

I-70 Interchange in Grand Junction – TAC Meeting #10

February 8, 2024

Agenda

- ▶ Welcome and Introductions
- ▶ I-70 Traffic Mitigation Evaluation
- ▶ TDM Requirements
- ▶ Next Steps
- ▶ Schedule

Meeting Goal:

Present Current Results of the Level 3 Analysis



PRE-1601



1601/NEPA



CURRENT PROCESS



GOAL:

Is there a need for an interchange?

DETERMINATION OF NEED

Traffic

- Straight Model Results
- Freeway Analysis
- Select Limits/Select Grades
- Safety

Analysis Tools

- MPO Model
- HCS (Freeway)

COMPLETED



LEVEL 1 SCREENING GOAL:

29 Road or 30 Road?

EFFECTIVENESS & IMPACTS

Traffic

- Interchange Spacing
- Arterial Volume Changes
- Freeway LOS
- Activity Centers
- Land Use

Park-n-Ride/TDM

- Roadway Plans
- Connectivity
- Planning History
- Activity Centers

Impacts

- Community Context
- Access/Driveways
- Airport
- Historic
- Previous Public Involvement
- Planning History

Analysis Tools

- MPO Model
- HCS (Freeway LOS)

COMPLETED



LEVEL 2 SCREENING GOAL:

Identify and Select Alignment and Interchange Configuration & Key Project Elements *(see next page for details)*

IMPACTS

Traffic

- Interchange Type (DDI, SPUI, Diamond)

Environmental

- Noise
- Connectivity
- Air Quality
- Historic
- Air Quality

Roadway

- 29 Road

Analysis Tools

- Field Data
- CAP-X
- Crash Modification Factors (CMFs)

COMPLETED



LEVEL 3 ANALYSIS & REFINEMENT GOAL:

CDOT 1601 Approval (including SLS) & FHWA IAR Approval

PREFERRED ALTERNATIVE EVALUATION

Traffic

- Operations
- Queuing
- Upstream/Downstream Interchange Effects
- Arterial Improvements

Safety

- Safety Performance Functions (SPFs)

Multimodal

- Accessibility

Guide Signing

- Conceptual Plan

SUPPORTING ELEMENTS

Traffic

- I-70 Auxiliary Lane
- 29 Road
- Patterson Road

TDM

- Park-n-Rides
- Bike Lanes
- Mobility Hubs

Environmental

- Mitigation Commitments

Analysis Tools

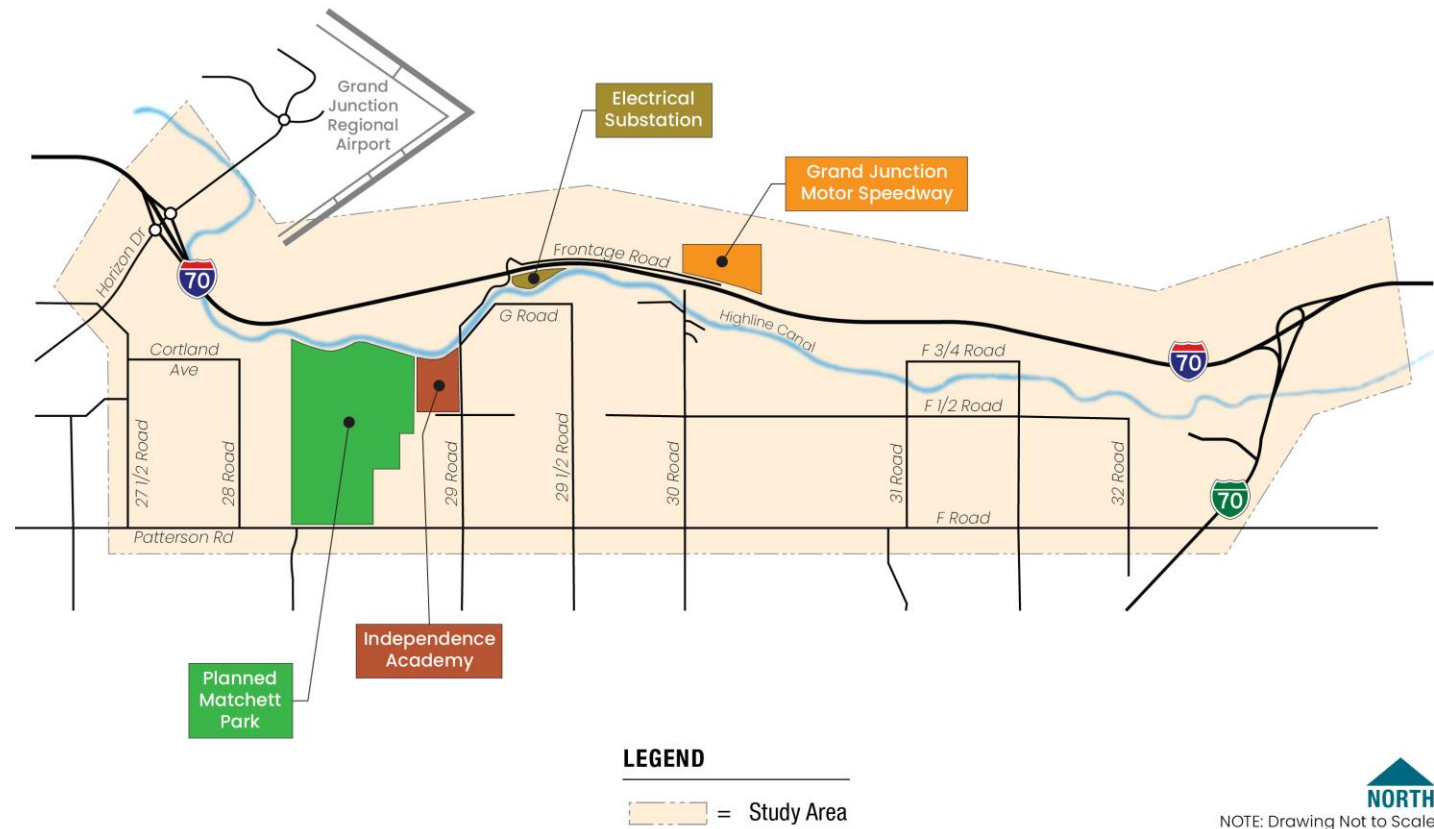
- Field Data
- Synchro / Rodel (arterials)
- HCS (Freeway)

- Level of Service (LOS)
- Diverging Diamond Interchange (DDI)
- Single-Point Urban Interchange (SPUI)

I-70 Traffic Analysis Refresher

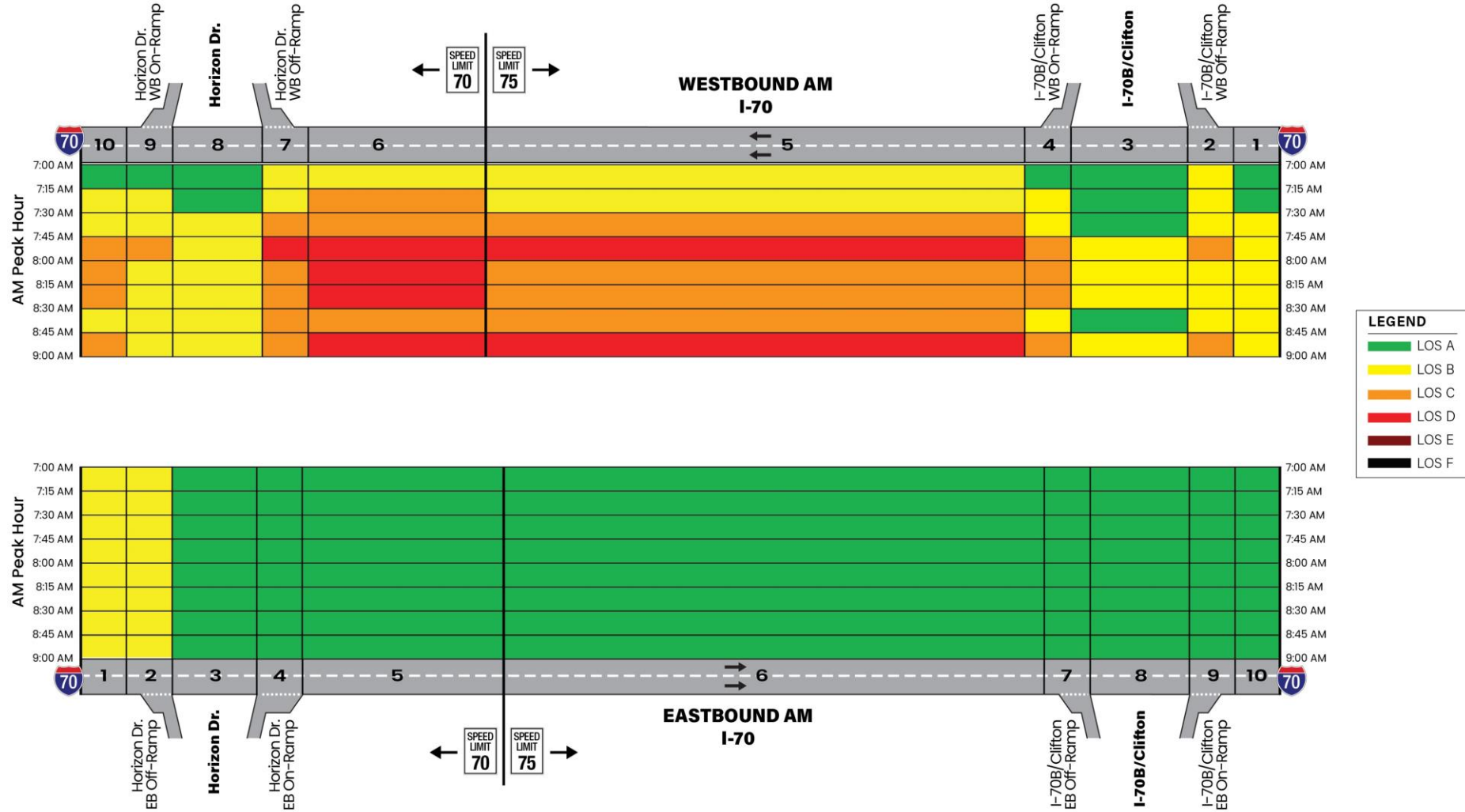
I-70 Traffic Operations: Background

- ▶ Evaluated I-70 from west of Horizon Drive to east of Clifton
- ▶ Freeway, merge, and diverge segments

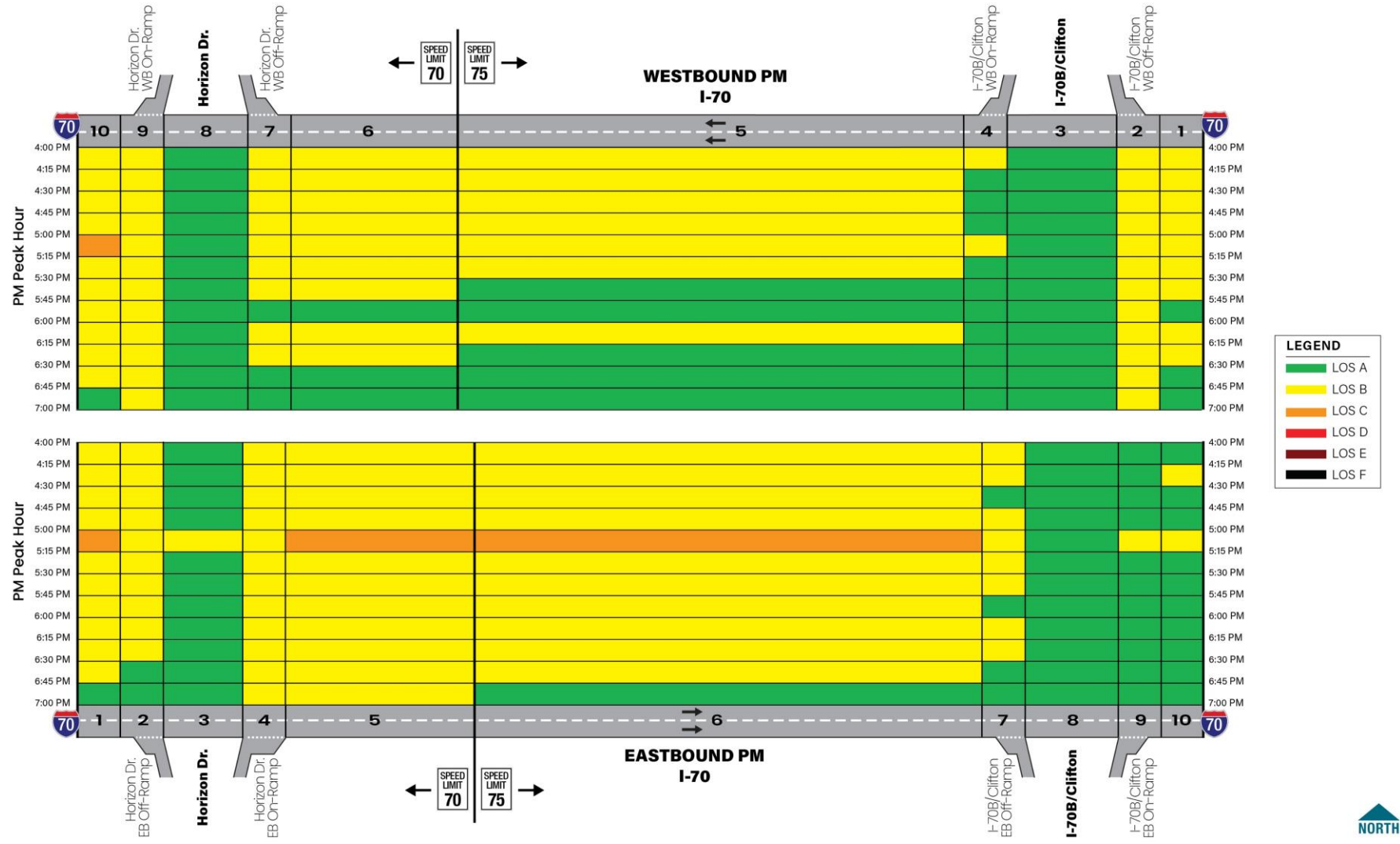


I-70 Traffic Operations: No Action

- ▶ Year 2045 No-Action traffic analysis results
 - ▶ AM peak period:
 - ▶ Westbound: LOS D or better.
 - ▶ Eastbound: LOS C or better.
 - ▶ PM peak period:
 - ▶ Westbound: LOS C or better.
 - ▶ Eastbound: LOS D or better.



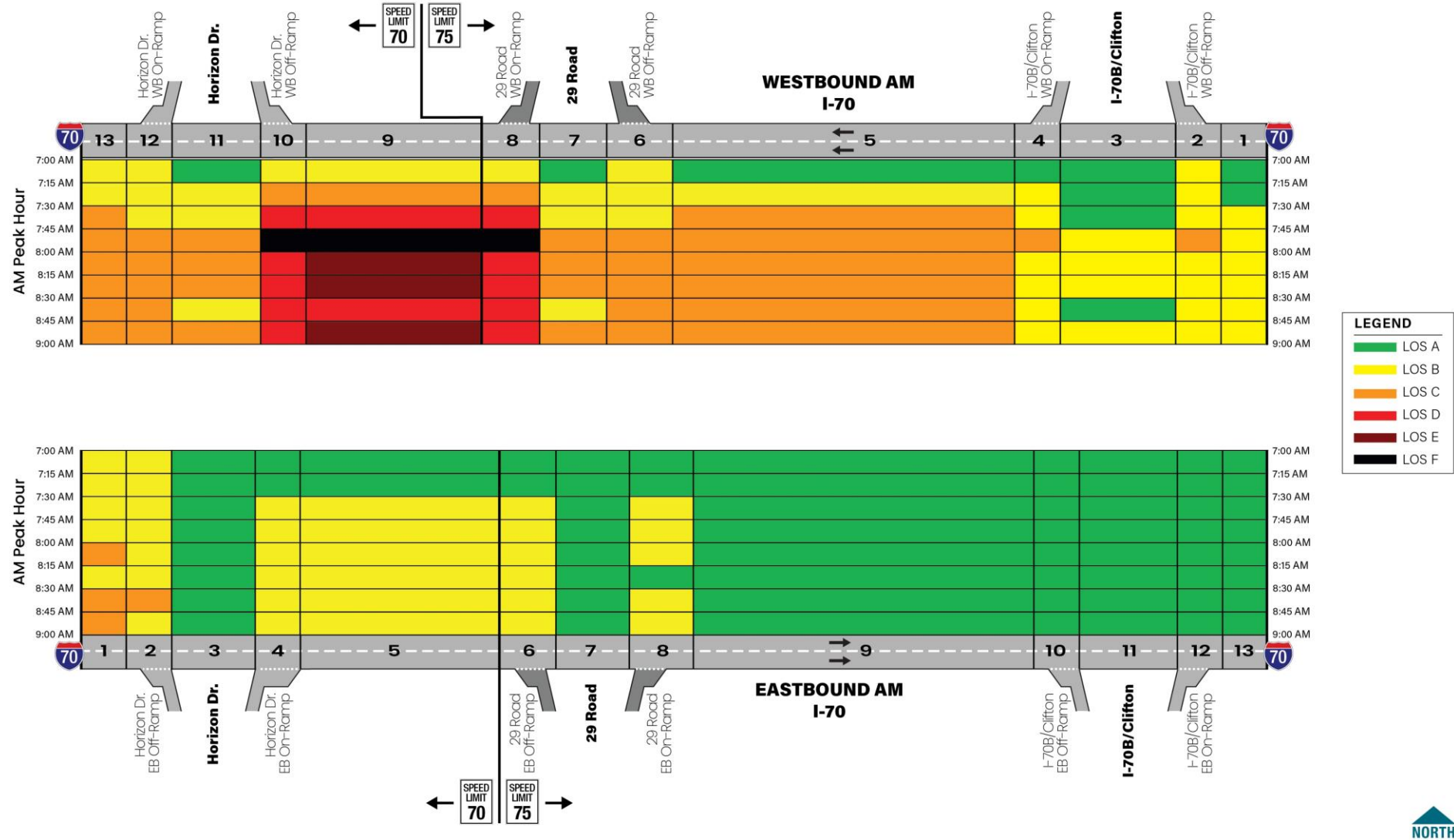
I-70 No-Action Operations (2045 AM Peak Period)



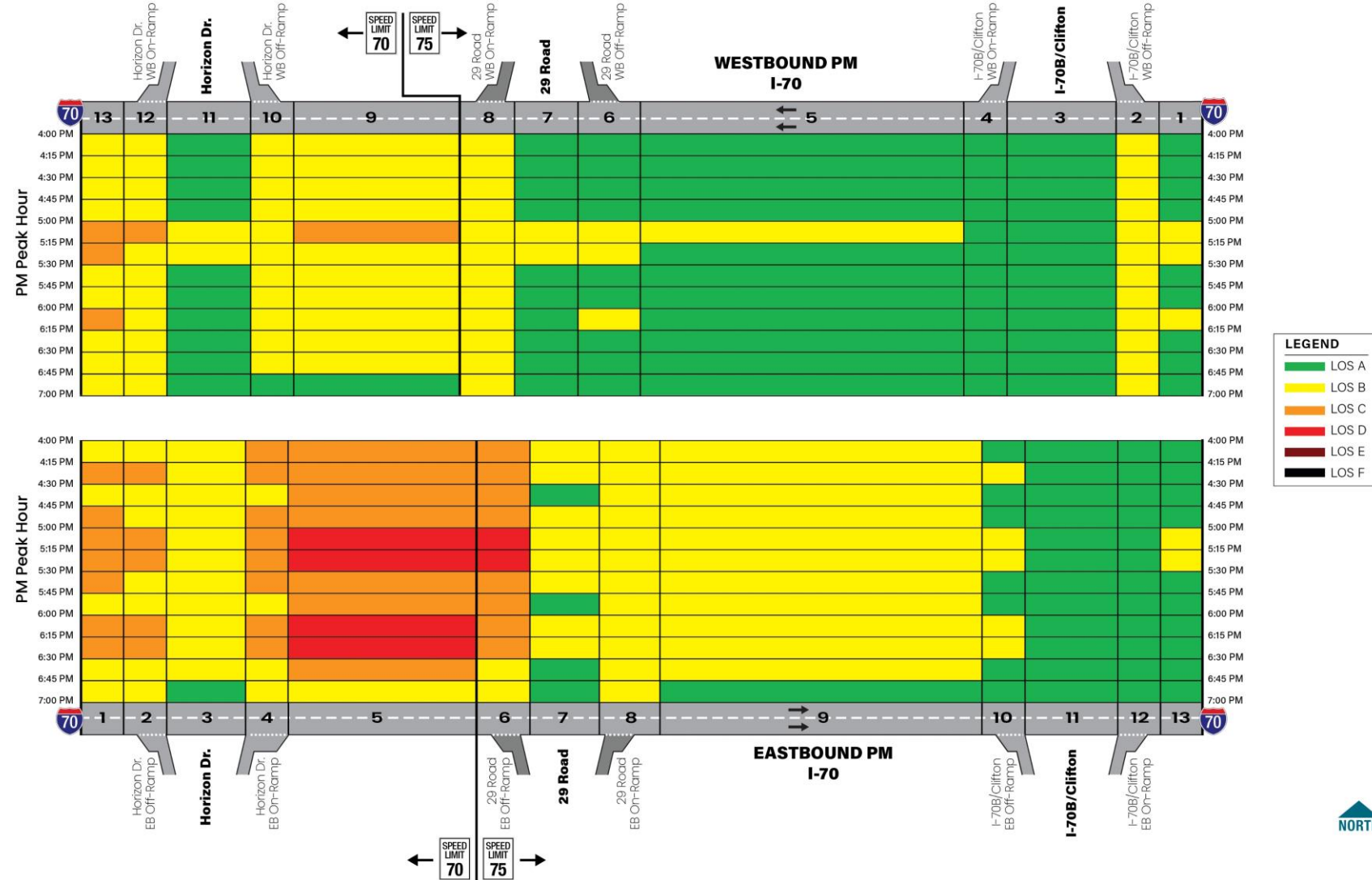
I-70 No-Action Operations (2045 PM Peak Period)

I-70 Traffic Operations: 2045 Build

- ▶ Year 2045 Build traffic analysis results
 - ▶ AM peak period:
 - ▶ Westbound: LOS E or LOS F for four 15-minute periods (one hour). Consider mitigation.
 - ▶ Eastbound: LOS C or better. No mitigation required.
 - ▶ PM peak period:
 - ▶ Westbound: LOS C or better. No mitigation required.
 - ▶ Eastbound: LOS D or better. No mitigation required.
- ▶ Mitigation needed in year 2045



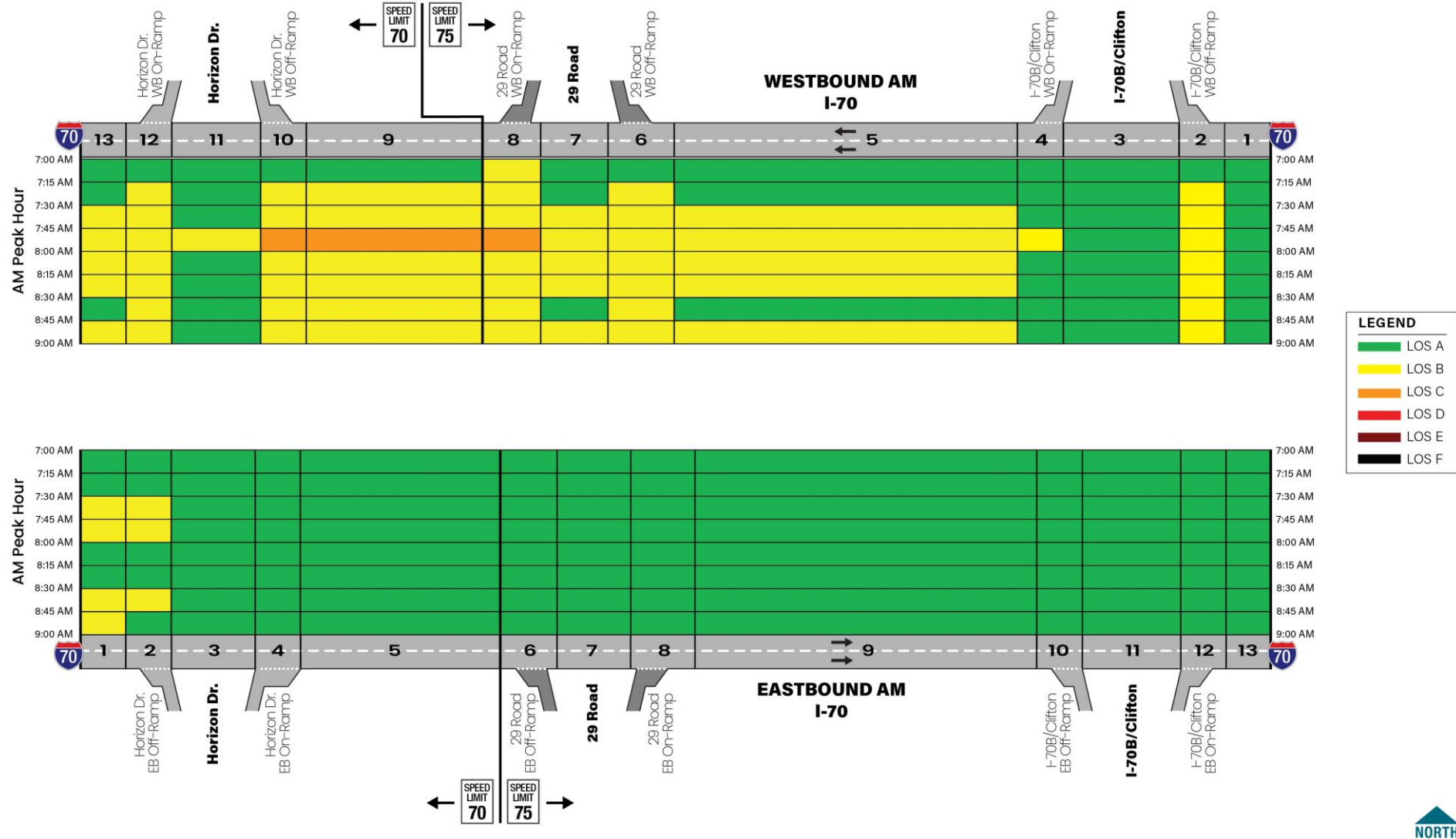
I-70 Build Operations (2045 AM Peak Period)



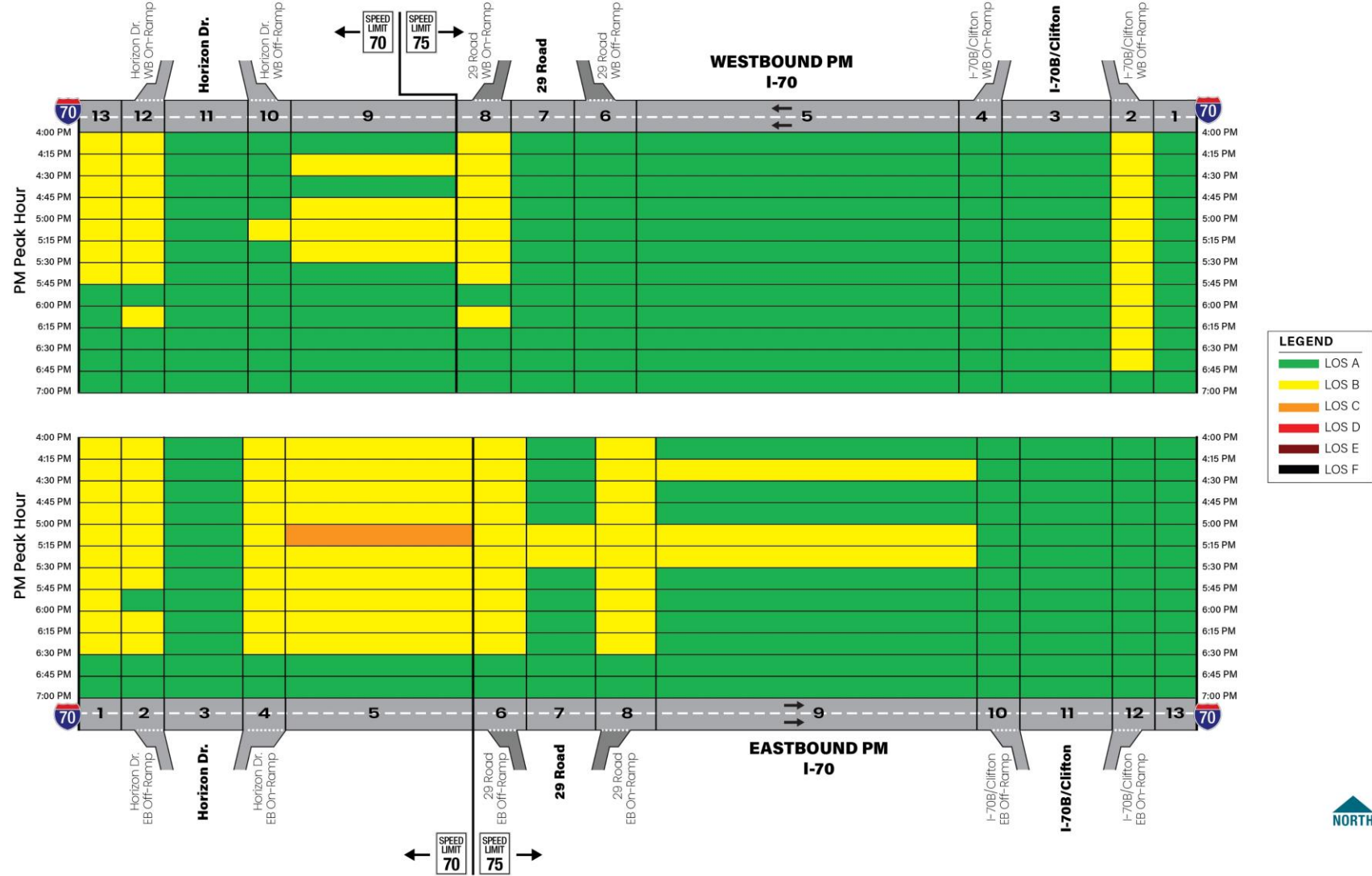
I-70 Build Operations (2045 PM Peak Period)

I-70 Traffic Operations: 2030 Build

- ▶ Year 2030 Build traffic analysis results
 - ▶ AM peak period:
 - ▶ Westbound: LOS C or better. No mitigation required.
 - ▶ Eastbound: LOS B or better. No mitigation required.
 - ▶ PM peak period:
 - ▶ Westbound: LOS B or better. No mitigation required.
 - ▶ Eastbound: LOS C or better. No mitigation required.
- ▶ Mitigation not warranted on Opening Day



I-70 Build Operations (2030 AM Peak Period)



I-70 Build Operations (2030 PM Peak Period)

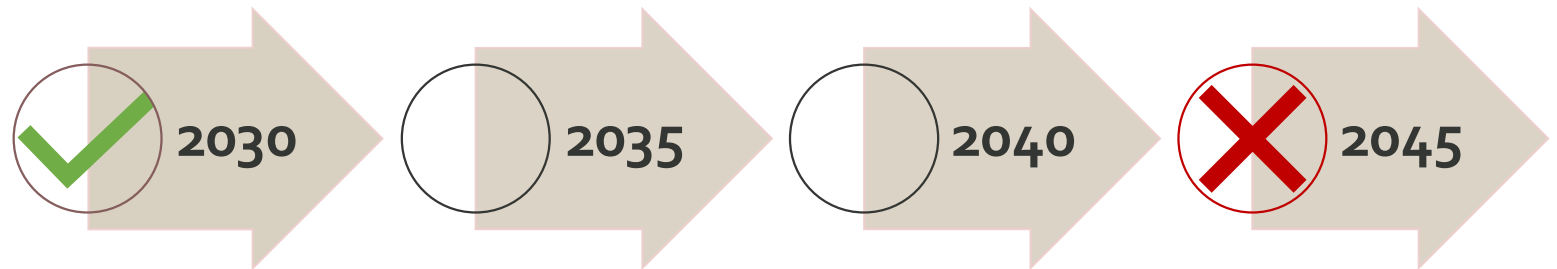
I-70 Mitigation Evaluation

I-70 Traffic Mitigation: Measure?

- ▶ What mitigation is required?
 - ▶ Long-term results show LOS C or better except for segment between 29 Road and Horizon Drive
- ▶ Does an auxiliary lane between interchanges work?
 - ▶ Yes!
- ▶ Analysis shows acceptable westbound operations with:
 - ▶ Auxiliary lane between 29 Road on-ramp and Horizon Drive off-ramp
 - ▶ Two-lane exit ramp at Horizon Drive

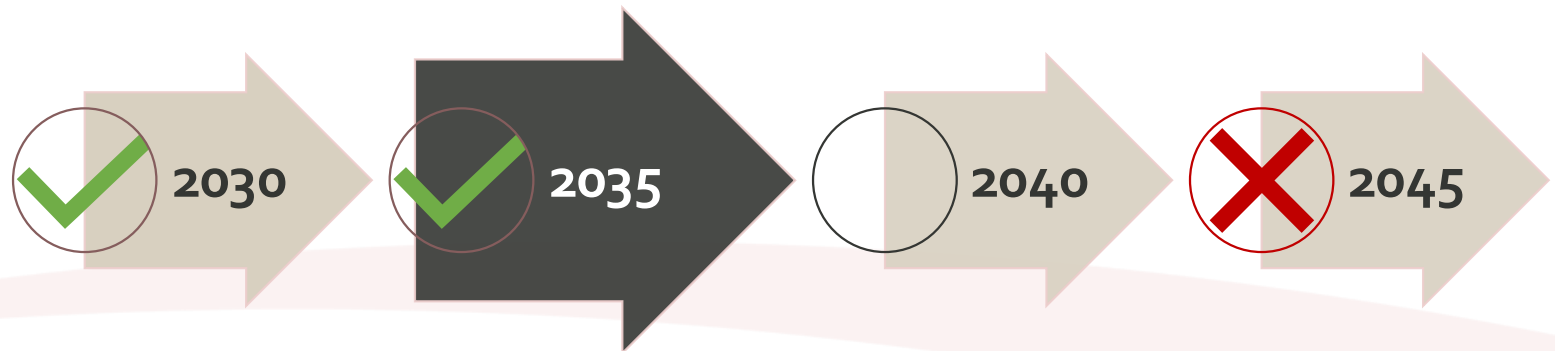
I-70 Traffic Mitigation: Timing?

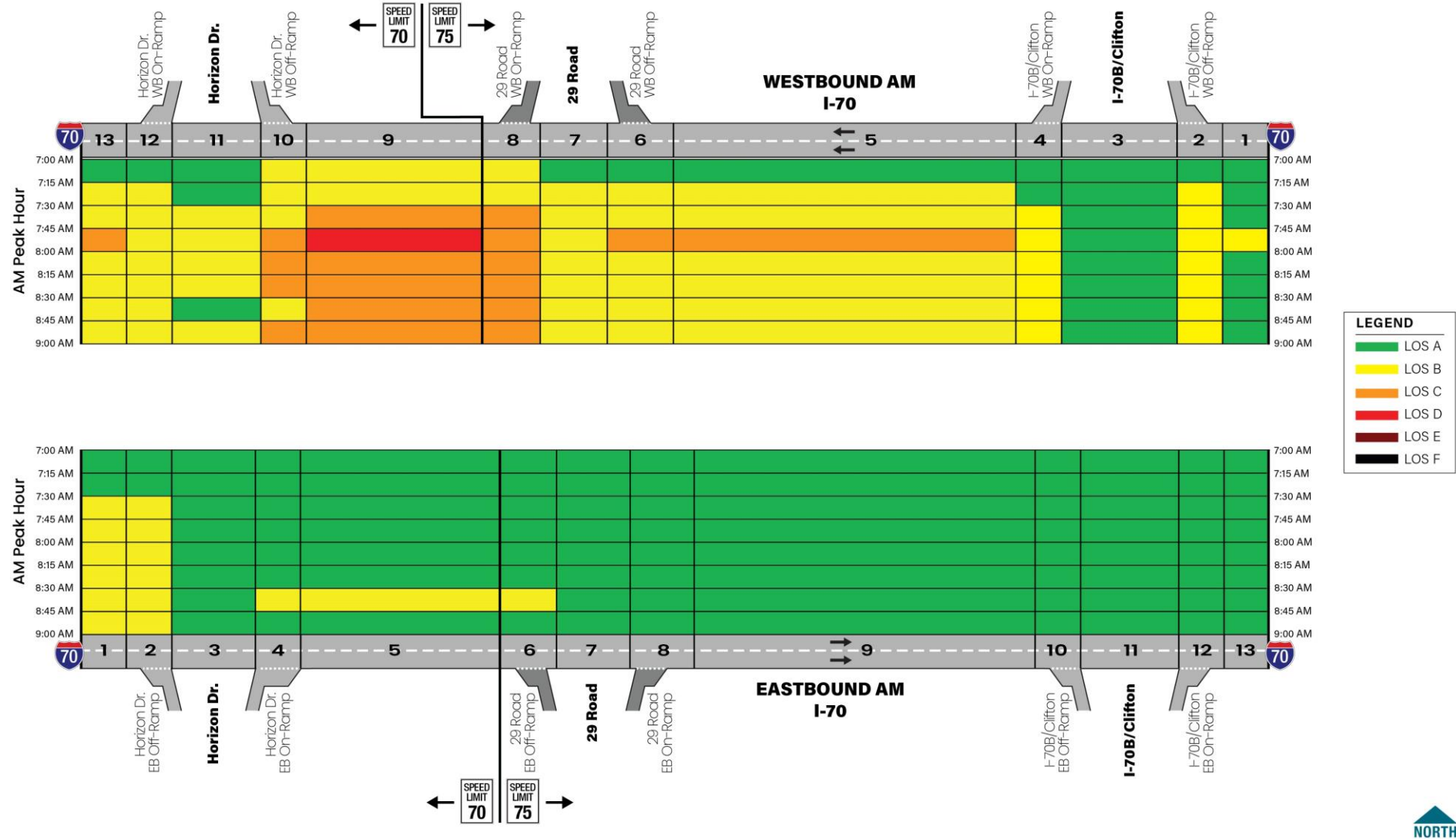
- ▶ When do we implement it?
 - ▶ Without mitigation:
 - ▶ 2030 operations acceptable; 2045 operations LOS E / F
 - ▶ With mitigation:
 - ▶ 2030 and 2045 operations acceptable
- ▶ What year should we plan to construct the auxiliary lane?
 - ▶ Consider 5-year increments



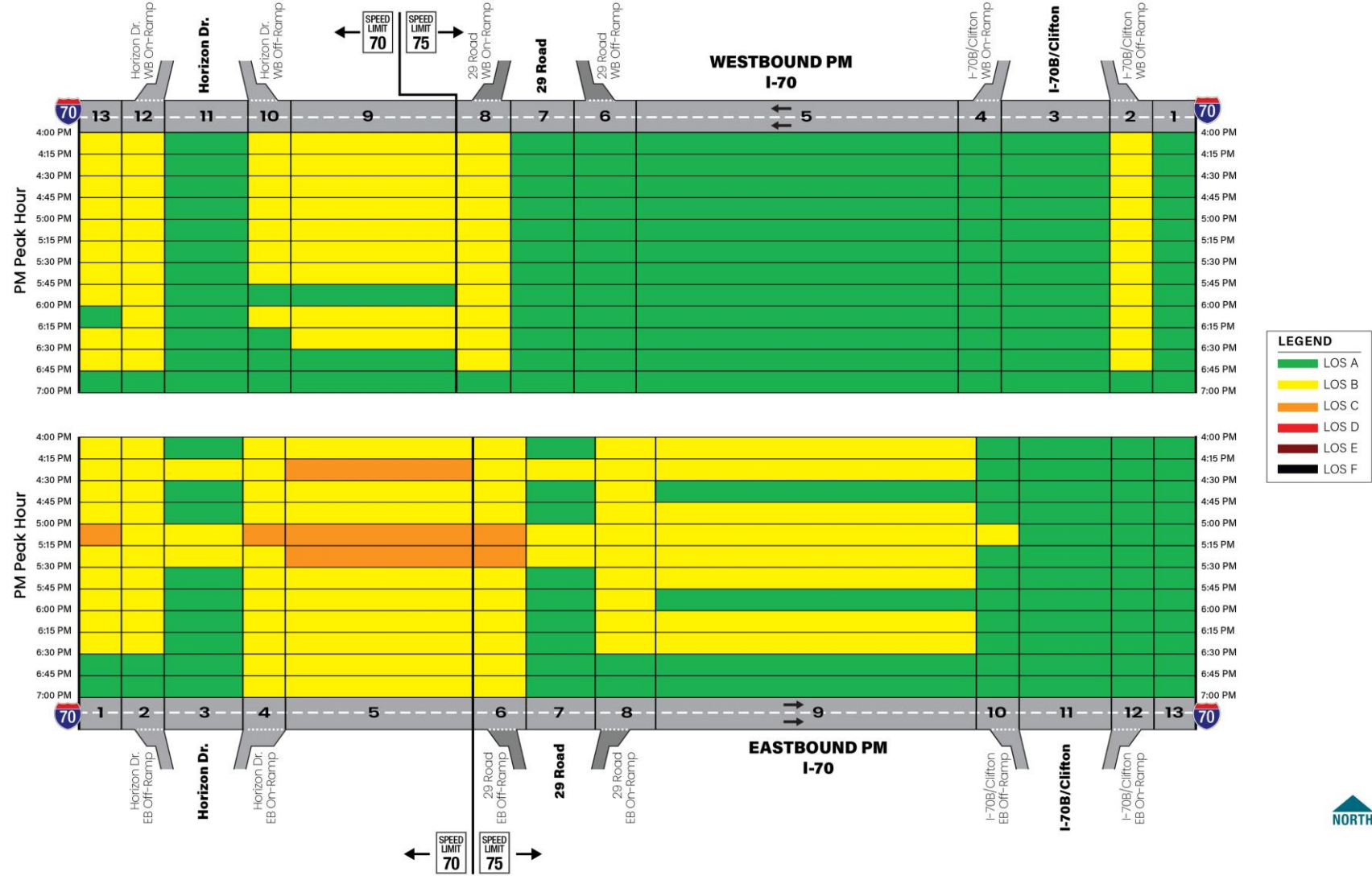
I-70 Traffic Mitigation: Year 2035

- ▶ Year 2035 Traffic Analysis
 - ▶ AM peak period:
 - ▶ Westbound: One 15-minute period at LOS D; remainder at LOS C or better. No mitigation required.
 - ▶ Eastbound: LOS B or better. No mitigation required.
 - ▶ PM peak period:
 - ▶ Westbound: LOS B or better. No mitigation required.
 - ▶ Eastbound: LOS C or better. No mitigation required.
- ▶ Mitigation not warranted in Year 2035





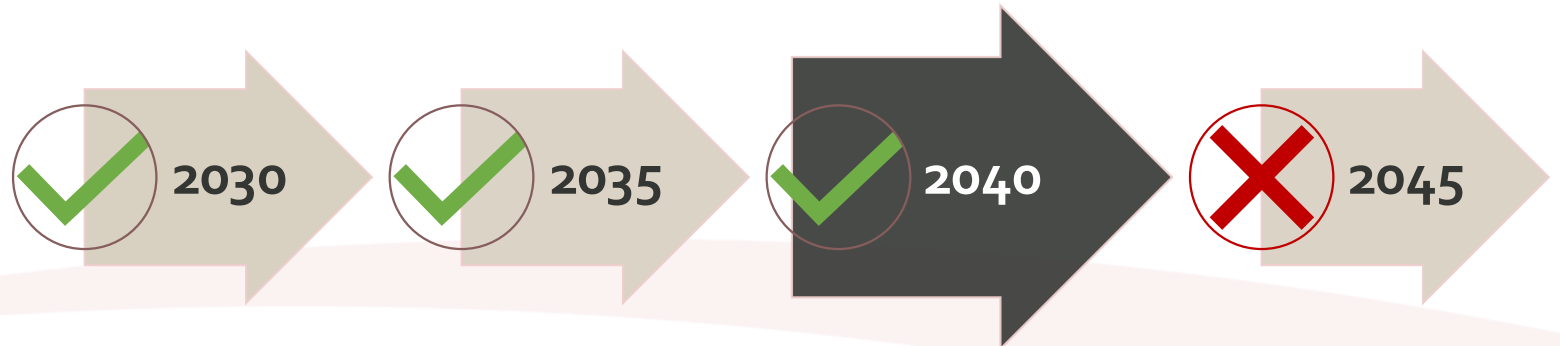
I-70 Traffic Operations (2035 AM Peak Period)

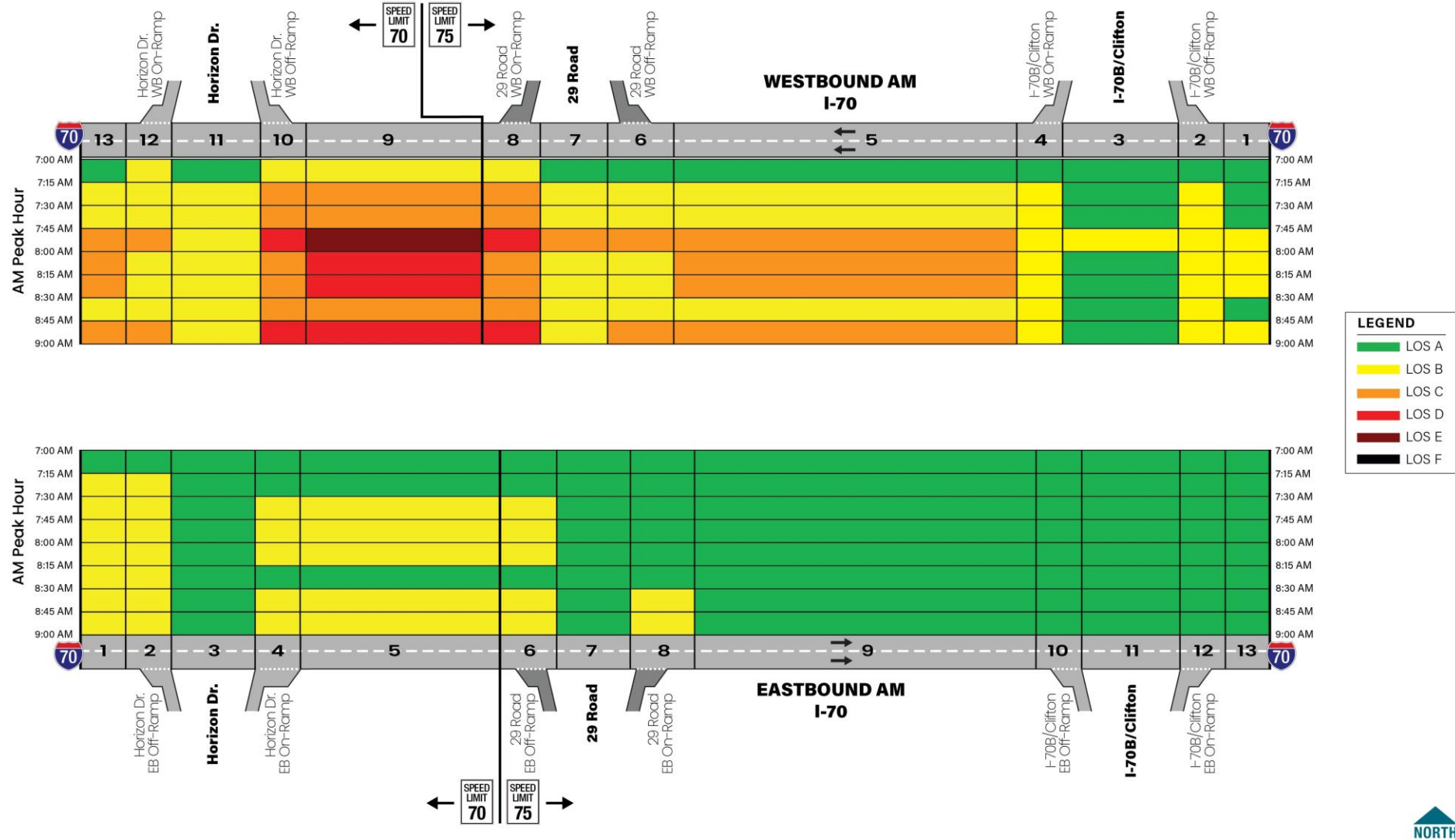


I-70 Traffic Operations(2035 PM Peak Period)

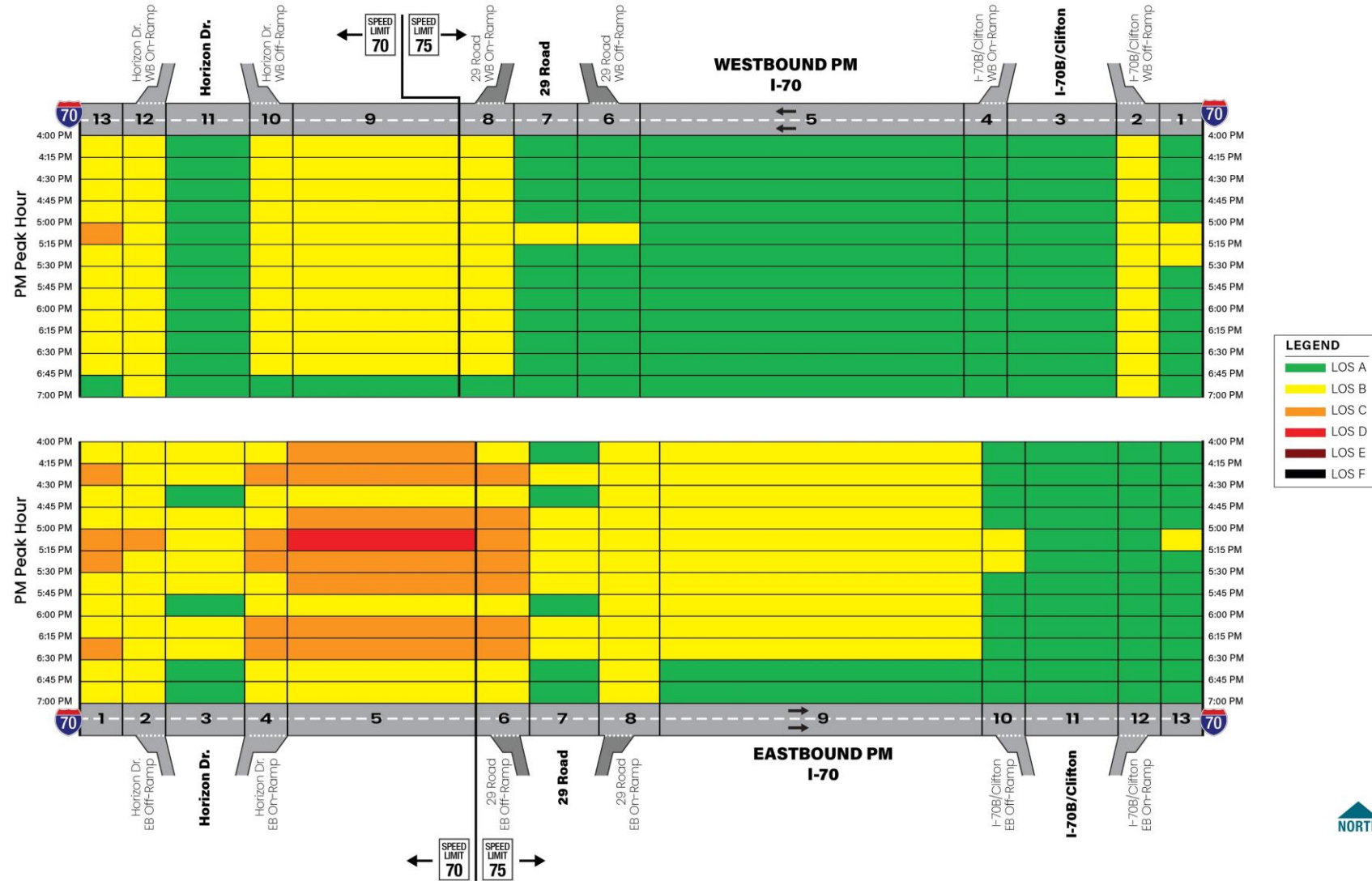
I-70 Traffic Mitigation: Year 2040

- ▶ Year 2040 Traffic Analysis
 - ▶ AM peak period:
 - ▶ Westbound: One 15-minute period at LOS E; remainder at LOS D or better. No mitigation required.
 - ▶ Eastbound: LOS B or better. No mitigation required.
 - ▶ PM peak period:
 - ▶ Westbound: LOS C or better. No mitigation required.
 - ▶ Eastbound: LOS D or better. No mitigation required.
- ▶ Mitigation not warranted in Year 2040 (but close)





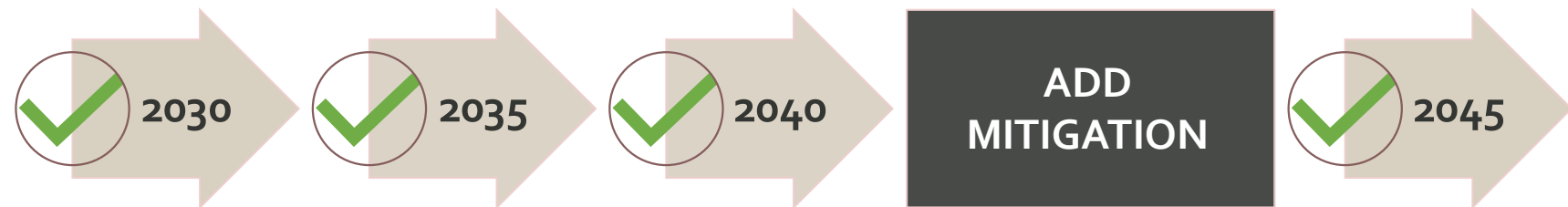
I-70 Traffic Operations (2040 AM Peak Period)



I-70 Traffic Operations (2040 PM Peak Period)

I-70 Traffic Mitigation: Timing Conclusion

- ▶ Analysis results:
 - ▶ Operations degrade over time based on increased volumes
 - ▶ Only one 15-minute period would fall below the acceptable threshold in 2040.
- ▶ Mitigations required in the long-range planning horizon would not be necessary until year 2040 or later.



Volume Threshold Analysis

Threshold Analysis: Background

- ▶ We know forecasts are just that – forecasts
 - ▶ Unforeseen events can significantly change future traffic estimates
- ▶ The previous analysis defined an I-70 mitigation timeframe
 - ▶ Need improvements between 2040 and 2045
- ▶ What if the forecasts are wrong?
 - ▶ Need a more practical metric to trigger mitigations

Threshold Analysis: Approach

- ▶ Goal: Define I-70 volume thresholds for improvements
 - ▶ Use existing freeway conditions (geometry, vehicle mix, etc.)
 - ▶ Examine effect of volume increases
- ▶ Methodology based on iterative HCS runs
 - ▶ Began with 2045 volumes (LOS F conditions)
 - ▶ Reduced mainline demand by 100 vehicles per hour until freeway LOS D reached
 - ▶ Reduced ramp volumes by 100 vehicles per hour until diverge LOS D reached

Threshold Analysis: Conclusion

- ▶ Analysis Results:
 - ▶ Westbound I-70 between 29 Road and Horizon Drive can operate acceptably at up to *3,500 vehicles per hour*
 - ▶ The westbound Horizon Drive exit ramp (diverge) can operate acceptably at up to *1,850 vehicles per hour*
- ▶ Recommendation:
 - ▶ Monitor I-70 westbound and Horizon drive exit ramp volumes until thresholds are reached
 - ▶ Begin design and construction of auxiliary lane and ramp widening when either threshold is reached.

TDM Requirements

CDOT Policy Directive 1601

TDM Requirements



"To preserve the overall functionality and operability of the state of Colorado's highway system, the applicant will implement traffic reduction or TDM strategies to preserve the long-term functionality of the constructed interchange improvement."



"The effectiveness of TDM strategies is highly dependent on the specific location, complementary strategies, the nature of the travel segment being targeted, and implementation and promotion"



"TDM requirements apply to urban and rural Type 1 and Type 2 interchange proposals. The proposed TDM improvements will be included for analysis in the Systems Level Study."

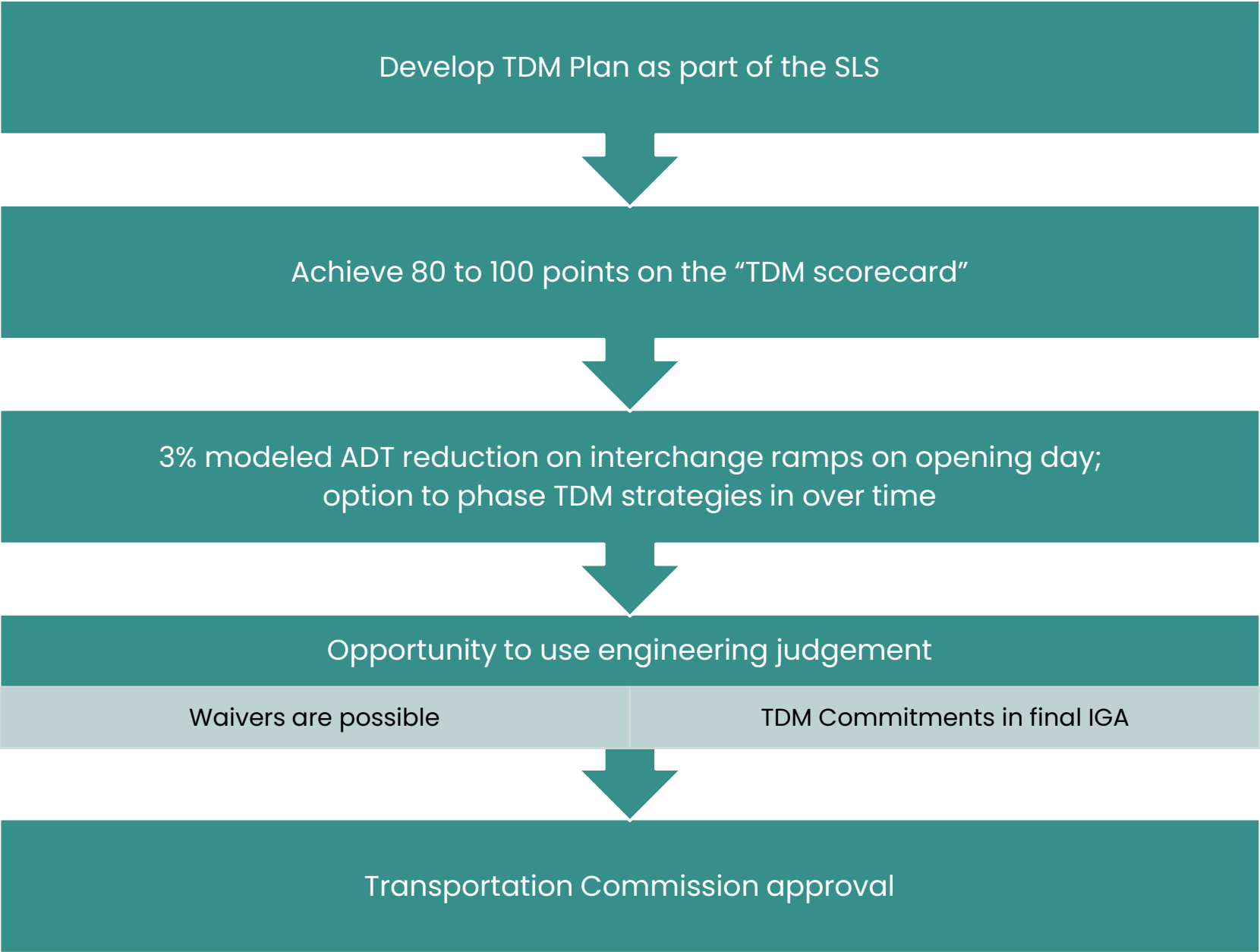
Interchange Designation

29 Road / I-70 Interchange Designation

Type 1
(new interchange on
interstate system)

Urban
(within RTPO)

1601 TDM Requirements



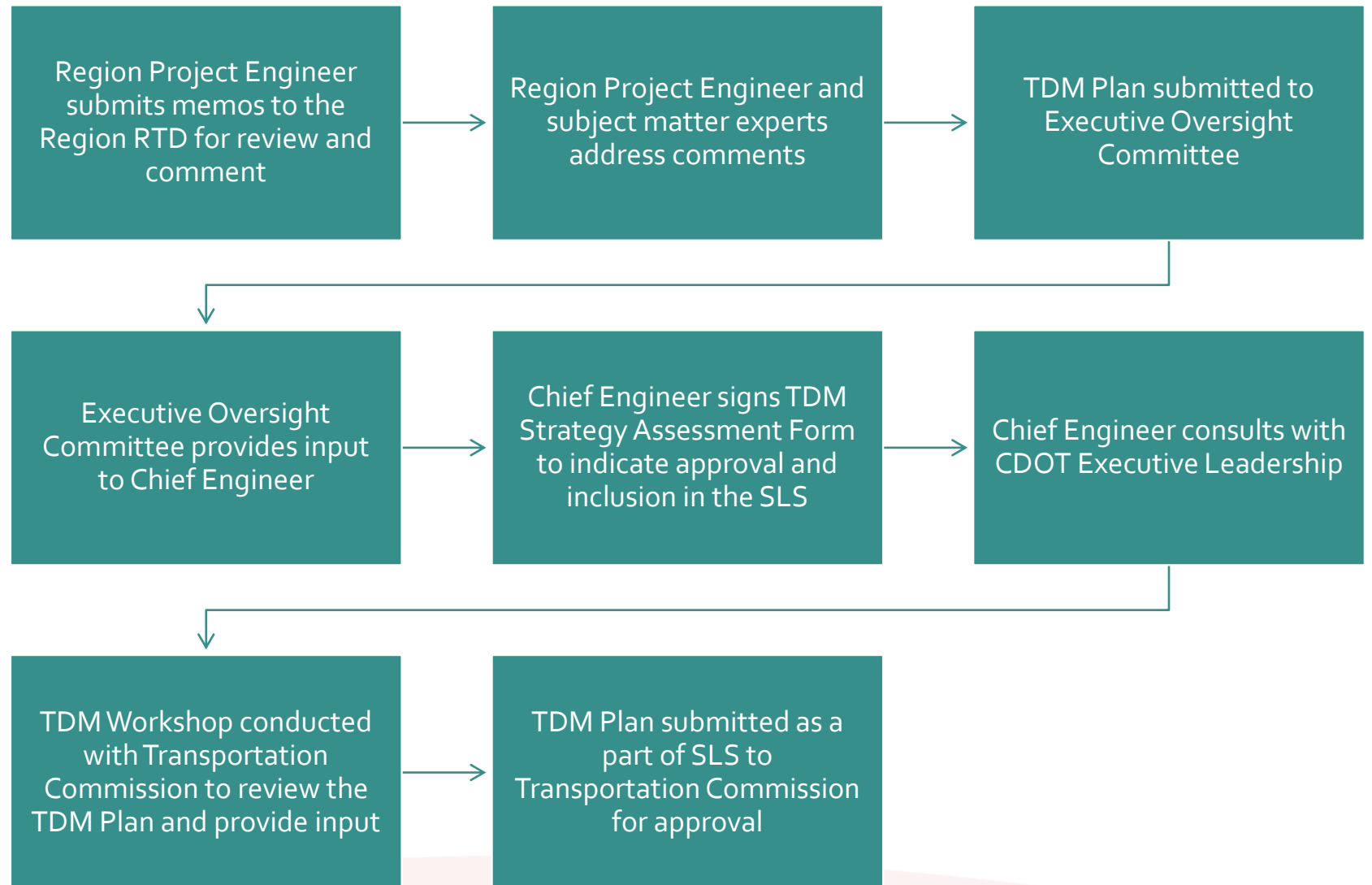
Evolving Process with CDOT

- ▶ CDOT 1601 TDM Manual updated October 2023
 - ▶ Creates Executive Oversight Committee (EOC)
 - ▶ Chief Engineer makes recommendation to Transportation Commission
 - ▶ EOC provides input to the Chief Engineer on TDM eligibility and exemption questions, preliminary approval of TDM strategies, final TDM Plan
 - ▶ CDOT region project manager, region staff, DTD, and OIM provide support and technical expertise

TDM Strategies & Evaluation Process

- ▶ Step 1. Develop Memo #1 – Existing Conditions and TDM Background
- ▶ Step 2. Develop Memo #2 – Potential TDM Strategies (can be combined with Memo #1 if desired)
- ▶ Step 3. Develop Memo #3 – TDM Strategies & TDM Strategies Assessment Form
- ▶ Step 4. CDOT Preliminary Approval of TDM Strategies
- ▶ Step 5. Finalize TDM Plan for inclusion in SLS
- ▶ Step 6. 1601 Approval Decision
- ▶ Step 7. Finalize the Operations and Maintenance IGA

TDM Strategies Evaluation & Approval Process



I-70/29 Road Interchange Ramp Volumes

- ▶ Forecasted 2030 (Opening Day) Ramp Volumes
 - ▶ 7,660 total ADT
 - ▶ 3% daily trip reduction requirement – 230 trips
- ▶ Forecasted 2035 Ramp Volumes if TDM strategies phased in over time
 - ▶ 12,455 total ADT
 - ▶ 3% daily trip reduction requirement – 374 trips

Recommendation – Implementation all TDM Strategies to support opening day

Potential I-70/29 Road TDM Strategies

- ▶ Mobility Hubs
- ▶ Intercity Transit
- ▶ Local Transit
- ▶ Shuttles, Feeders, & Paratransit
- ▶ Transit Service Upgrades
- ▶ Transit-Oriented Development
- ▶ Mixed-Use Development
- ▶ Bicycle & Pedestrian Facilities
- ▶ Park-and-Ride Lots
- ▶ Parking Management
- ▶ ITS
- ▶ School Pool Program
- ▶ Vanpool Program
- ▶ Regional Ridesharing Programs
- ▶ Transportation Management Organization Participation
- ▶ Event-Related TDM Program*
- ▶ Guaranteed Ride Home*
- ▶ Car-Sharing
- ▶ Modal Subsidies & Vouchers
- ▶ Other TDM Strategy



= Potential I-70/29 Road TDM Strategy

*Can only be used as a supporting strategy

Viable Strategies & Next Steps

- ▶ Initiate development of **Existing Conditions & TDM Background Memo** (Step 1)
 - ▶ Includes trip reduction goal
 - ▶ Development and land use map
 - ▶ Current TDM strategies serving the area
 - ▶ Recommendations from any TDM or Transit plans
- ▶ Develop **preliminary list of TDM strategies** with the most potential for the I-70/29 Road interchange
- ▶ RTPo coordination with DRCOG on methodology for calculating trip reductions for TDM strategies
- ▶ Review strategies and forecasted reductions with County/City and obtain commitment on strategies to advance to CDOT (Step 2)

Next Steps

Overall Project

- ▶ Complete Draft System Level Study
 - ▶ CDOT Transportation Commission Presentation
 - ▶ Complete NEPA Analysis
 - ▶ Public Meeting
- 

Traffic

- ▶ 29 Road & Patterson Road Intersection
 - ▶ Evaluate potential improvements
- ▶ Multimodal Considerations
 - ▶ Multimodal LOS analysis
 - ▶ Cycle track transitions
- ▶ Access Management
 - ▶ Finalize 29 Road Access Management
- ▶ Safety
 - ▶ Complete HSS evaluation (29 Road, I-70)
- ▶ Freeway Guide Signing
 - ▶ Develop proposed guide signing plan (latest MUTCD)

TDM

- ▶ Initiate development of Existing Conditions & TDM Background Memo (Step 1)
 - ▶ Includes trip reduction goal
 - ▶ Development and land use map
 - ▶ Current TDM strategies serving the area
 - ▶ Recommendations from any TDM or Transit plans
- ▶ Develop preliminary list of TDM strategies with the most potential for the I-70/29 Road interchange
- ▶ RTPo coordination with DRCOG on methodology for calculating trip reductions for TDM strategies
- ▶ Review strategies and forecasted reductions with County/City and obtain commitment on strategies to advance to CDOT (Step 2)

Design

- ▶ 29 Road Interchange
 - ▶ Refine Design Impacts for ROW, environmental impacts
- ▶ 29 Road Corridor
 - ▶ Finalize design alternatives
- ▶ 29 Road & Patterson Road Intersection
 - ▶ Finalize Intersection Alternatives
- ▶ Public Meeting Exhibits

NEPA

- ▶ NEPA Kick-off/Scoping Meeting held on November 27, 2023
 - ▶ Initial field work for existing conditions completed in May 2023
 - ▶ Resources reviewed including Environmental Justice (EJ), biological resources, historic, noise, and hazardous materials among others
 - ▶ Wetlands are present on the southern end of the 29 Road corridor along Indian Wash
 - ▶ The Government High Line Canal could be a historic hurdle.
 - ▶ No EJ communities are present with the presumed study area.

Schedule

▶ February / March

- ▶ Advance Conceptual Design (Interchange / 29 Road)
- ▶ Complete SLS Documentation
- ▶ Complete NEPA documentation
- ▶ TDM Analysis—Identification of methodology/scorecard
- ▶ Traffic Analysis—29 Road / Patterson intersection; safety

▶ March / April

- ▶ CDOT TC Workshop (TC Vote in May)
- ▶ Public Meeting
- ▶ Review/Revisions of SLS Documentation
- ▶ Initial review of NEPA Documentation

Schedule

Thanks!