Congestion Management Process Update

Surface Transportation Technical Committee Workshop

May 28, 2021

Michael Bils and Natalie Bettger

North Central Texas Council of Governments

CMP Overview

One of five federally-mandated planning documents
(MTP, TIP, UPWP, Public Participation Plan, CMP)

Required for urbanized areas with populations exceeding 200,000 (also known as Transportation Management Areas "TMA")

First enacted under ISTEA (1991) as Congestion Management System (CMS)

- 1994: First regional CMS adopted by Regional Transportation Council
- 2005: CMS amended via MTP Update
- 2007: CMS renamed CMP by SAFETEA-LU (2007)
- 2013: Most recent update of CMP for NCTCOG

Why Do We Need Such a Process?

- Manage Travel Demands
- Reduce Single Occupancy Vehicle Travel
- Improve Efficiency of Transportation System
- Maximize Transportation Funds
- Justify Additional Capacity is Needed
- Coordinate with Regional Partners

Currently focused on limited access facilities.

MTP/Conformity

- Long-term (breakout by 5-to-10-year increments)
- System-Level/Modal Approach: Prioritize Corridors (stated categorizing – asset optimization, major roadway recommendations, roadway corridor for future evaluation)(performance criteria and roadway/transit assets)
- Identify high-level capacity needs to meet corridor demand and strategies as programs

CMP

- Short-term (ops and demand reduction focus)
- System-Level/Corridor Approach: Identify corridors' deficiencies (performance criteria and roadway, modal and operational assets)
- Identify possible strategies (infrastructure, modal, ops and demand reductions) to resolve corridor deficiency

if cannot meet financial constraint or other corridor constraints that restrict capacity

if cannot meet need through ops and demand strategies alone

Feasibility / Corridor Study / NEPA

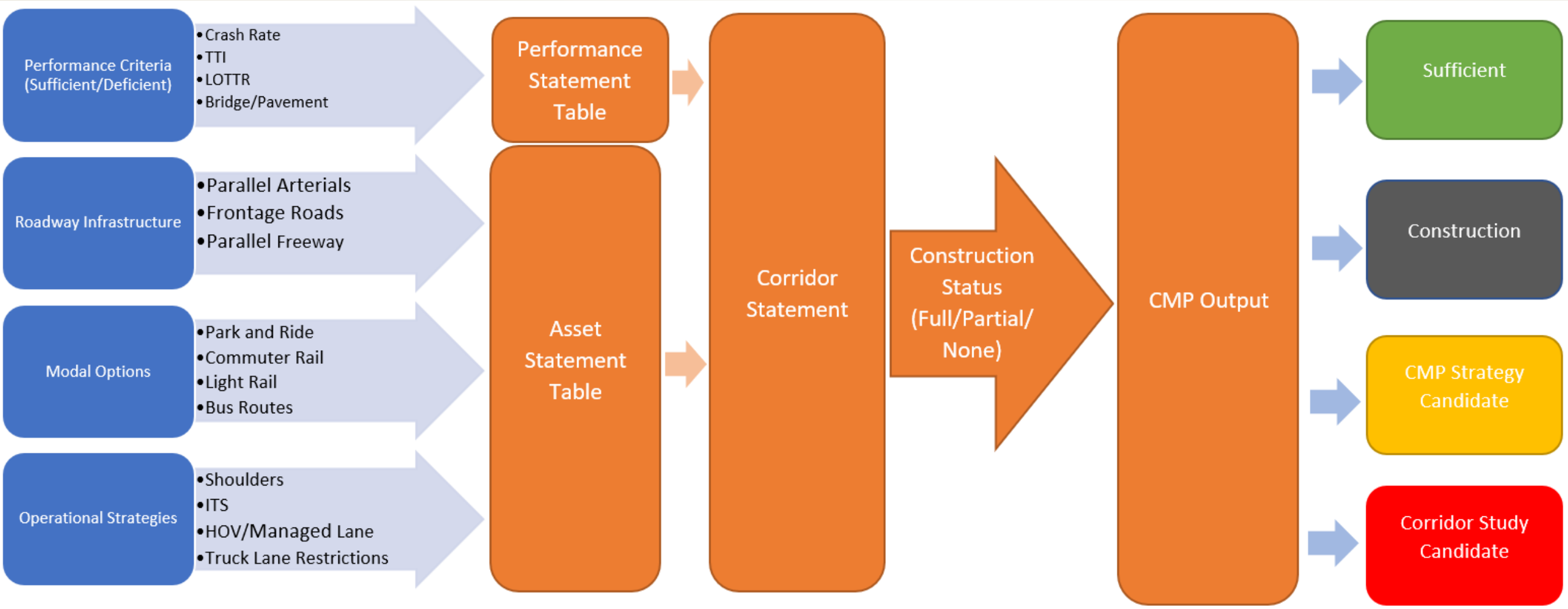
Asset Optimization
Mid-Term Corridor-Level: Identify detailed corridors roadway and other modal design needs.
Identify detailed corridor needs, staging, and design elements.

if can meet need through ops and demand strategies

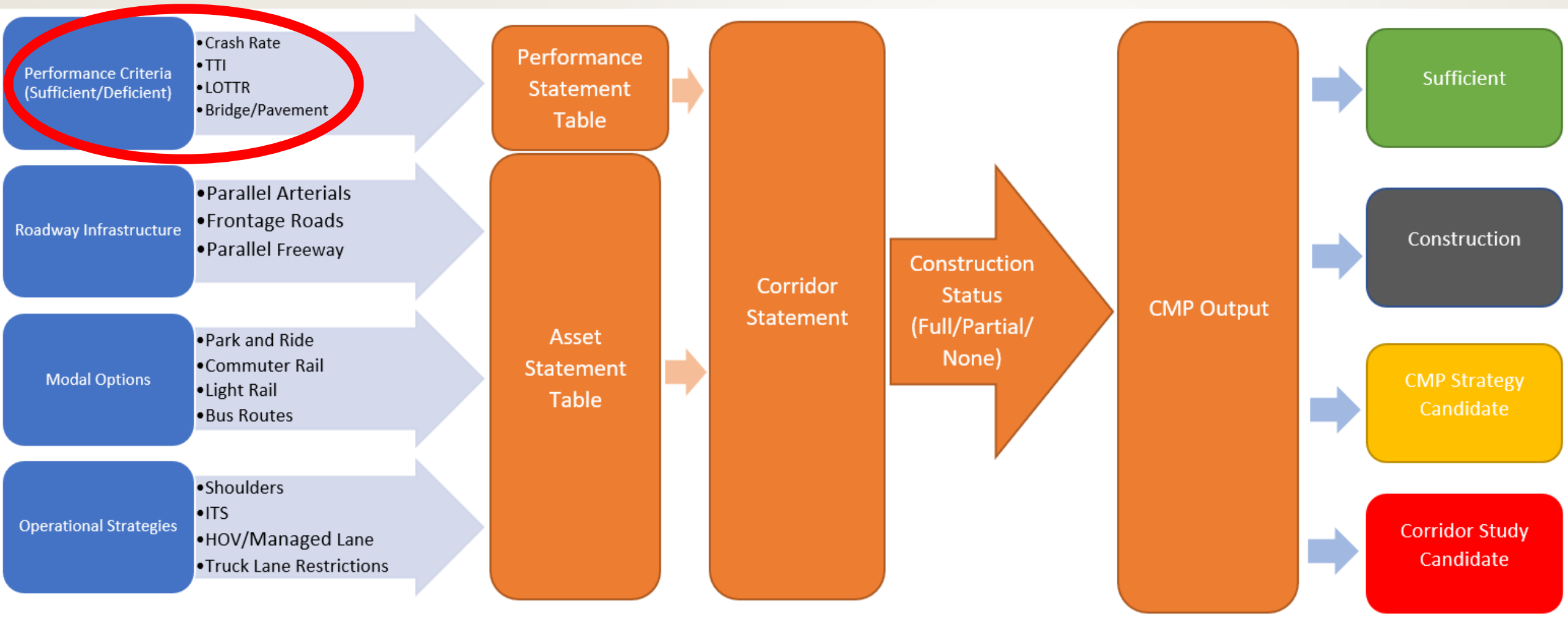
SOV Analysis/CMP Form/ Corridor Commitments

TIP/Conformity
Project Implementation

Congestion Management Process Flow



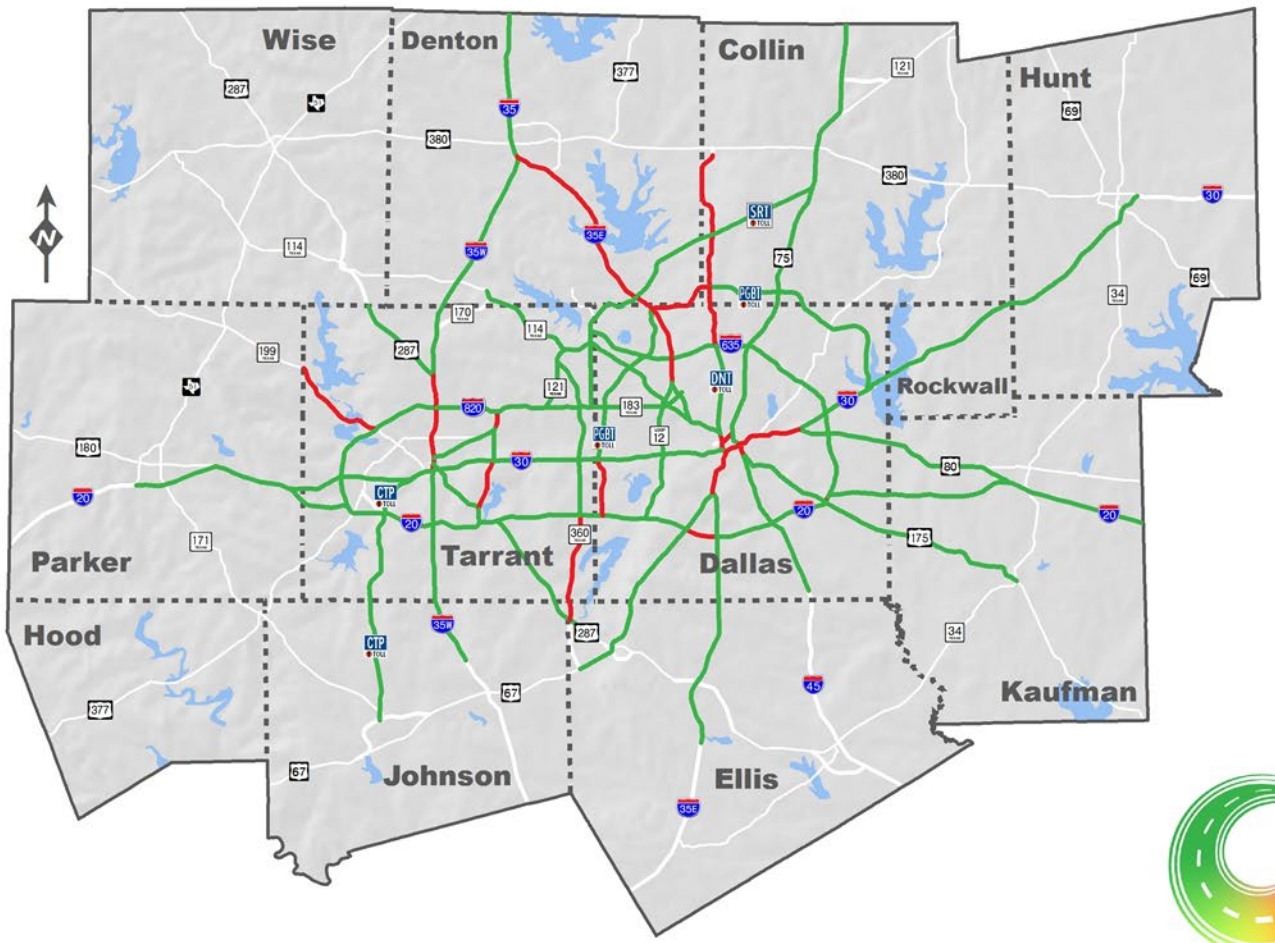
Performance Measures



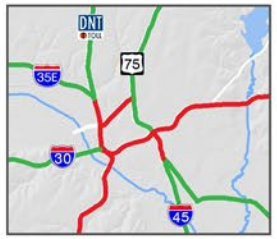
Crash Rate

Crash Rate Per 100 Million VMT

- <102 (101)
- >102 (25)



Dallas CBD



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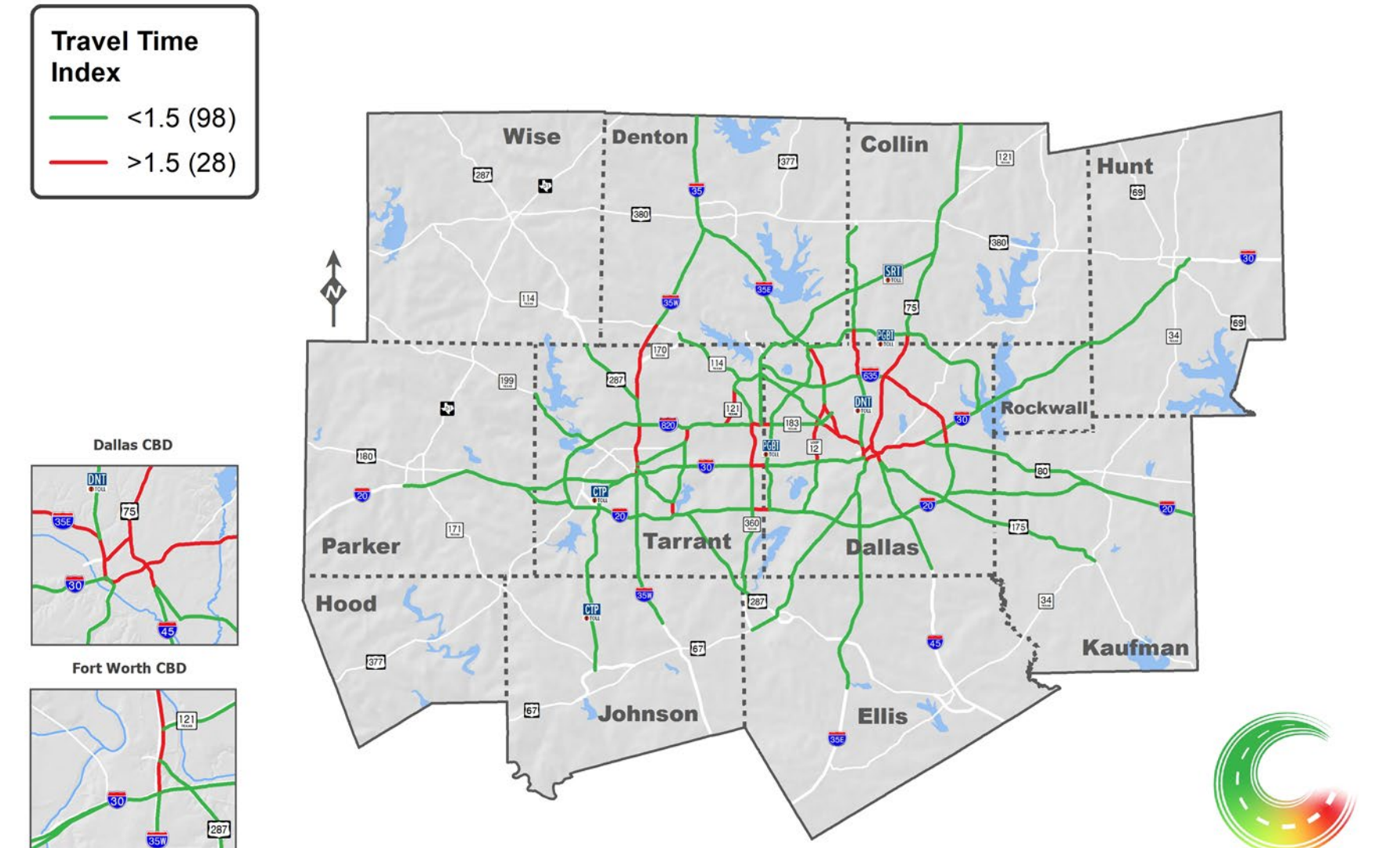
Travel Time Index



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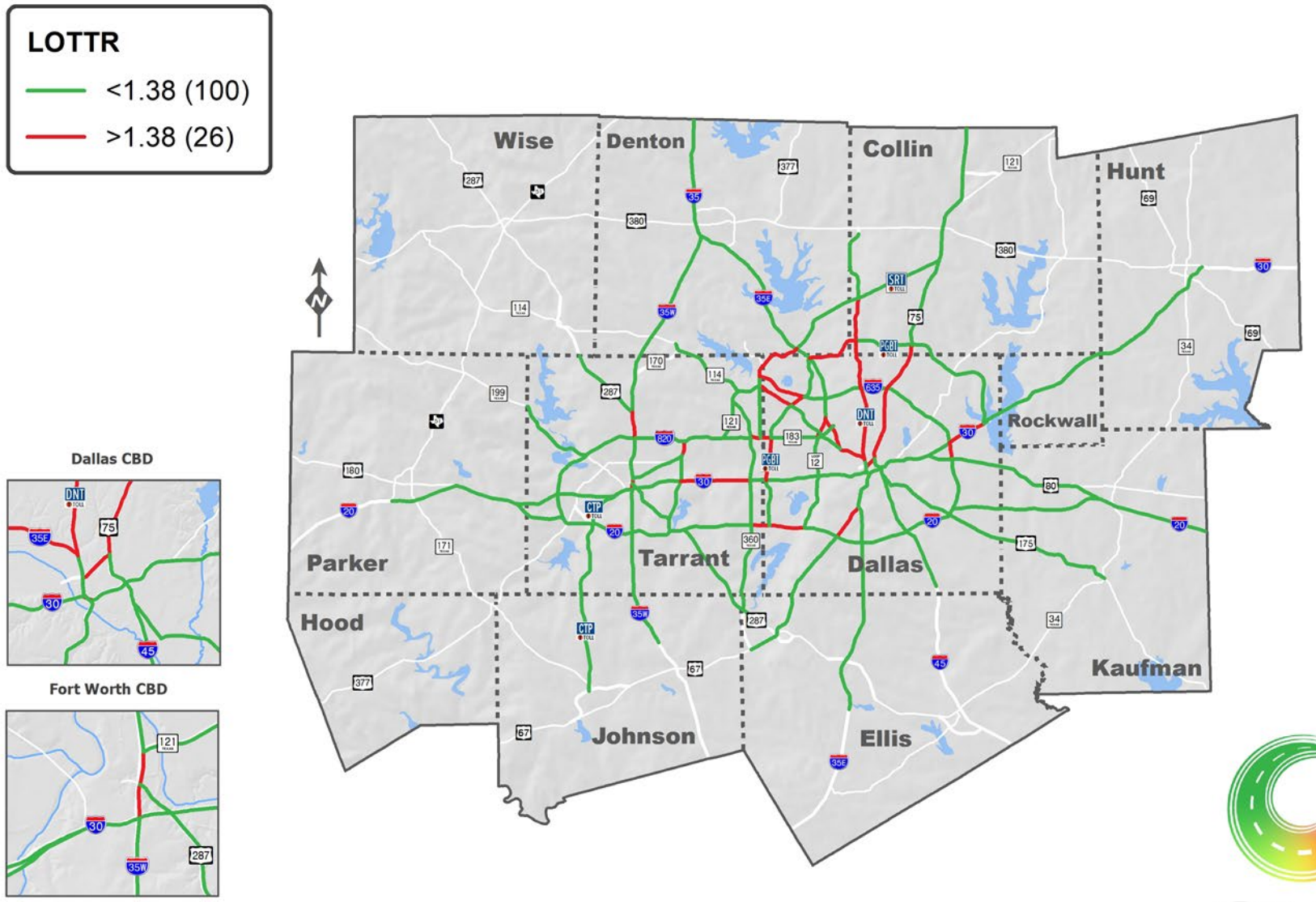
Level of Travel Time Reliability



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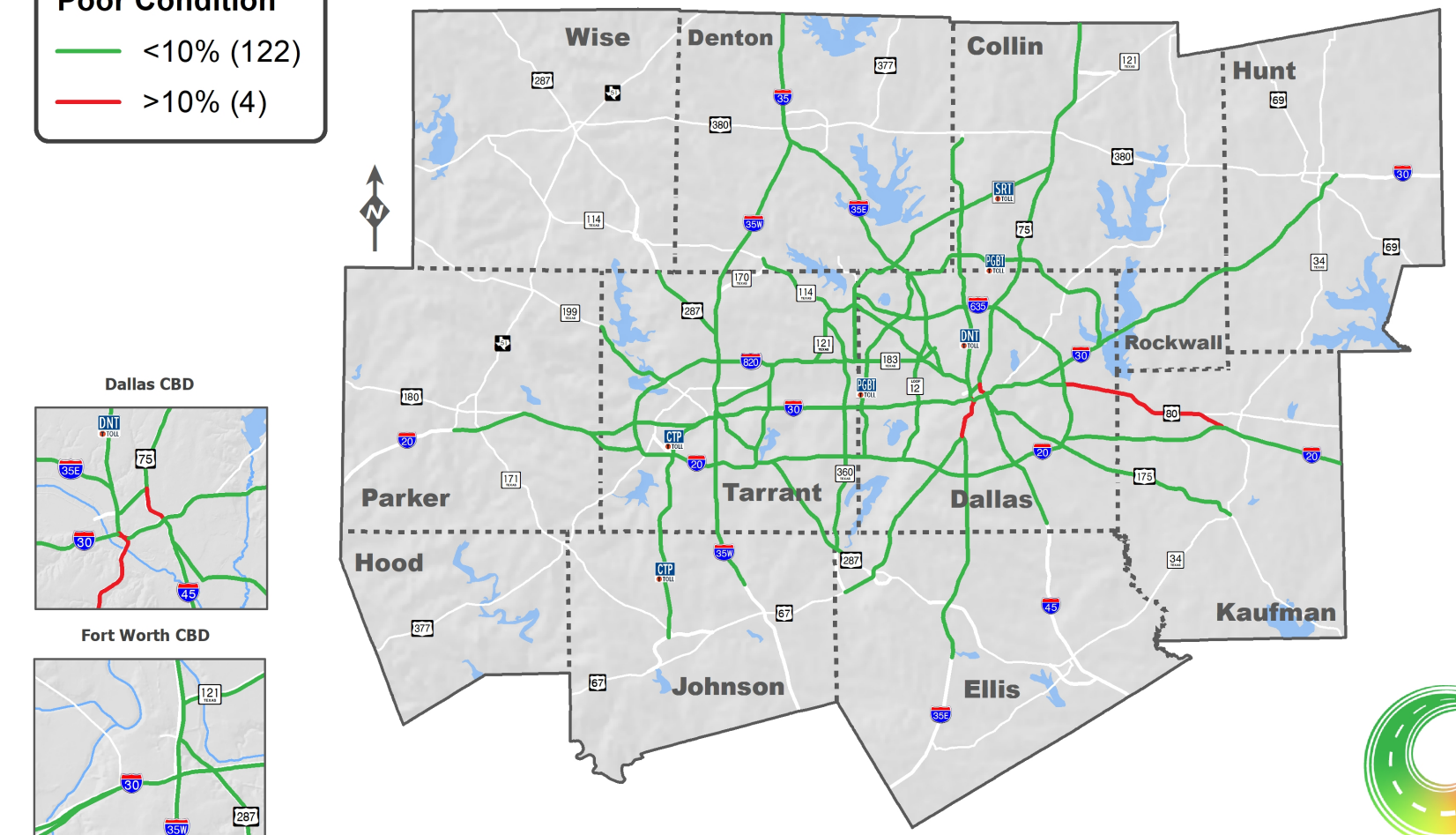
Bridge Condition

Percentage of Bridge Deck in Poor Condition

- <10% (122)
- >10% (4)



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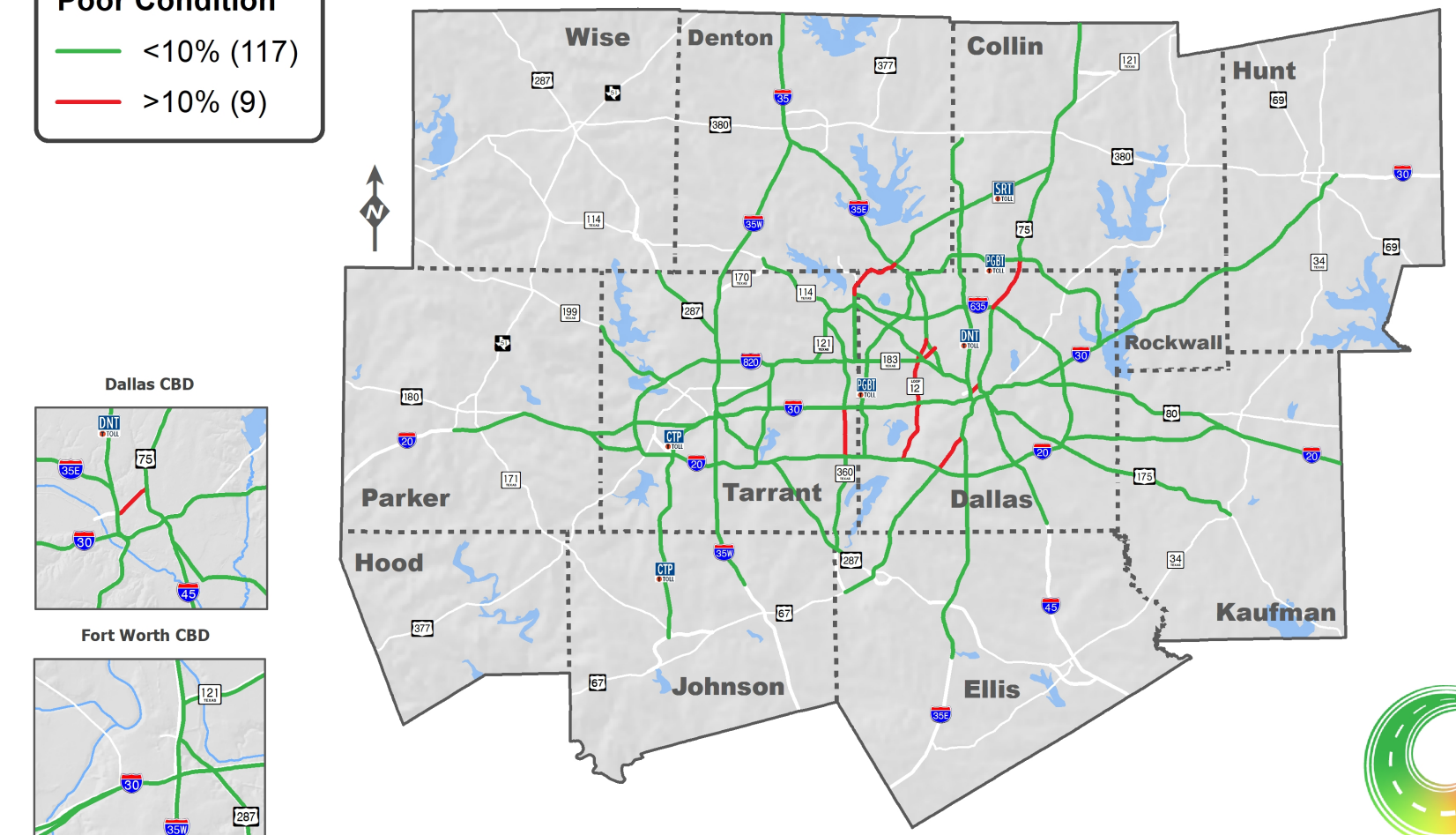
Pavement Condition

Percentage of Pavement in Poor Condition

- <10% (117)
- >10% (9)



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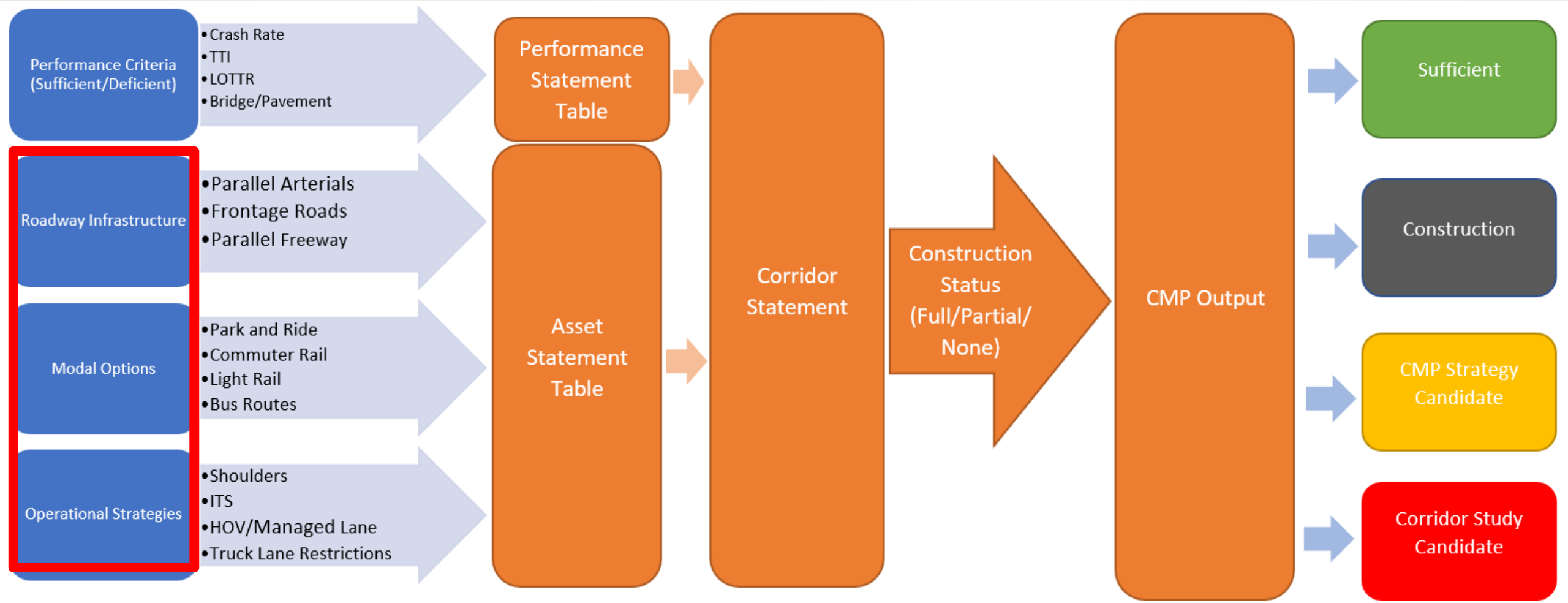
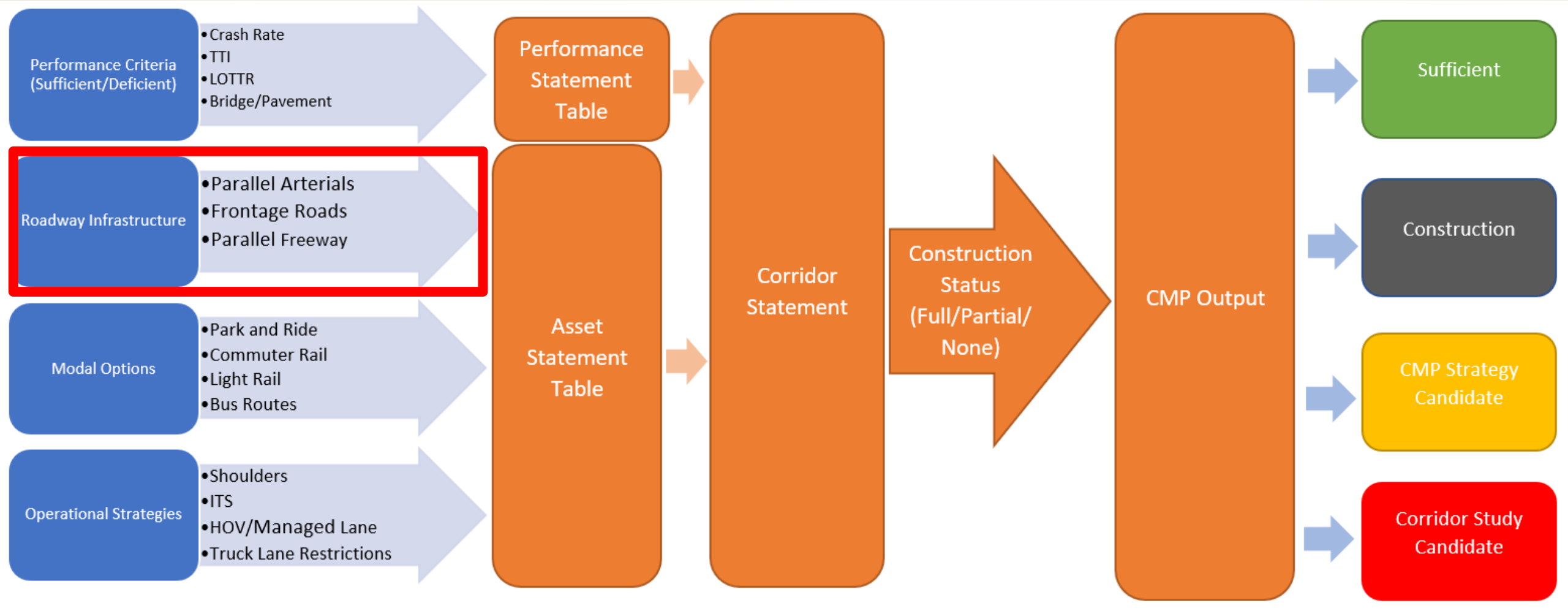
Asset Scoring



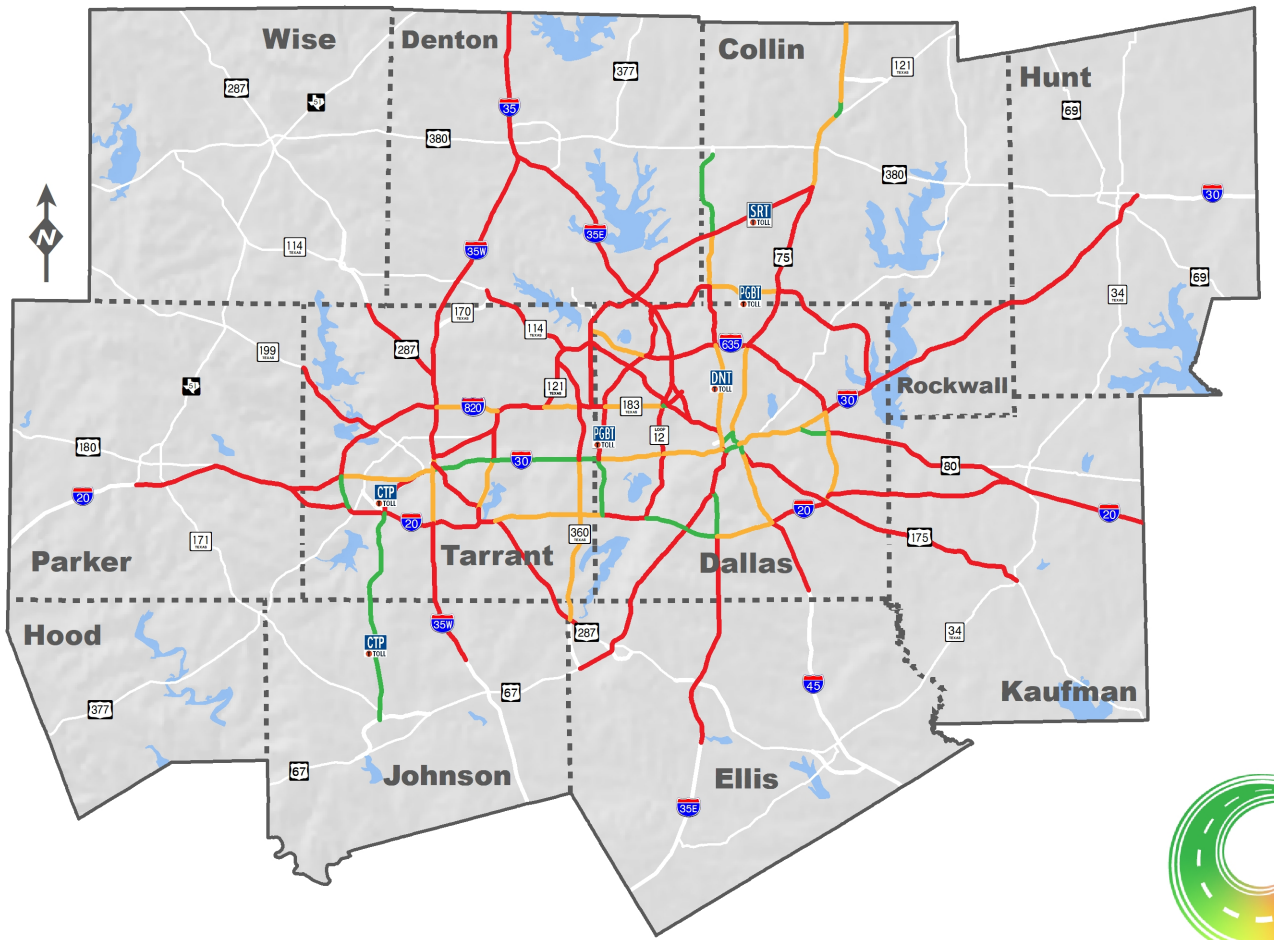
Asset Scoring



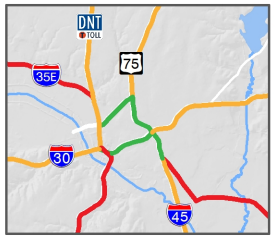
Parallel Arterials

Parallel Arterial Availability as a Percentage of Segment Length

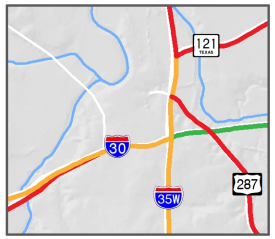
- Below 50% (80)
- 50%-80% (28)
- Above 80% (18)



Dallas CBD



Fort Worth CBD



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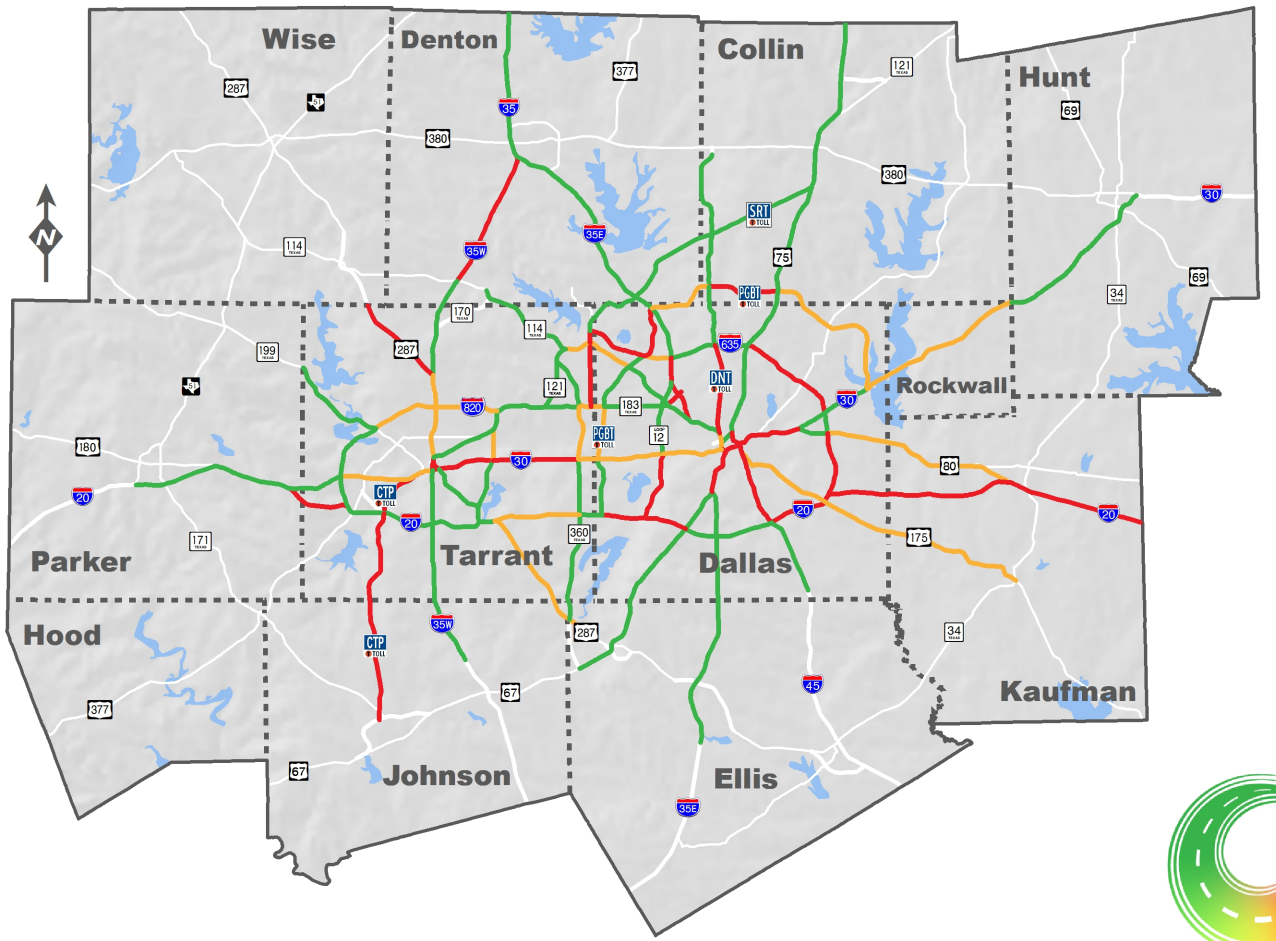
Frontage Roads

Frontage Road Availability as a Percentage of Segment Length

- Below 50% (33)
- 50%-80% (25)
- Above 80% (68)



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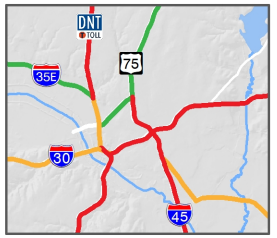

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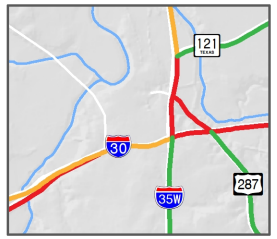

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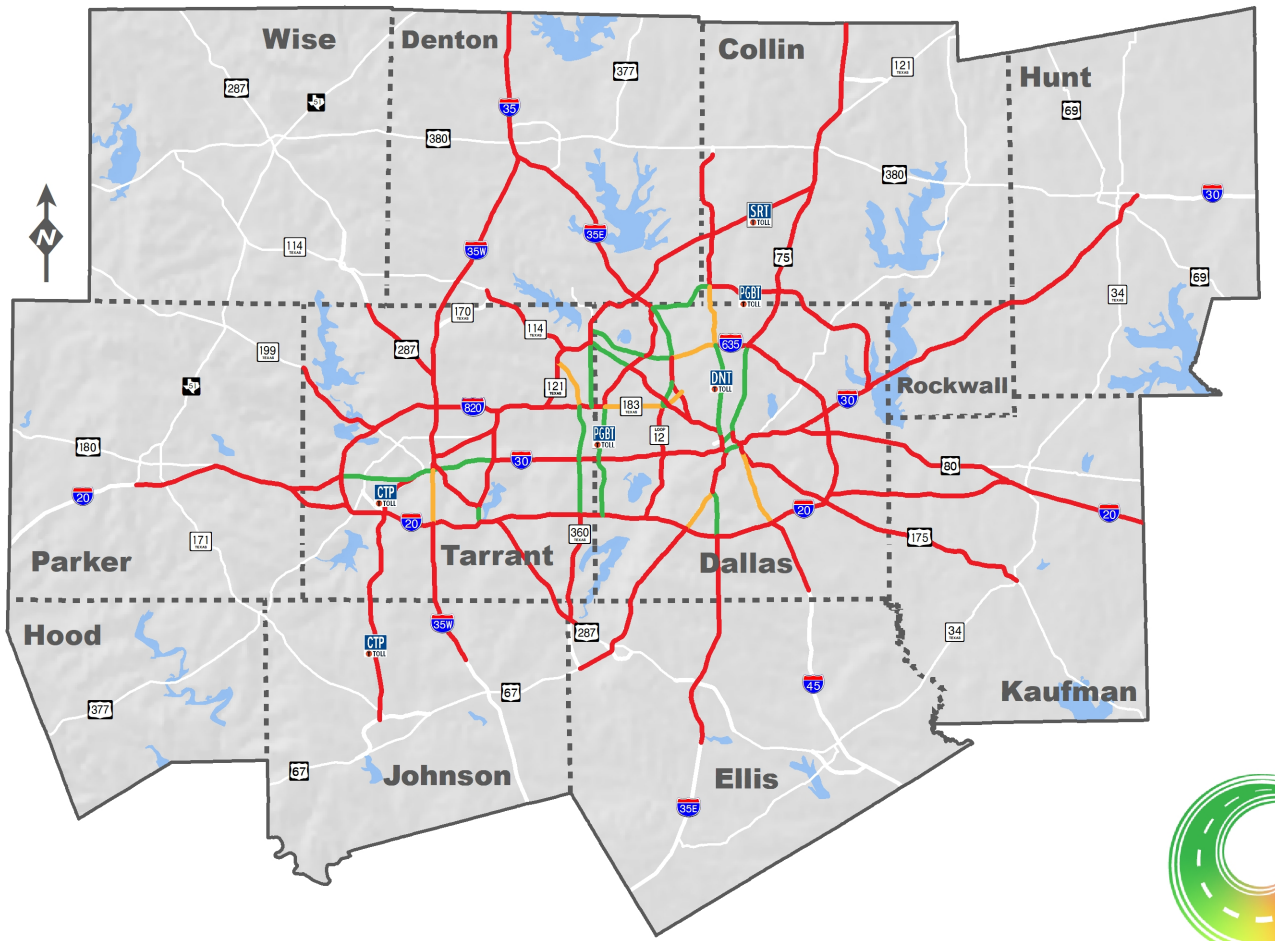
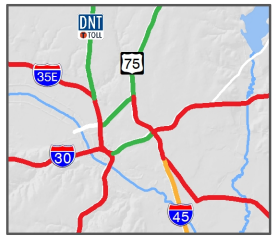
Parallel Freeway

Parallel Freeway Availability as a Percentage of Detourable Capacity

- Below 50% (98)
- 50%-80% (8)
- Above 80% (20)



Dallas CBD



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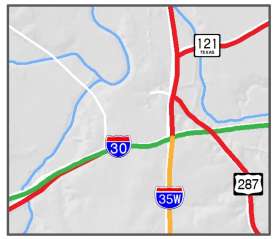

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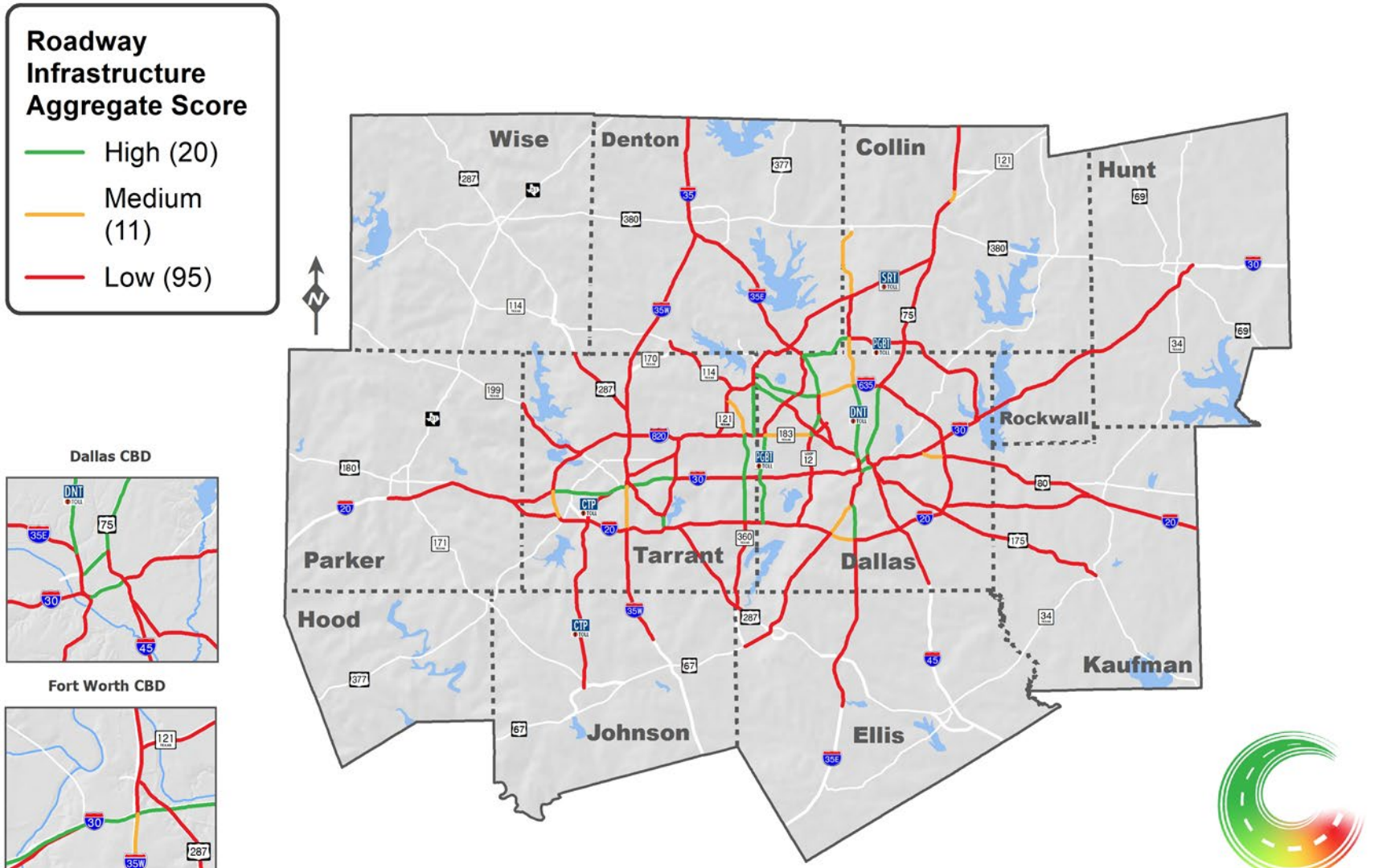
Roadway Infrastructure



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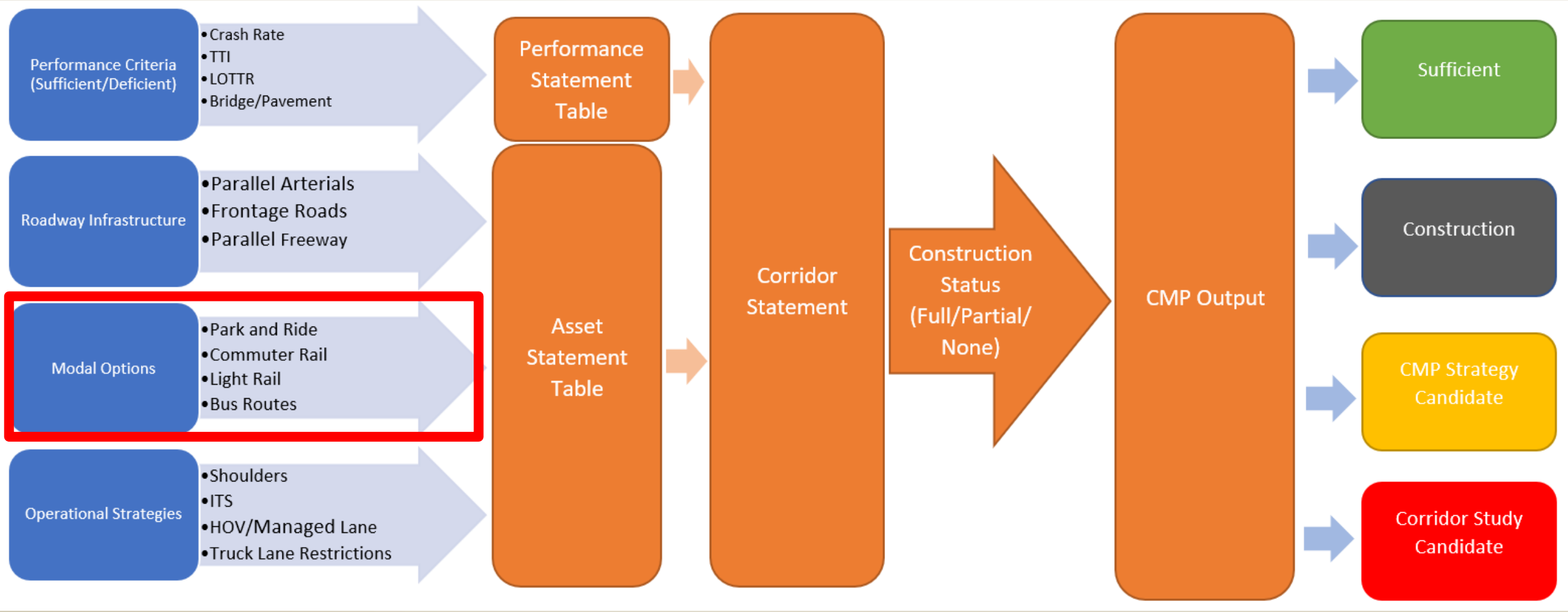
Asset Weights

- Parallel Freeway-20
- Frontage Roads- 10
- Parallel Arterial Capacity-10

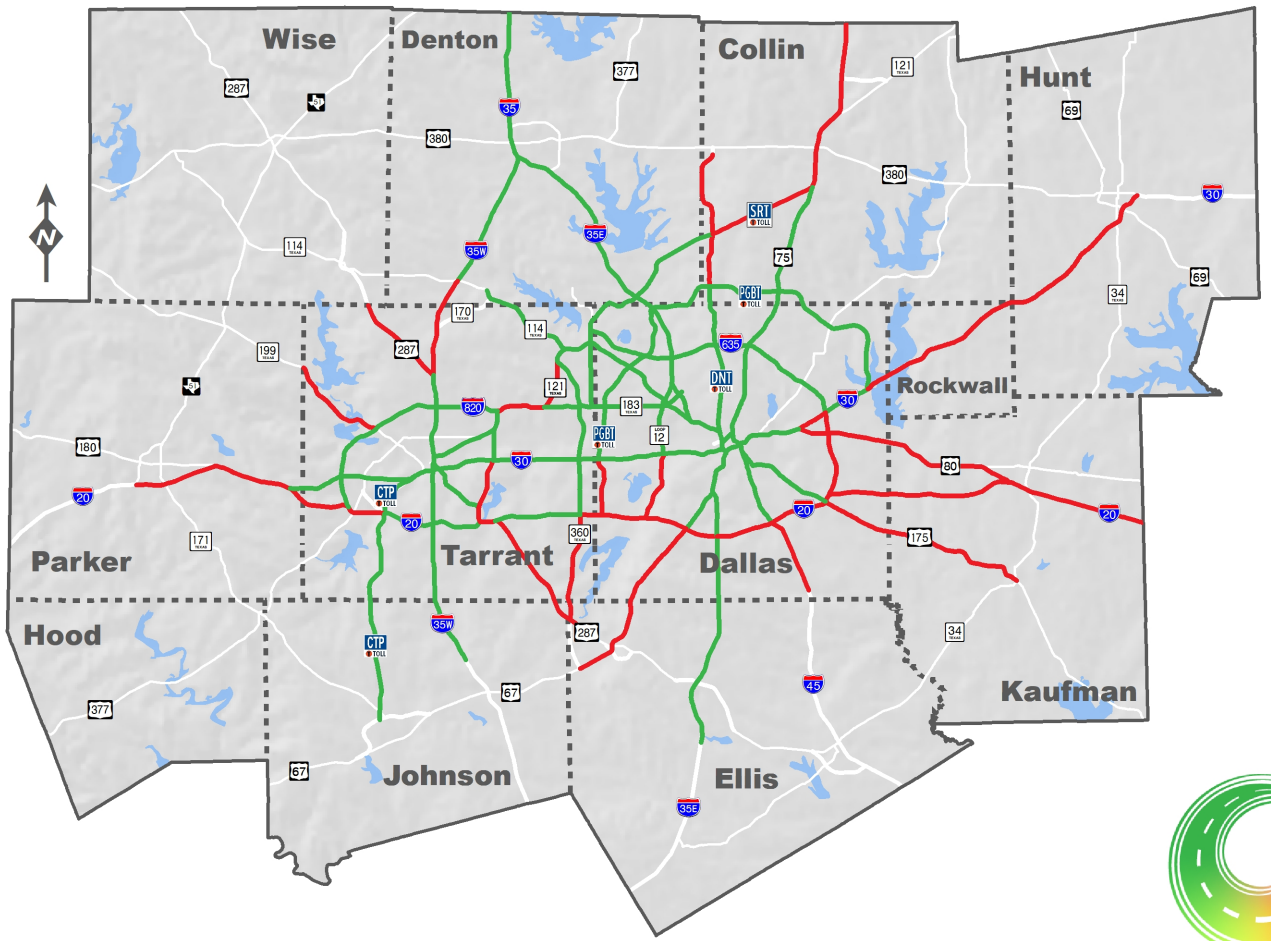
Asset Scoring



Park and Ride

Park and Ride Availability

- Not Available (40)
- Available within 1 Mile (86)



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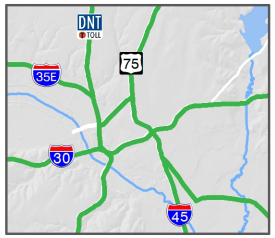

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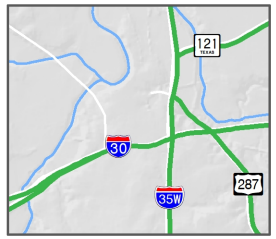

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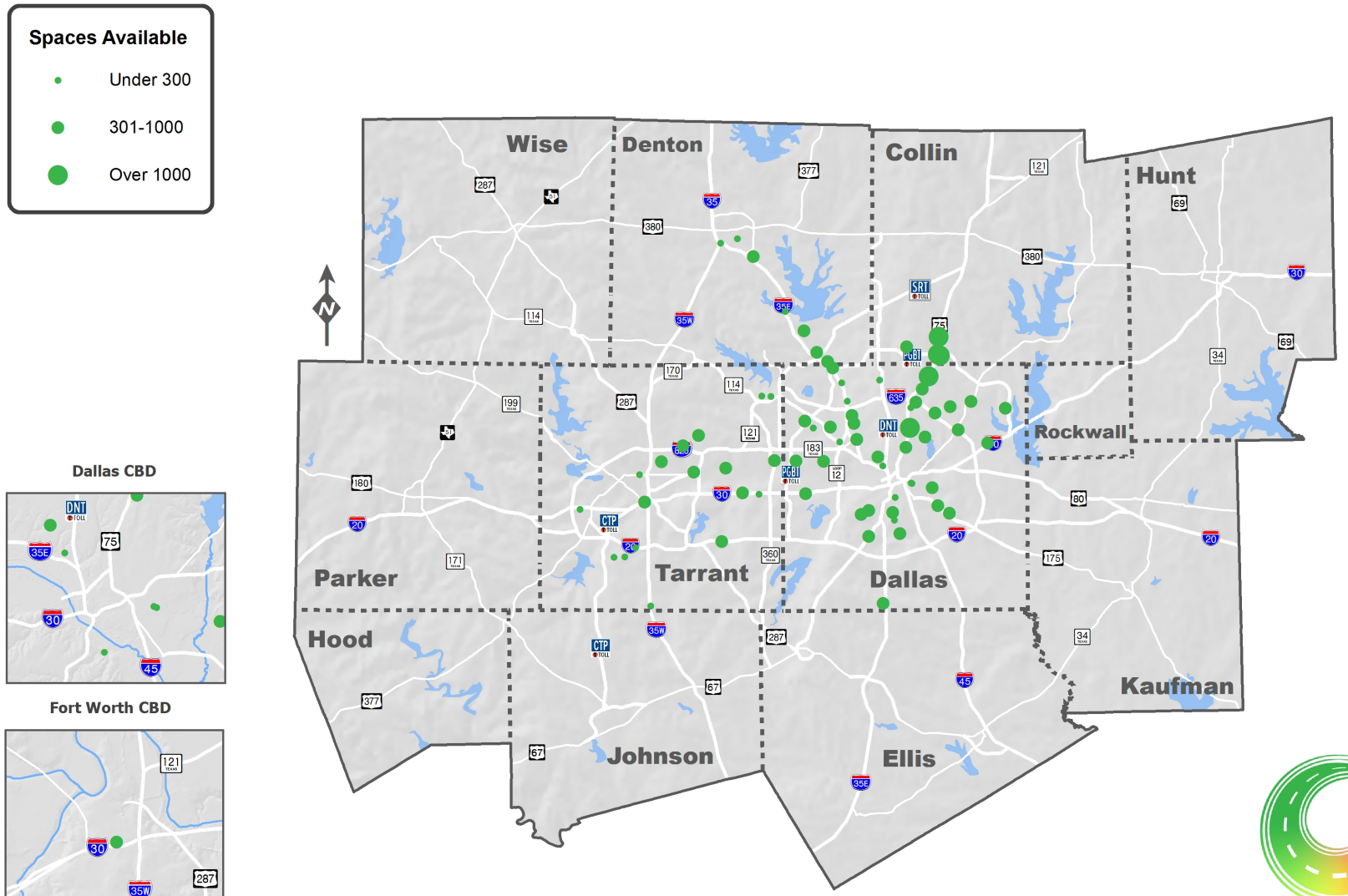
Park and Ride



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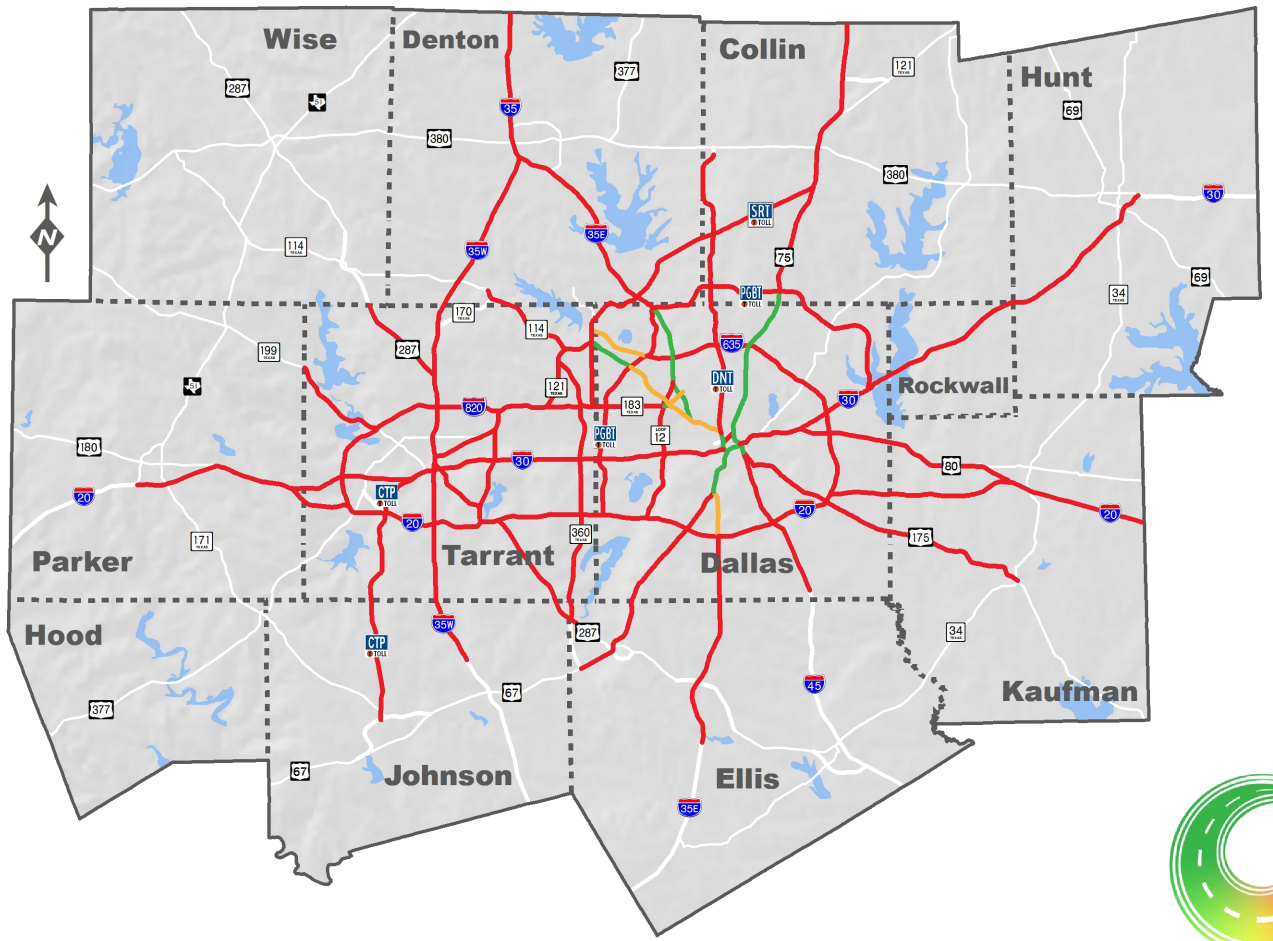
Light Rail

Parallel Light Rail Availability as a Percentage of Segment Length

- Below 50% (107)
- 50%-80% (6)
- Above 80% (13)



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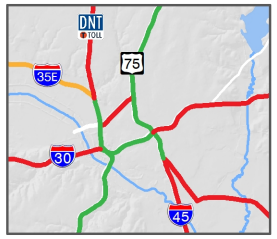

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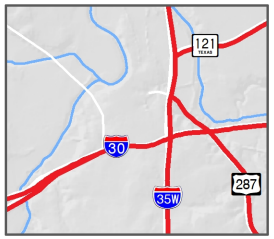

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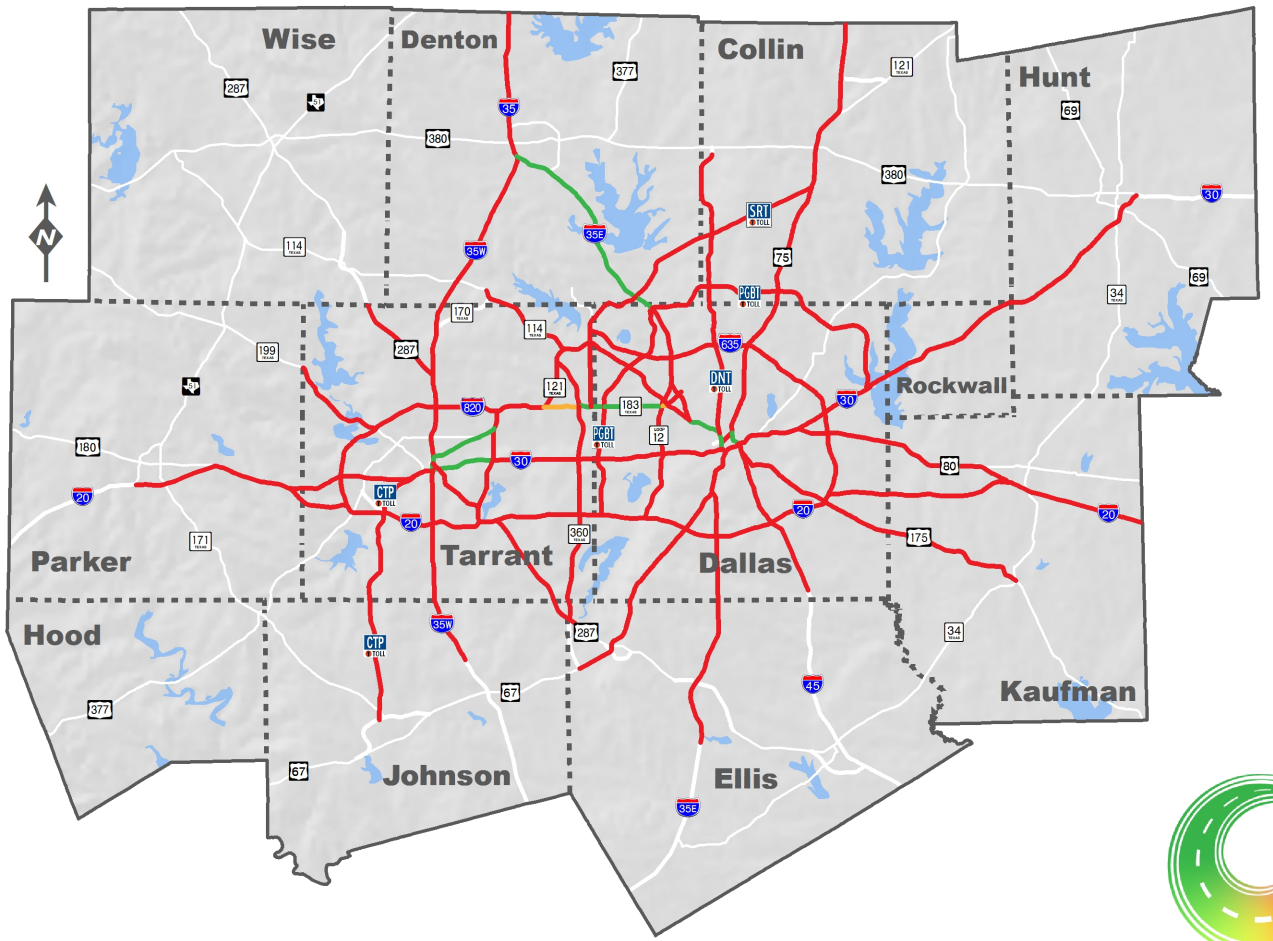
Commuter Rail

Parallel Commuter Rail as a Percentage of Segment Length

- Below 50% (114)
- 50%-80% (2)
- Above 80% (10)



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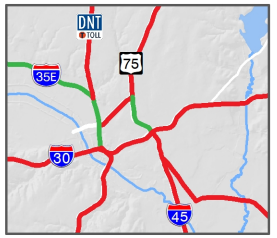

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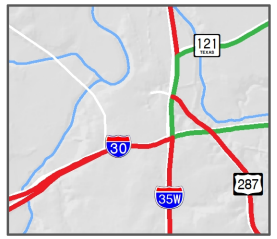

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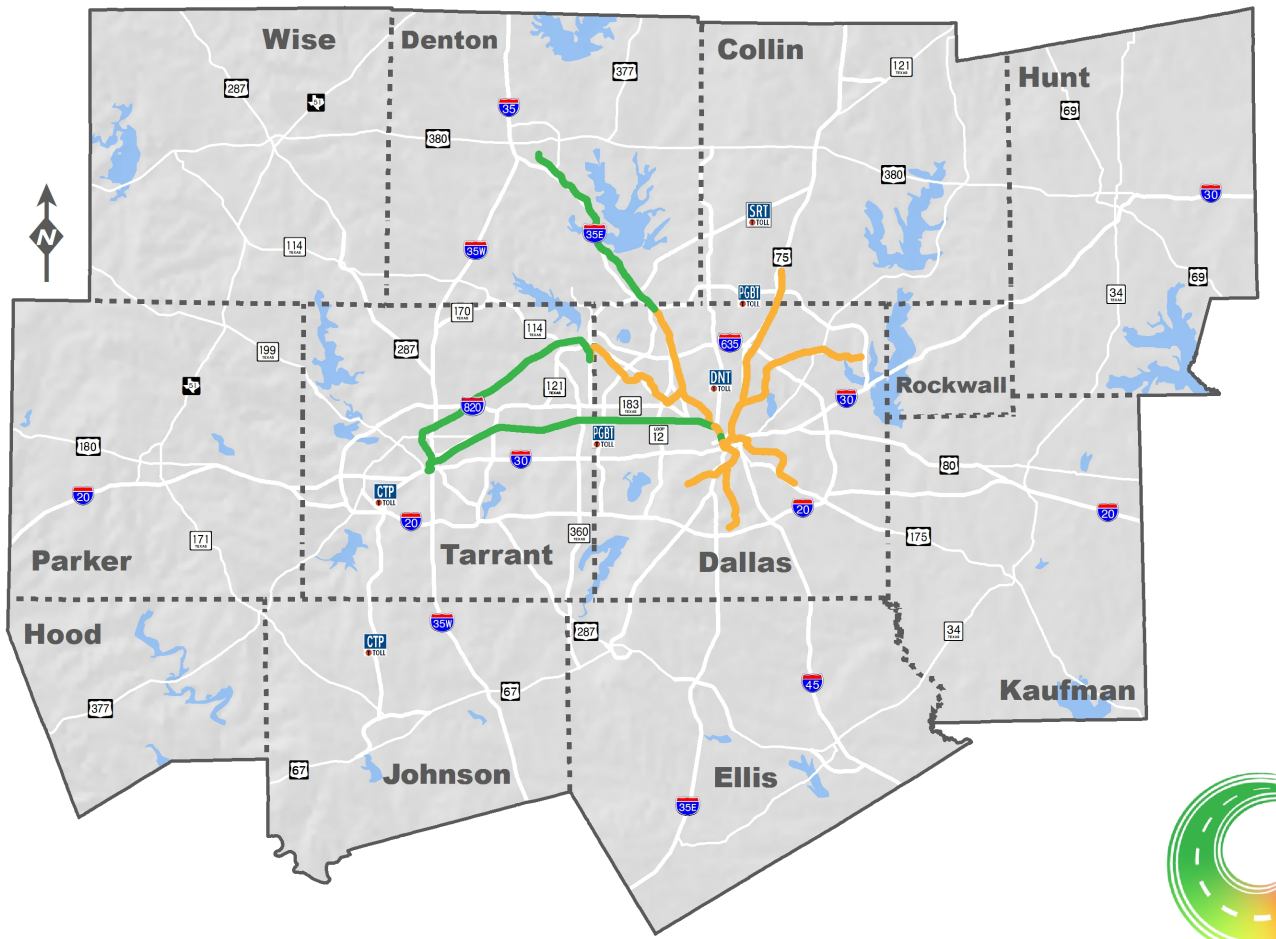
Light and Commuter Rail

Existing Lines

Mode

- Commuter Rail
- Light Rail



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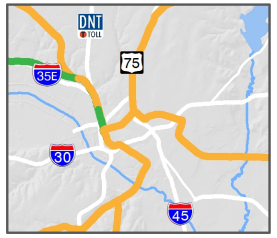

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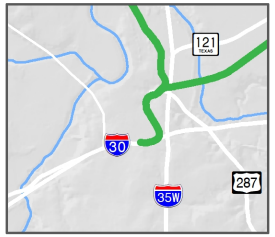

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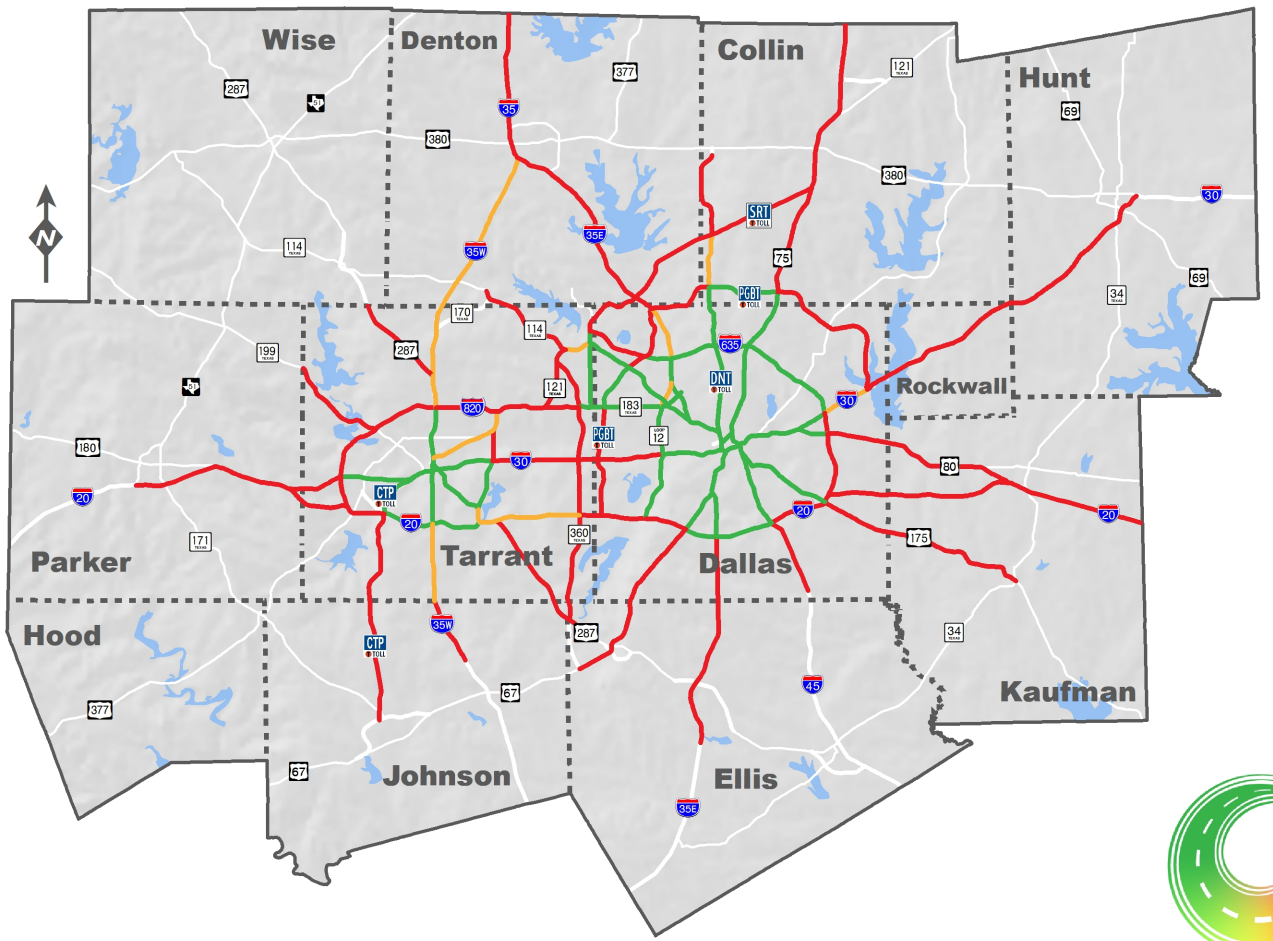
Bus Availability

Combined Bus Metrics

- High (52)
- Medium (14)
- Low (60)



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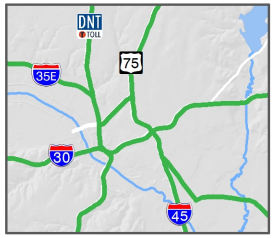

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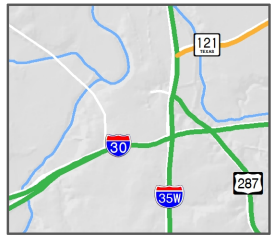

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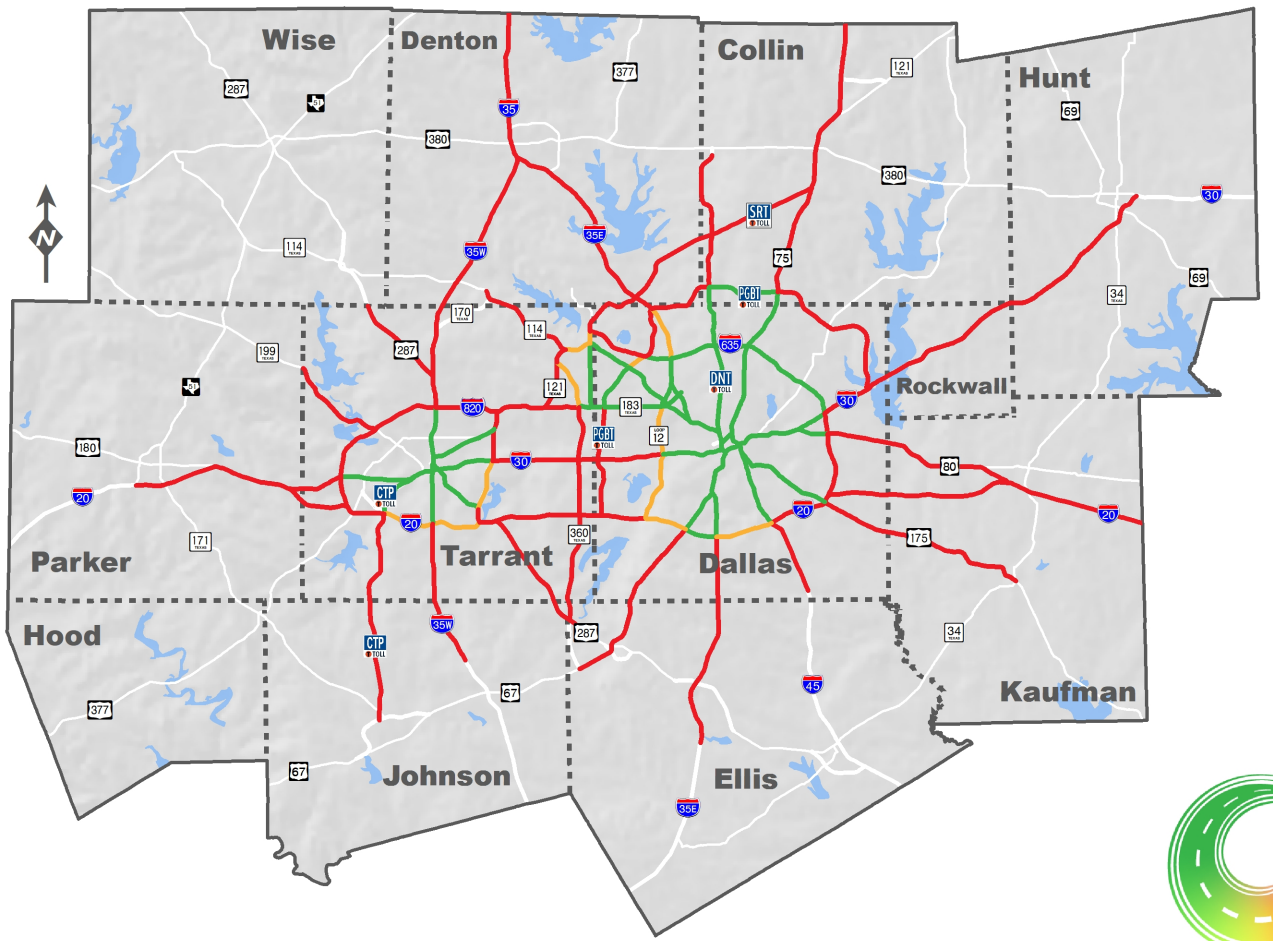
Bus Route Density

Frequency of service per GTFS feed

- High (47)
- Medium (12)
- Low (67)



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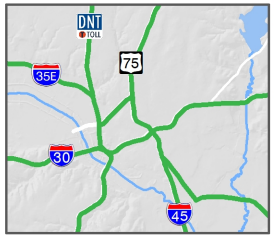

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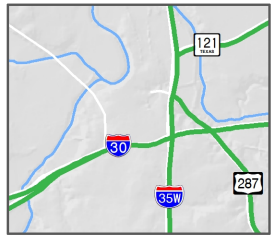

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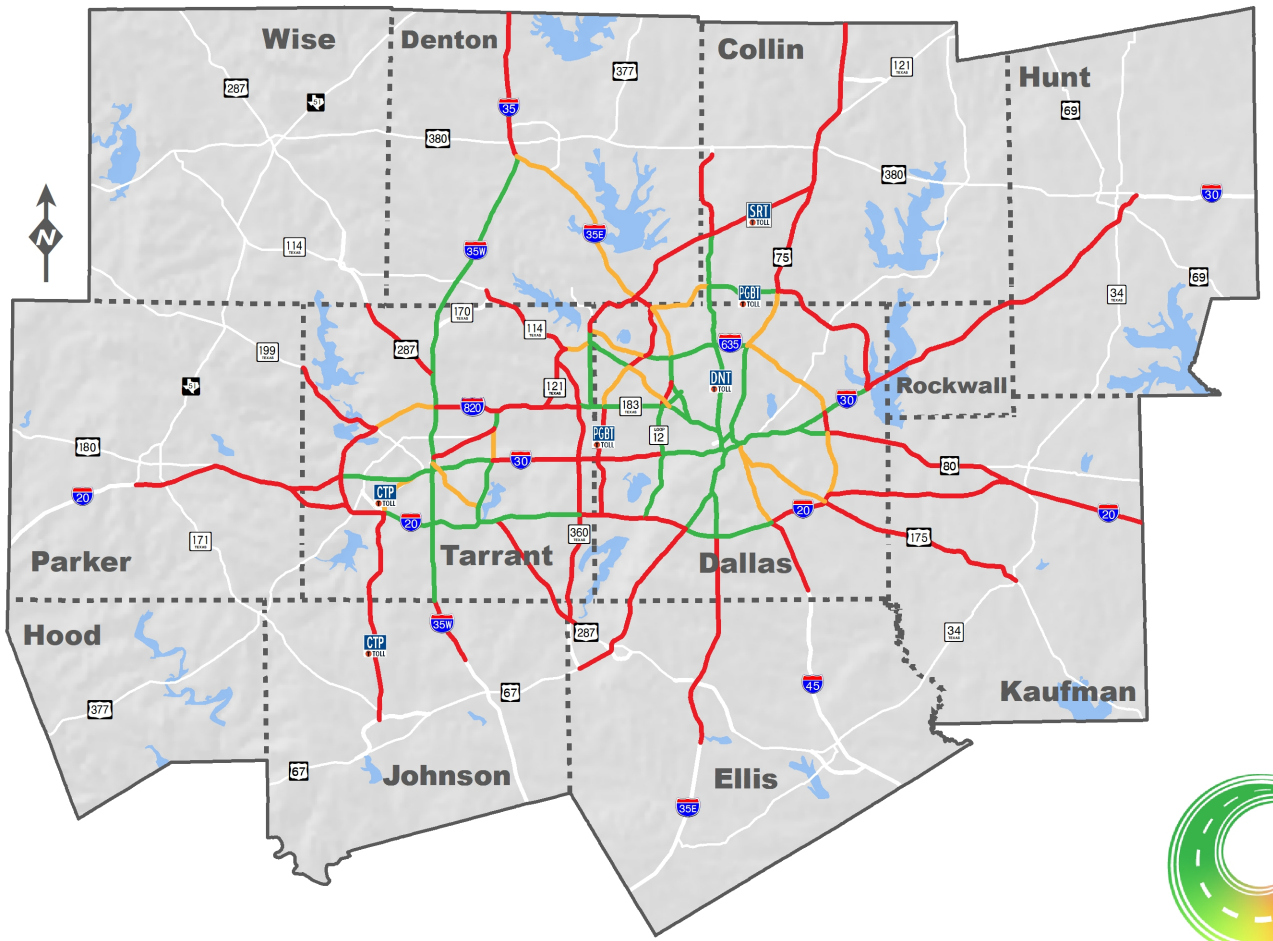
Parallel Bus Route

Percentage of segment length with available parallel bus route

- High (52)
- Medium (18)
- Low (56)



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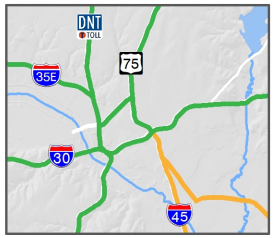

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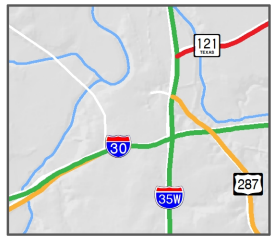

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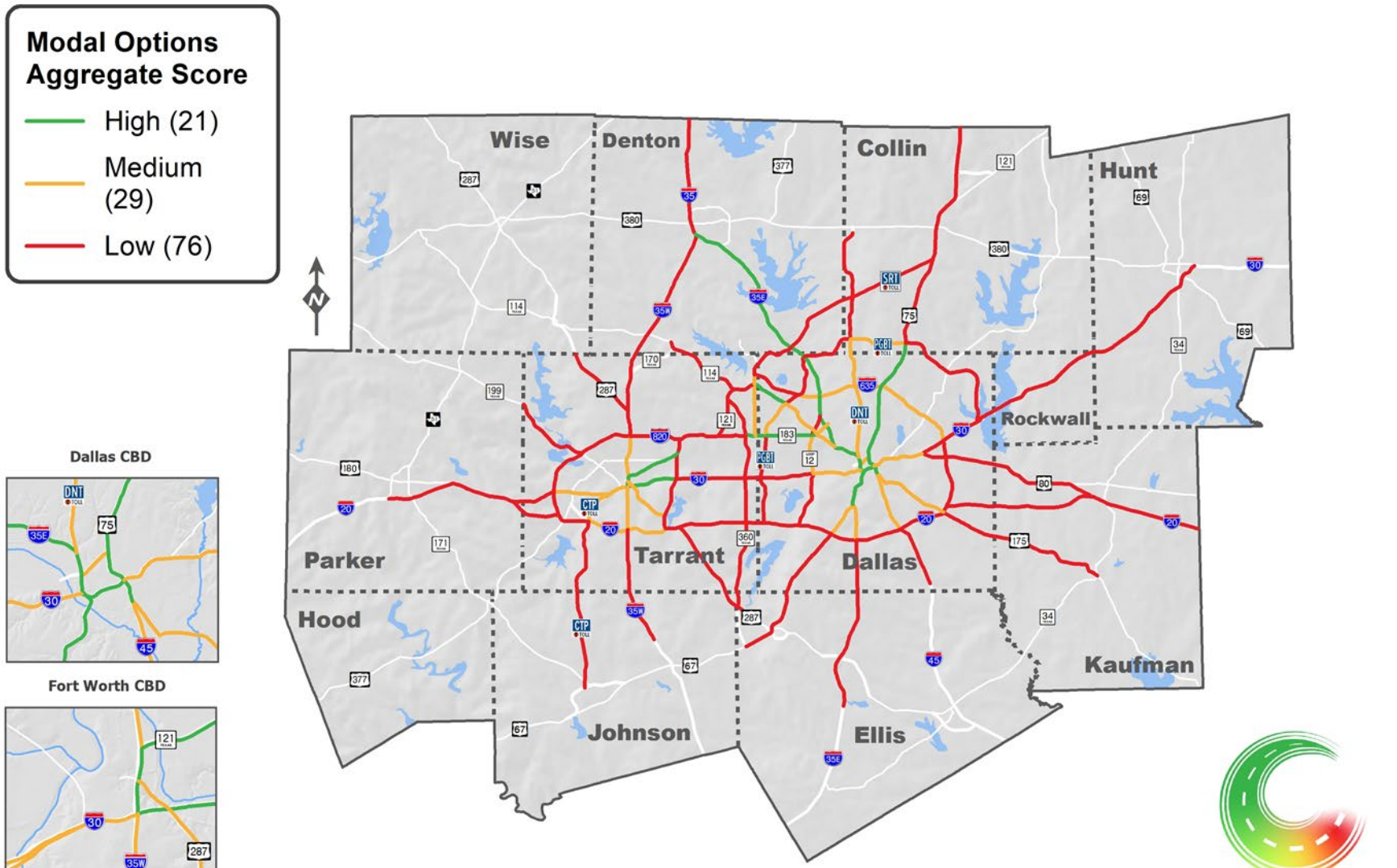
Modal Options



Asset Weights

- Park and Ride- 10
- Commuter Rail- 10
- Light Rail-10
- Bus Routes-10

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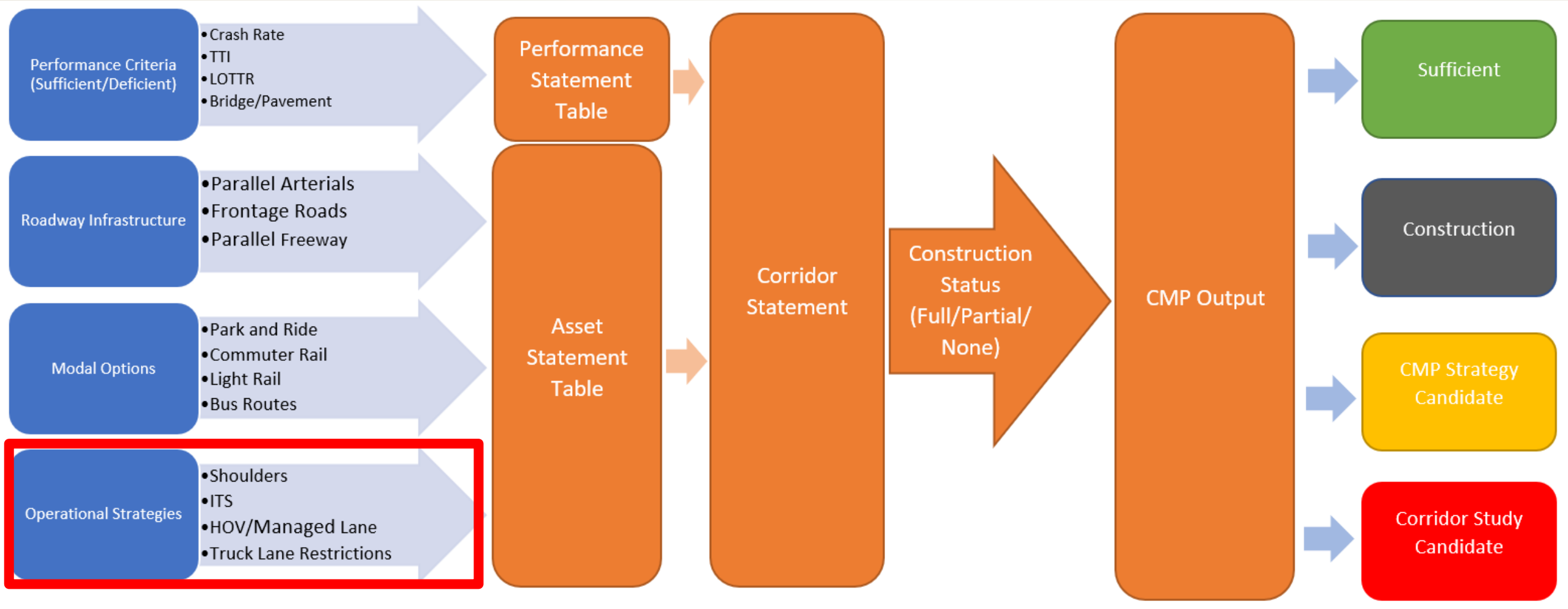
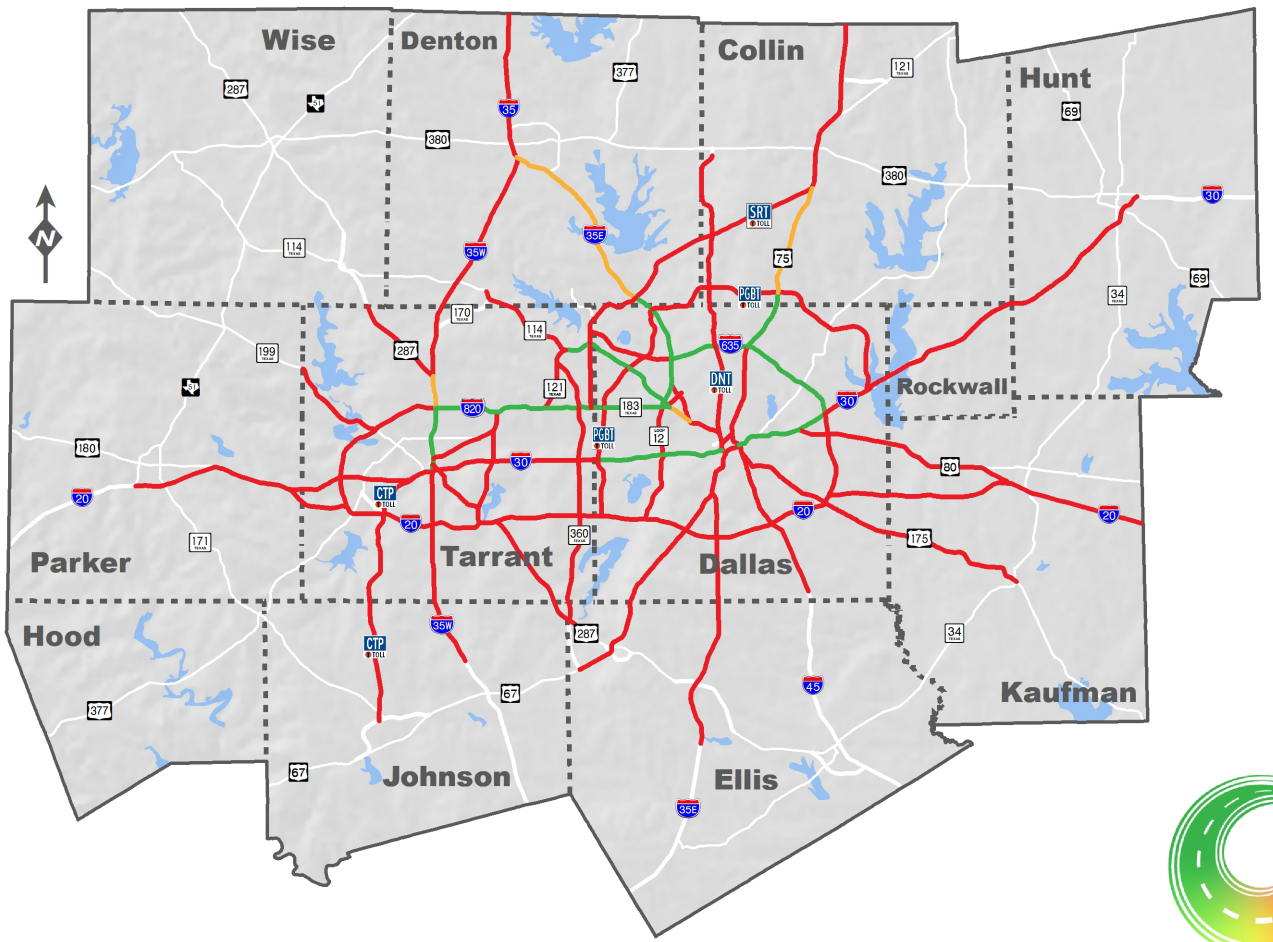
Asset Scoring



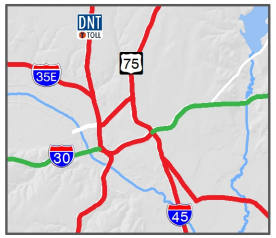
HOV and Managed Lanes

HOV and Managed Lanes as a Percentage of Segment Length

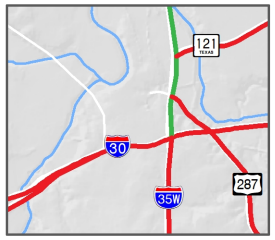
- Below 50% (99)
- 50%-80% (4)
- Above 80% (23)



Dallas CBD



Fort Worth CBD



North Central Texas Council of Governments

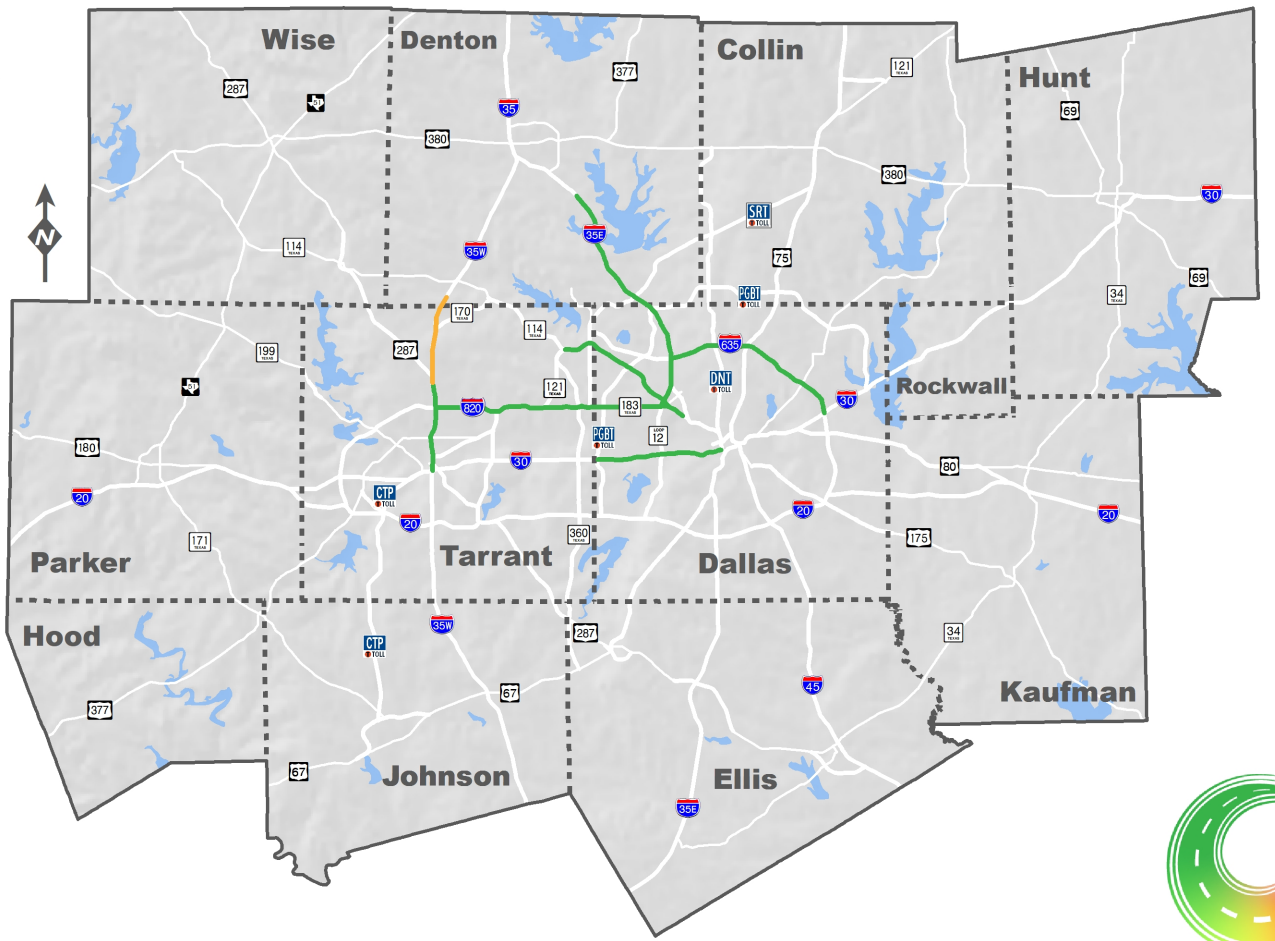
January 2021

CMP
CONGESTION MANAGEMENT PROCESS

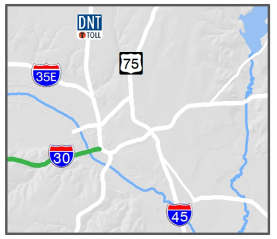
Managed Lanes

Implementation

- Completion by 2023 (1)
- Existing Managed Lanes (36)



Dallas CBD



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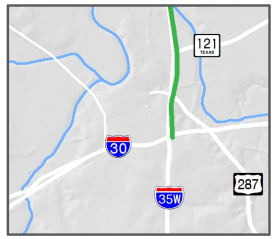

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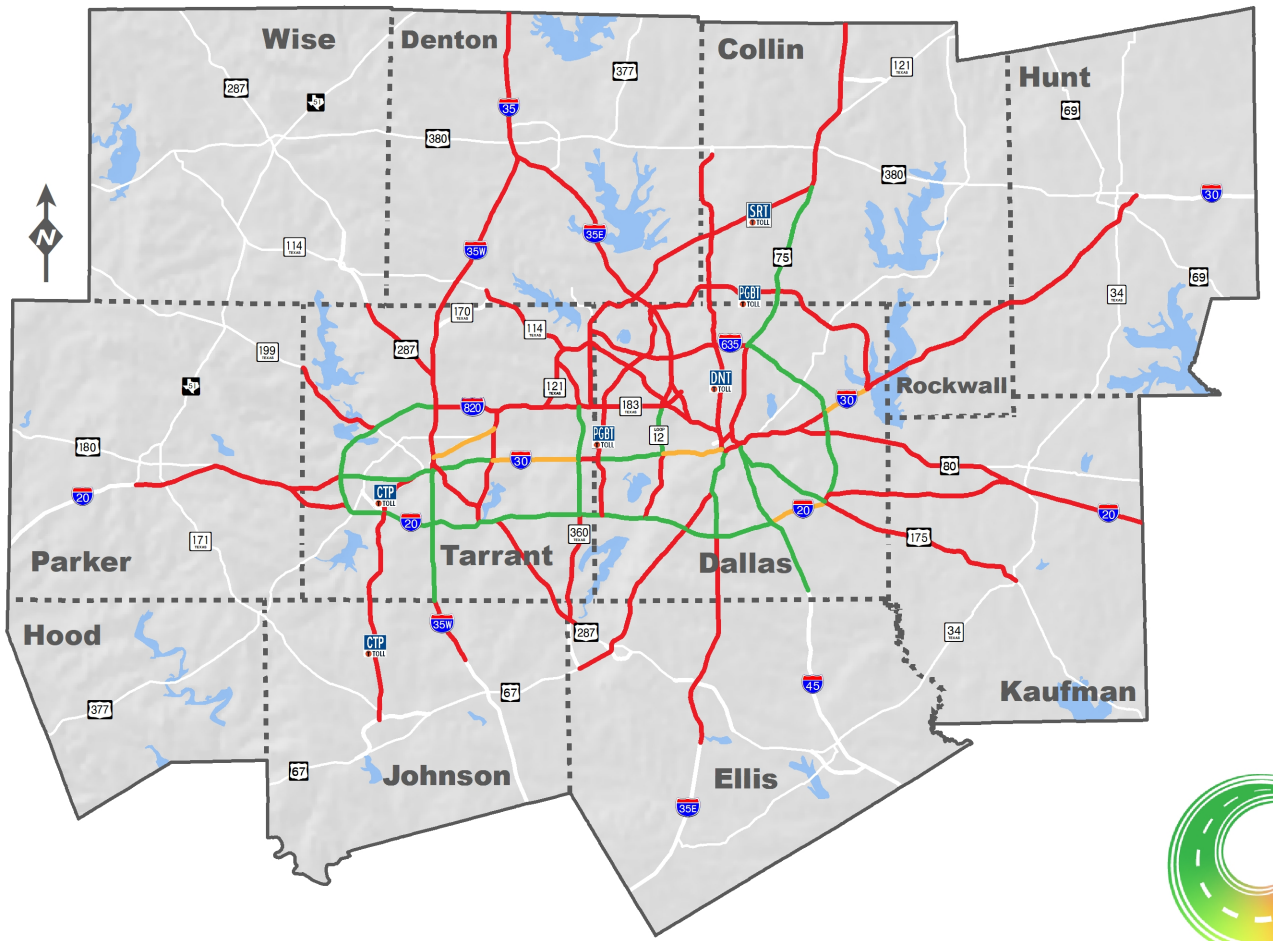
CMP
CONGESTION MANAGEMENT PROCESS

January 2021

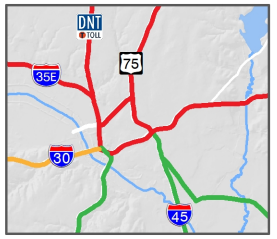
Truck Lane Restrictions

Truck Lane Restrictions as a Percentage of Segment Length

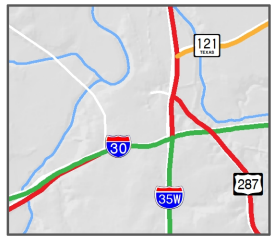
- Below 50% (89)
- 50%-80% (5)
- Above 80% (32)



Dallas CBD



Fort Worth CBD



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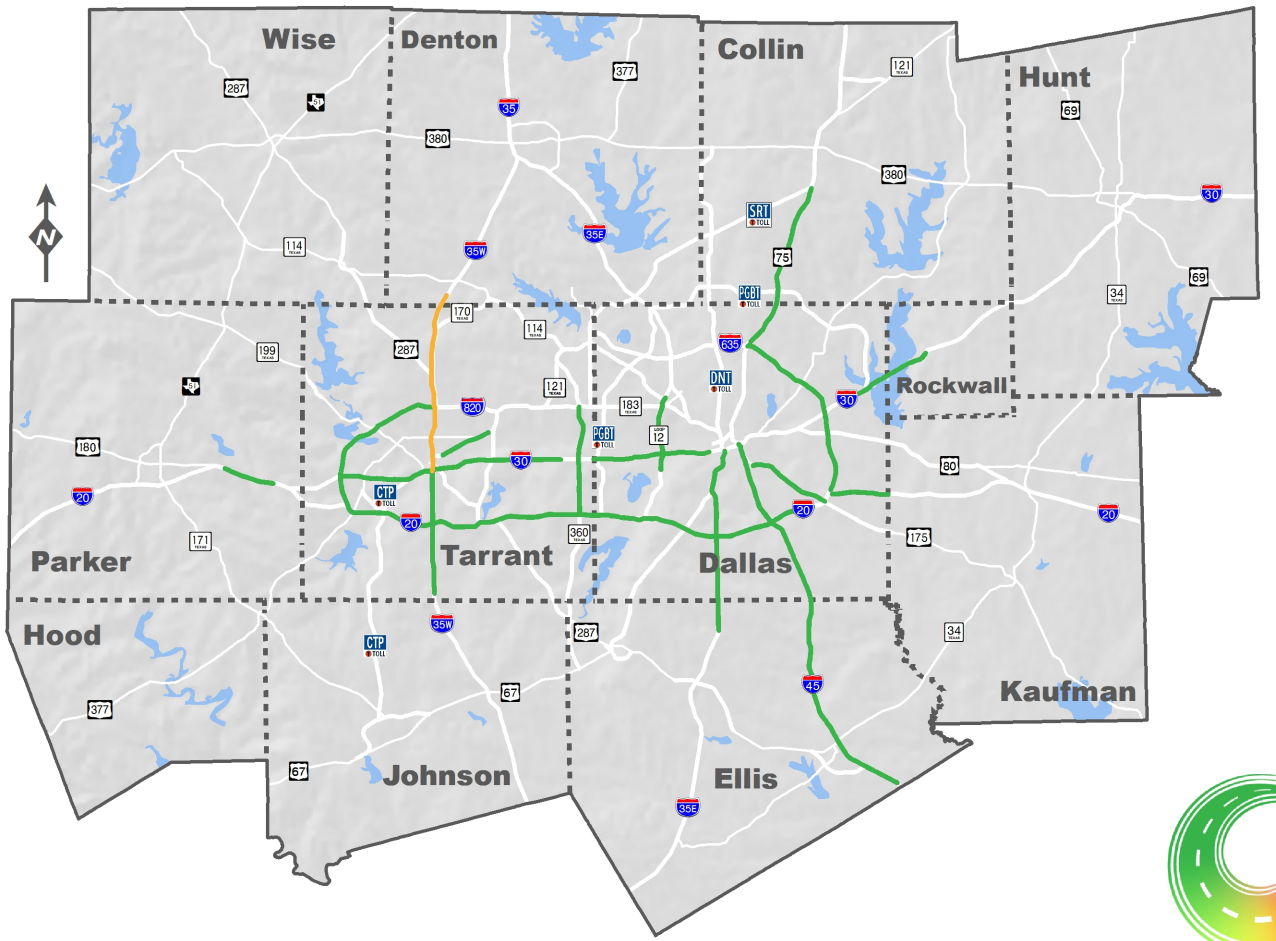
January 2021

CMP
CONGESTION MANAGEMENT PROCESS

Truck Lane Restrictions

Implementation

- Existing
- Completion By 2023



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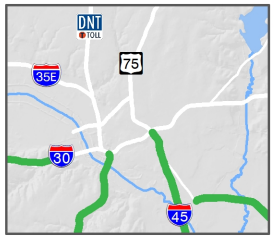
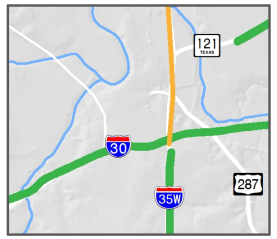


Fort Worth CBD



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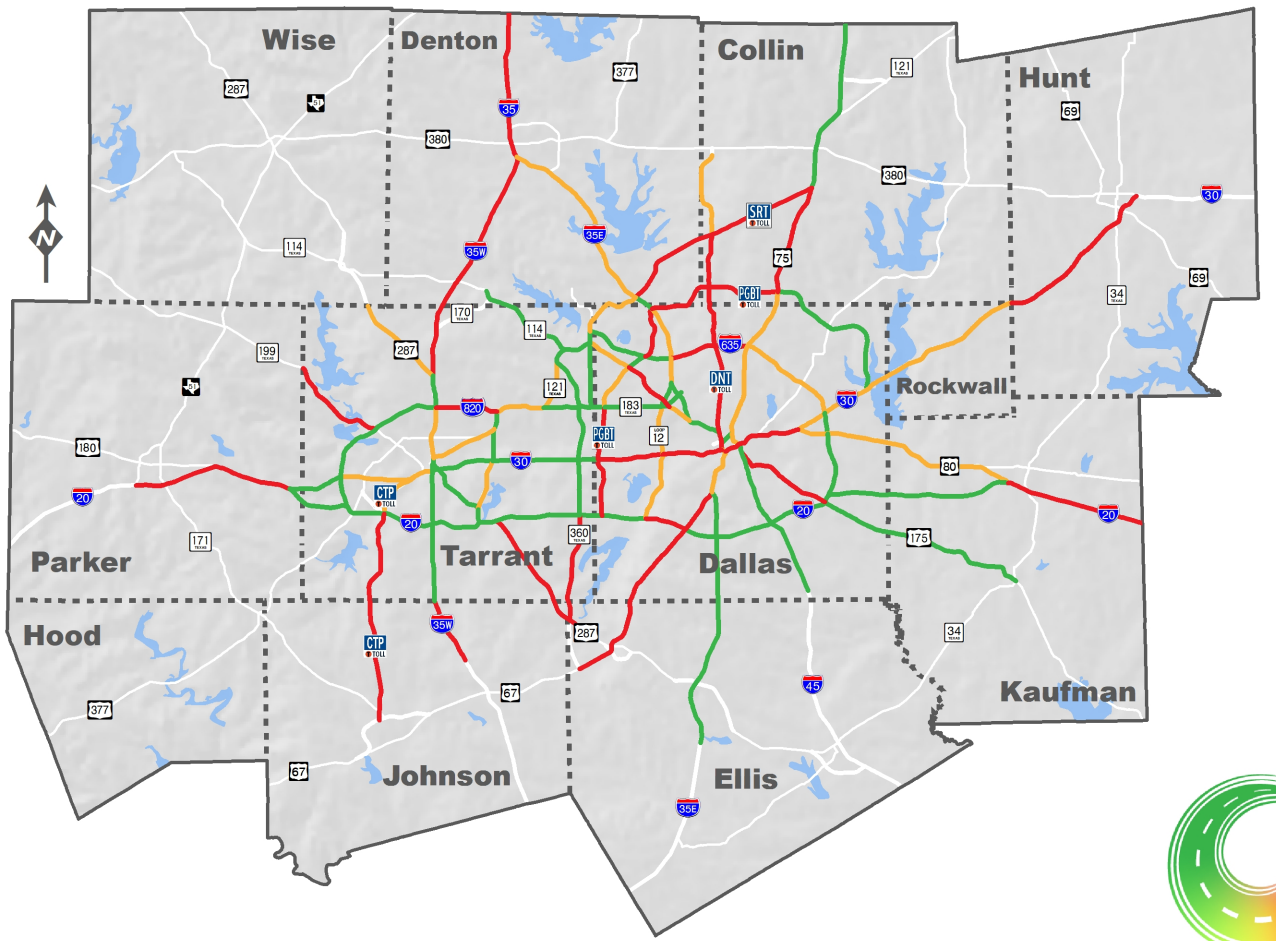
January 2021

CMP
CONGESTION MANAGEMENT PROCESS

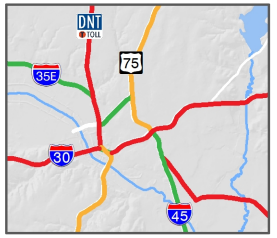
Shoulder Availability

Availability of 8 ft Shoulder

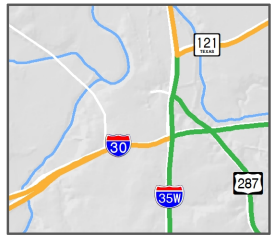
- High (63)
- Medium (28)
- Low (35)



Dallas CBD



Fort Worth CBD



High- Full outside shoulder
Medium- Partial outside and inside shoulder
Low- Partial or no outside shoulder, no inside shoulder

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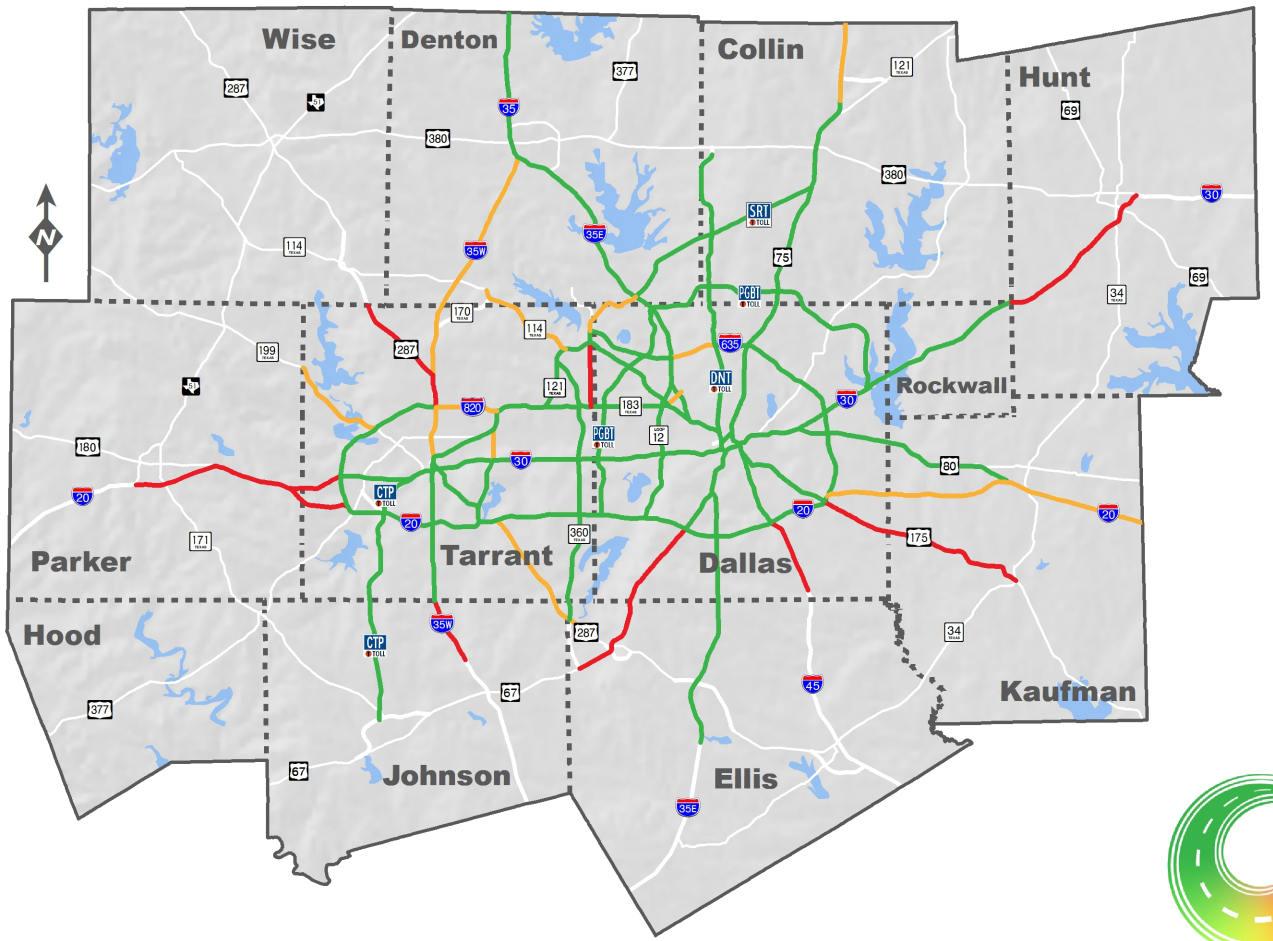
CMP
CONGESTION MANAGEMENT PROCESS

January 2021

Intelligent Transportation Systems

Percentage of Segment within 1/2 Mile of ITS Device

- Below 50% (11)
- 50%-80% (14)
- Over 80% (101)



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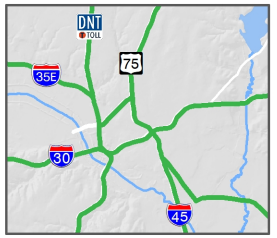
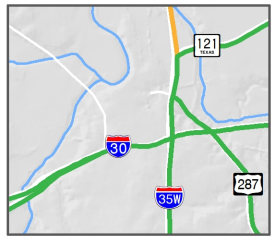


Fort Worth CBD



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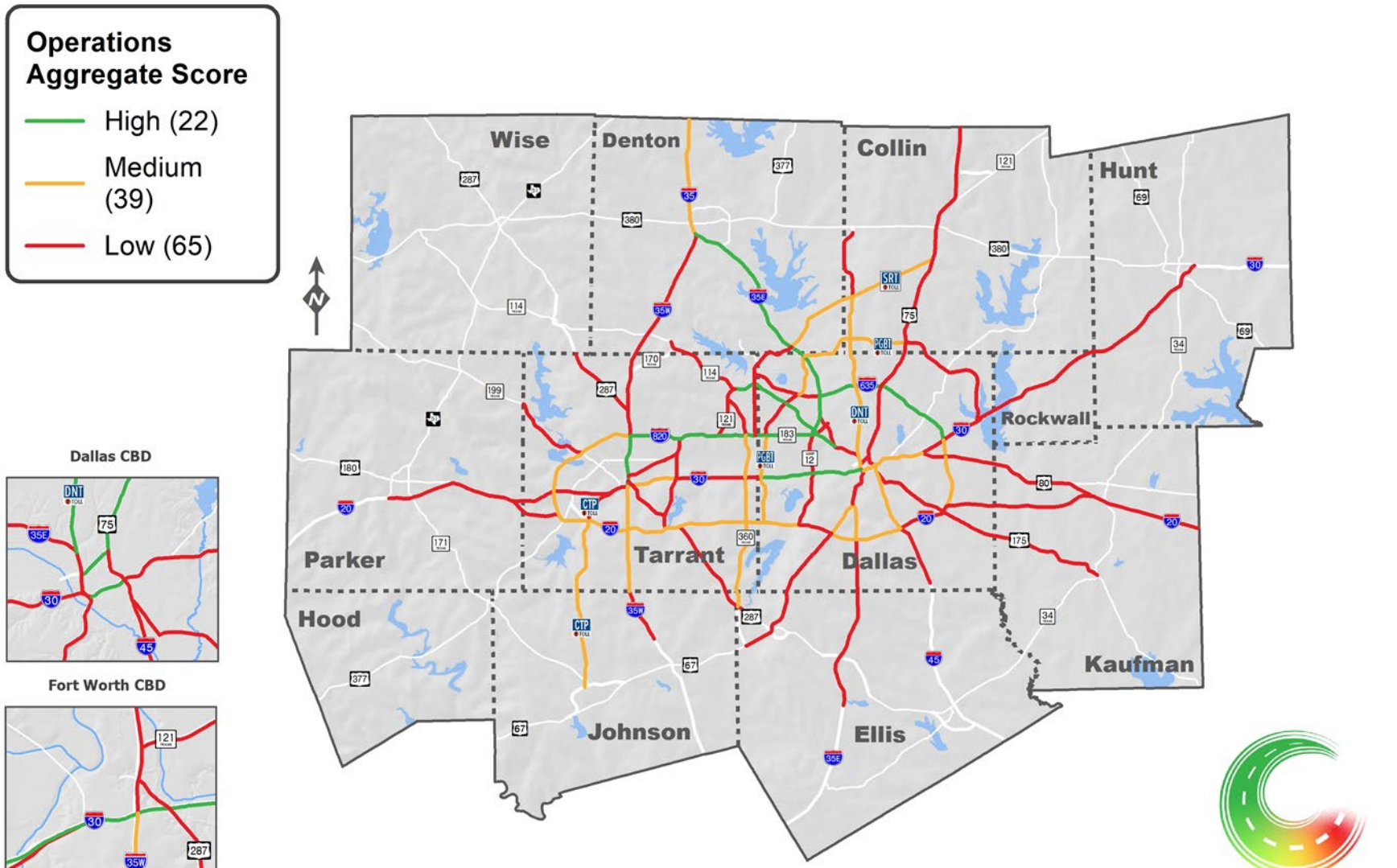
CONGESTION MANAGEMENT PROCESS

Operations



Asset Weights

- HOV/Managed Lanes-20
- ITS-7
- Shoulder Availability-5
- Truck Lane Restrictions-3

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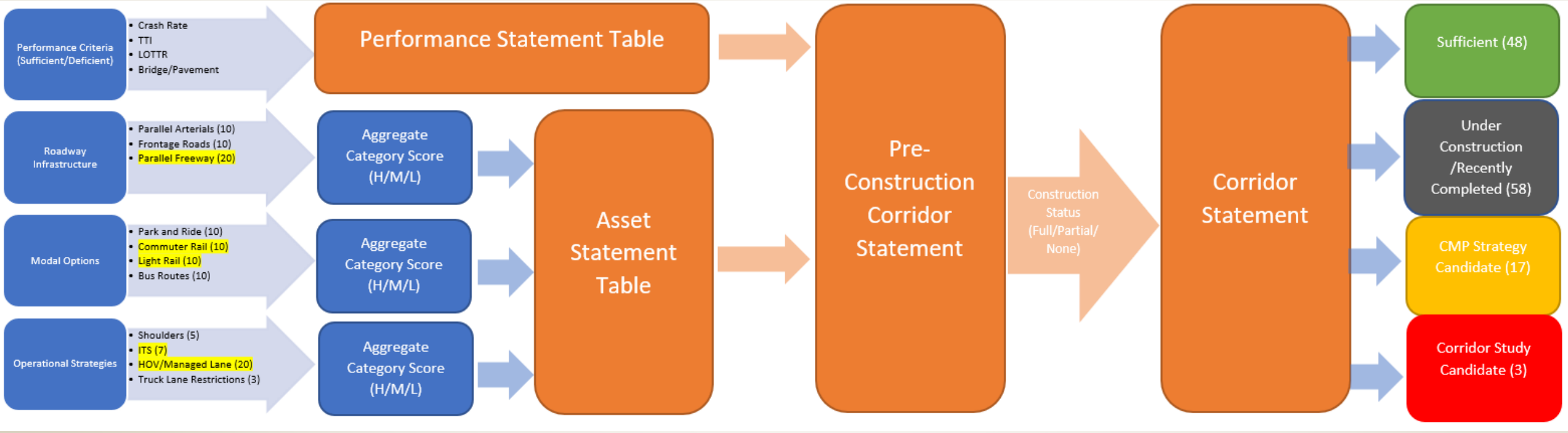
CMP
CONGESTION MANAGEMENT PROCESS

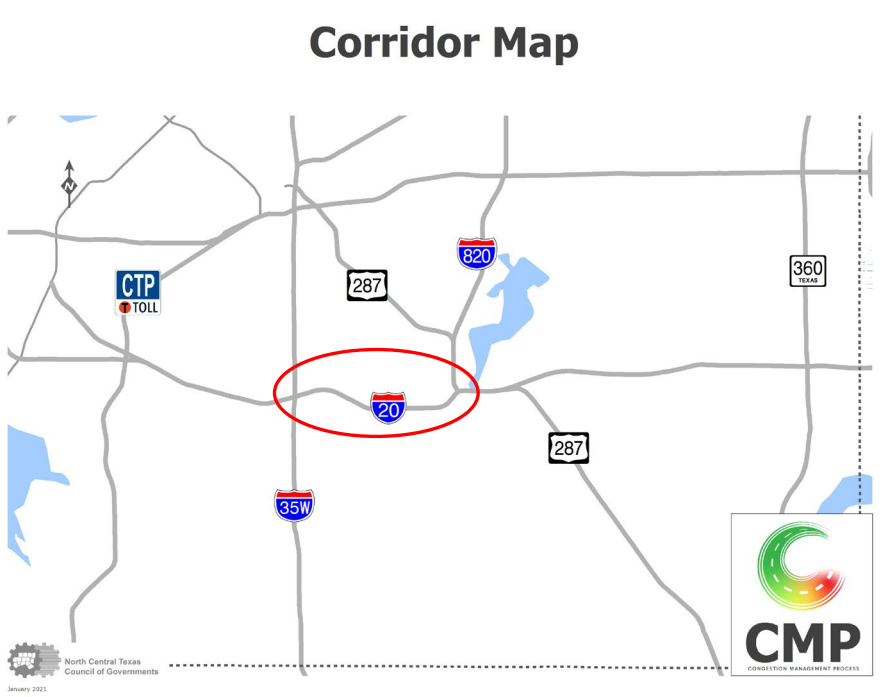


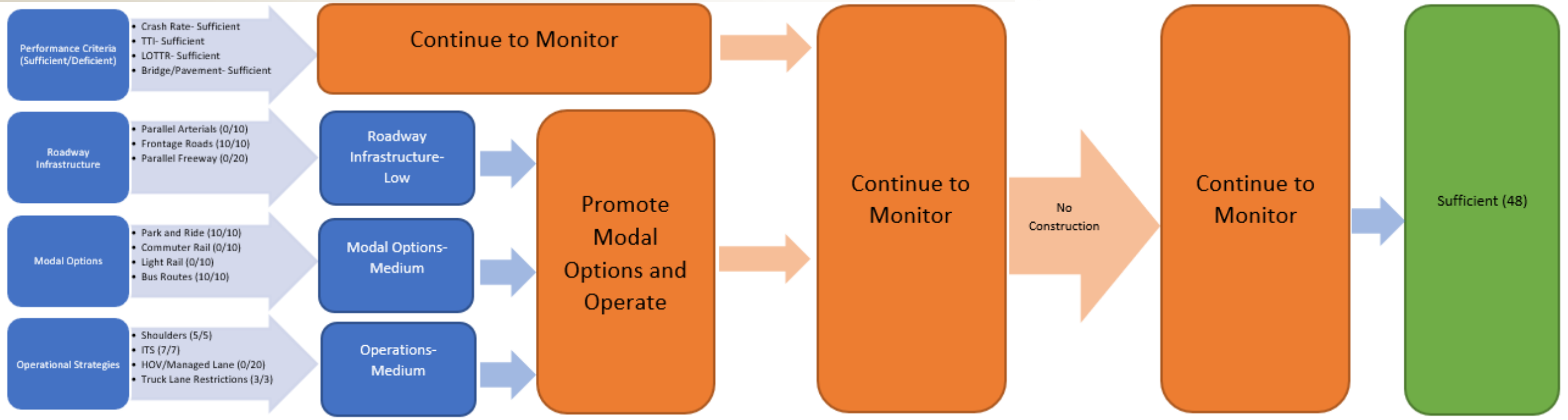
High: 30+
Medium: 20-29
Low: Under 20

Highlighted cells signify criteria which can alter aggregate category score.

Blue: Numeric/Score Based
Orange: Manual Process

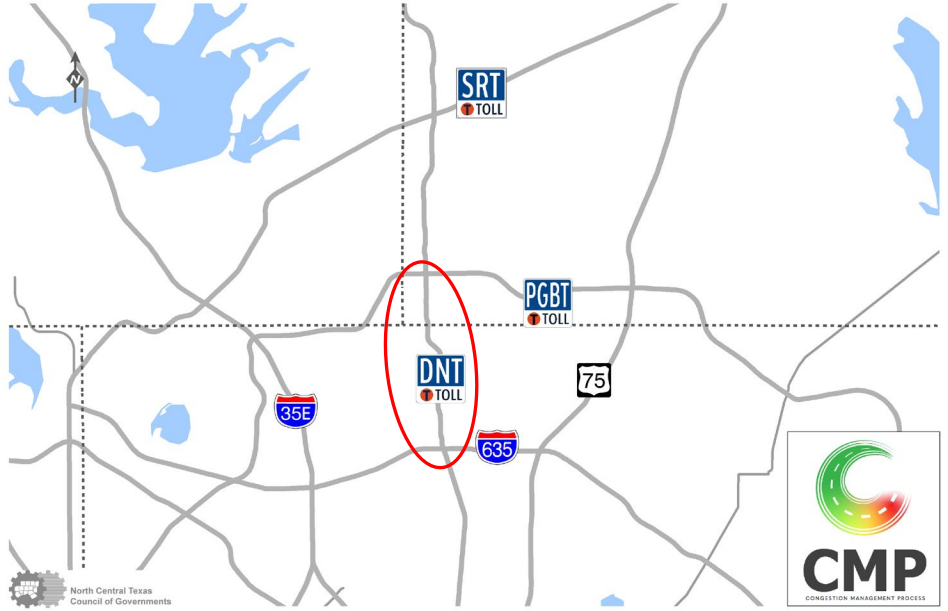
IH 20 from 35W to IH 820 (East)

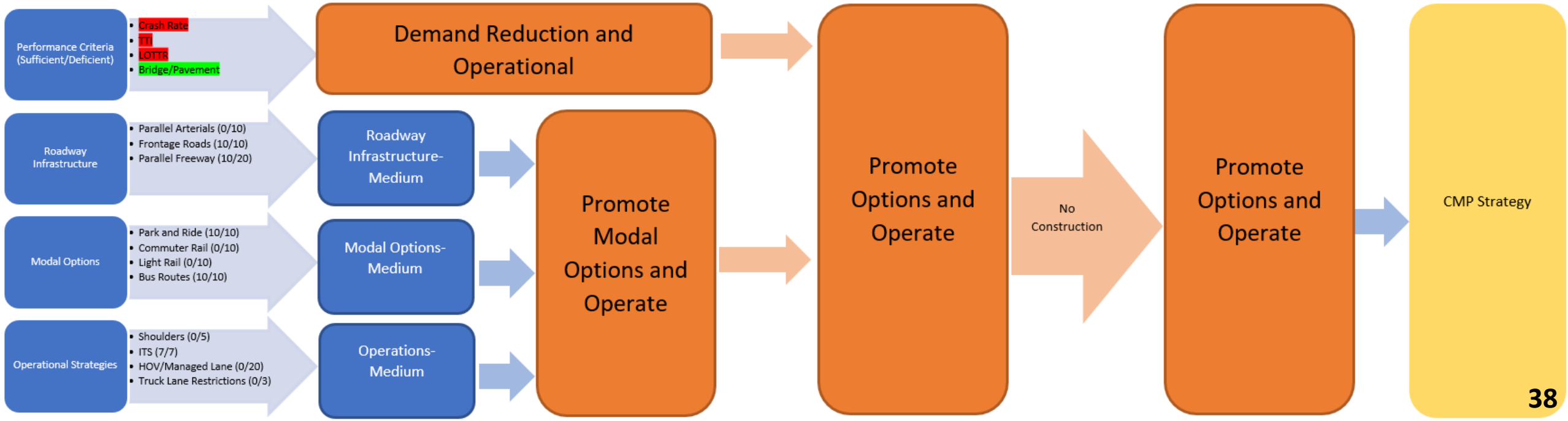




DNT from PGBT to IH 635

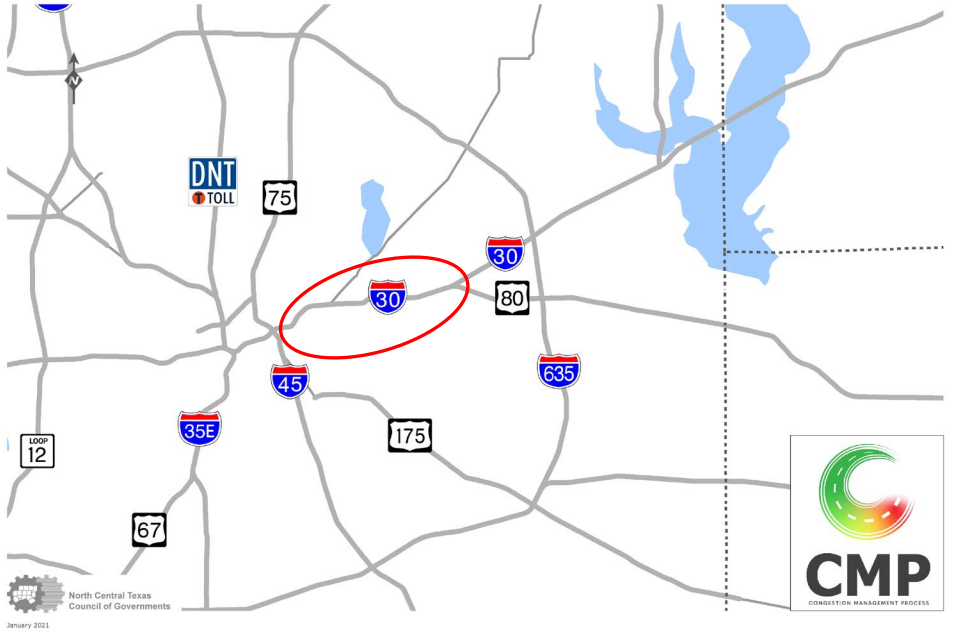
Corridor Map

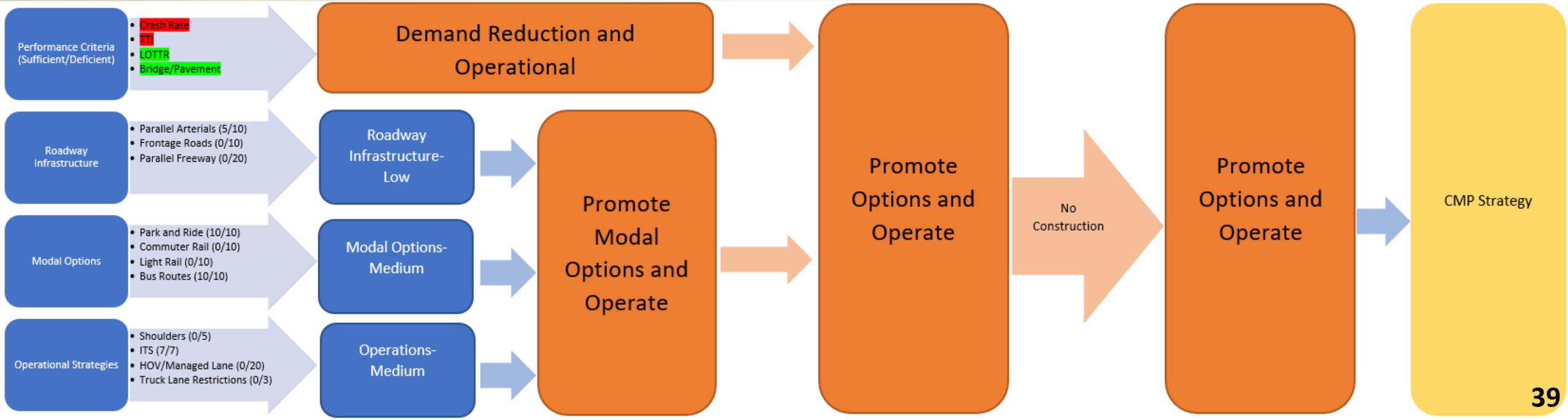




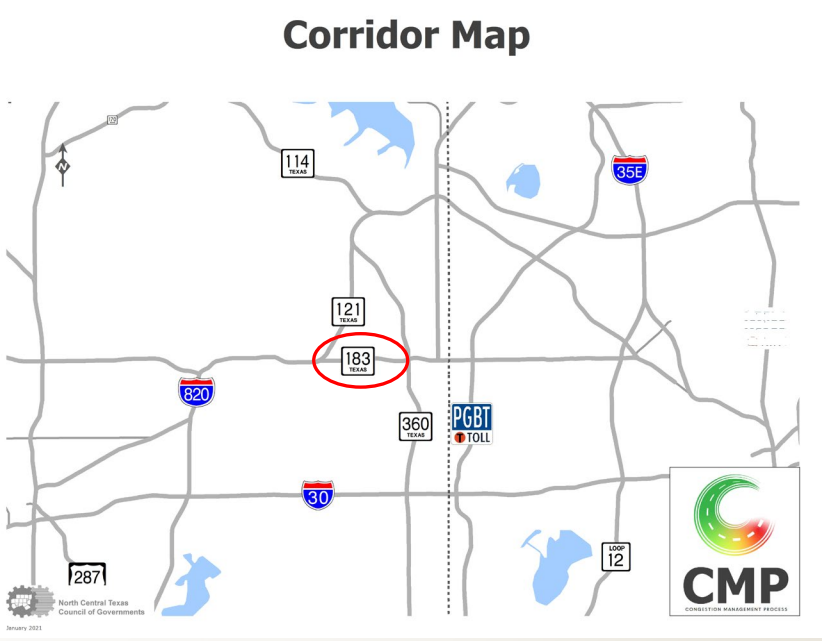
IH 30 from IH 45 to US 80

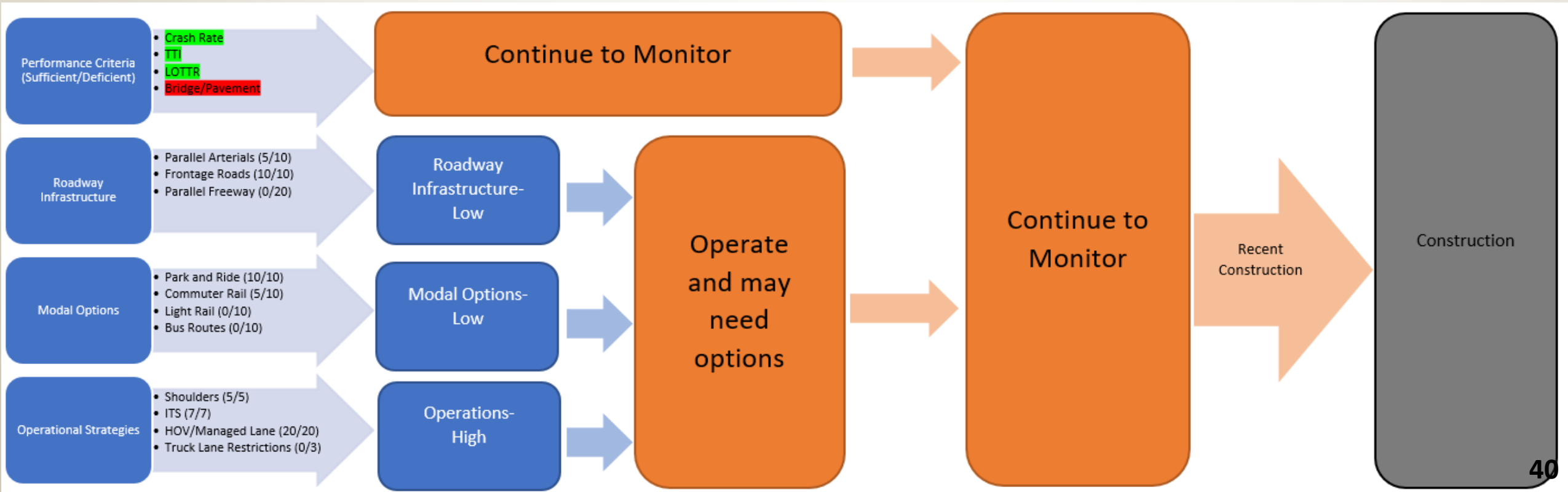
Corridor Map



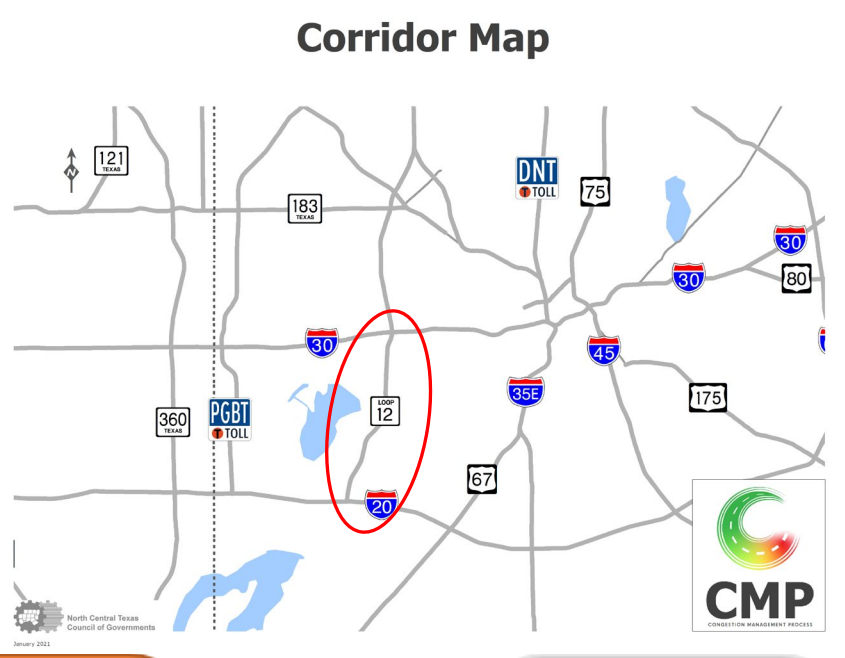


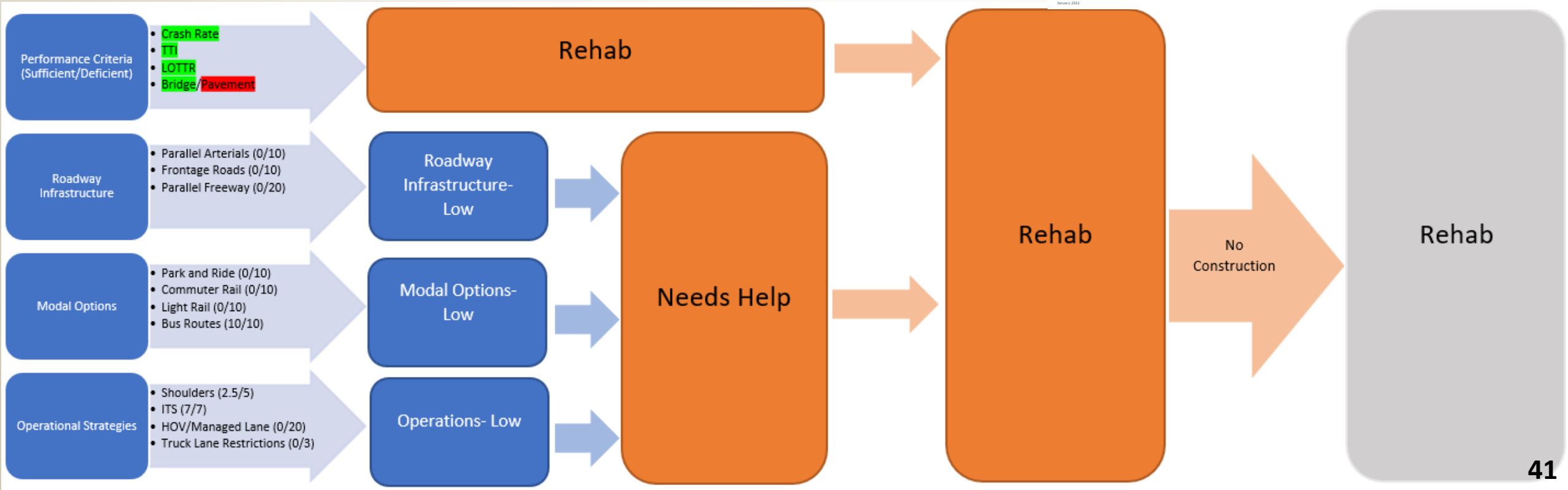
SH 183 from SH 121 to SH 360





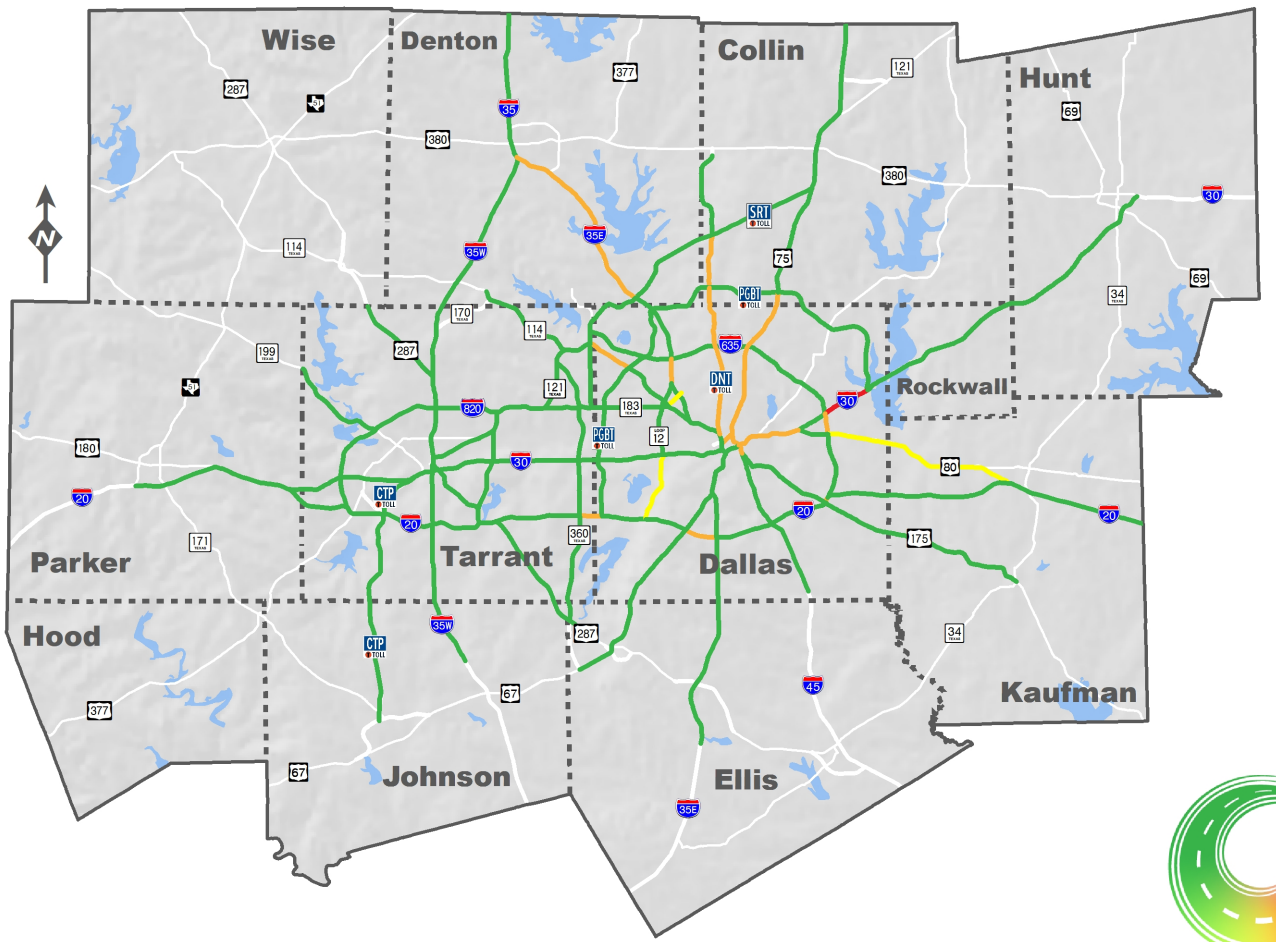
Loop 12 from IH 20 to IH 30



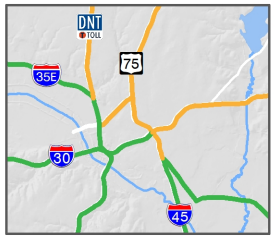


Process Outputs

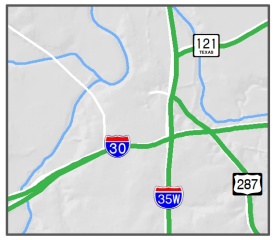
- Construction (Recent or Planned) (61)
- Continue to Monitor (45)
- CMP Strategy (16)
- Rehab (3)
- Corridor Study (1)



Dallas CBD



Fort Worth CBD



North Central Texas Council of Governments

January 2021

CMP
CONGESTION MANAGEMENT PROCESS

CMP Strategy Selection

Internal Review Process

Performance Criteria Deficiencies

Available Assets

Identify Possible Strategies

Strategy Selection

- Identify all potential strategies
- Find strategies which “solve” for performance measure deficiencies
- Find percentage of primary and secondary asset items that match those identified for the strategy
  - Primary asset items - full point
  - Secondary asset items - half point
- Rank potential strategies based on best matching assets and performance measures

Strategy Selection Example: US 75 from IH 635 to Spur 366

Performance Deficiencies

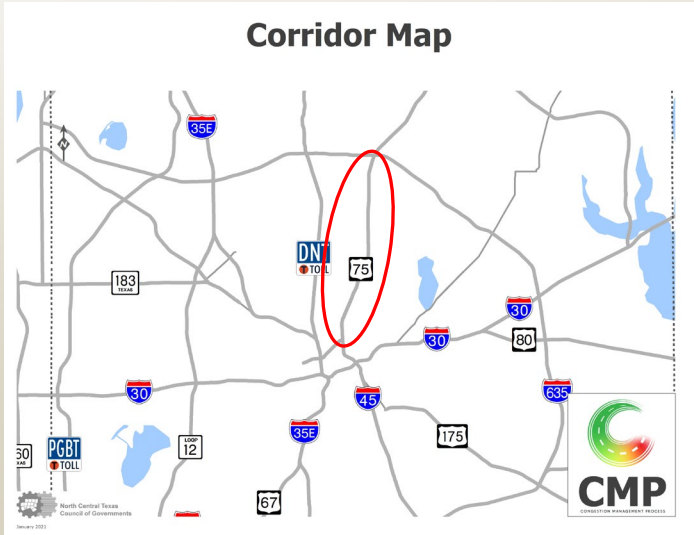
- Travel Time Reliability
- Travel Time Index

Available Assets

- Frontage Road
- Parallel Freeway
- Park and Ride
- Light Rail
- Bus
- ITS
- Mobility Assistance Patrol

Best Initial Strategy Matches

- Ridesharing and Carpool
- Transit System Signal Priority
- SOV Trip Reduction Program focused on transit
- Bottleneck Analysis



Strategy Selection Example: IH 20 from PGBT to SH 360

Performance Deficiencies

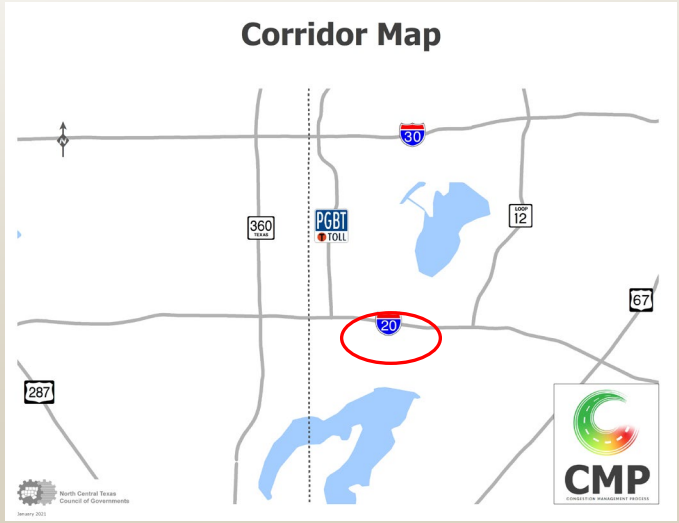
- Travel Time Reliability
- Travel Time Index

Available Assets

- Frontage Road
- Shoulder Availability
- ITS
- Truck Lane Restrictions
- Mobility Assistance Patrol

Best Initial Strategy Matches

- Ridesharing and Carpool
- SOV Trip Reduction Programming/Commuter Financial Incentives
- Shoulder Utilization Program
- Demand Response Transit Operations



Types of Congestion Management Strategies

Focus on Management and Operational Strategies which should include:

- Travel Demand Management (TDM) Strategies;
- Transportation System Management and Operational (TSMO) Strategies;
- Intelligent Transportation System (ITS) Technologies;
- Traffic Incident Management;
- Construction Management and Coordination; and
- Asset Optimization Improvements.24

CMP Strategy Selection (cont.)

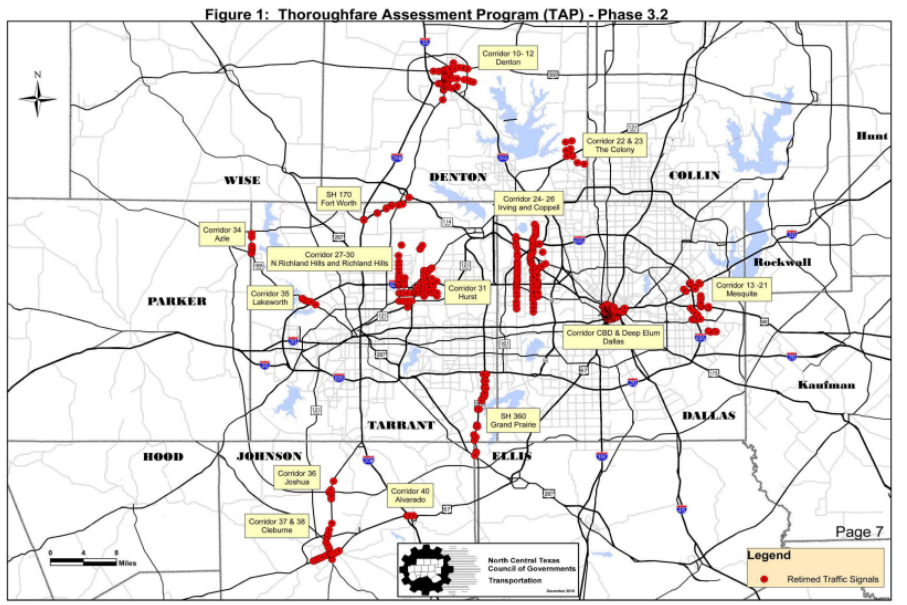
CMP Strategy Review

- Organize Review Group
  - Cities, TxDOT/NTTA, Transit Agencies, Counties
  - NCTCOG staff in associated program areas
- Review existing TIP projects on corridor
- Group selects strategies
- Establish CMP Program of Projects
  - Request STTC and RTC approval of program
  - Program into TIP

Project Performance Evaluation

- Develop a set of Baseline Performance Measures to Evaluate Strategies for Effectiveness
- Look to Existing Before/After Studies for Relevant Measures
- Focus on “Initial Criteria” Performance Measures (LOS, Reliability, etc.)
- Use Process to Track Federal Performance Measures as Necessary

Project Selection Example: TAP Phase 3.2 Corridor Signal Retiming



	Total (Per Day)	Per Corridor	Per Signal
Signal Delay Reduction (Hours)	3,007	75	12
Number of Stops Reduced	233,032	5,825	962
Travel Time Reduction (Hours)	3,924	98	16
Fuel Consumption Reduction (Gallons)	9,378	234	38
Savings	$37,597	$939	$155

Example Project Performance Measures

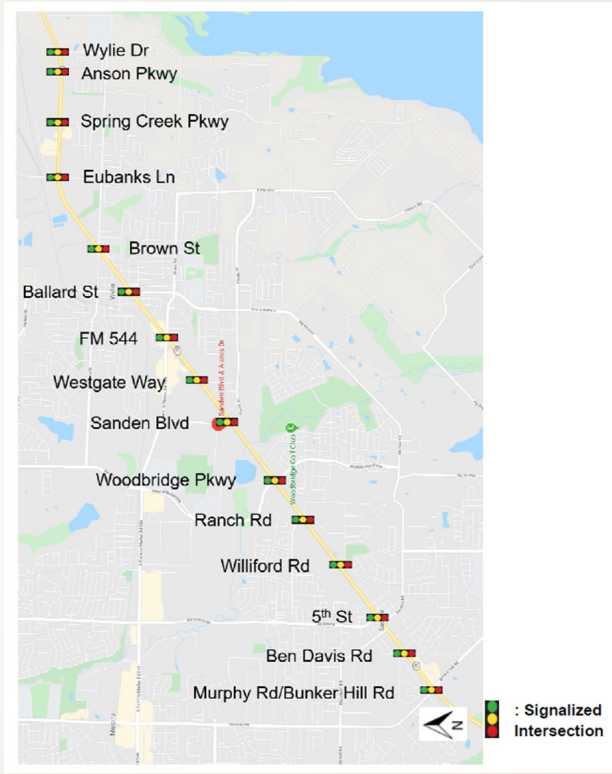
- Before/After Speeds
- Before/After Volumes
- Before/After Crash Rate
- Transit Ridership/Mode Split
- Changes in Asset Inventory
- Changes in Asset Condition
- Changes in Criteria Performance Measures, Peak Hour LOS, Crash Rate, Travel Time Reliability

Ongoing Corridor Monitoring Example: Ridership on McKinney Avenue Trolly

	Monthly			Cumulative		
	2019	2020	Change %	2019	2020	Cumulative %
JAN	31,802	59,661	**88%**	31,802	59,661	**88%**
FEB	29,513	52,778	**79%**	61,315	112,439	**83%**
MAR	52,277	46,267	**-11%**	113,592	158,706	**40%**
APR	47,174	23,413	**-50%**	160,766	182,119	**13%**
MAY	49,502	36,113	**-27%**	210,268	218,232	**4%**
JUN	52,671	38,809	**-26%**	262,939	257,041	**-2%**
JUL	54,252	46,860	**-14%**	317,191	303,901	**-4%**
AUG	42,457	49,815	**17%**	359,648	353,716	**-2%**
SEP	41,440	55,211	**33%**	401,088	408,927	**2%**
OCT	44,556	59,037	**33%**	445,644	467,964	**5%**
NOV	54,139	56,867	**5%**	499,783	524,831	**5%**
DEC	75,853	63,379	**-16%**	575,636	588,210	**2%**

- Example tracks ridership to measure impact of increased service
- Similar ridership data available for DART, Trinity Metro, DCTA
- Transit ridership could be used to measure impact of CMP project implementation aimed at incentivizing use of alternative modes

Ongoing Corridor Monitoring Example: Signal retiming on SH 78



Peak Period	Direction	Travel Time (sec)		# of Stops		Average Speed (mph)		Delay (sec)	
		Before	After	Before	After	Before	After	Before	After
AM Peak	NB	634	641	4.4	4.8	30.4	30.1	176	174
	SB	605	724	3.6	6.0	31.8	26.6	147	257
	Average	**619**	**683**	**4.0**	**5.4**	**31.1**	**28.4**	**162**	**215**
Midday	NB	599	555	4.2	3.4	32.1	34.7	143	92
	SB	564	570	3.2	3.6	34.2	33.8	116	116
	Average	**582**	**563**	**3.7**	**3.5**	**33.2**	**34.3**	**130**	**104**
PM Peak	NB	667	597	4.4	3.8	28.9	32.3	206	149
	SB	702	571	5.2	3.8	27.5	33.8	244	112
	Average	**684**	**584**	**4.8**	**3.8**	**28.2**	**33.1**	**225**	**131**

Peak Period	Direction	Travel Time		# of Stops		Average Speed		Delay	
		sec	%	Total	%	mph	%	sec	%
AM Peak	NB	7	1.2%	0.4	9.1%	-0.3	-1.0%	-3	-1%
	SB	119	19.7%	2.4	66.7%	-5.2	-16.4%	110	75%
	Average	**63**	**10.2%**	**1.4**	**35.0%**	**-2.8**	**-8.8%**	**54**	**33%**
Midday	NB	-44	-7.4%	-0.8	-19.0%	2.6	8.1%	-52	-36%
	SB	6	1.1%	0.4	12.5%	-0.4	-1.2%	0	0%
	Average	**-19**	**-3.3%**	**-0.2**	**-5.4%**	**1.1**	**3.3%**	**-26**	**-20%**
PM Peak	NB	-70	-10.4%	-0.6	-13.6%	3.4	11.8%	-57	-28%
	SB	-131	-18.6%	-1.4	-26.9%	6.3	22.9%	-132	-54%
	Average	**-100**	**-14.6%**	**-1.0**	**-20.8%**	**4.9**	**17.2%**	**-95**	**-42%**

- Sample shows before and after data available to measure impact of signal retiming project
- Similar data will be available for CMP corridors via existing performance measure platforms

CMP Schedule

Committee	Dates
STTC Workshop and STTC (Info)	May 28, 2021
RTC Info	June 10, 2021
STTC – Action	June 25, 2021
Public Comment Period	June 2021
RTC – Action	July 8, 2021

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