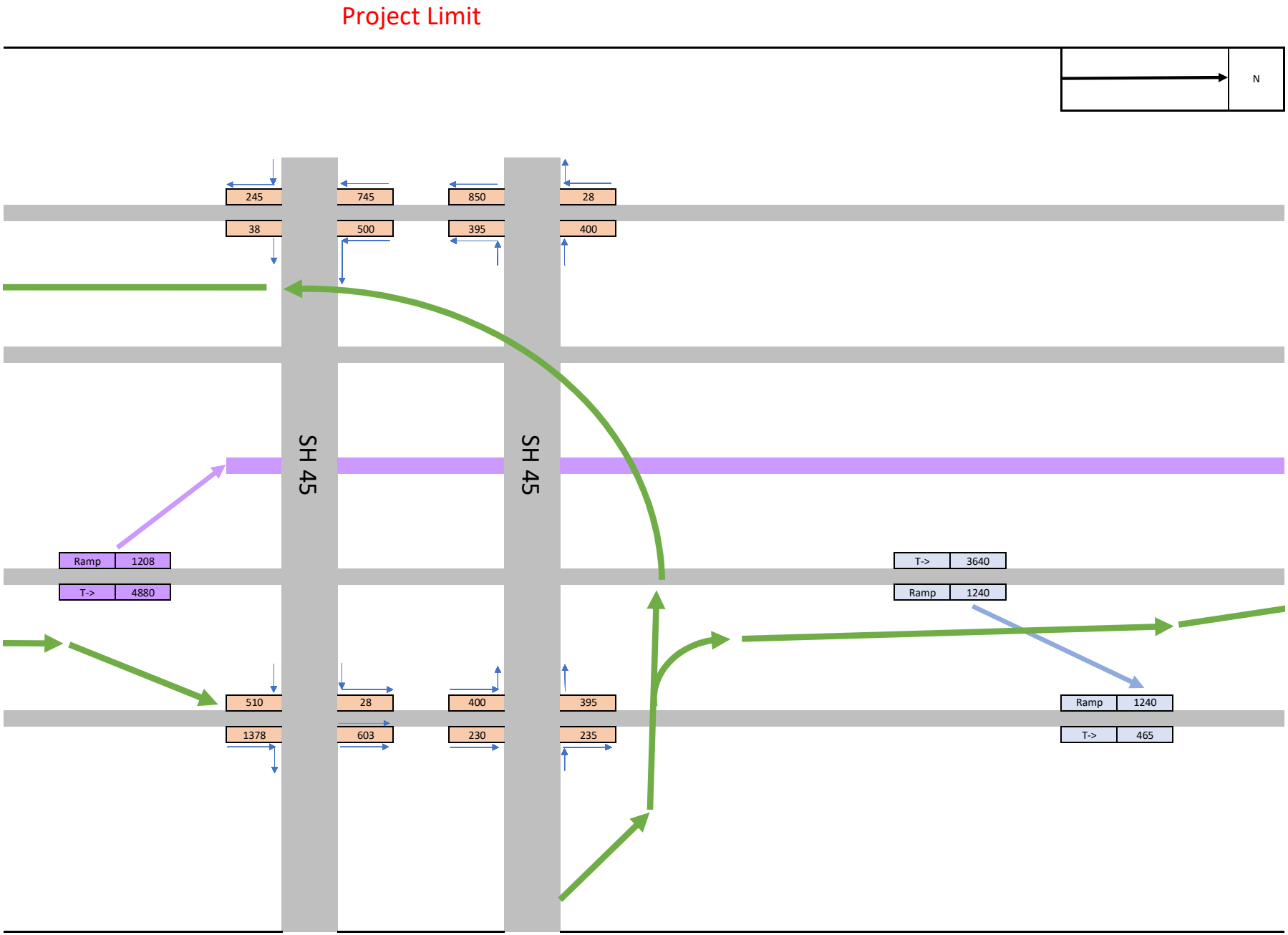

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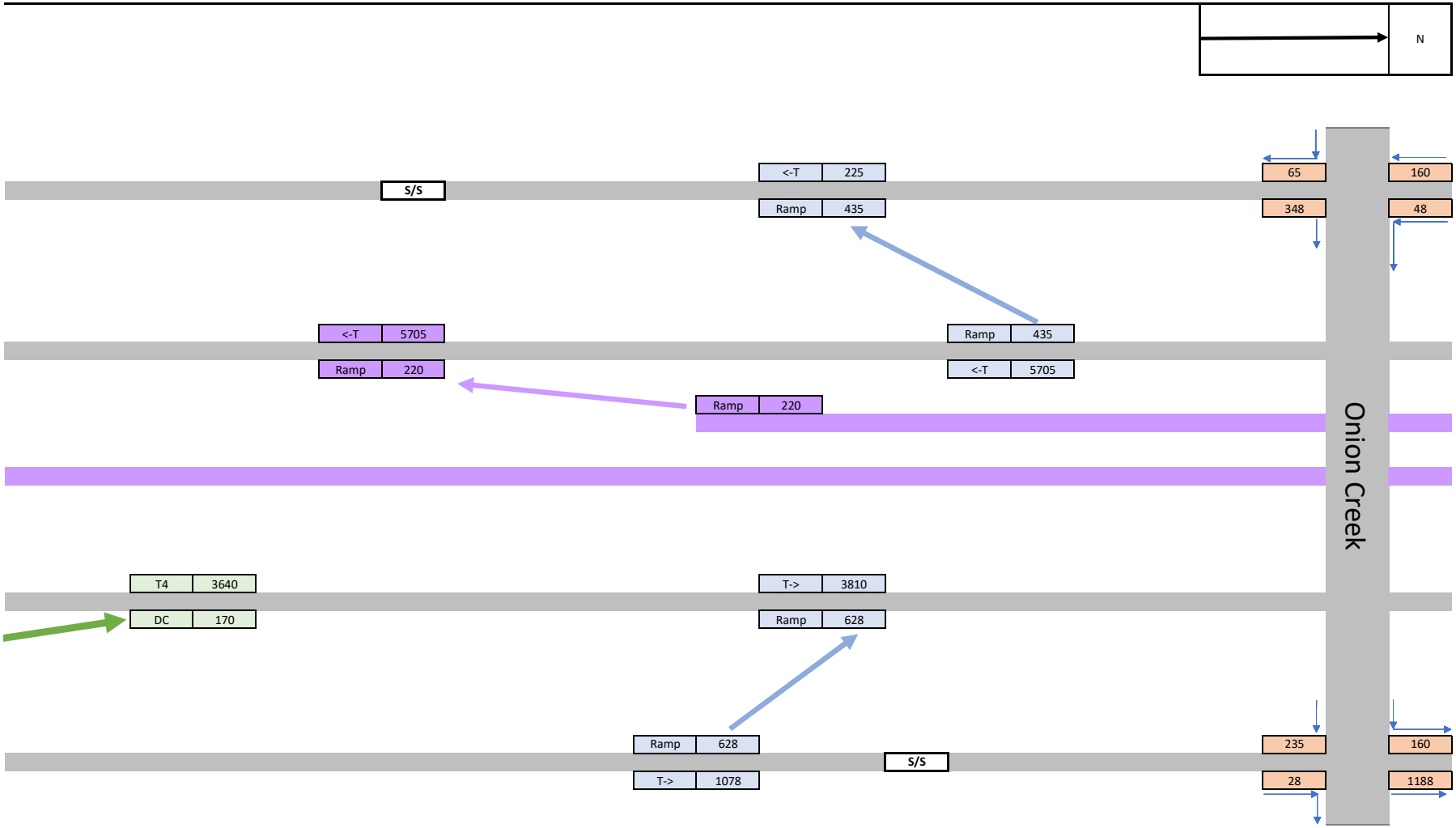

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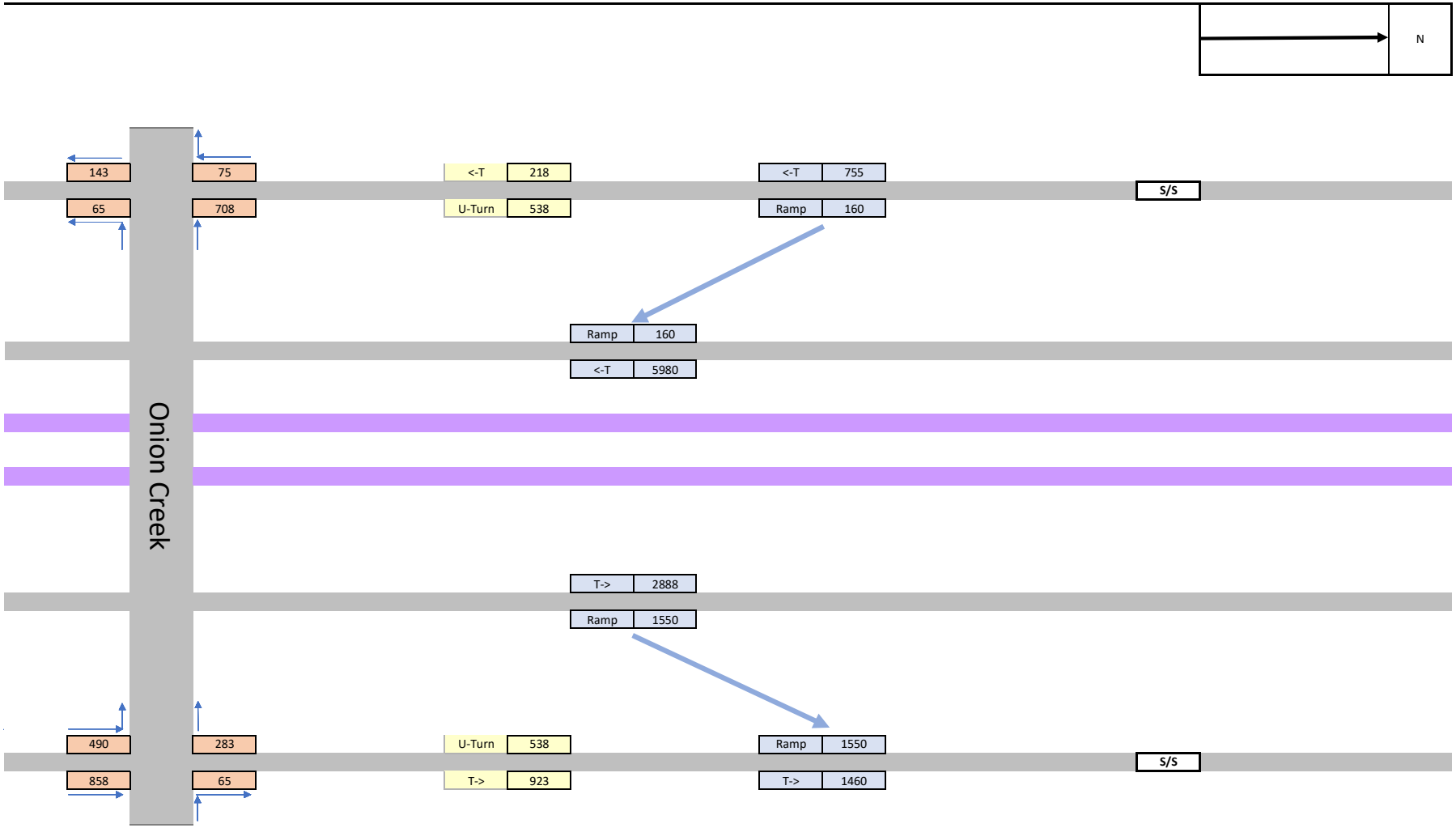

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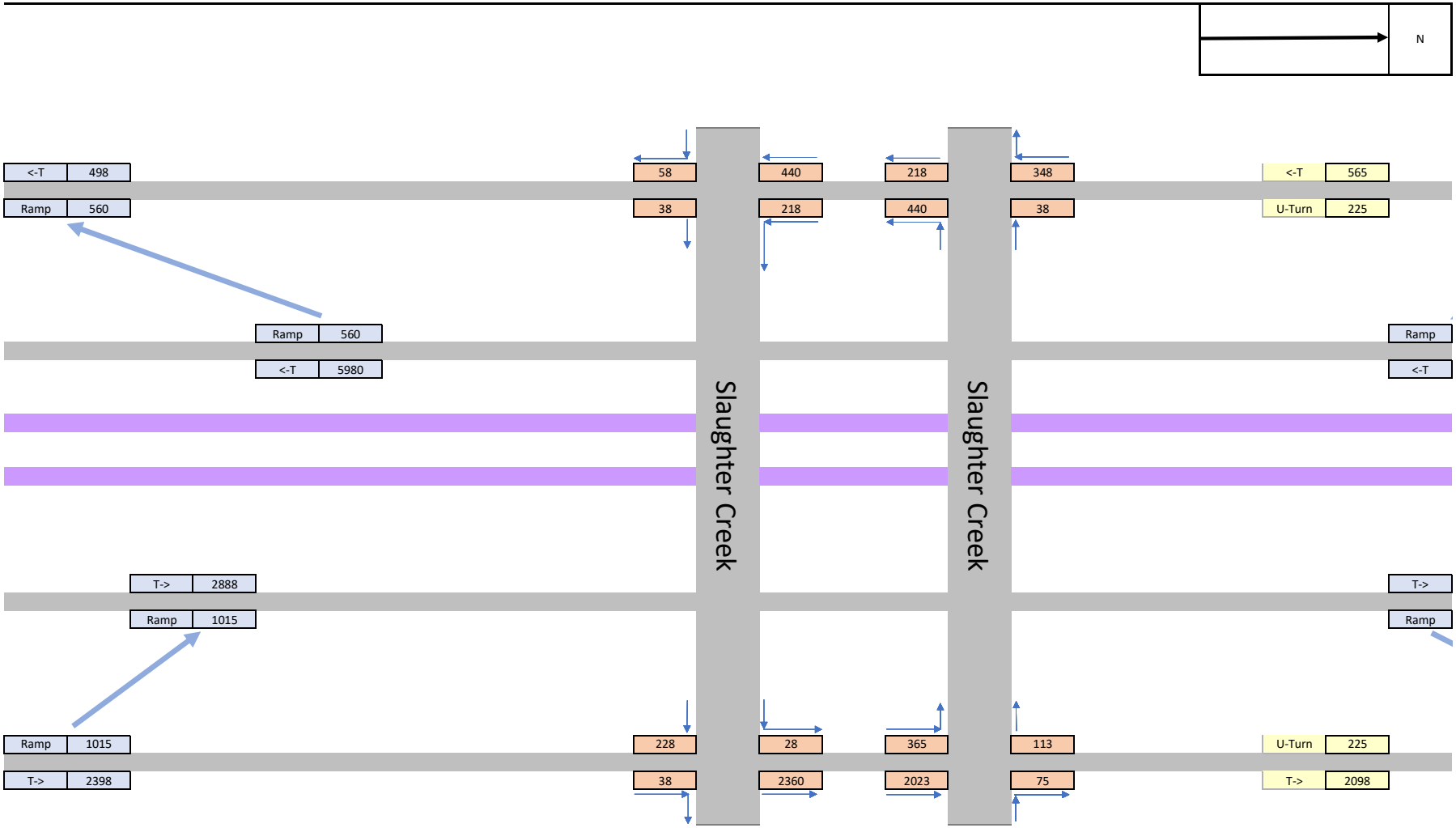

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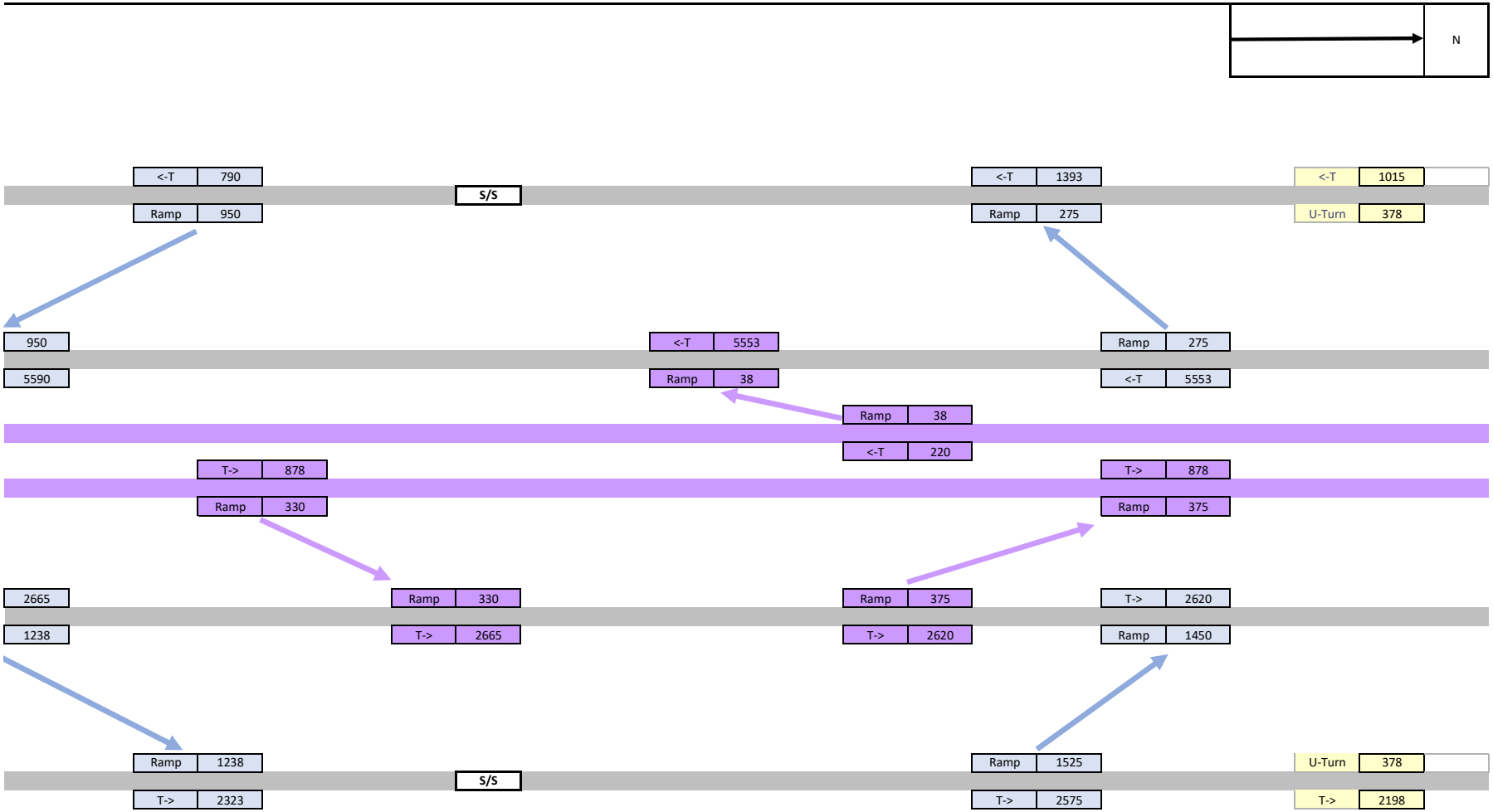

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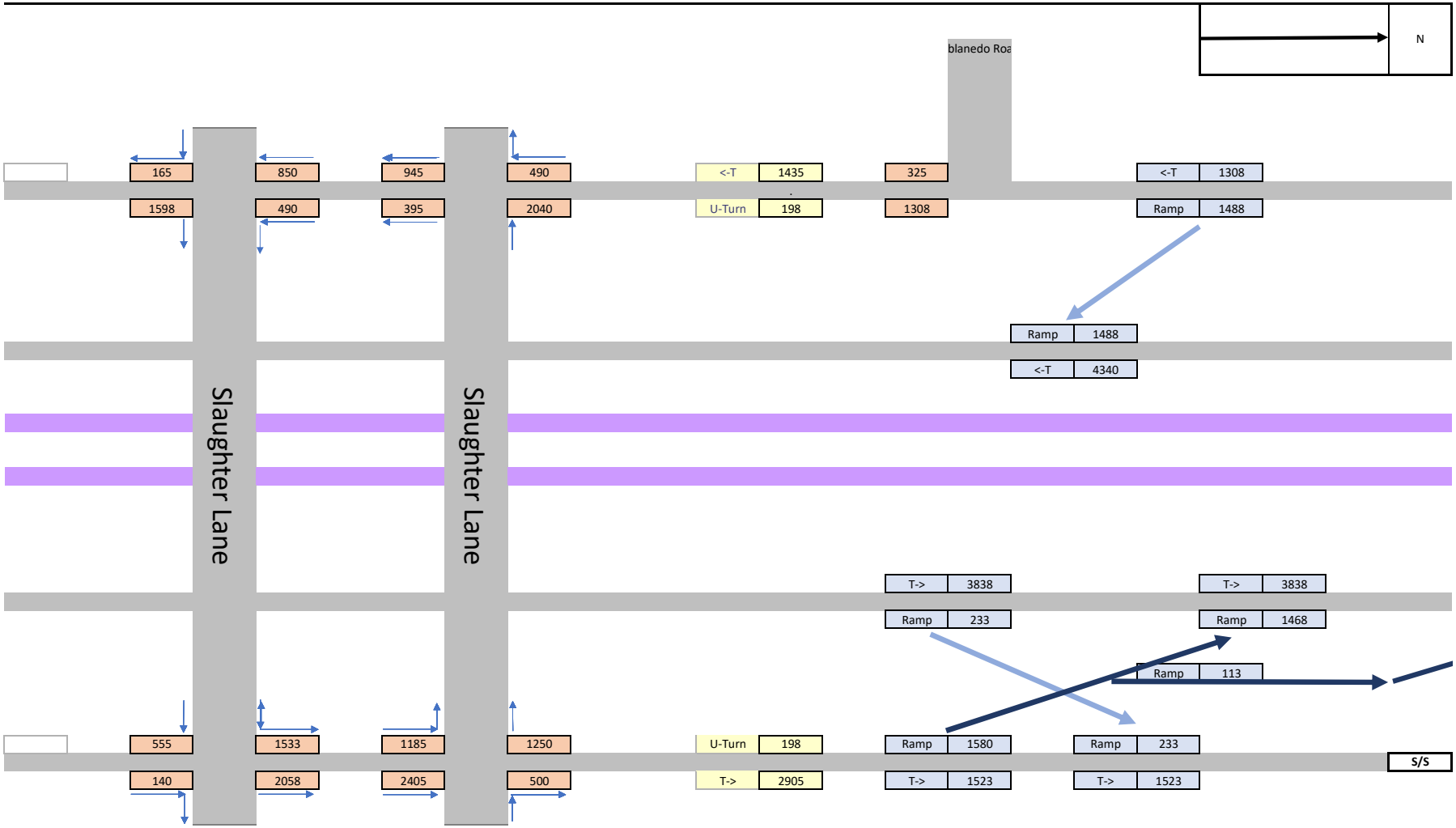

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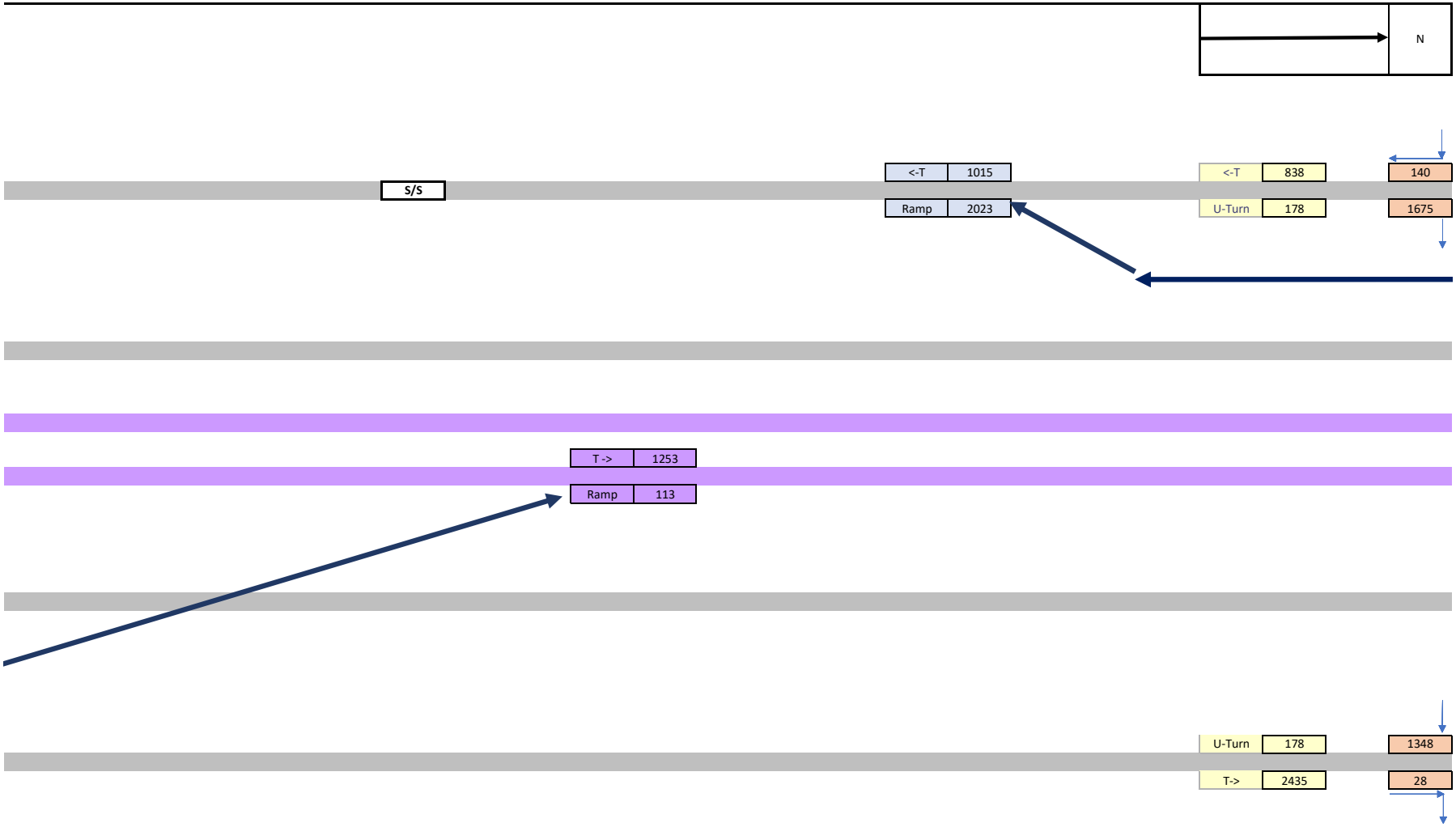

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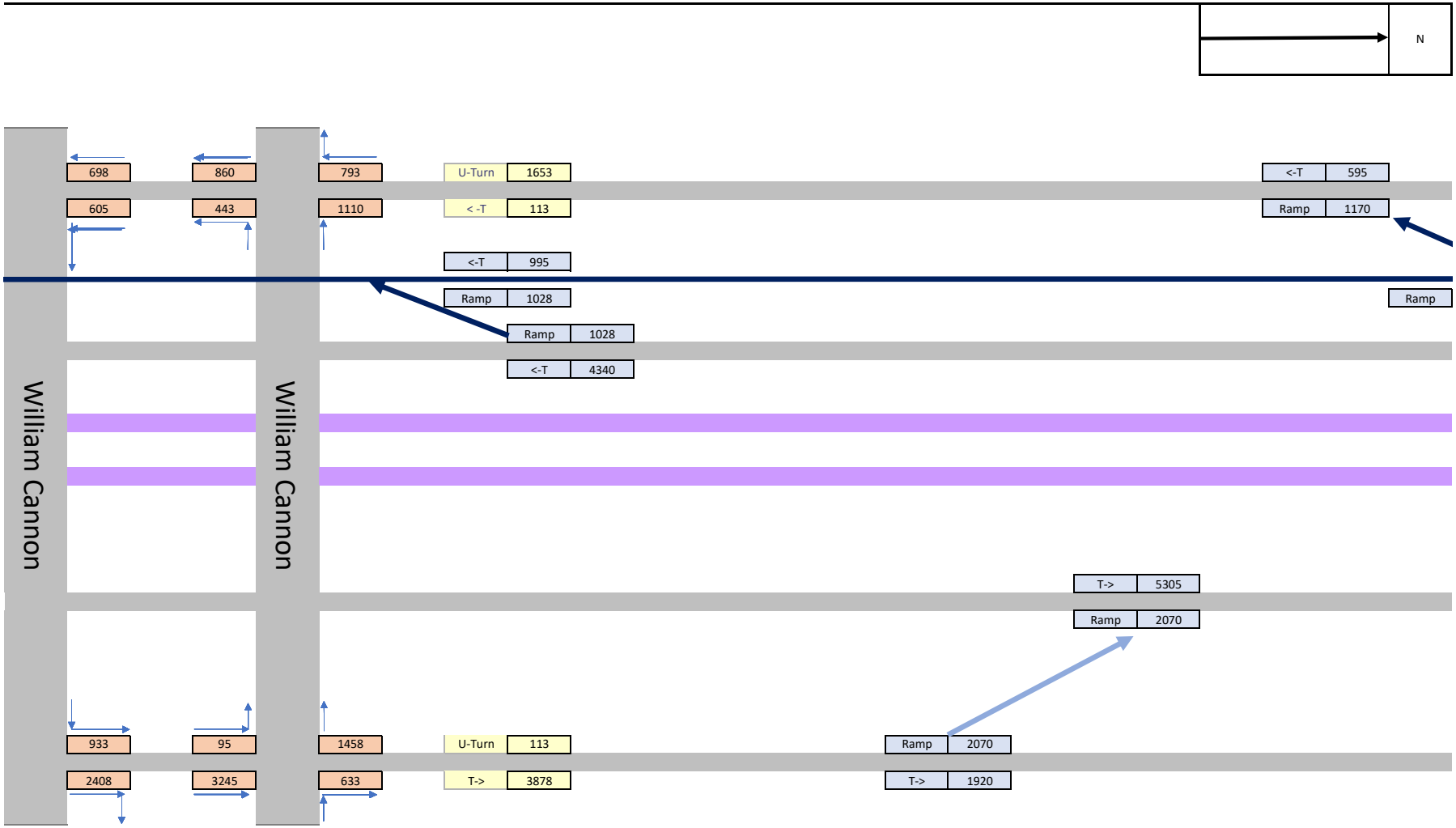
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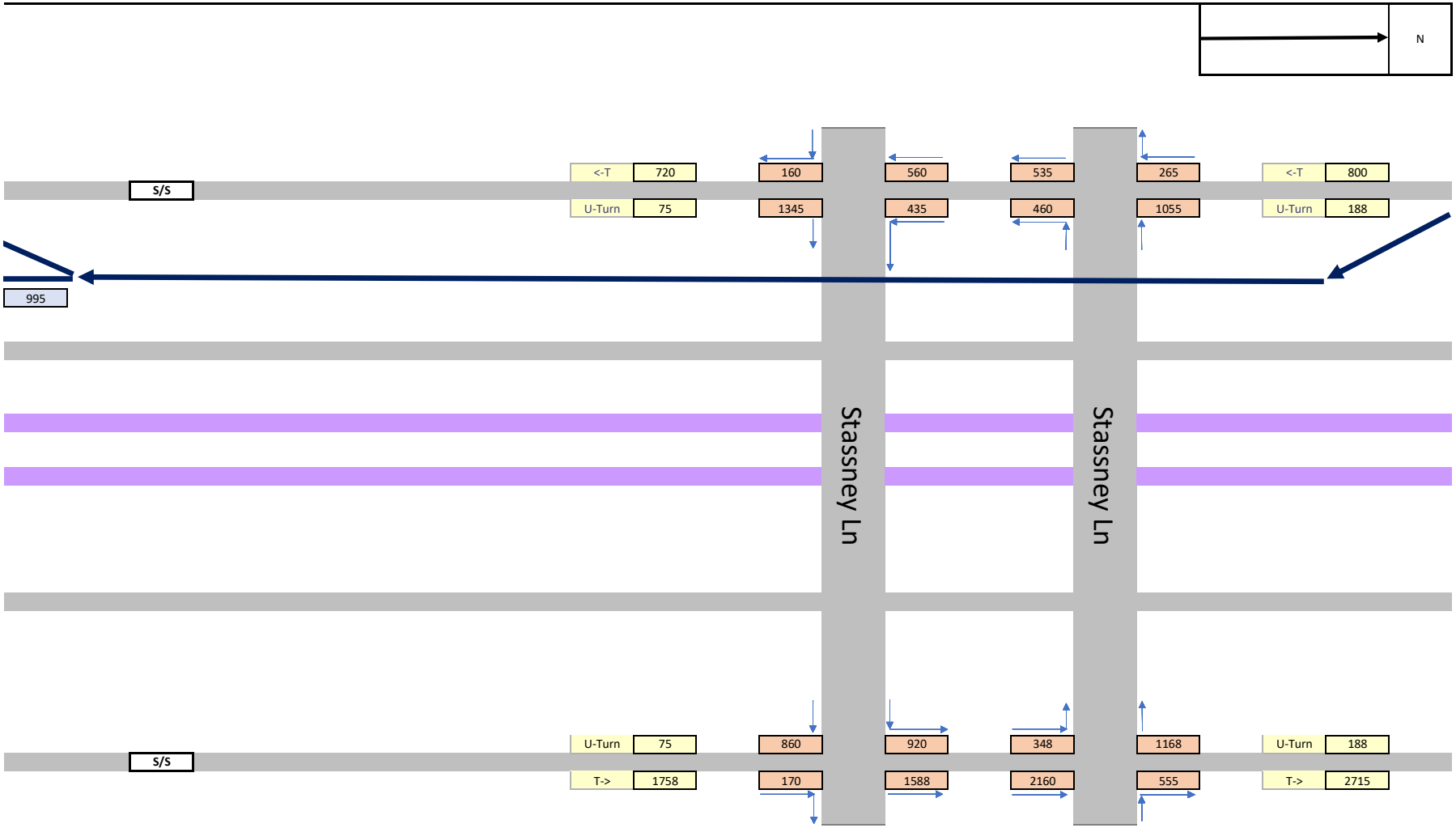

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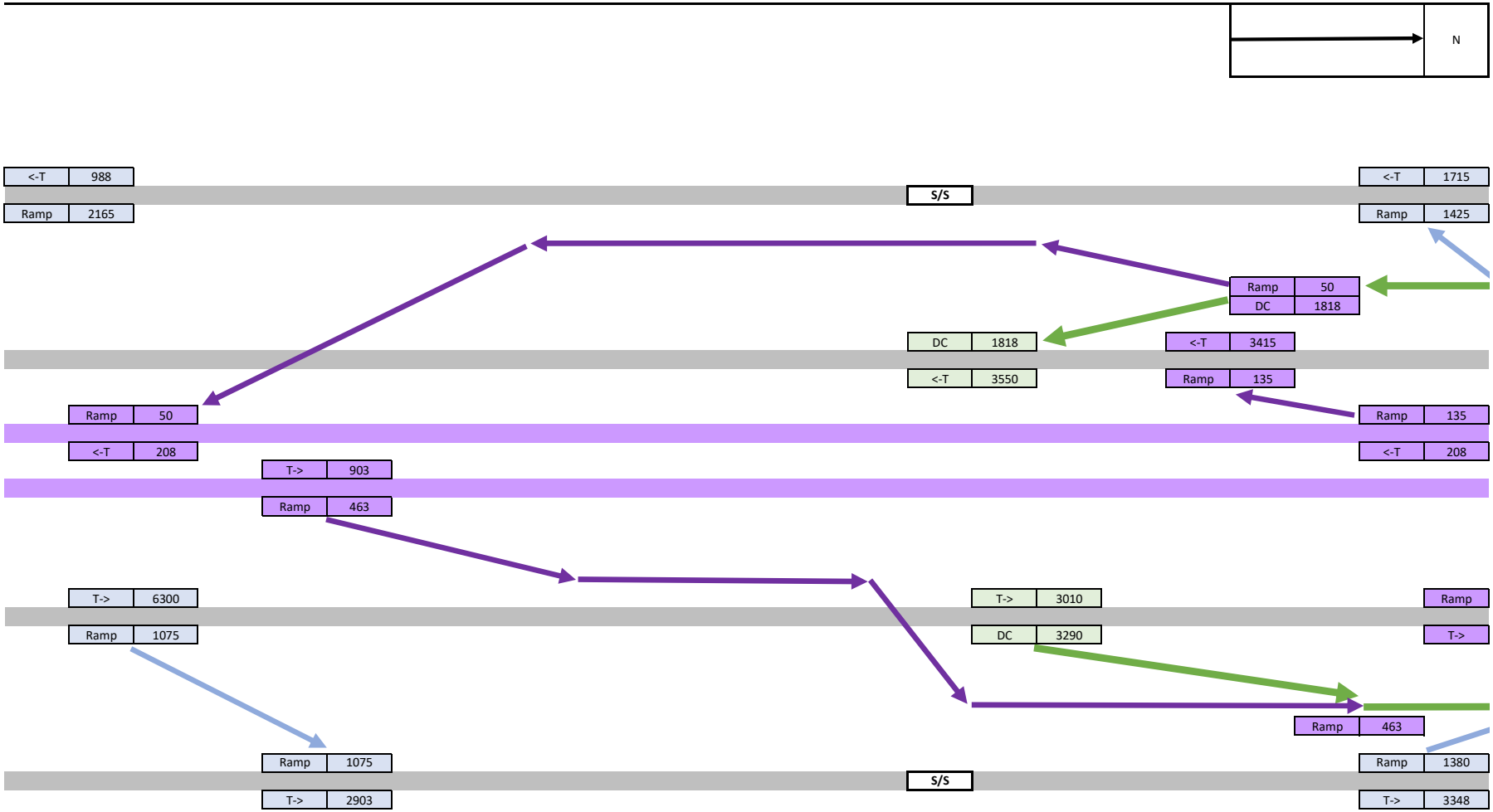

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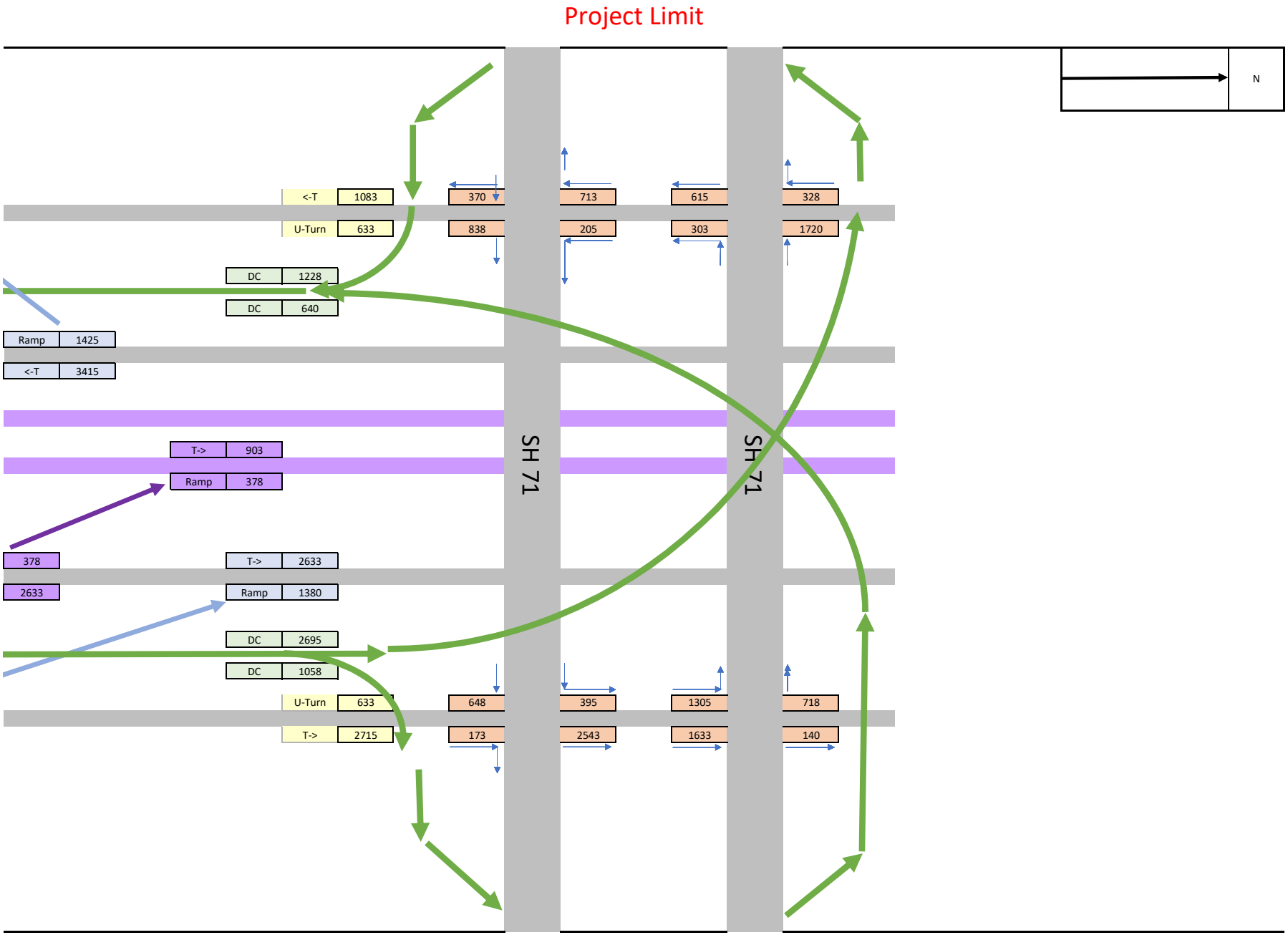

2045 Peak Hour Traffic

Appendix D

CO TAQA Receptor Locations

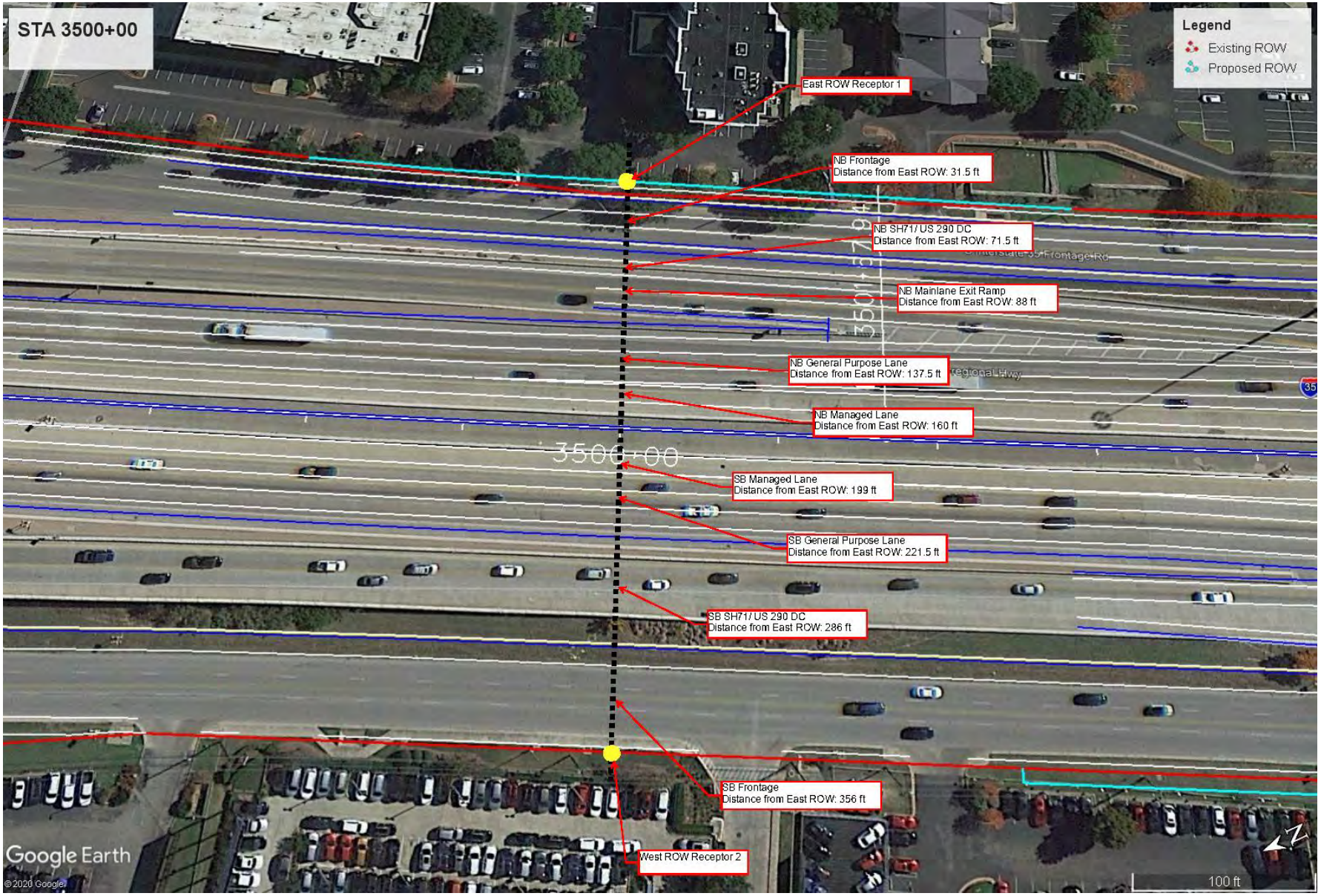

Figure 1: TAQA Receptor Locations Map on Aerial STA 3500+00

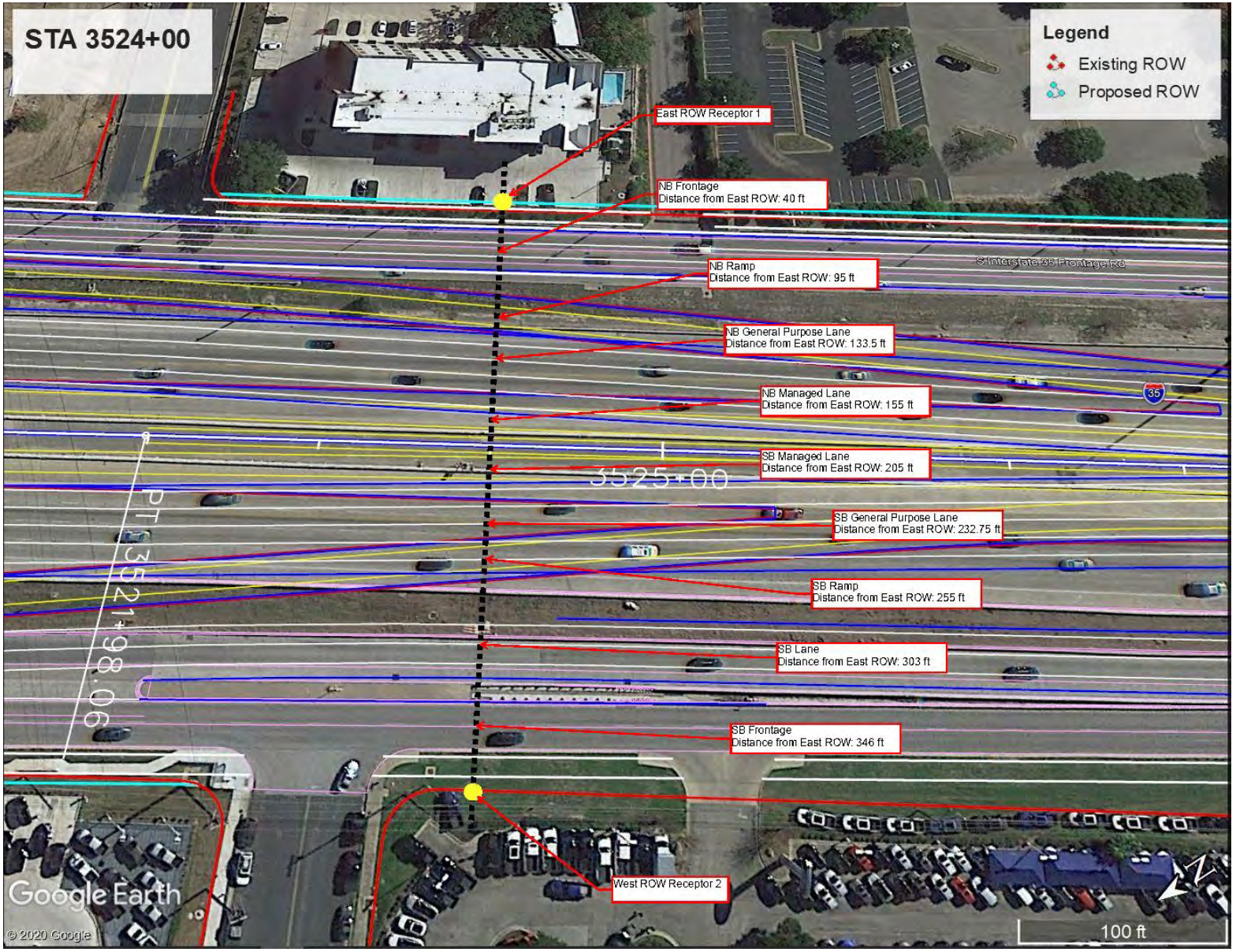

Figure 2: TAQA Receptor Locations Map on Aerial STA 3524+00

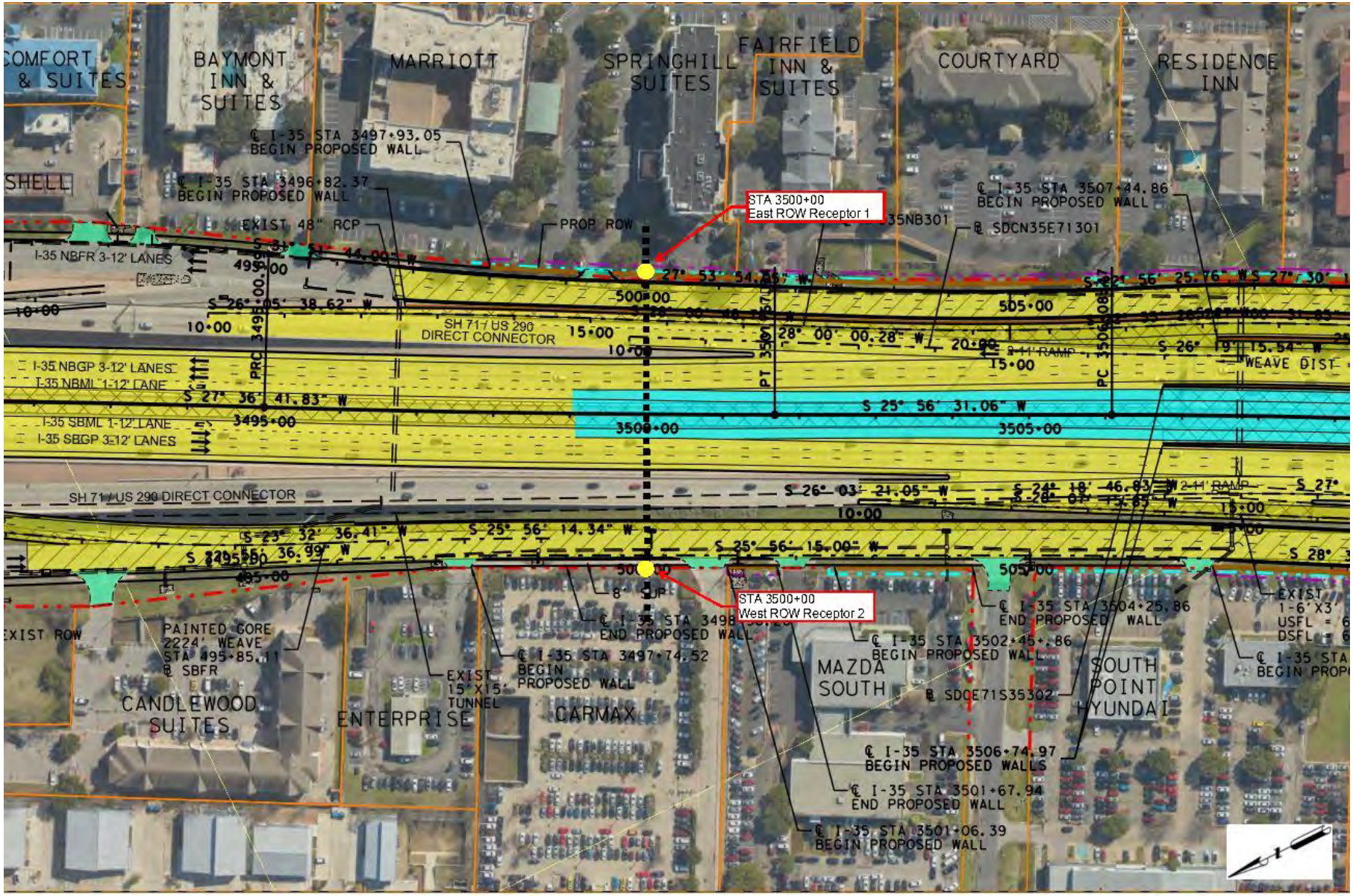

Figure 3: TAQA Receptor Locations Map on Schematic STA 3500+00

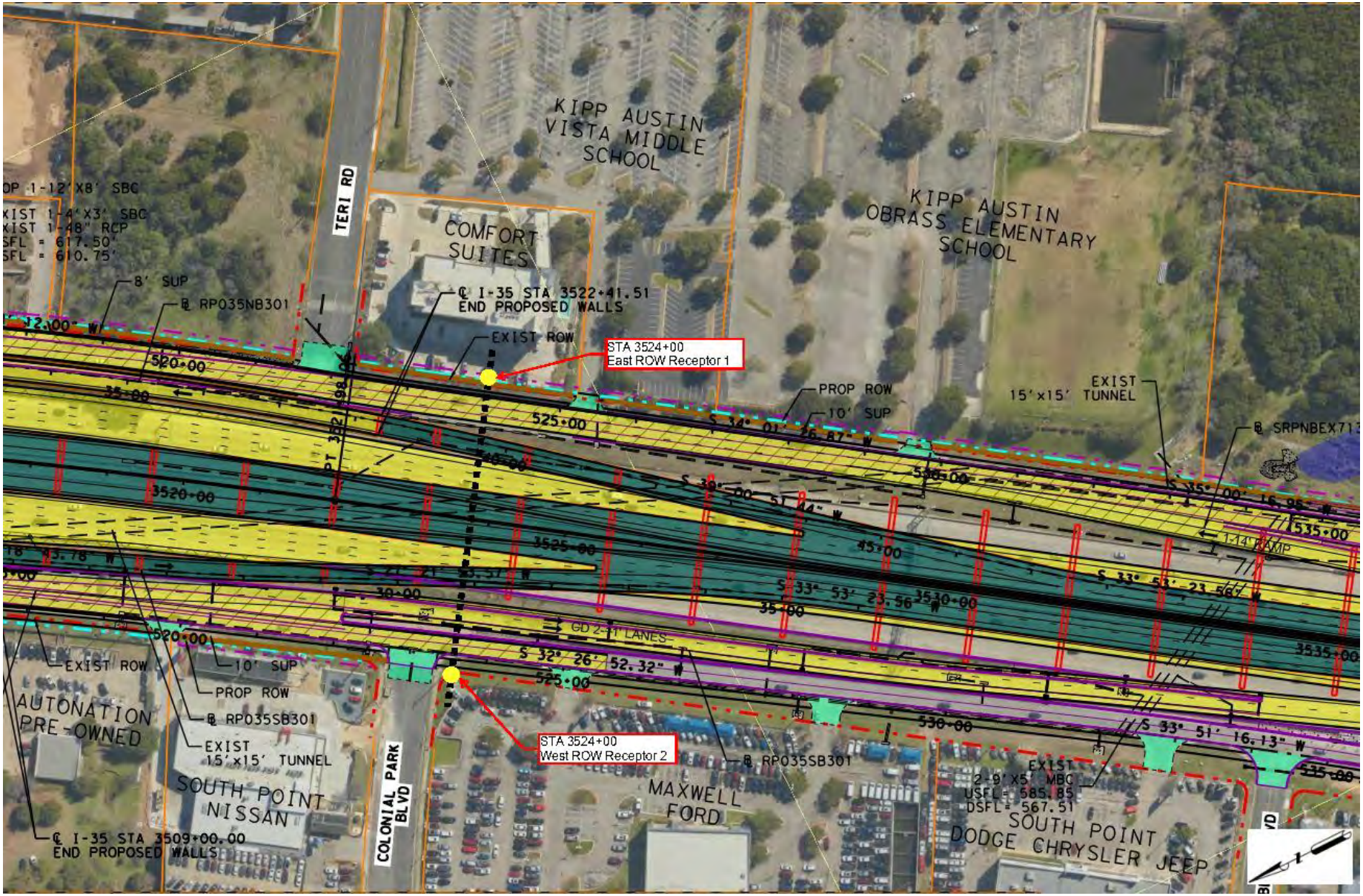

Figure 4: TAQA Receptor Locations Map on Schematic STA 3524+00