IBTTA SUMMIT OF THE AMERICAS IN MEXICO CITY

Innovations and Technology Shaping the Future

Border Crossing Time Measurement at the U.S./Mexico Border

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Background and Objectives

- Delay time for commercial vehicles at ports-of-entry is a key indicator of transportation and international supply-chain performance.
- TXDOT, FHWA and U.S. CBP are interested in measuring travel times for commercial trucks crossing from Mexico to the US
- Data collected in the system will be used to analyze different improvements in the border crossing process
- Information will be the basis for a border performance measurement system - cost, fluidity, etc.

Background and Objectives

- Data collected in the system will be used to analyze different improvements in the border crossing process
- Travel time and travel time reliability is important for shippers and carriers
- U.S./Mexico truck trade – 5.5 million trucks per direction, $375 billion in 2015

Commercial Vehicles - Technology Assessment

- Six Technologies were Originally Analyzed
  - Automatic Vehicle Identification (AVI)
    - AVI using Radio Frequency (RFID)
  - Automatic License Plate Recognition (ALPR)
  - Vehicle Matching
  - Automatic Vehicle Location (AVL)
    - GPS
  - Mobile Phone Location
  - Inductive Loop Detectors

- Two Technologies Emerged as Best Candidates
  - **GPS**
  - **RFID**

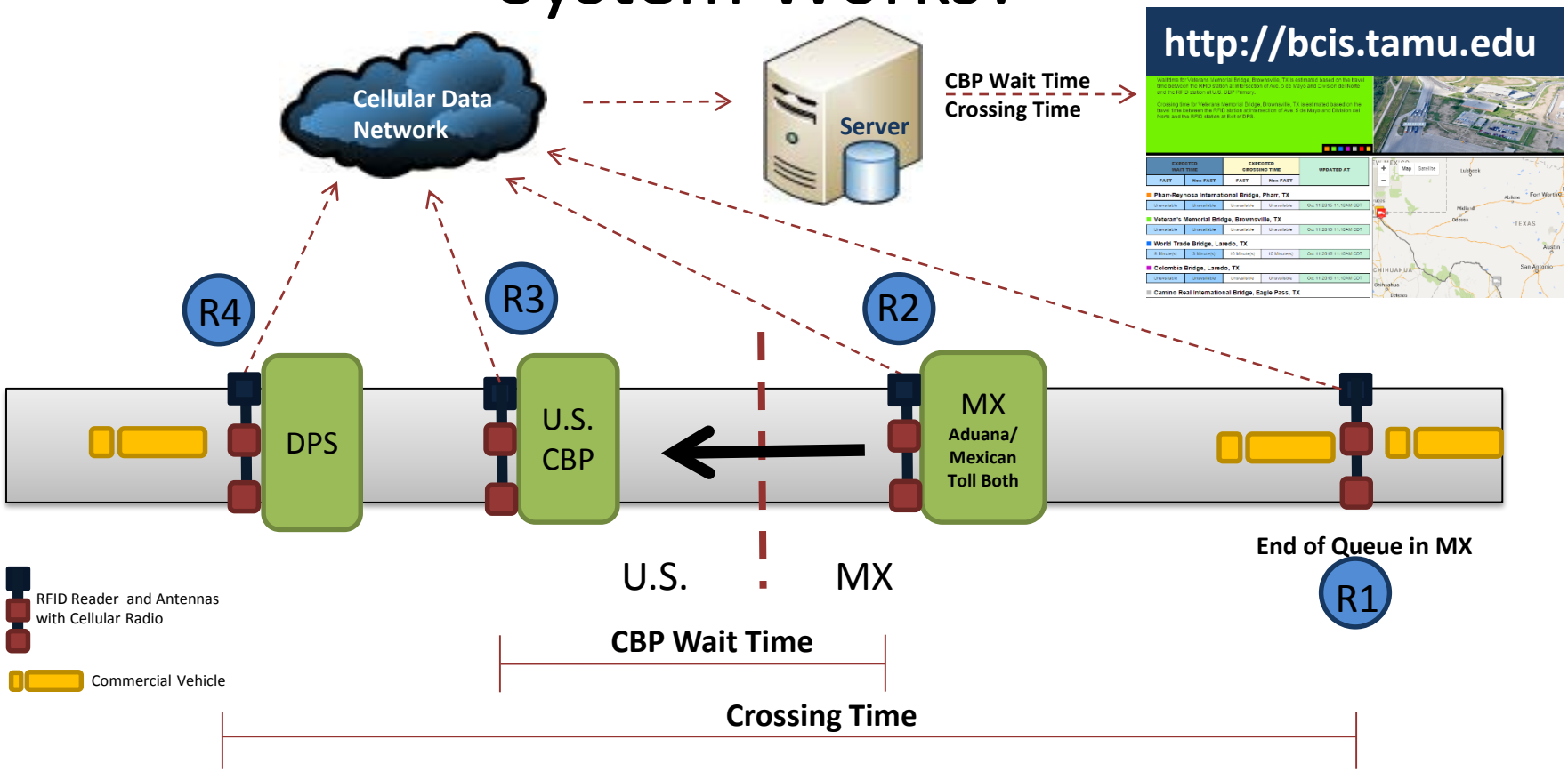
Commercial Vehicles - Technology Assessment (con't)

RFID

- **Benefits**
  - RFID technology already used by CBP, tolling agencies, state agencies
  - No in-truck equipment installation required
  - Continuing costs of operation is relatively low
  - Not 100% sample required

- **Concerns**
  - Data collected is not as precise as GPS
  - Agreements must be made with US / Mexican agencies to install RFID readers

How RFID Based Wait and Crossing Time System Works?



- The system only captures the ID of the tag, does not include information about the vehicle.

Current Location of RFID Antennas

- R1. at the end of the queue in Mexico, in the approach to the POE.
- R2. At the toll booth in Mexico prior to the commercial bridge.
- R3. At the CBP Primary Inspection Booth
- R4. Border Vehicle Safety Inspection Facility
  - One antenna per traffic lane.
  - The system only captures the ID of the tag, does not include information about the vehicle

Commercial Vehicles CBP Wait Times

RFID systems operating in seven border crossings in Texas

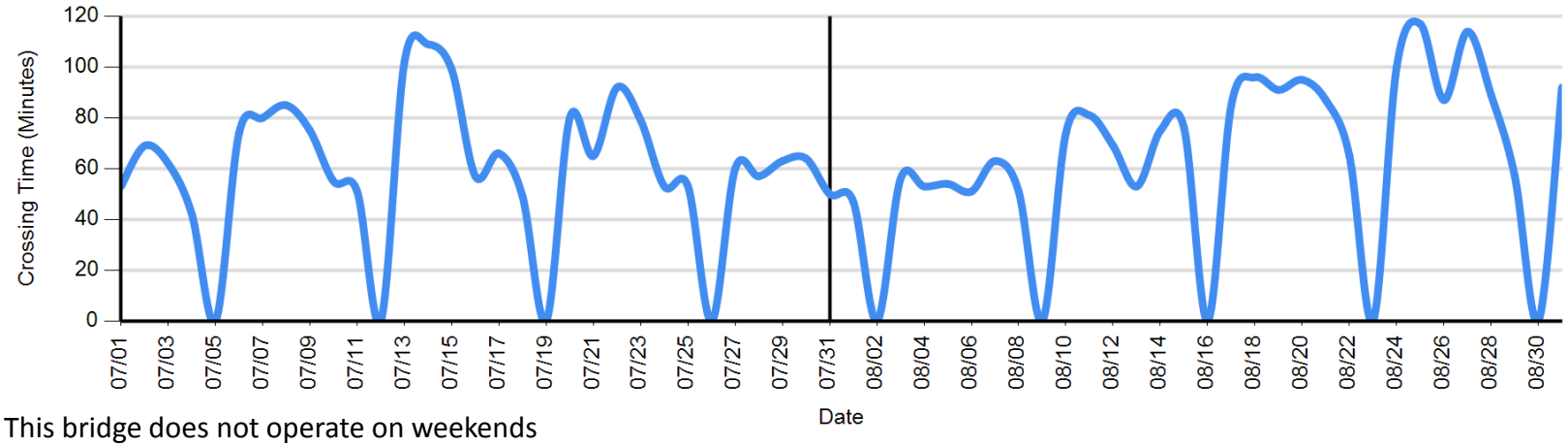
Source: Google

Texas A&M Transportation Institute

Bridge of the Americas, El Paso, TX
August 2015

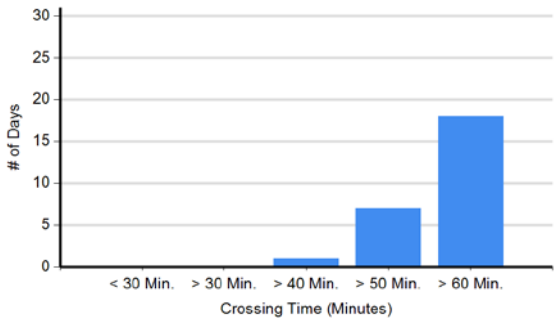
http://bcis.tamu.edu/

Two Month Average Daily Crossing Time

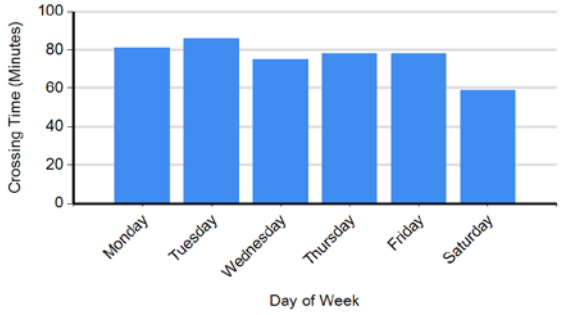


This bridge does not operate on weekends

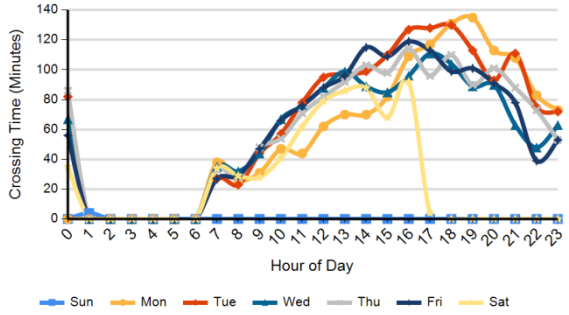
Crossing Time Distribution



Average Crossing Time by Day of the Week



Average Crossing Time by Hour of the Day



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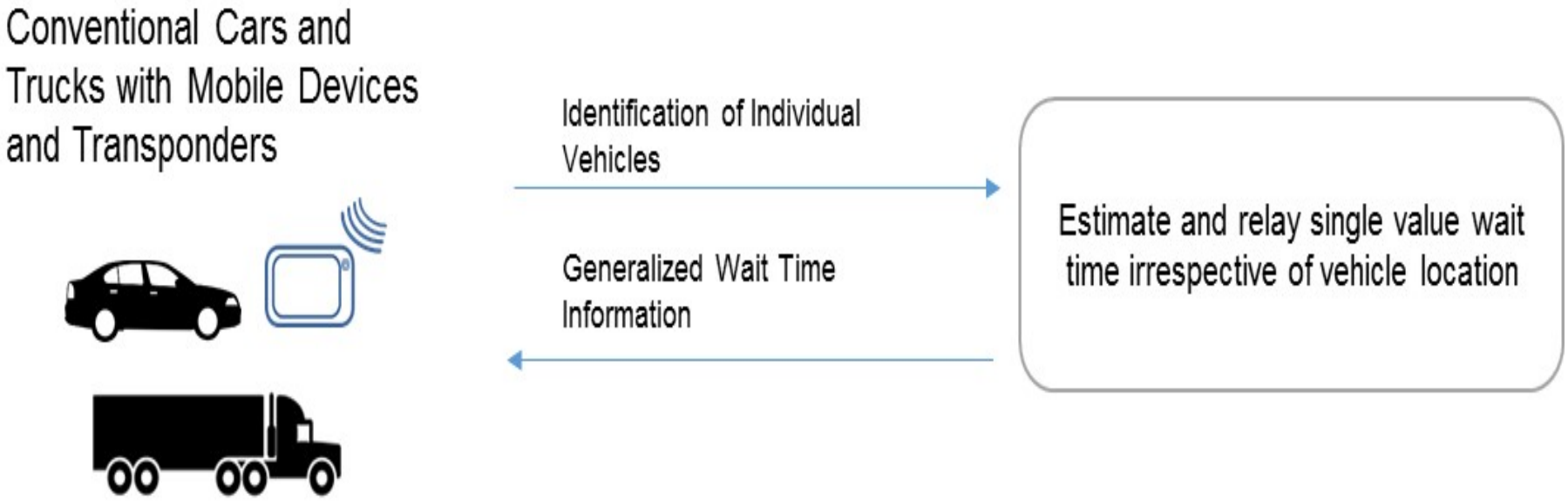
Innovative Approach

- Use connected vehicle technology



Current RFID/Bluetooth Approach

Innovative Approach

- Use connected vehicle technology

Cars and Trucks Equipped with Connected Vehicle Technology

Location of Individual Vehicles →

Speed of Individual Vehicles →

Speed Snapshot of Individual Vehicles →

← Location Specific Information to Vehicles about Wait Time, and Approach Lane Assignment

← Enhanced CBP Inspection Lane Management

← Advanced Screening of Vehicles

Transmit Wait Time to Individual Vehicles Based on Their Locations

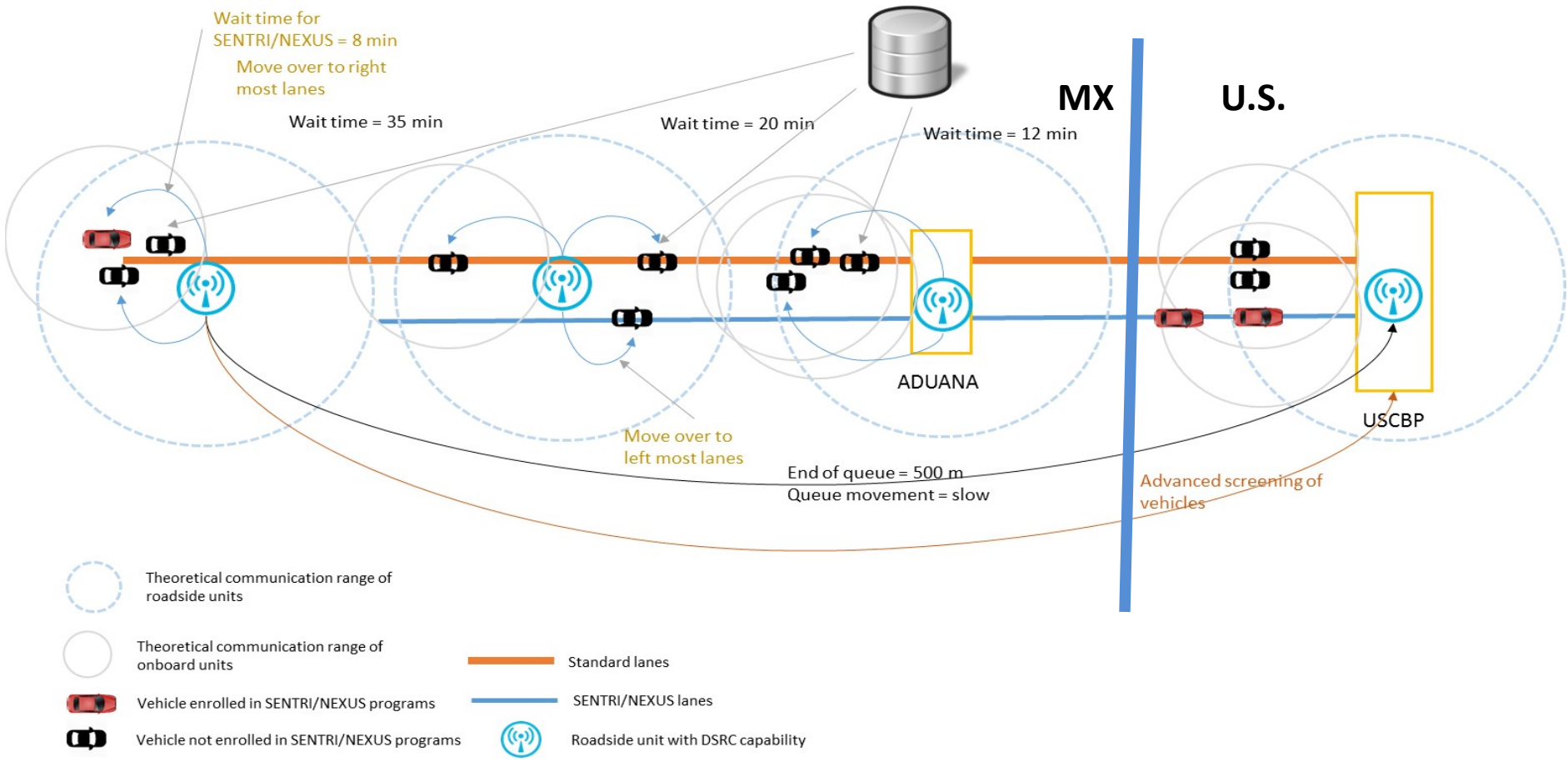
Transmit Appropriate Lane Info to Individual Vehicles Based on Their Location

Optimize Inspection Lanes Using Real Time Queue Length, Progression, and Wait Time

Perform Advanced Pre-Clearance and Screening

Desired Approach

High Level Overview of the Enhanced System



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