

# Operating a Smarter Detour

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**Using Collaboration, Planning and Technology**

*Tom Hartmann, P.E., PTOE*

*July 23<sup>rd</sup>, 2019*

# Overview

- Great example of collaboration between agencies and project stakeholders
- Minimized delay and disruption to motorists during significant construction closures
- Leveraged
  - Information sharing
  - Big Data
  - Coordinated signal systems
  - Traffic management centers

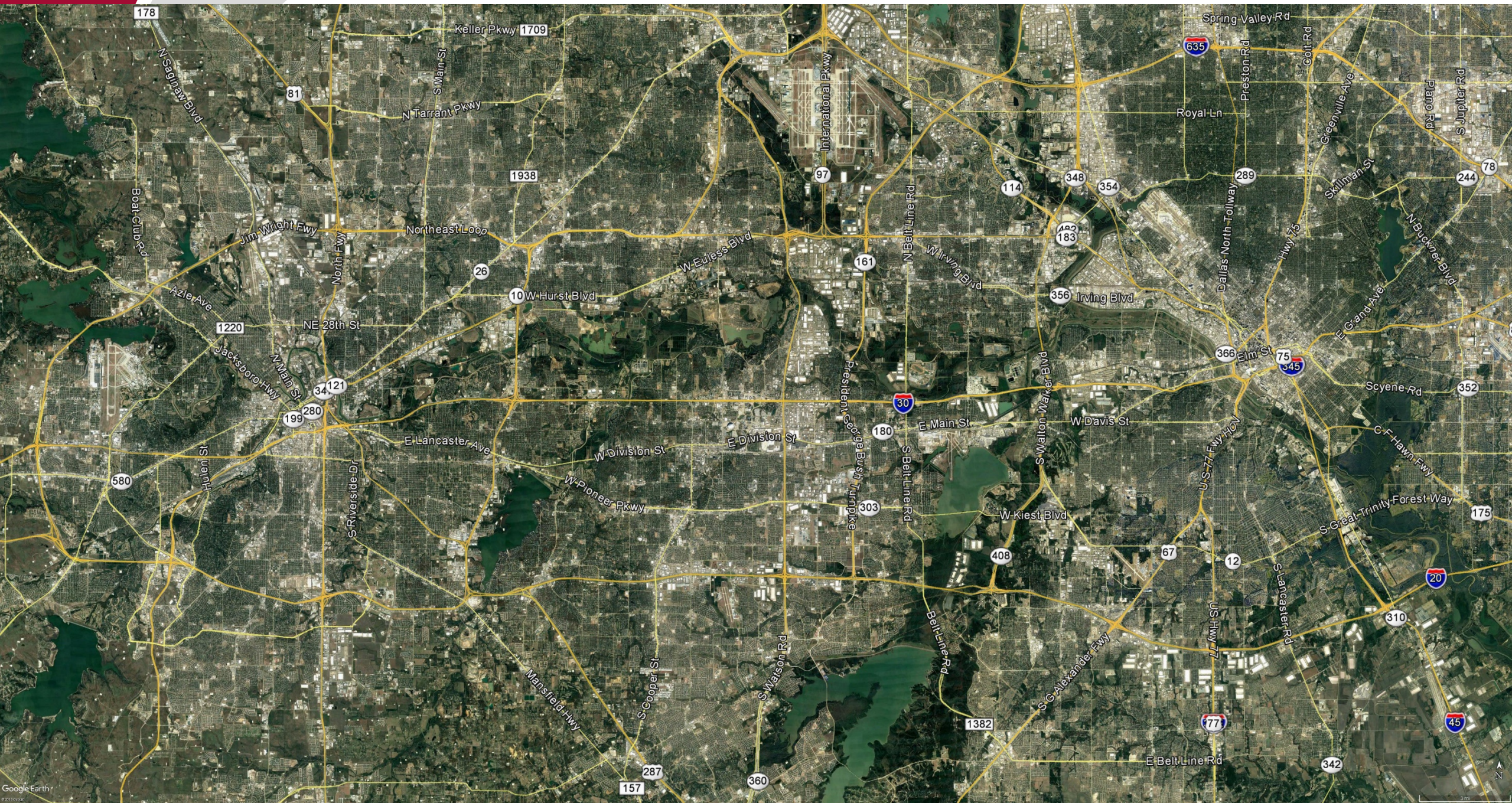
# Background













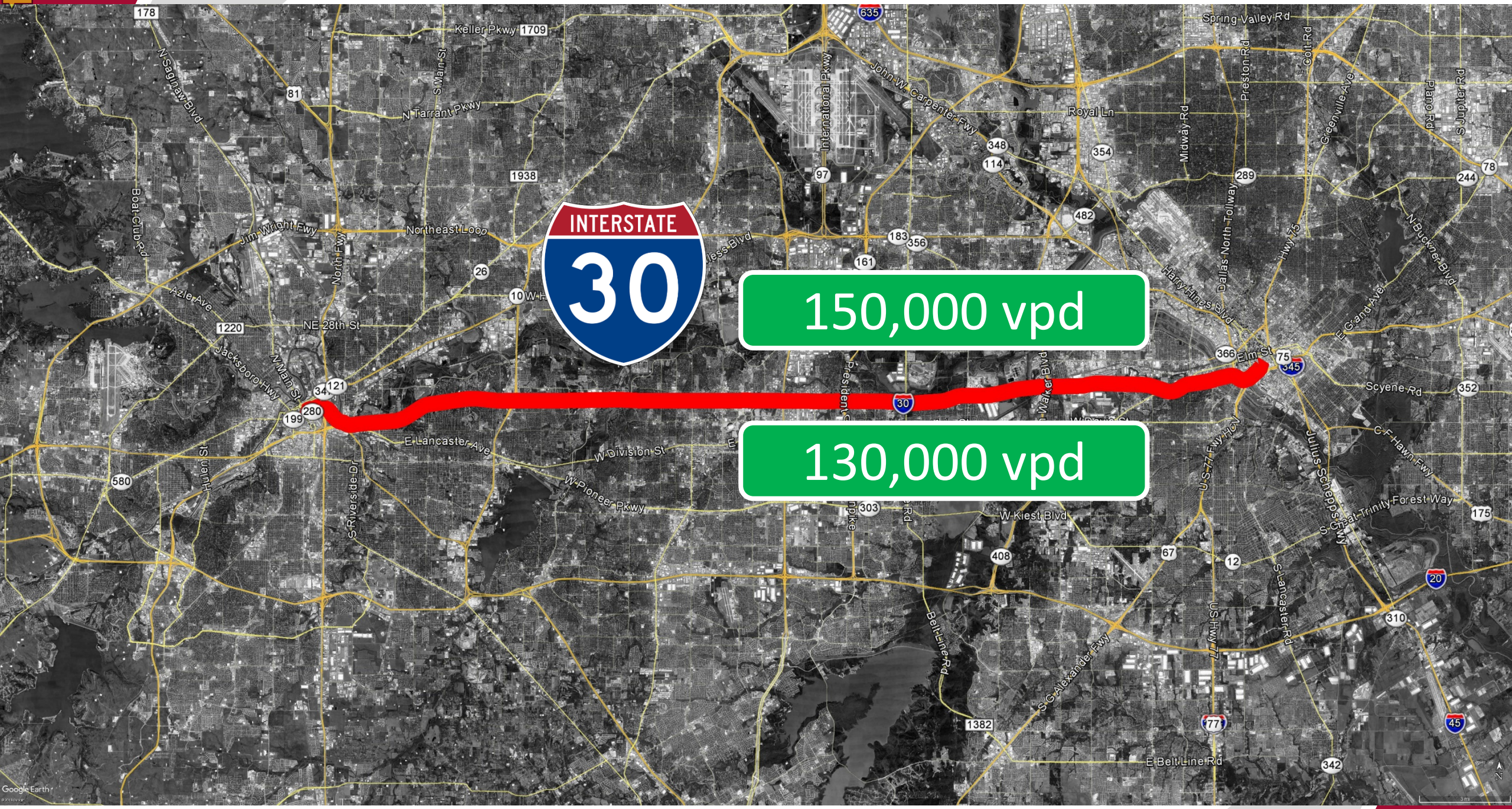






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# Initial Plan



# Initial Plan

- Night-time closures
- One direction at a time
- Not a major undertaking
- Single weekend plan for each direction would be developed

# That would be a boring presentation





# A New Twist

- Project Engineering and Construction
  - Incentives tied to schedule

1  
direction  
overnight



# Challenges

- Coordination
- Construction schedules
- Weather
- Trains
- Normal high-volume weekend traffic
- Existing signal coordination
- Many local and regional events



Let's Close I-



# Back to the Drawing Board

1. Planning
2. Advance Coordination
3. Day of Operations
4. After



# Planning

- 6 closures planned
  - First – November 9-11, 2018
- Detour routes
- Diversion timing plans
- Temporary traffic control

# City Systems



- TACTICS Central System
- Communications to detour signals
- Video surveillance



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36 intersections

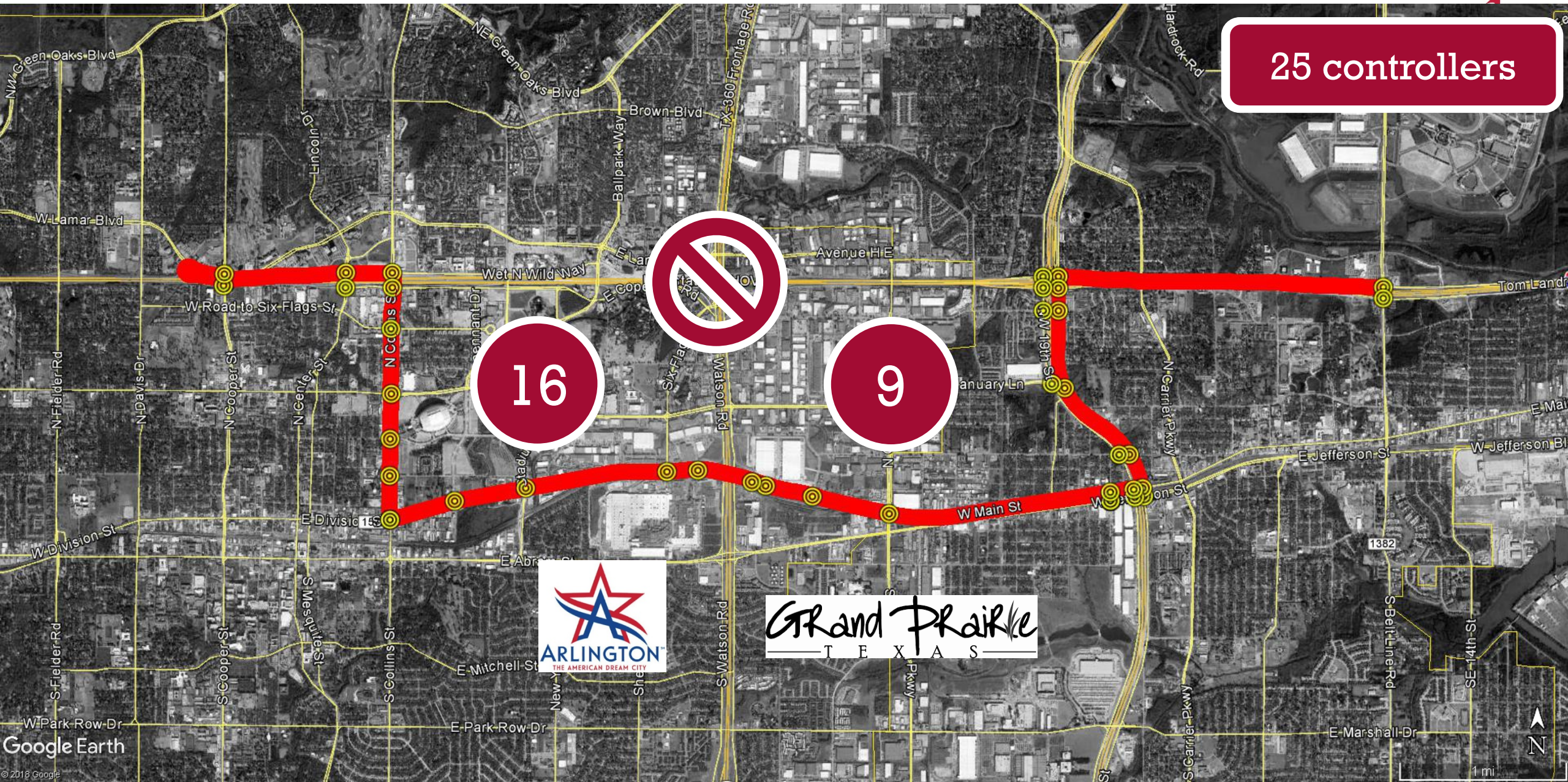


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25 controllers



16

9



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Google Earth

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2 box diamonds



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5 diamonds



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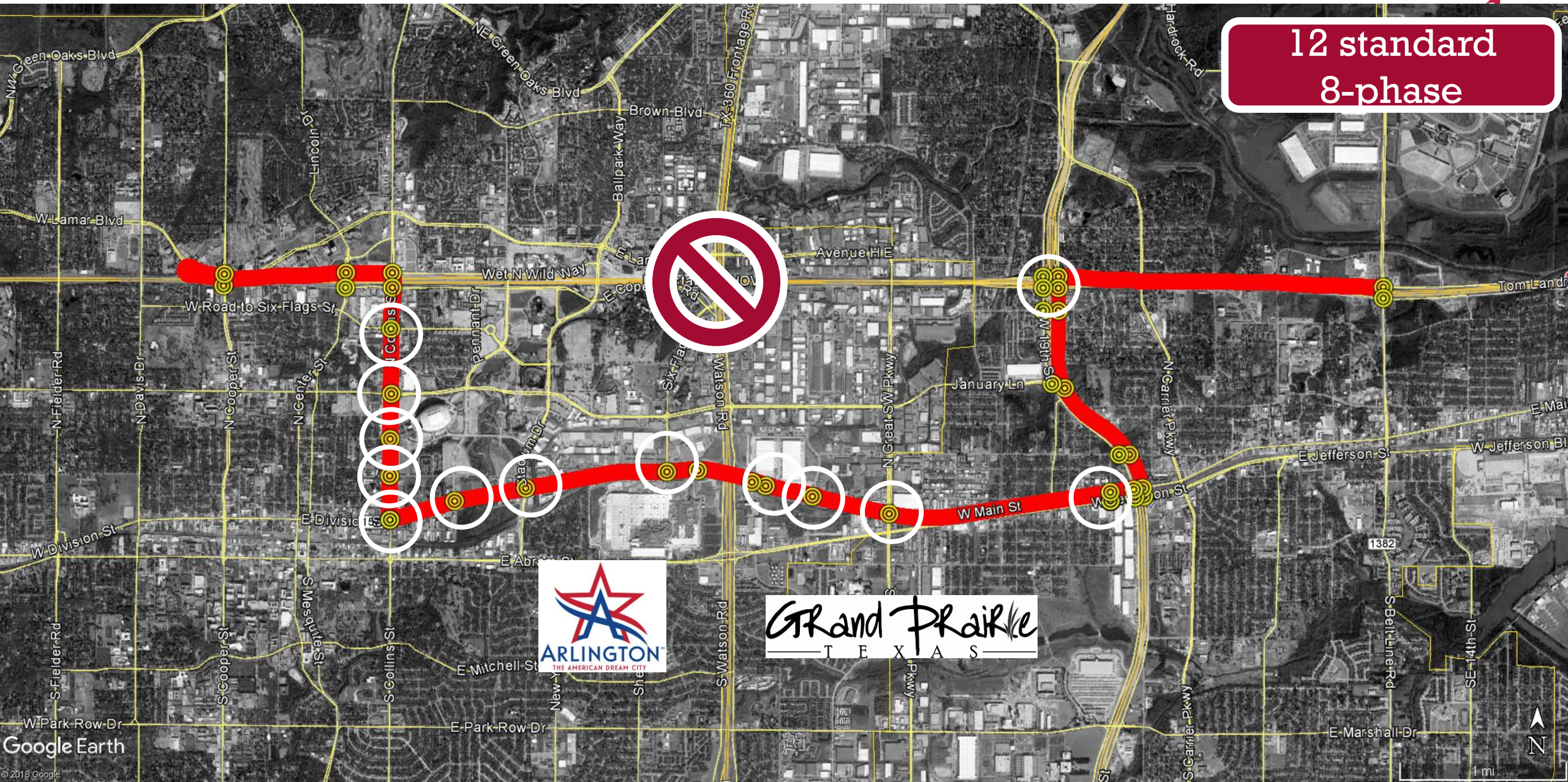
1 partial  
cloverleaf



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12 standard  
8-phase







# Development of New Timing Plans

- 1,500 vph was routed eastbound and westbound through the modeled detour network
- All available capacity was shifted to the detour movements.
- Provided equally dispersed capacity for detouring traffic

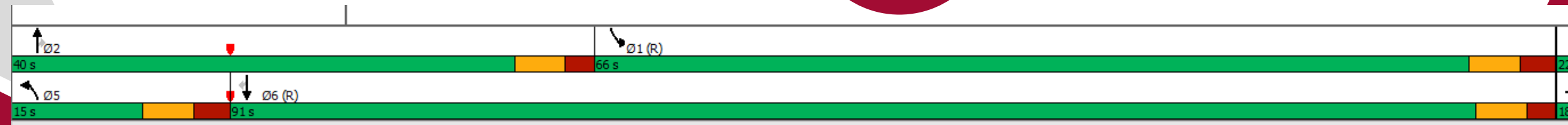
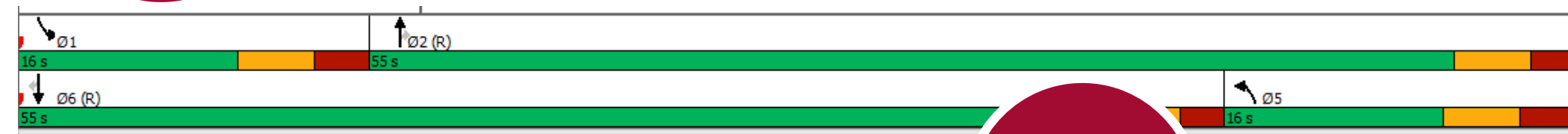
# Development of New Timing Plans

16 s

120 seconds

66 s

150 seconds





# Pre-Prepared Timing Plans

- Recognized unknowns (such as impact of SH 360 traffic and magnitude of diverting traffic)
- Initial late-night implementation on non-event date
- Rather than setting up a schedule, plans were implemented and changed as needed based on observed conditions

Late Night 120

Late Night 150

Weekend 150

# Recommended Improvements for Enhanced Intersection Operations

- Recommended coordinating with NTTA to make use of SH 161 direct connectors to and from IH 30
- Recommended temporary lane assignments and channelization to improve intersection operations
- Use of dynamic lane assignment signs (creating dual left-turns at critical locations)
  - Use of variable message signs (convey information to motorists)
  - Use of cones for lane closures and channelization, to convert signalized or yield-controlled right-turns at critical intersections to “Free Rights”, and to guide traffic into desired lanes in advance of modified intersections.
- Modified signing and pavement markings
- Minor improvements to curbs and medians to better facilitate heavy left-turn movements

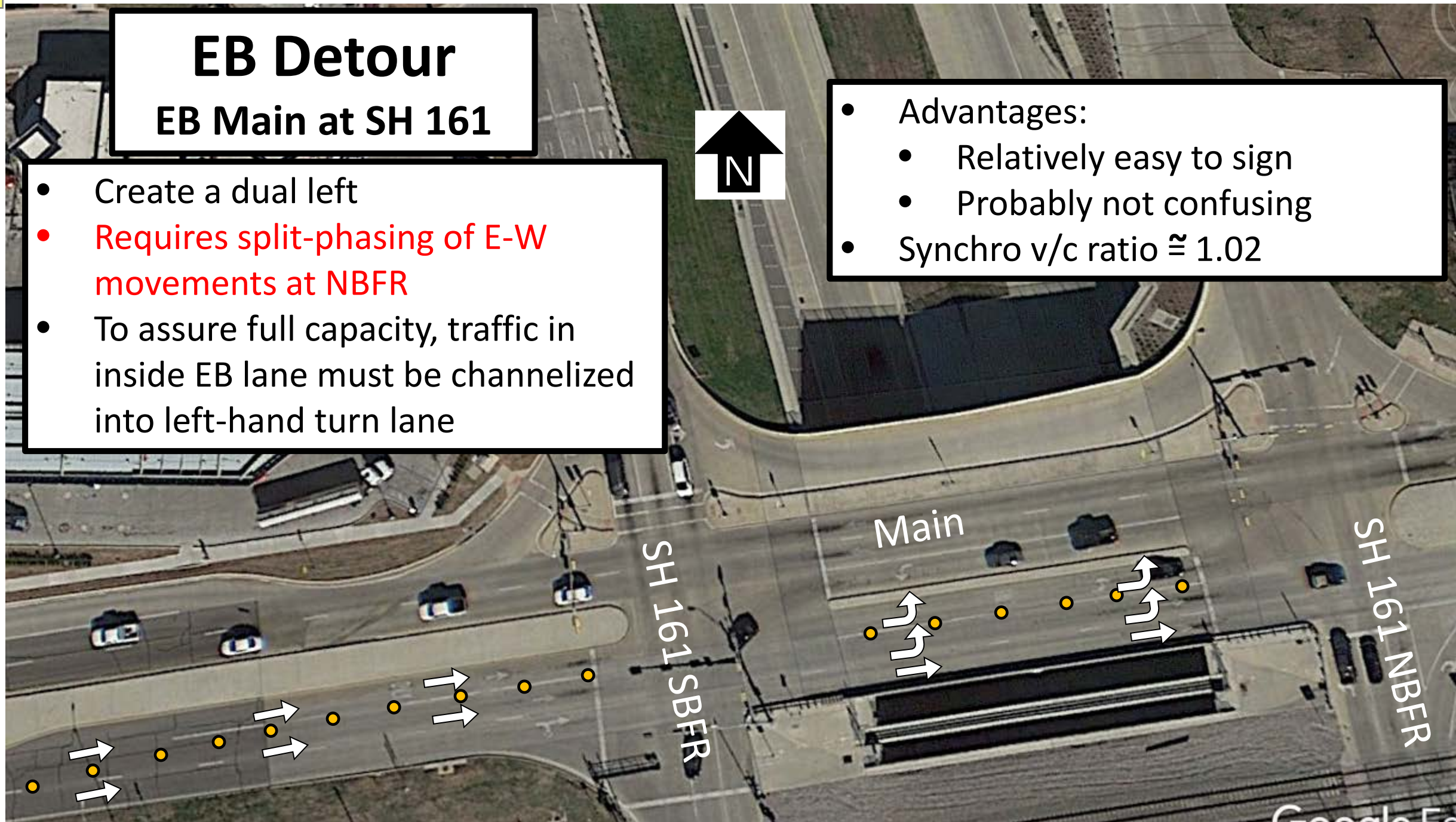
# EB Detour

## EB Main at SH 161

- Create a dual left
- Requires split-phasing of E-W movements at NBFR
- To assure full capacity, traffic in inside EB lane must be channelized into left-hand turn lane



- Advantages:
  - Relatively easy to sign
  - Probably not confusing
  - Synchro v/c ratio  $\approx 1.02$



# Advance Coordination

- Involve all stakeholders
- Schedule around events
- Advance notice to discourage drivers



# Stakeholders



North Central Texas  
Council of Governments



Grand Prairie  
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Source: [NBCDFW.com](https://www.nbcdfw.com)







# Traditional Media



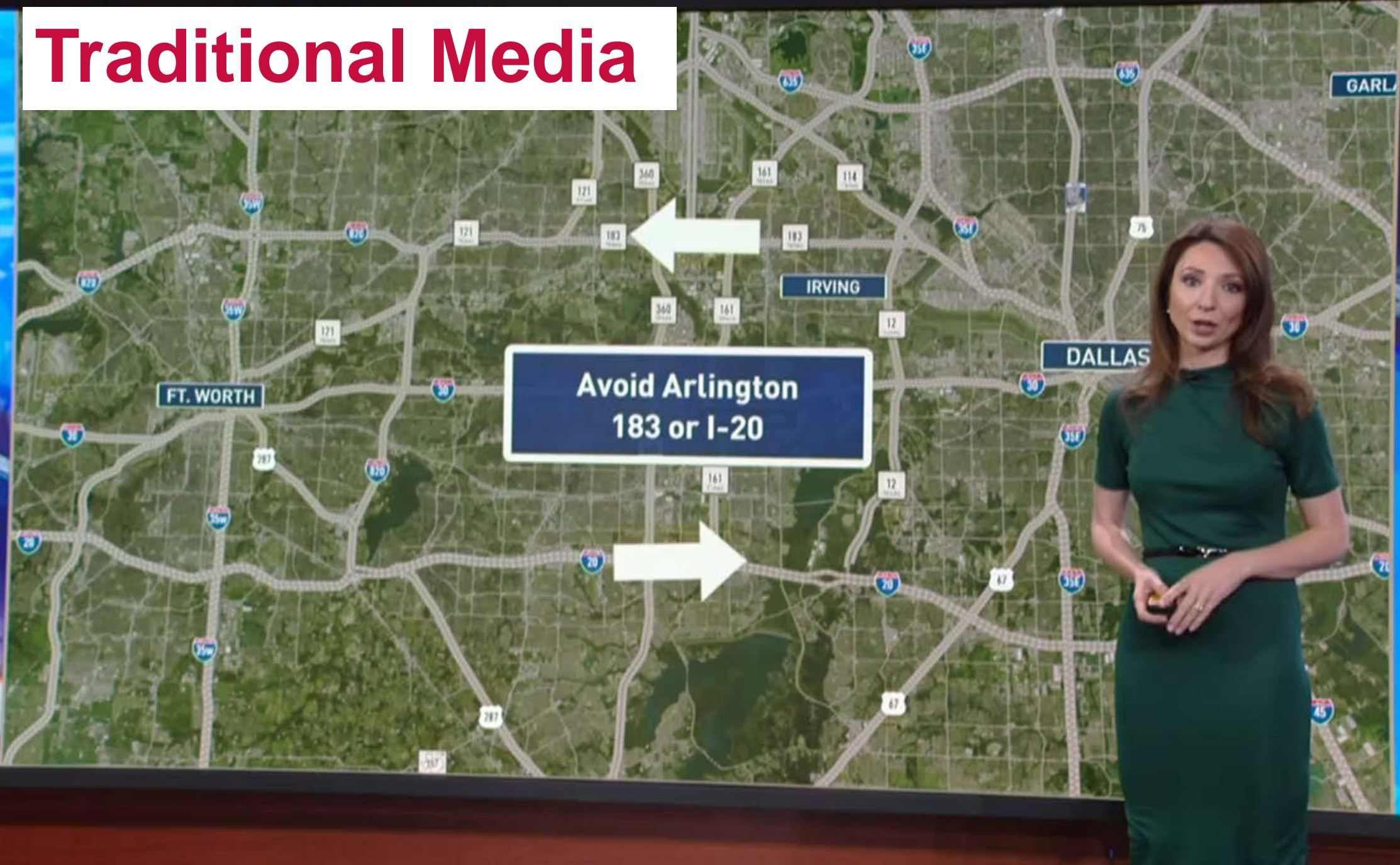


# Traditional Media





# Traditional Media



TEXAS CONNECTS US • TEXAS

TEXAS CONNECTS US • TEXAS





WFAA

@wfaa

Following

I-30 in Arlington and Grand Prairie to be closed all weekend [bit.ly/2QwYlvx](https://bit.ly/2QwYlvx)



9:45 AM - 10 Nov 2018

4 Retweets 3 Likes



4

3



Social Media





Texas Rangers ✓

@Rangers

Following



Coming to [@tx\\_live](#) for weekend 🏈 games?

Reminder that I-30 between FM 157/Collins St & PGBT will be closed thru Sunday for a bridge removal. Detours are available through Arlington & Grand Prairie for alternate access.



12:00 PM - 10 Nov 2018

19 Retweets 66 Likes



2



19



66



# Social Media

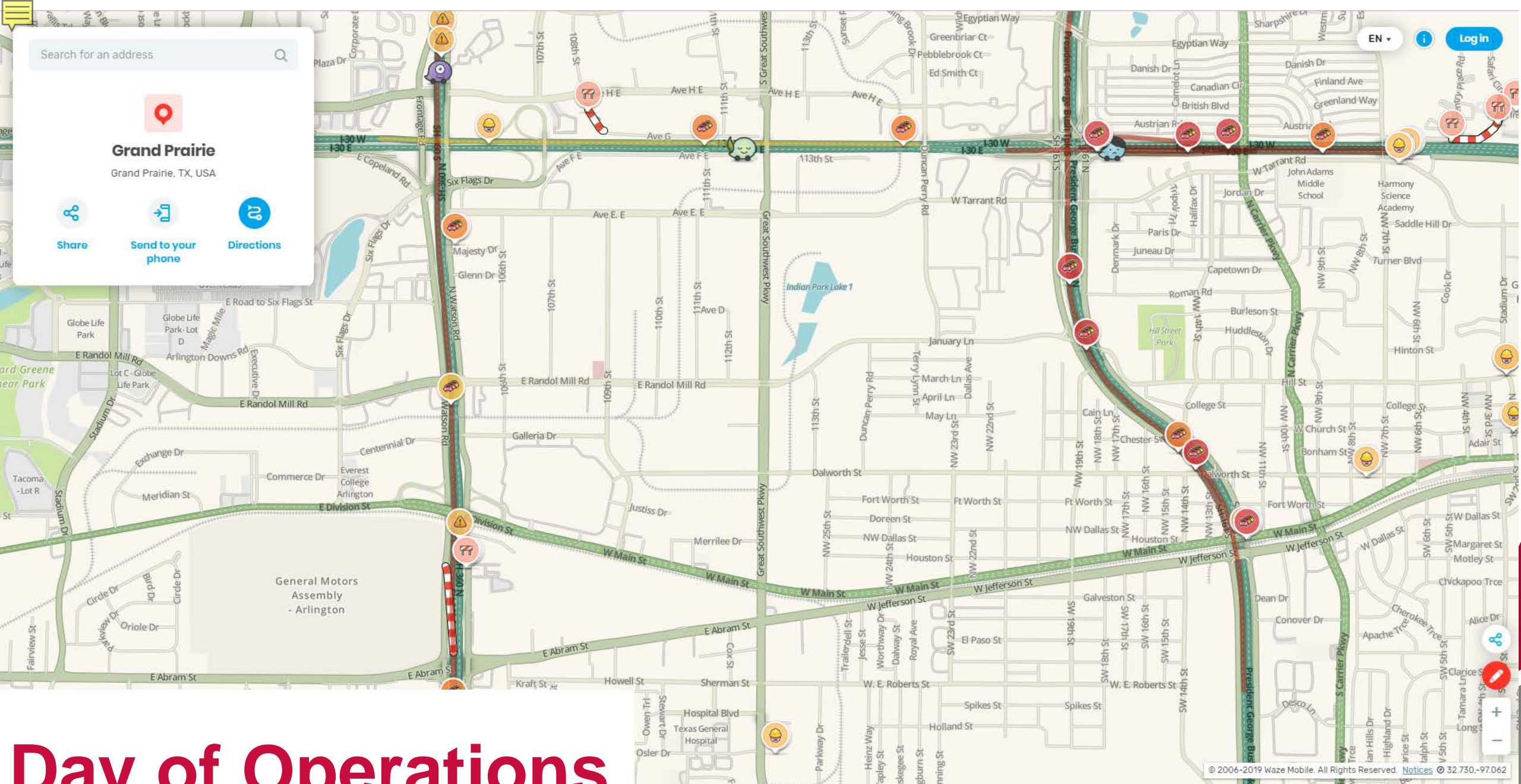




# Day of Operations

- First of 6 closures took place on November 9-11, 2018.
- Signal Timing Plans were activated and monitored from Arlington and Grand Prairie TMC's.
  - Both Kimley-Horn and City Staff
  - Friday evening into early Saturday morning
  - 8:00 AM Saturday until IH 30 was reopened (~7:30 PM Saturday)
- Vehicles choosing to follow the marked detour was significantly less than anticipated.
- Almost all intersections and detour elements monitored at TMCs via cameras.
- TMCs provided insight and recommendations to Contractor and PD personnel on the street
  - Real-time adjustments
  - Documented for future use
  - Real-time updates into the WAZE system.
- NCTCOG and TTI collected field data during the closure
  - Relative increases in traffic along the detour and other adjacent routes
  - Travel-time data along the detour route.





# Day of Operations





I-20 AND LAKE RIDGE 11-10-2018 12:25:01 AM



ARKANSAS AT ROBINSON 11-10-2018 12:24:54 AM



SE 14TH AND JEFFERSON 11-10-2018 12:24:53 AM



9TH AND MAIN 11-10-2018 12:25:01 AM



I-20 AND E 8TH 11-10-2018 12:25:02 AM



GSE AND SHERMAN 11-10-2018 12:24:51 AM



BELT LINE AND JEFFERSON 11-10-18 12:24:54 AM



CARRIER AT JEFFERSON 11-10-2018 12:24:56 AM



SH 161 SBFR 11/10/18 12:24:54 AM



JEFFERSON / SH 161 NBFR 11/10/18 12:24:54 AM





MAIN / SH 161 SBFR  
11/10/18 12:29:42 AM



# Results



# Early Finish



- Scheduled to be closed until 5 a.m. Monday
- Reopened just after 7 p.m. Saturday



# Qualitative Observations

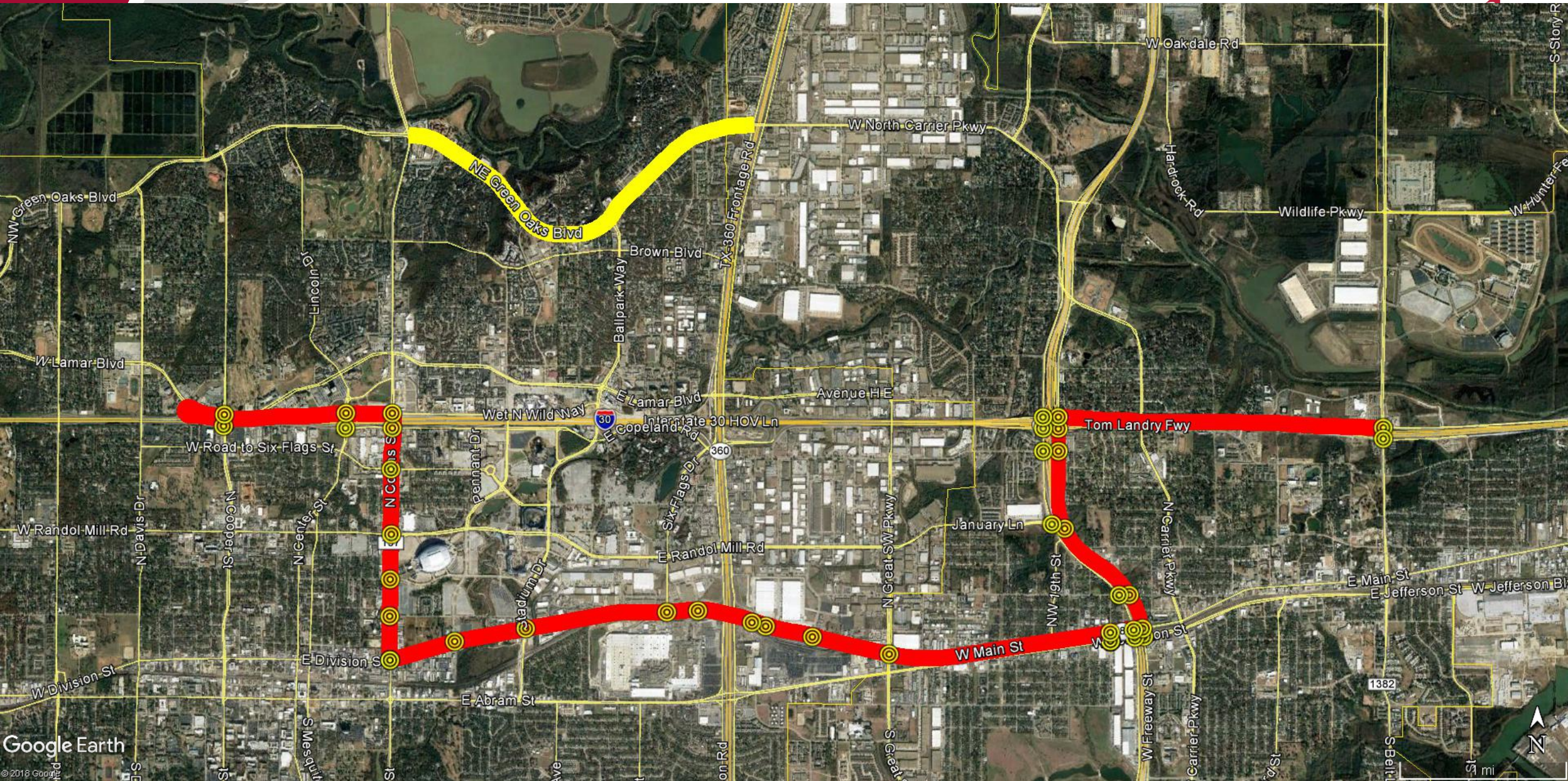
- Hugely successful
- Advance notice very effective
- Drivers not fully adhering to detour routes
- NO ISSUES OBSERVED



# Quantitative Observations

- NCTCOG used crowd-sourced data from anonymized cell network data
- Only 2 routes had travel time increases >5% during closure compared to typical Saturday in November
  - EB Green Oaks Blvd from Collins Street to SH 360
  - WB Green Oaks Blvd from SH 360 to Collins Street
- Showed that advertising/operations/monitoring were very successful
- Perhaps target Green Oaks for additional timing next time







# Lessons Learned



# Lessons Learned

- Process valuable for a detour of this magnitude
- Regular application throughout Texas recommended
- Preparation, preparation, preparation
  - Develop and implement timing before hand
- Communications
  - Stakeholders (early and often)
  - Public
- Work with partners
- Demand management was crucial
- Leverage Big Data
- Leverage modern systems
  - Real-time adjustment
  - Monitoring capabilities



# Contact Information

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