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challenging limits

Tolling and Managed Lane Solution in Texas

The LBJ Express and North Tarrant Express

The LBJ Freeway opened in 1969 to carry 180,000 vehicles per day. By 2008, traffic had risen to 270,000 vehicles—with a volume forecast of over 500,000 vehicles per day by 2020. With this level of demand, better management of roadway capacity is the critical solution.

Fully Redundant, Single Gantry Solution with a robust Traffic Management System.

The LBJ Express, NTE Express and NTE 35W Express project encompasses 36.7 miles of expanded frontage lanes, general purpose lanes, and TEXpress managed lanes across north Dallas and Fort Worth. These dynamically-priced toll lanes are intended to ensure a minimum predictable driving speed of 50 mph to drivers who elect to pay for expedited travel. The project also includes a lower section of approximately five miles through north Dallas, where the tolled managed lanes run under the general purpose lanes in an open tunnel. The first two segments of LBJ TEXpress (segment 3B and segment 1) commenced operations in December 2013 and July 2014 – each significantly ahead of the original timeline and segments 2 and 3A have become operational in 2015. Most recent data shows that in the 4th quarter of 2020 the TEXpress lanes processed 22.2 million transactions that generated $90.4 Million in revenue. Eight years after the first gantry was installed the system continues to operate at a high level.

Project Scope:

- Design, install, and implement the field systems as a key piece of a fully integrated managed lanes system for three projects in the Dallas-Fort Worth Metroplex.

- The field systems include the Toll Collection System (TCS), an Advanced Traffic Management System (ATMS), Intelligent Transportation System (ITS) and a fully redundant Network Communication System (NCS) used to manage all toll and traffic operations in real-time.

- Manage the physical infrastructure portions of the TCS and ITS project which comprised gantry and pole structure design, structural analysis, structure roadway placement, electrical design, fiber optic physical plant design and routing, and electrical conduit routing optimization.

- Reconstruction of expanded frontage lanes and main-line lanes in the crucial I-820 and Airport Freeway corridor.

The Challenges:

- The customer wanted to avoid any in-pavement components for axle counting in order to avoid the downsides of higher maintenance and lane closures, while also requiring that alternative solutions be able to work with existing North Texas Tollway Authority (NTTA) systems.

The Solution:

- A fully integrated TCS, ITS and an ATMS with a Central System which includes the ability to perform transaction collection and efficiently manages traffic congestion.

- The Kapsch DYNAC ATMS® software which provides incident management and vehicle volume data to the Central System, where the TSM's dynamic pricing algorithm calculates the tolls. The tolling tariffs are dependent on emission and the ANPR enforcement system checks if the emission-based deduction is valid for the registered vehicles.

- A laser-based volumetric system utilizing Kapsch Laser Vehicle Detection and Classification (LVDC) scanning technology. It creates vehicle profiles based on detailed measurements of more than twenty vehicle features.

- A Toll Tag-independent system. From a single platform the Kapsch solution is capable of reading tags from other agencies throughout Texas, such as the NTTA Toll Tag, TxTag, EZ TAG, as well as HOV tags. The system is scalable for future interoperability by implementing the Kapsch Multiple Protocol Reader (MPR) technology.

- A video toll system which uses the Kapsch VR2 camera and captures high definition front and rear images of each vehicle.

The Added Value

- *A safe, reliable, and congestion-free trip*

- *A dynamic tolling model that offers travelers a choice.*

- *Access to more reliable travel time which enables better commute planning and encourages paid travel to corridor-wide destinations such as the Dallas/Fort Worth airport.*