

NTRCI

NATIONAL TRANSPORTATION
RESEARCH CENTER, INCORPORATED
University Transportation Center

Trusted Truck® Overview and Demonstration

August 13, 2010
Knoxville, TN



Agenda

- Introductions
- Project Overview
- Technical Details
- Walk Around the Trusted Truck®
- Q&A
- Closing Remarks

NTRCI University Transportation Center

- Chartered in 1998 as a non-profit organization
- Supports the transportation industry with research and education with a focus on Heavy Vehicles
- Began research in 2003 with 3 partners
- Designated by Congress in 2005 as a UTC with a strategic theme of Heavy Vehicle Safety, Security and Operational Efficiency
- 2010 - almost 50 partners from industry, universities, national labs, Federal, State and local agencies and other nonprofit research centers



The Trusted Truck[®] Journey

- Phase 1 – Demonstration in December 2004
 - Transmit Real-time Brake data
 - Wirelessly at highway speeds
 - Concept hardware
- Phase 2 – Four Years of Incremental Enhancements
 - Incremental safety items added to system
 - Industry outreach identified data privacy concerns
 - Development of Trusted Truck[®] Management Center (TTMC) as third party intermediary
 - Added data security protocol and migrated to production ready hardware

The Trusted Truck[®] Project

- Vision to develop a secure and “trusted” transport solution from pickup to delivery
- Increase safety, security, and efficiency of truck transportation by presenting wireless credentials to roadside inspectors
- Confirm driver, tractor, trailer, and cargo meet all appropriate FMCSA requirements for safe cargo transportation
- By presenting these credentials without the need to stop
 - Transportation efficiency improves
 - Inspections efficiency increase
 - Inspectors have more time to target more likely safety violations
- For the safe fleets
 - Save time and fuel costs
 - Opportunity to improve CSA2010 BASIC Score
 - Potential costs savings from lower insurance rates

Trusted Truck[®] Message Set (TTMS)

- General Information:
 - Date & Time
 - Location
 - Inspection Reason
- Identification Information:
 - Tractor VIN
 - Electronic License Plate
 - Trailer ID
 - USDOT number
- Driver Information:
 - CDL Number
 - Hours of Service Data
 - Health Record
- Vehicle Information:
 - Brake Status
 - Tire Status
 - Vehicle Weight
 - Stability System Status
 - Lighting Status
 - Safety Belt Status
 - Fire Extinguisher Status
 - Vehicle Inspection Records
- Cargo/Load Information:
 - Cargo Security System Status
 - Manifest
 - HazMat Credentials
 - Permit validation

Trusted Truck[®] Management Center (TTMC)

- Third-party provider of data-management between FMCSA and the fleets
- For Industry:
 - Buffer for Sensitive Data
 - Indication only when vehicle satisfies requirements
- For Government
 - Allows focus on unsafe vehicle
 - Detailed “Trusted” status provided by a certified source
 - Increased inspections which improves highway safety

TTMC Security Protocol

- UT has developed a unique security protocol for the TTMC
 - Confidentiality
 - Authentication
- Implemented on both truck and TTMC
- Customized for truck/TTMC communications
- Facilitates low-cost truck-based equipment
- Relies on approved data security standards
- UT team included faculty working with undergraduate and graduate students

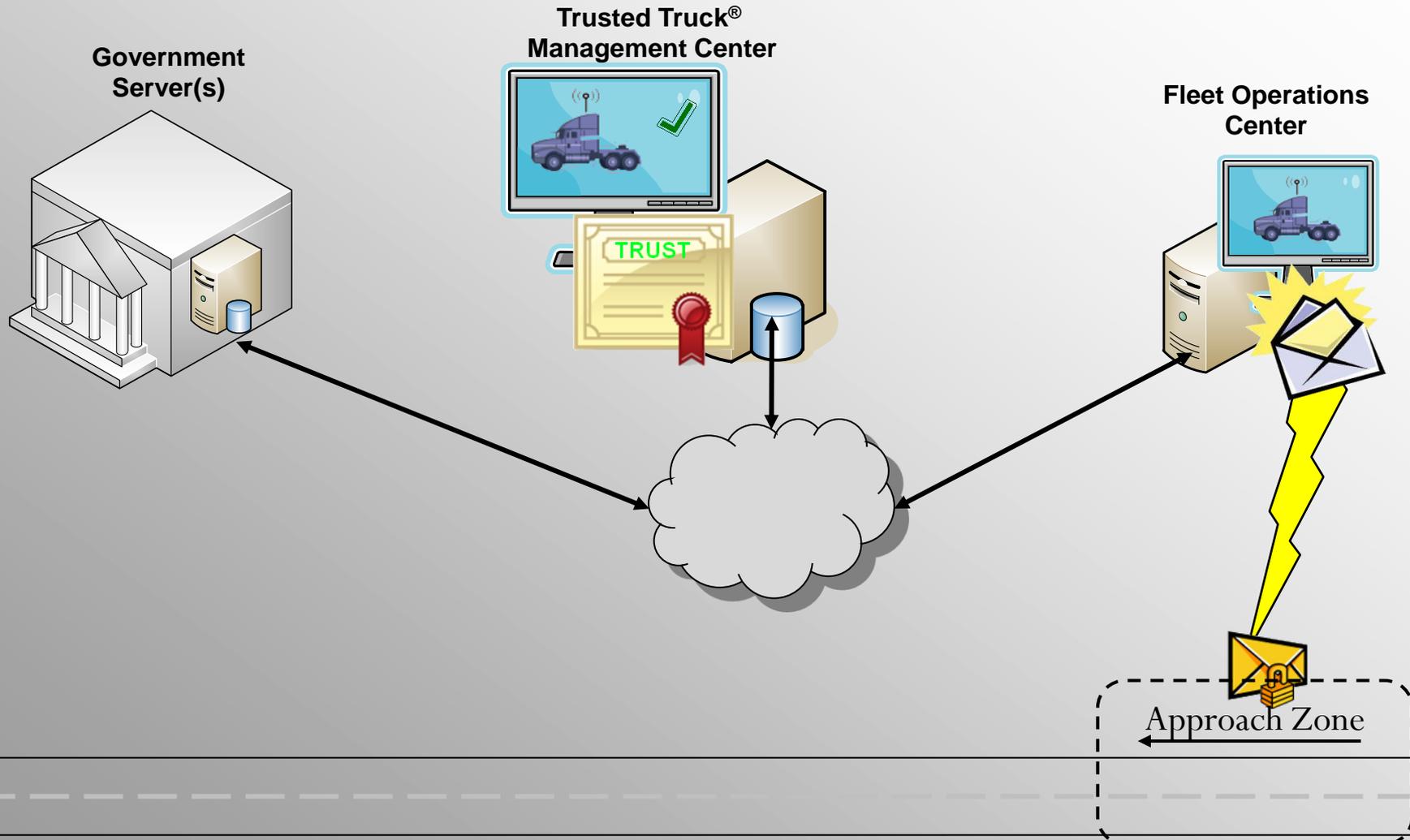


Basic Concept

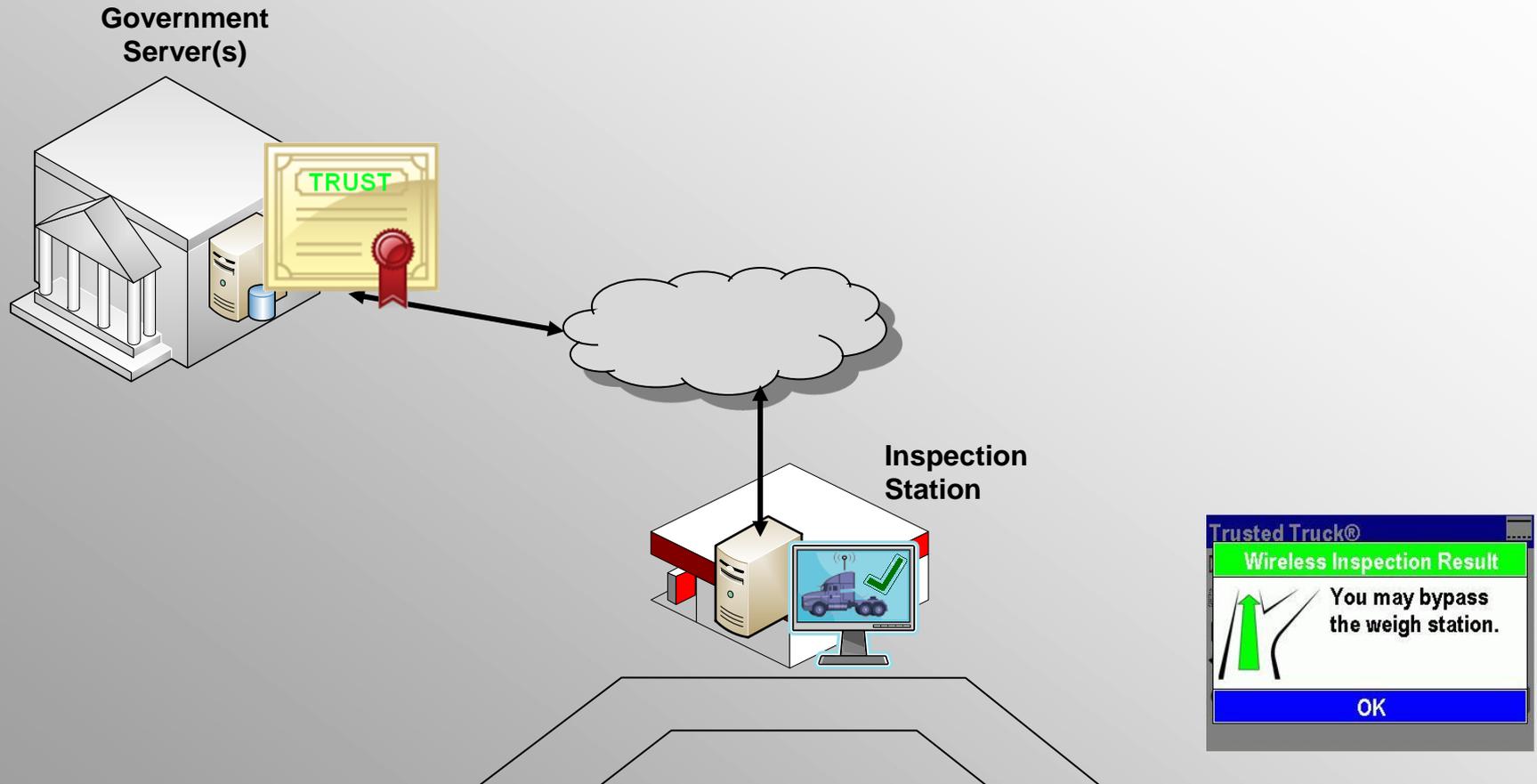
- Driver Pre-Trip Inspection
 - Manually triggered wireless inspection
 - Walk-around physical inspection
 - Provides opportunity to address issues
- Approach Zone
 - Inspection Message sent to TTMC
 - TTMC wirelessly inspects truck
- Inspection Station
 - **Passed Inspection:** Driver notified “Ok to Bypass” – Inspection station notified Trusted Truck® bypassing
 - **Failed Inspection** or **No Inspection:** Truck enters inspection as part of the “general population” – Fleet and Driver notified of failure



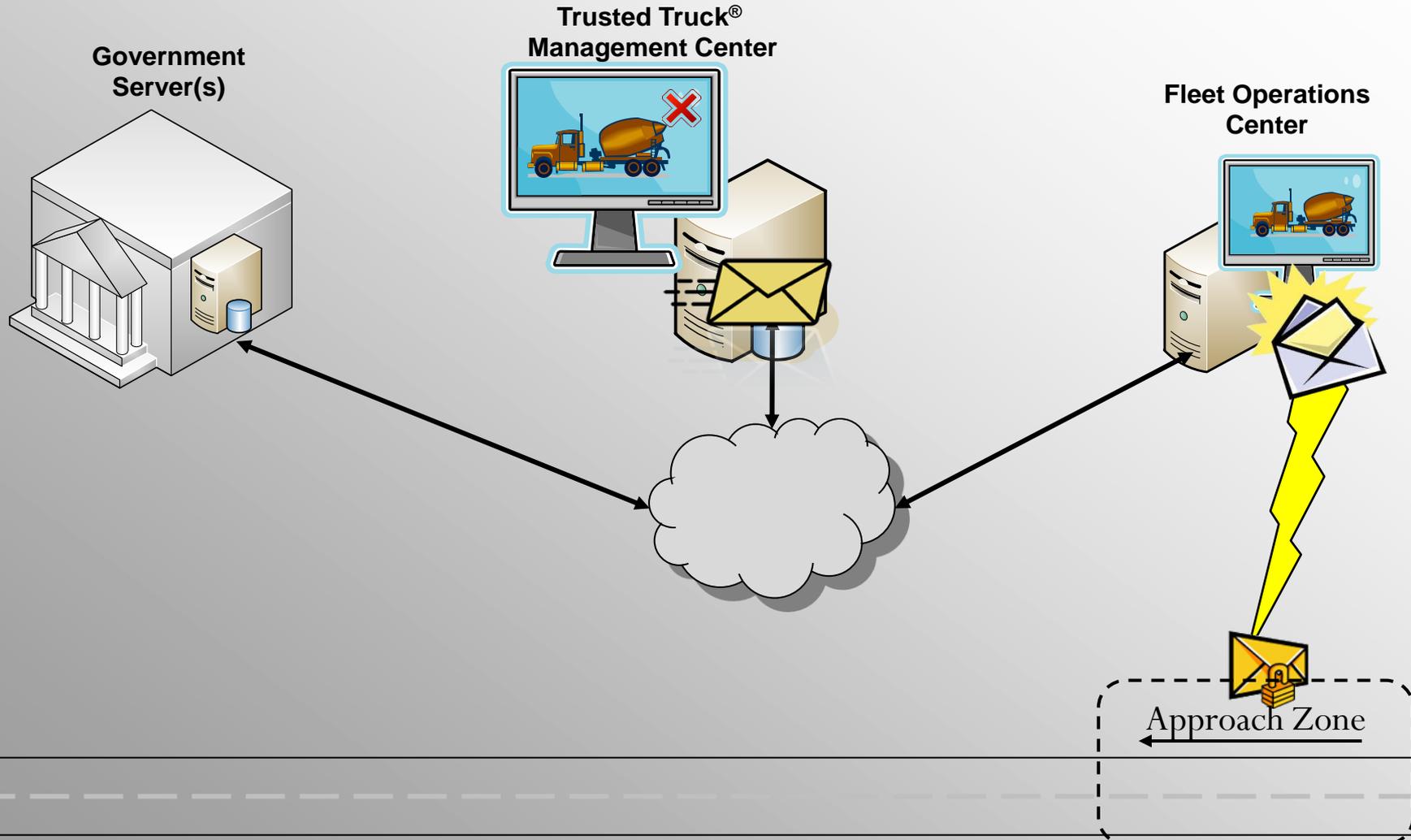
Approach Zone (Passed Inspection)



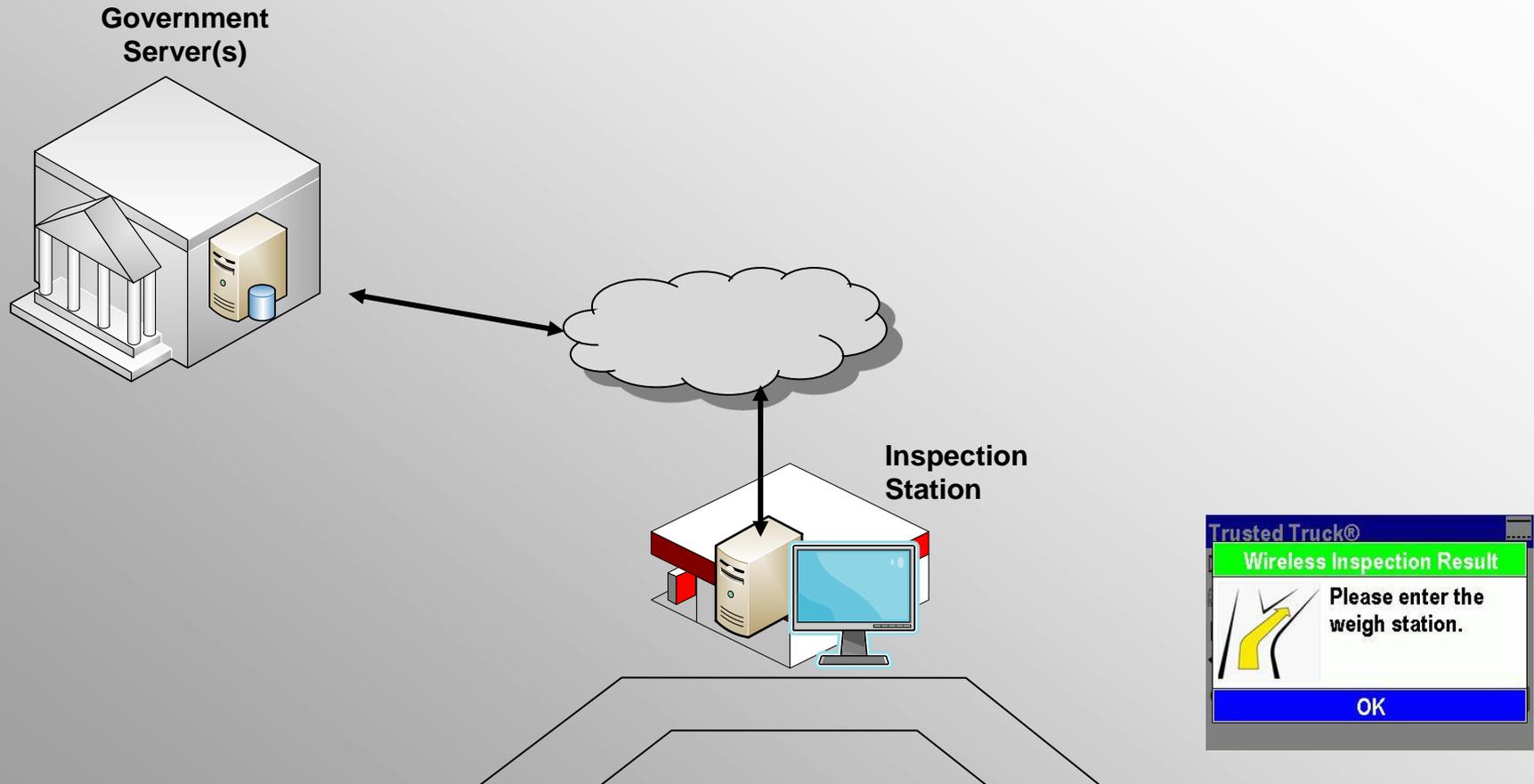
Inspection Station (Passed Inspection)



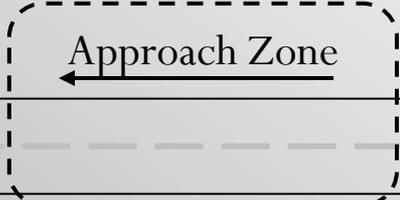
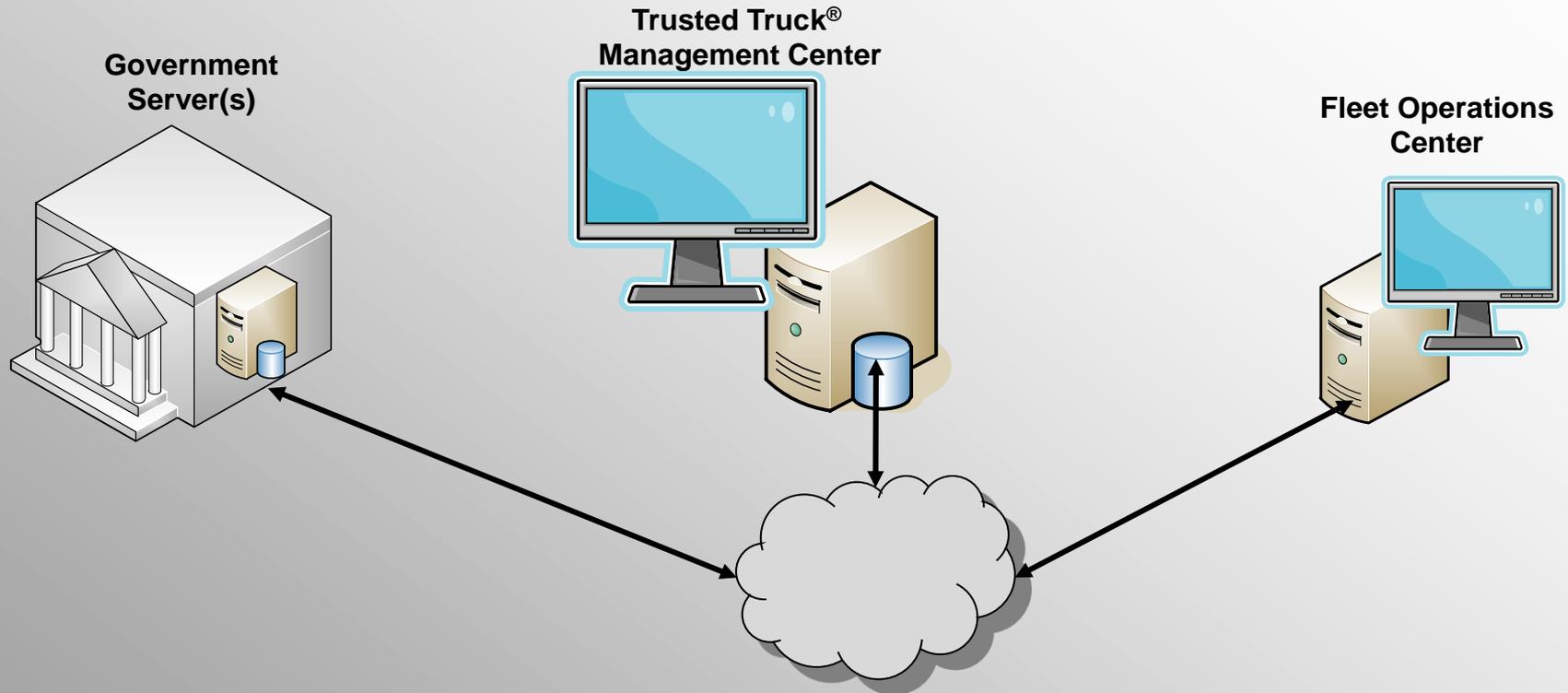
Approach Zone (Failed Inspection)



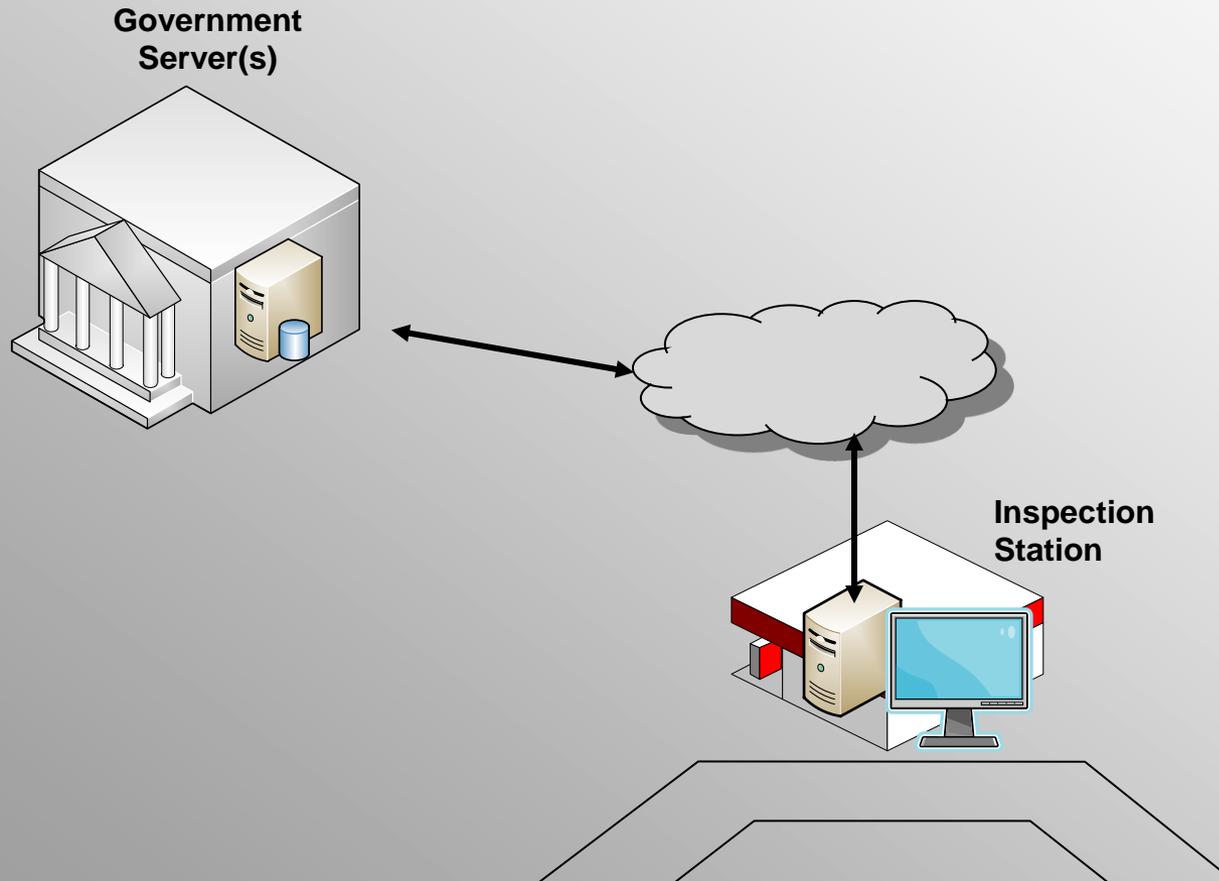
Inspection Station (Failed Inspection)



Approach Zone (No Inspection)

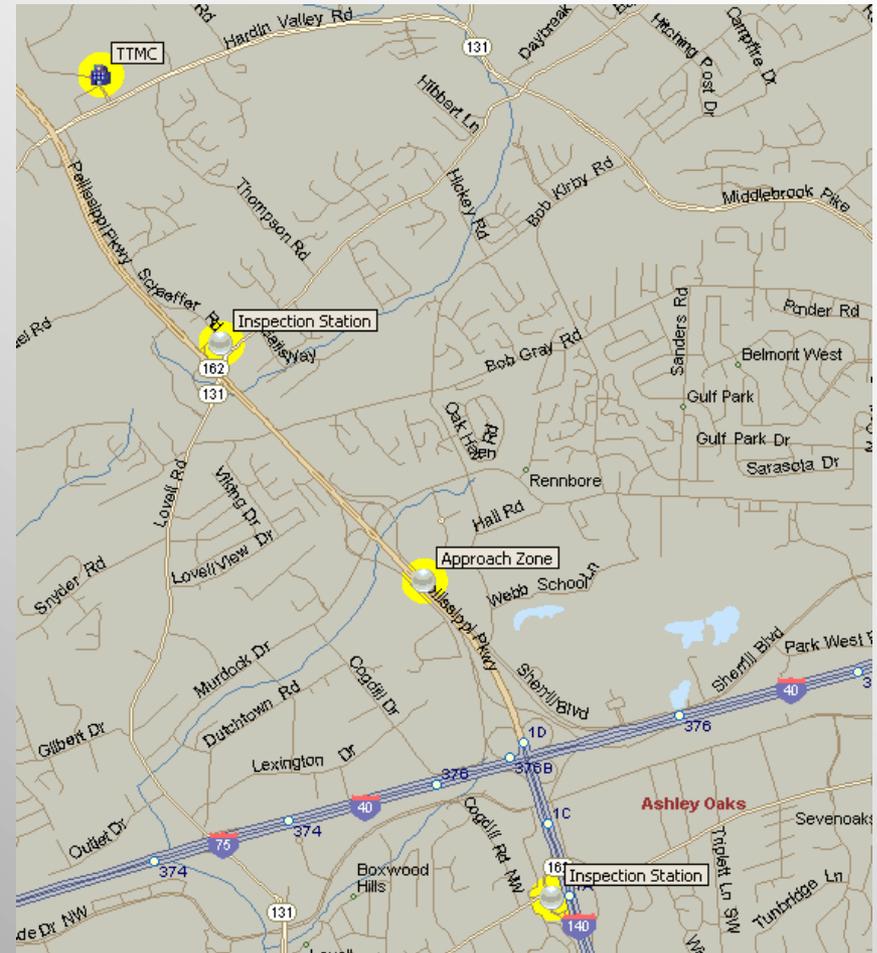


Inspection Station (No Inspection)



Demonstration

- TTMC located here
- Truck Operating on Pellissippi Pkwy
- Fleet Offices in Greensboro, NC



Potential Benefits of Trusted Truck[®]

- Acts as a third party broker between fleets and government
- Actively monitors key safety parameters
- Provides incentive to “Trusted” fleets
 - opportunity for more positive inspections increasing their safety scores
 - Saves time and fuel as they can bypass weigh stations
 - Lowers operational costs and makes them more competitive
 - Potential insurance savings
- Increases the number of inspections to improve highway safety
- Allow inspectors to focus on the unsafe vehicles

Conclusion

- Significant progress made during this project including:
 - Instrumenting key on-vehicle safety parameters
 - Transmitting the data securely
 - Integrating federal standards into the project
- Next Steps:
 - Operate multiple Trucks in normal commercial runs through several states including more than one fleet
 - Include DOTs of neighboring states such as Tennessee and North Carolina
 - Ultimately, a broader national Field Operational Test coordinated with FMCSA

- Questions/Comments
- Walk around the truck
- Thank You For Your Attention