SMARTE
Saving Money and Reducing Truck Emissions

North Central Texas Council of Governments

korem THE GEOSPATIAL EXPERT SHOP

Saving Money and Reducing Truck Emissions Webinar Series

TRUCK ROUTES

Date: Thursday, September 1, 2022

Time: 11:00 – 12:00 PM Central Standard Time

Hosted by the **North Central Texas Council of Governments (NCTCOG)**

Register at https://forms.office.com/r/Y3NBCauRcv

Webinar will be presented through **ZOOM**

Contact: Huong Duong, hduong@nctcog.org

Presenters:

Thomas J. Bamonte, NCTCOG

Joe Francica, Korem

Morgan Tavallaee, NCTCOG

OVERVIEW

Image provided by Getty

Welcome, Introduction
Presenter: Huong Duong, Transportation Planner, NCTCOG

Truck Routes
Presenter: Morgan Tavallaee, Transportation Planner, NCTCOG

Modeling Traffic Analytics and Other KPIs for Efficient Routing
Presenter: Joe Francica, Senior Director, Geospatial Strategy, Korem

Freight Vehicle Optimization at Signalized Intersections: Overview of Dallas-Fort Worth Project With National Implications
Presenter: Thomas J. Bamonte, Senior Program Manager, NCTCOG

Questions

Local Updates and Close

Saving Money and Reducing Trucking Emissions Program

GOALS
Promote emissions reduction and cost saving strategies within the trucking industry

INITIATIVES
Build relationships within the trucking industry
Share information about emission reduction strategies
Connect SmartWay verified technology to trucking owner/operators and fleet managers
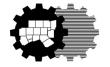
SMARTE

Saving Money and Reducing Truck Emissions

Truck Routes

Truck Routes Meeting - SMARTE
September 1, 2022

Morgan Tavallaee, Transportation Planner
NCTCOG Transportation Department

FREIGHT
NORTH TEXAS

FEDERAL & STATE TRUCK ROUTES

The National Highway Freight Network. This network includes 265,000 miles of highways to help support interstate commerce by providing national truck routing.

State truck routes are put in place by the State Freight Highway Network. The State Freight Highway Network includes state funded facilities.

Source: Getty Images

MUNICIPALITY TRUCK ROUTES

Each city/town designates specific roads as truck routes.

Importance-
- Allows truck movement to pass from city to city
- Moves trucks efficiently
- Helps provide safe movements for trucks
- Helps keeps trucks out of specific areas (residential)

Designated truck routes can be found in city ordinances. Municipalities update and change their specific truck routes through the ordinance process.

NCTCOG TRUCK ROUTE

Each year, staff tracks truck route changes throughout the region.

An Excel spreadsheet is updated based on the changes the cities have made to their ordinances.

Once the updates have been made in the spreadsheet, the truck routes in the region are updated in a GIS shapefile.
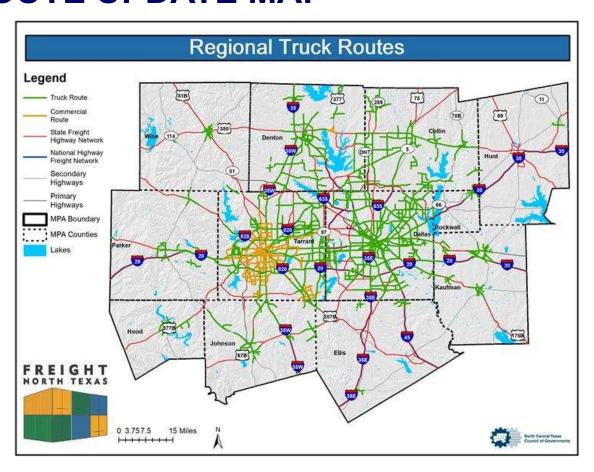
This is a standard dataset used each year for this analysis and studies by NCTCOG.

NCTCOG plans to do a study on truck routes to improve connectivity and safety within the region.

The updates/changes to the truck routes are then tracked in a report.

TRUCK ROUTE UPDATE MAP

LANCASTER TRUCK ROUTE ANALYSIS

NCTCOG was asked by the city of Lancaster to help evaluate the city's truck route network.

On-site reviews to observe traffic, assess roadway conditions, and evaluate the design and functionality of Lancaster's designated truck route network were conducted.

Additionally, NCTCOG reviewed local and regional truck routes to better match infrastructure to freight transportation demand.

Lancaster Truck Routes	
Beltline Road	From the east city limits to the west city limits.
Danieldale Road	From its point of intersection with the IH 20 service road west to its point of intersection with the IH 35E service road.
IH 35E and IH 35E Service Roads	From the north city limits to the south city limits.
IH 20 and IH 20 Service Roads	From the east city limits to the west city limits.
Lancaster-Hutchins Road	From the north city limits to its intersection with State Highway 342 (Dallas Avenue).
North Longhorn Drive	From its intersection with Danieldale Road to its intersection with West Road.
Pleasant Run Road	From the east city limits to the west city limits.
Springfield Road	From its intersection with the IH 35E service road to a point 1597 feet east from its intersection with the IH 35E service road.
State Highway 342	From the north city limits to the south city limits.
West Road	From its intersection with North Longhorn Drive to its intersection with the IH 35E service road.

LANCASTER TRUCK ROUTE ANALYSIS

The analysis included a list of recommendations for potential and future truck routes.

Meetings with city staff were held to discuss the findings and recommendations.

NCTCOG plans to use this analysis as a path forward for a Regionwide Truck Route Analysis of the region.

TRUCK ROUTE ANALYSIS

NCTCOG will conduct an analysis to identify issues within the region's truck route network to better create first/last mile connects from city to city and improve access to the region's FODs.

The Regionwide Truck Route Analysis will include findings and recommendations that address:
- Connectivity issues within cities
- Connectivity issues from city to city
- Truck route description issues within city ordinances
- Truck routes issues (road size, condition, geometry, etc.)
- Recommending potential truck routes

This is a collaborative effort. From this analysis, cities will have the ability to work together and help make goods move more efficiently and effectively in the region.

CONTACT INFORMATION

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Mike Johnson
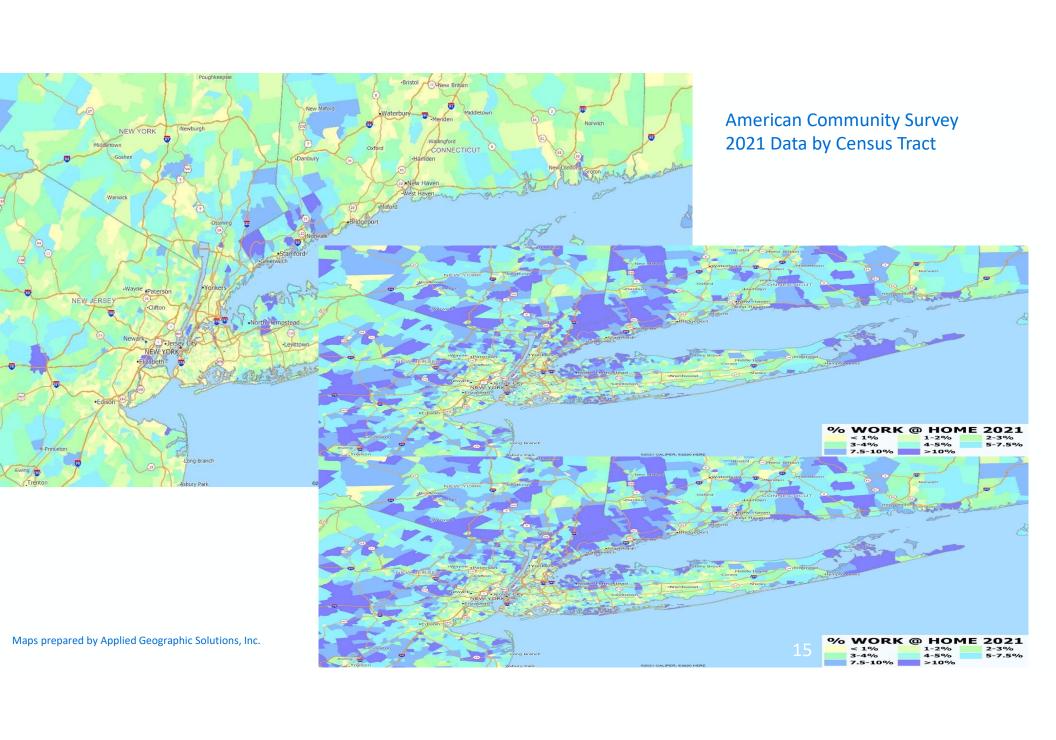**Principal Planner**
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Modeling Traffic Analytics and Other KPIs for Efficient Routing

Joe Francica

Sr. Director, Geospatial Strategy

Korem

jfrancica@korem.com

American Community Survey
2021 Data by Census Tract

% WORK @ HOME 2021
< 1%   1-2%   2-3%
3-4%   4-5%   5-7.5%
7.5-10%   >10%

Maps prepared by Applied Geographic Solutions, Inc.

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Korem is a geospatial solutions & provider of data as a service

Truck Data Attributes for Route Optimization

WARNINGS
Road Conditions
Weather

PHYSICAL RESTRICTIONS
Bridge Height / Road Weight Limitations

TRUCK POINTS OF INTEREST
Fuel Stations, etc.

DISTANCE MARKERS

LOADING DOCK LOCATIONS
Specific loading / unloading locations

LEGAL RESTRICTIONS

ENVIRON-MENTAL AND HAZARDOUS MATERIAL RESTRICTIONS

korem.com/product/here-trucks/

Supply Chain Journey

Suppliers

Manufacturer /Shipper

Fleet Operators

Rail Operators

Air Cargo Operators

Shipping Operators

Fleet Operators

Warehousing

Fleet Operators

Retail

Fleet Operators

Customer

Long Haul

Middle Mile

Last Mile

Transporting goods from ports and docks to depots and warehouses
Long Haul Trucking

Fleet Operators   Warehousing   Fleet Operators   Retail   Fleet Operators   **Customer**

Long Haul   **Middle Mile**   **Last Mile**

KEY USE CASE

Dynamic Route Optimization

Compliance and Safety

PRODUCTS

HERE Commercial Vehicle Regulations;

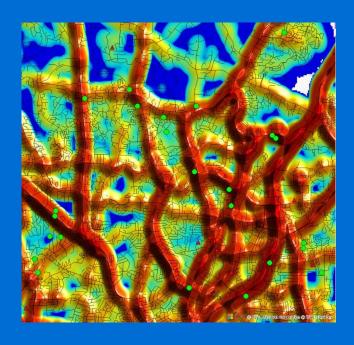HERE Toll Costs

HERE Routing – with enhanced Trucks attributes)

HERE Traffic Patterns

HERE Route Matching

GOAL

To identify road impedance and restrictions that impact driver safety and regulatory factors.

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Key Challenge

Traffic data, in its raw format, comes with very large volumes of information that are not easy to store or analyze with traditional geographic information systems (GIS).

Computing traffic analysis at scale requires intensive geospatial data delivery and integration skills that leverage cloud data warehouse technology.

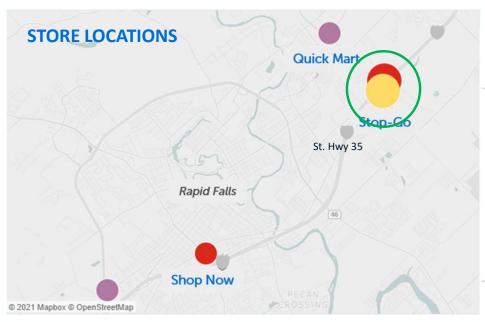# Usage of Traffic Data for Location Analytics: The Basics

Ideal for:

- Comparing cars on street "A" vs street "B" at a given hourly time period during the day

- Observing traffic volume changes for street "A" by day or month.

- Understanding consumer travel patterns (origin/destination)

- Differentiate trucks vs. car volume
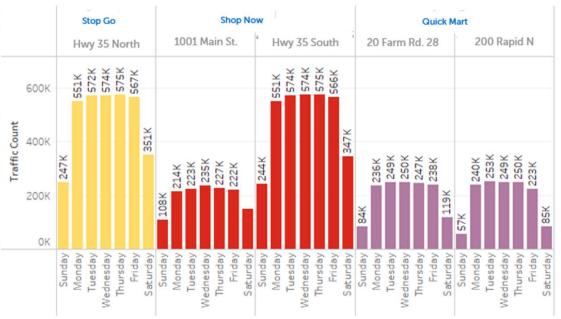
- Route Optimization

Not ideal for:

- Conducting a macro-analysis of all traffic within a country or a state

- Obtaining "live" traffic counts (there is a 48-hour lag on data collection).

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Example of Traffic Analytics Data

STORE LOCATIONS

Quick Mart

Stop-Go

St. Hwy 35

Rapid Falls

Shop Now

© 2021 Mapbox © OpenStreetMap

- 🟣 Quick Mart
- 🔴 Shop Now
- 🟡 Stop-Go

Size of dot represents traffic volume

DAILY TRAFFIC VOLUME BY DAY BY STORE

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Example of Traffic Analytics Data

STORE LOCATIONS

Quick Mart

Stop-Go

St. Hwy 35

Rapid Falls

Shop Now

© 2021 Mapbox © OpenStreetMap

● Quick Mart

● Shop Now

● Stop-Go

Size of dot represents traffic volume

TRAFFIC VOLUME BY DAY BY HOUR – St. Hwy. 35

Epoch_60m..	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
0	1.701%	0.672%	0.336%	0.322%	0.392%	0.481%	1.123%
1	0.949%	0.375%	0.293%	0.267%	0.322%	0.392%	0.610%
2	0.644%	0.276%	0.255%	0.257%	0.290%	0.321%	0.603%
3	0.592%	0.411%	0.357%	0.318%	0.384%	0.426%	0.635%
4	0.799%	0.881%	0.697%	0.680%	0.803%	0.792%	0.895%
5	0.816%	2.144%	2.017%	1.872%	2.045%	1.829%	1.152%
6	1.230%	4.361%	4.198%	4.056%	4.207%	4.006%	2.228%
7	2.207%	6.337%	7.111%	6.712%	7.375%	6.385%	3.722%
8	3.821%	7.018%	7.566%	7.003%	7.613%	7.013%	5.554%
9	5.905%	7.180%	6.808%	6.425%	7.010%	7.094%	7.006%
10	8.096%	7.729%	7.282%	7.000%	7.326%	7.520%	8.265%
11	8.885%	8.512%	8.191%	7.712%	8.125%	8.419%	8.829%
12	9.875%	8.031%	8.346%	7.937%	8.089%	8.786%	8.211%
13	9.017%	7.930%	8.233%	8.068%	8.016%	8.409%	7.770%
14	7.573%	7.686%	7.672%	7.717%	7.816%	7.639%	7.069%
15	6.708%	7.537%	7.905%	8.196%	7.837%	7.135%	6.187%
16	6.191%	6.899%	7.048%	7.568%	6.498%	6.106%	5.876%
17	5.975%	5.627%	5.528%	5.763%	4.919%	4.823%	5.090%
18	5.216%	3.872%	3.762%	4.417%	3.629%	3.620%	4.592%
19	4.249%	2.373%	2.308%	2.748%	2.364%	2.692%	3.665%
20	3.311%	1.631%	1.699%	1.970%	1.656%	1.902%	3.516%
21	2.702%	1.174%	1.148%	1.432%	1.326%	1.756%	2.942%
22	1.855%	0.782%	0.717%	0.955%	1.144%	1.472%	2.351%
23	1.682%	0.562%	0.521%	0.605%	0.815%	0.982%	2.109%

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…And in the not too distant future

The overall logistics supply chain will also have to be redesigned for autonomous trucks. Loading and unloading need to be optimized and times adjusted to an environment in which freight can and will come in 24/7.

Automotive World

October 18, 2021

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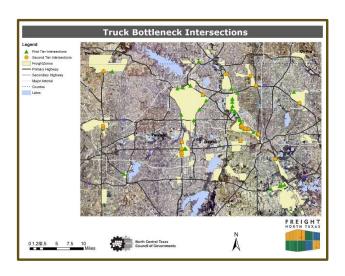
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Thank you.

Joe Francica

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For more information go to:

korem.com/product/here-trucks/

Improving Truck Routing With Freight Vehicle Optimization Technology

Project Inspiration

Truck Bottleneck Intersections

TxDOT Connected Freight Corridors

City of Arlington: Connected Vehicle Corridor

31 Intersections C2N DSRC CV2X — Arlington TX

GDOT & ARC: Georgia Regional Connected Vehicle Program

Project Vision

Technology

Integrator

Coordination

Adaptation

ROI

Project Implementation

Software only
- No RSUs/OBUs

Coverage
- Up to 500 signalized intersections in DFW
- Up to 5,000 vehicles supported simultaneously
- Up to ten jurisdictions
- Multiple AVL providers supported
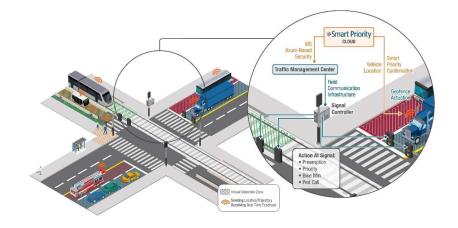- Open to all freight vehicles

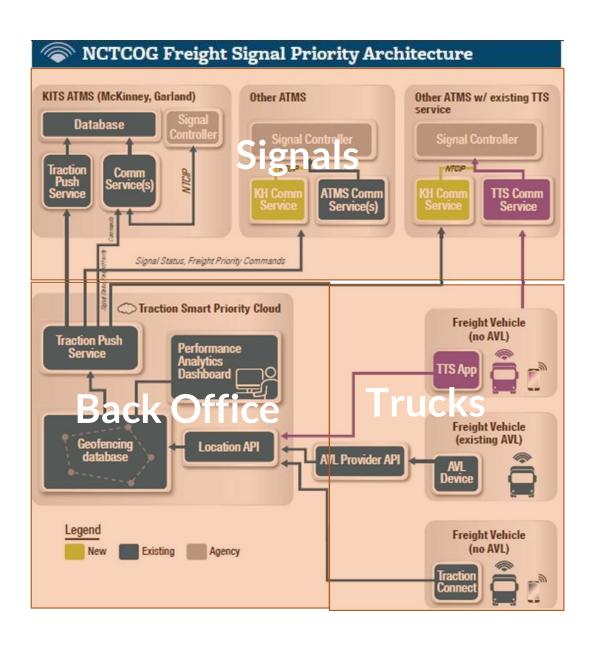# Two Solutions Combined

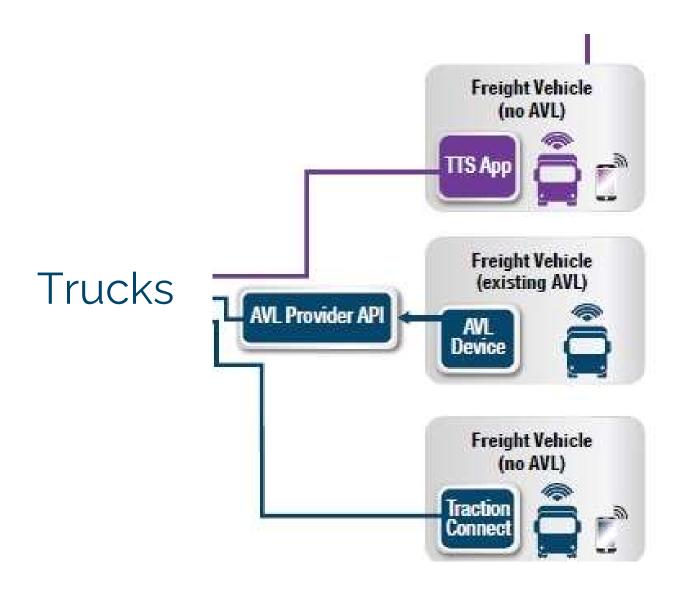Green Light Optimized Signal Advisory (GLOSA)
- Speed to hit the green

Signal priority
- Green light timing adjustment

NCTCOG Freight Signal Priority Architecture

KITS ATMS (McKinney, Garland)
- Database
- Signal Controller
- Traction Push Service
- Comm Service(s)
- NTCIP

Other ATMS
- Signal Controller
- KH Comm Service
- ATMS Comm Service(s)

Other ATMS w/ existing TTS service
- Signal Controller
- NTCIP
- KH Comm Service
- TTS Comm Service

Signals

Signal Status, Freight Priority Commands

Traction Smart Priority Cloud
- Traction Push Service
- Performance Analytics Dashboard
- Geofencing database
- Location API

Back Office

Trucks

Freight Vehicle (no AVL)
- TTS App

Freight Vehicle (existing AVL)
- AVL Provider API
- AVL Device

Freight Vehicle (no AVL)
- Traction Connect

Legend
- New
- Existing
- Agency

Trucks

Freight Vehicle
(no AVL)

TTS App

Freight Vehicle
(existing AVL)

AVL Provider API

AVL
Device

Freight Vehicle
(no AVL)

Traction
Connect

Project Implications

Routing: More efficient routes to/from expressways

Time Savings: Depends on intersections/corridor (~$1/minute)

Energy Savings: Up to 20% = EV truck range extension

Emissions Reduction

Traffic Flow: Improved for all

Other vehicle types: e.g., transit, school buses, delivery bots

Goal: Optimize freight vehicle movement along freight-heavy truck routes in DFW and scale to other use cases

Project Status

Launched in June 2022

Current

- Intersection targeting
- Local partner cooperation
- Freight industry outreach

Soon: Initial partners announced

Next year: Initial implementation

Incentive payment if Kimley-Horn delivers positive ROI

Project Opportunities for Freight Industry Partners

Fleet participation

Intersection identification

Public agency recruitment

Project advisory committee

Contact

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Questions?

Local Updates

North Texas Freight Terminal Electrification

Deadline: 10/14/2022

North Texas Clean Diesel Project

Deadline: 10/14/2022

Image provided by Getty

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