

2026 TexITE Transportation Achievement Award – Traffic Engineering

Kimley-Horn is pleased to nominate the North Central Texas Council of Governments (NCTCOG) Regional Traffic Signal Program (RTSP) for the TexITE 2026 Transportation Achievement Award in Traffic Engineering.

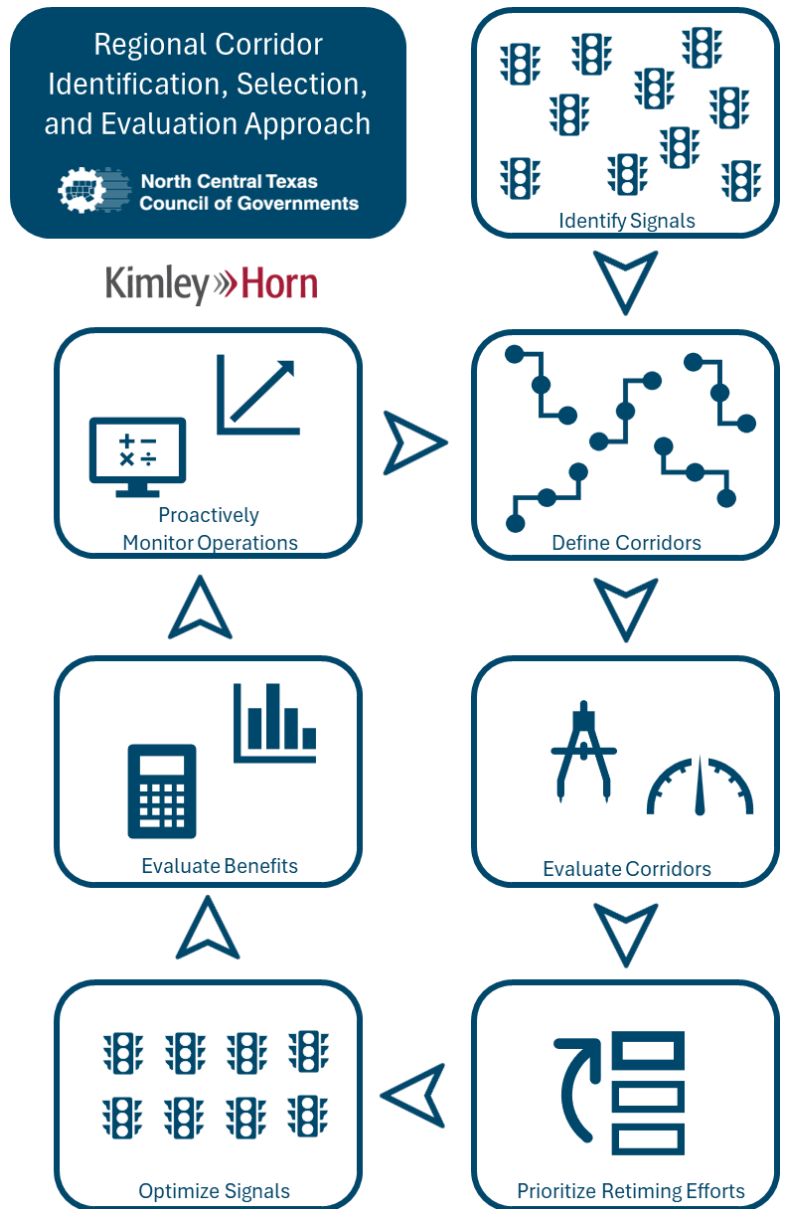
The North Central Texas Council of Governments (NCTCOG) Regional Traffic Signal Program (RTSP) is the latest evolution of NCTCOG’s commitment to the goals of improved air quality, improved travel reliability, improved transportation efficiency, reduced delay, reduced fuel consumption and vehicle emissions, and reduced congestion throughout the region. Initial efforts toward these goals were performed under the Thoroughfare Assessment Program (TAP) and continued with the Regional Traffic Signal Retiming Program (RTSRP) projects. RTSP innovates on previous efforts by adding a regional equipment inventory, setting minimum equipment standards, and objectively selecting corridors through INRIX Signal Analytics, a cutting-edge cloud-based traffic data platform.

RTSP is more than a retiming initiative. It also provides dedicated funding to upgrade traffic signal equipment throughout the region to meet the Regional Minimum Functional Standards. The Regional Traffic Signal Inventory identified specific equipment and capability gaps across the region, and RTSP addresses those deficiencies through an adaptable framework capable of supporting emerging technologies like enhanced detection, communications, and connected vehicle applications. Additionally, the program monitors traffic signal performance through the INRIX Signal Analytics platform.

RTSP will improve traffic in the Dallas-Fort Worth (DFW) leveraging this advanced traffic engineering data to more equitably prioritize, optimize, and retime more than 7,000 traffic signals in the 10-county area.

Project History

TAP, RTSRP, and RTSP are all focused on regionally significant traffic signal optimization. From the outset, NCTCOG has worked with member agencies and expert consultants to identify corridors and intersections for improvement. Once these corridors were identified, consultants have gathered data, created existing conditions models, developed new optimized timing plans, implemented and fine-tuned these plans in the field, and measured the results.



The TAP program started in 2002 and relied on manual data collection and floating-car travel time runs. As the program evolved into RTSRP starting in 2011, NCTCOG took advantage of technological innovations such as camera-based data collection and crowd-sourced probe-based data.

DFW has experienced rapid growth and is continuing to expand, which has resulted in an increasing number of traffic signals and corridors needing retiming. The county project area currently has more than 7,000 traffic signals. In the past, NCTCOG selected corridors through a Call for Projects (CFP), but RTSP now uses a performance-based platform to select corridors appropriate and suitable for retiming.

The previous CFP approach tended to select corridors based on which member agencies applied, which meant member agencies with significant potential for operational improvement but without on-staff traffic engineers on staff to advocate and submit to the CFP may have been skipped over. **The new RTSP performance-based platform allows NCTCOG to objectively evaluate the corridors and intersections across the region against predetermined measures to identify where optimization can produce the greatest benefits.**

The goals of RTSP are to:

- Improve the arterial transportation system in the DFW Air Quality Nonattainment Area;
- Improve air quality in region;
- Alleviate arterial congestion in the region; and
- Reduce idle emissions.

As has been the objective since the inception of the TAP program, RTSP is focused on optimizing the region's signal timing operations. To support traffic signal retiming efforts, RTSP introduced a Regional Traffic Signal System Evaluation to assess current conditions of traffic signals in the region, define obtainable minimum standards for the region, and recommend regional performance measures.

Objectives

The objectives for the Regional Traffic Signal System Evaluation are to:

- Inventory signal equipment at all existing traffic signals in the project area,
- Recommend minimum functional standards at the signalized intersection level,
- Recommend performance measures for investigation, monitoring, prioritization, and evaluation of traffic signal operations now and into the future and
- Recommend an approach for corridor identification, selection, and evaluation.

Additionally, RTSP:

- Inventories the region's existing traffic control capabilities
- Recommends regional traffic control minimum standards
- Recommends regional traffic control improvements
- Recommends regional traffic signal performance measures and functional requirements for a data platform

Regional Traffic Signal Inventory

The primary purpose of creating an updated inventory of the region's existing traffic control equipment and capabilities through RTSP was to identify minimum traffic signal standards and to inventory existing conditions to allow NCTCOG and the region to identify funding needs, specific funding opportunities, and traffic signal retiming efforts.

Minimum functional standards provide a baseline for operating and maintenance (O&M) agencies to efficiently operate traffic signals throughout the region. Coordinated traffic signal timing is one of the most immediate, impactful, and cost-effective methods to meet the goals of RTSP. However, the most efficient signal operations are not always coordinated.

The project area includes 10 counties in North Texas. The 10-county project area encompasses 123 municipalities and 6,805 signalized intersections (at the time of the inventory).

Prior to the Regional Traffic Signal Inventory, Kimley-Horn assisted NCTCOG and member agencies in developing minimum standards for traffic signal equipment, capabilities, and operations. The standards address equipment, capabilities, operations, and documentation. Specific equipment was not identified (e.g., traffic signal controller by make and model), but rather functional requirements and national standards (e.g., accurate time-keeping and NTCIP standards).

Developing these standards started with a question: “*What defines a functional traffic signal in North Texas?*”. To answer that question, the basic elements of a traffic signal were considered:

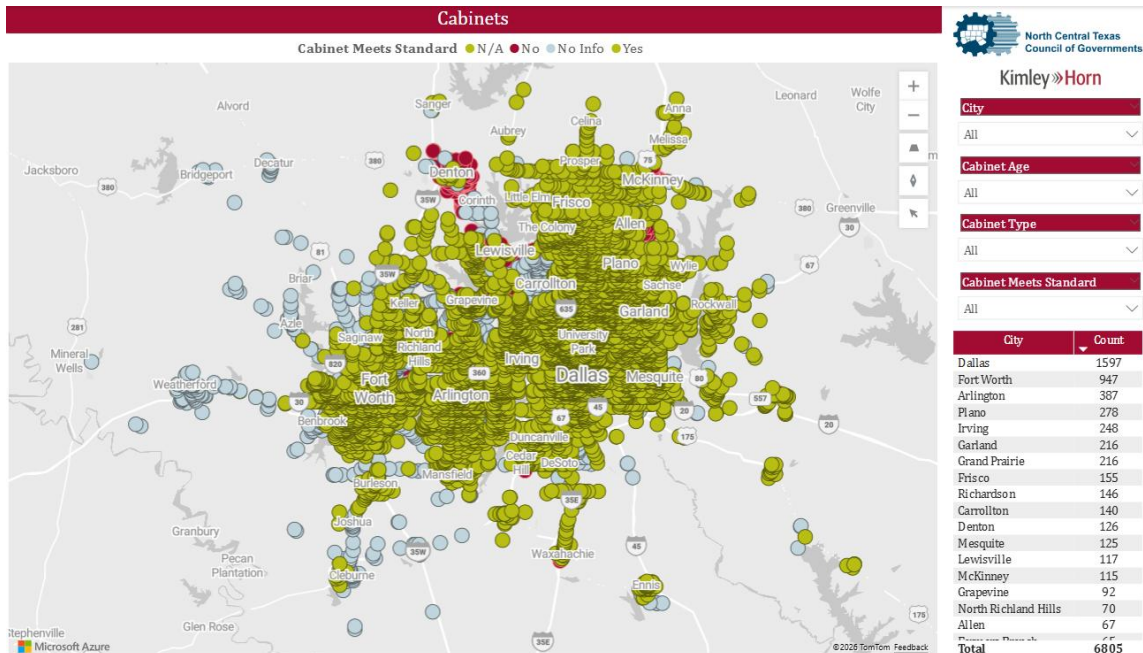
- Controller
- Cabinet
- Communications
- Vehicle detection
- Clock
- Operational capabilities

After workshops with regional stakeholders and multiple refinements, the following Initial Draft Recommended Minimum Standards were adopted for each signalized intersection in the NCTCOG Non-Attainment Area to define a functional traffic signal in North Texas:

Component	Minimum Functional Requirement
Cabinet	TS2, Caltrans, or ATC cabinet
Controller	TS2, 2070, or ATC controller (meets current ATC, NEMA, and NTCIP standards)
Time Keeping	Accurate and reliable
Communication	Controller can be remotely accessed and controlled Remote communications available and reliable
Detection	Detection present on at least side streets and left turns; detection accurate and reliable
Signal Hardware	FYA for Protected/Permitted Left Turns
Signal Hardware	LED Signal Heads

The Regional Traffic Signal Inventory provided a snapshot of traffic equipment, capabilities, and operations across the regions as of May 2022.

The inventory was used to develop a list of regional needs that can be associated with planning-level cost estimates. Together, costs to address specific needs will provide an understanding of funding needed to elevate signals in the region to meet identified minimum standards. This will help O&M agencies and NCTCOG program and fund upgrades to achieve the overall goals of RSTP. The Regional Corridor Identification, Selection, and Evaluation Approach being developed as part of RTSP will also draw on the information acquired through the survey process. To date, NCTCOG has dedicated more than \$10 million to member agencies to upgrade signal equipment.



Performance Measures

NCTCOG is using a data-driven approach to prioritize traffic signal improvements and identify corridors for implementation of traffic signal retiming/synchronization and performance monitoring on an ongoing basis. NCTCOG has procured a data platform, INRIX Signal Analytics, to measure performance of traffic signals in DFW. This platform tracks performance measures to monitor and document signal performance. **All performance measures are achievable without implementation of new hardware or direct access (physical or virtual) to the traffic signal cabinet or controller.** These performance measures identify candidate corridors for applying traffic signal improvements such as retiming. The INRIX Signal Analytics subscription is overseen and paid for by NCTCOG, with multiple user licenses provided for all public agencies that operate traffic signals in the region and their representatives.

NCTCOG and the Kimley-Horn team developed and refined goals of the RTSP and objectives to meet those goals. To measure the success of the identified objectives, seven performance measures were identified as requirements for the desired data platform.

The performance measures identified are outcome-related, rather than output-related. Outcome-related performance measures assess results of an agency's actions, while output-related performance measures are based on measuring actions. While there are additional administrative goals and objectives of the project, the performance measures prioritized in the following list focus **exclusively on quantifiable operational goals and objectives.**

- Average Delay per Mile
- Travel Time Reliability
- Intersection Delay
- Arrivals on Green
- Average Split Failures
- Peak Period Split Failures
- Off-Peak Split Failures

NCTCOG procured INRIX Signal Analytics, a cloud-based crowd-sourced probe data platform with data available to measure the performance of the traffic signals in the DFW region. As part of RTSP, NCTCOG provided access free of charge to all member agencies to support their daily operations.

Kimley-Horn is partnering with NCTCOG to develop their first Regional Corridor Prioritization System, using the data from Signal Analytics to proactively and objectively identify corridors across the region for retiming. Kimley-Horn's Regional Traffic Signal Inventory was used to create intersections in Signal Analytics; Kimley-Horn then helped NCTCOG and multiple client agencies review and refine intersections for accuracy. More than 1,300 corridors were created in the platform, focusing on regionally significant roadways and corridors crossing multiple jurisdictions. Kimley-Horn evaluated, updated, and revised every single corridor twice to improve data capture rate and capture relevant travel patterns.

Kimley-Horn is currently working with NCTCOG and INRIX to define the key metrics for corridor prioritization, including Level of Travel Time Reliability and Delay Per Mile. These normalized measures will allow NCTCOG to compare corridors with wildly different characteristics consistently to identify areas with the most potential for improvement based on optimized signal operations. **Signal Analytics will be integrated throughout the retiming process, from developing new signal timing based on measures of effectiveness (MOE) based on large data sets captured at the movement level over weeks to evaluating improvements with before/after analyses.**

NCTCOG evaluated 1,300+ regional corridors for eligibility.

- 74 corridors were identified for detailed review, representing approximately 600 total signals.
- Corridors ranked by average performance measure delay per mile.
- The top 42 corridors were selected, totaling 587 signals.
- Corridors were removed from the ranking if they had known construction, are overcapacity, corridors already in progress, those recently retimed, Central Business District corridors, duplicates, and corridors with less than eight signals.

Agencies helped refine and confirm:

- Preview current results.
- Corridor limits
- Add diamond signals.
- Realistic adjacent intersections.
- Recent or planned construction.
- Known operational constraints.
- Local knowledge not visible in the dataset.

As part of RTSP, NCTCOG is encouraging member agencies to use Signal Analytics for monitoring, identification, prioritization, calibration, evaluation, and troubleshooting in their daily operations; Kimley-Horn has assisted multiple member agencies in these tasks. For example, the City of Euless received a citizen complaint about side street delay after a corridor was retimed. Kimley-Horn used Signal Analytics data to compare conditions before and after the retiming effort and was able to provide quantitative justification for the changes. Armed with the measures of effectiveness, the City was able to illustrate why the new conditions were the optimal solution.

NCTCOG, INRIX, member agencies, and Kimley-Horn have used this data-driven approach to define, measure, and objectively prioritize 29 corridors involving 24 cities and agencies, accounting for more than 450 signalized intersections. Data from the Signal Analytics platform will be used throughout the process to supplement and replace traditional data gathered during the signal optimization process. Once optimization is completed in the field, Signal Analytics will be used to measure the benefits of RTSP across the region.

NCTCOG's innovative approach will lead the way in regional traffic signal management by providing access to the platform to member agencies. **NCTCOG has empowered member agencies to create continuous, proactive data-driven management of their traffic networks to deliver substantial benefits to drivers across North Texas.**