# Crash Data Initiatives

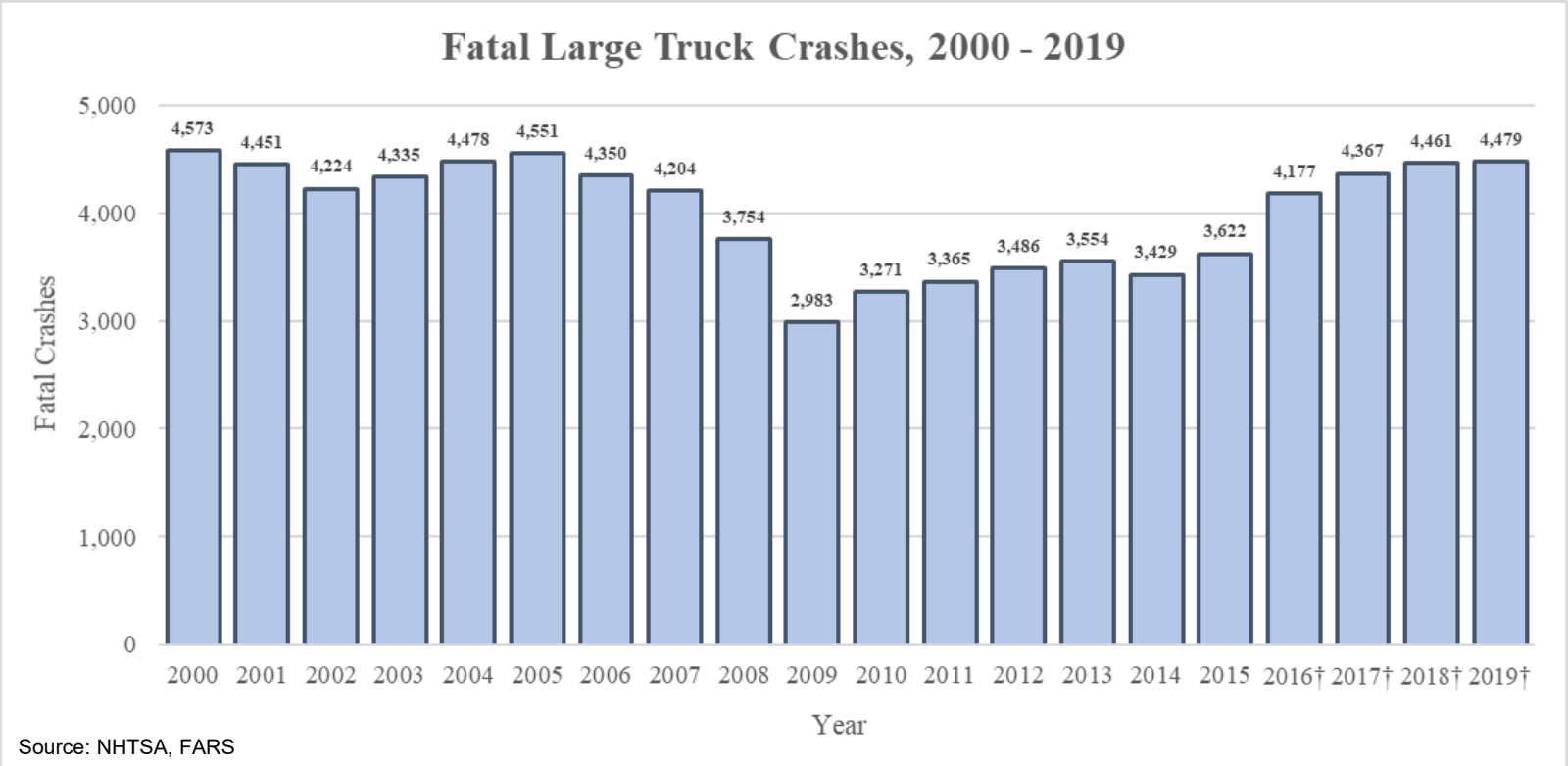
March 10, 2021

U.S. Department of Transportation
**Federal Motor Carrier Safety Administration**

# Large Truck Crash Causal Factors Study (LTCCFS)

# Large Truck Crash Casual Factors Study – Why Now?

- Fatal crashes involving large trucks have steadily increased since 2009
- 17 years since the original study
- Changes in technology, vehicle safety, driver behavior, and roadway designs
- Need up-to-date data and analysis about how these changes impact CMV safety
- The data will greatly increase our knowledge about causation and related factors sufficient to create countermeasures through legislation, regulation, enforcement and education




Source: NHTSA, FARS

# LTCCFS Value Proposition

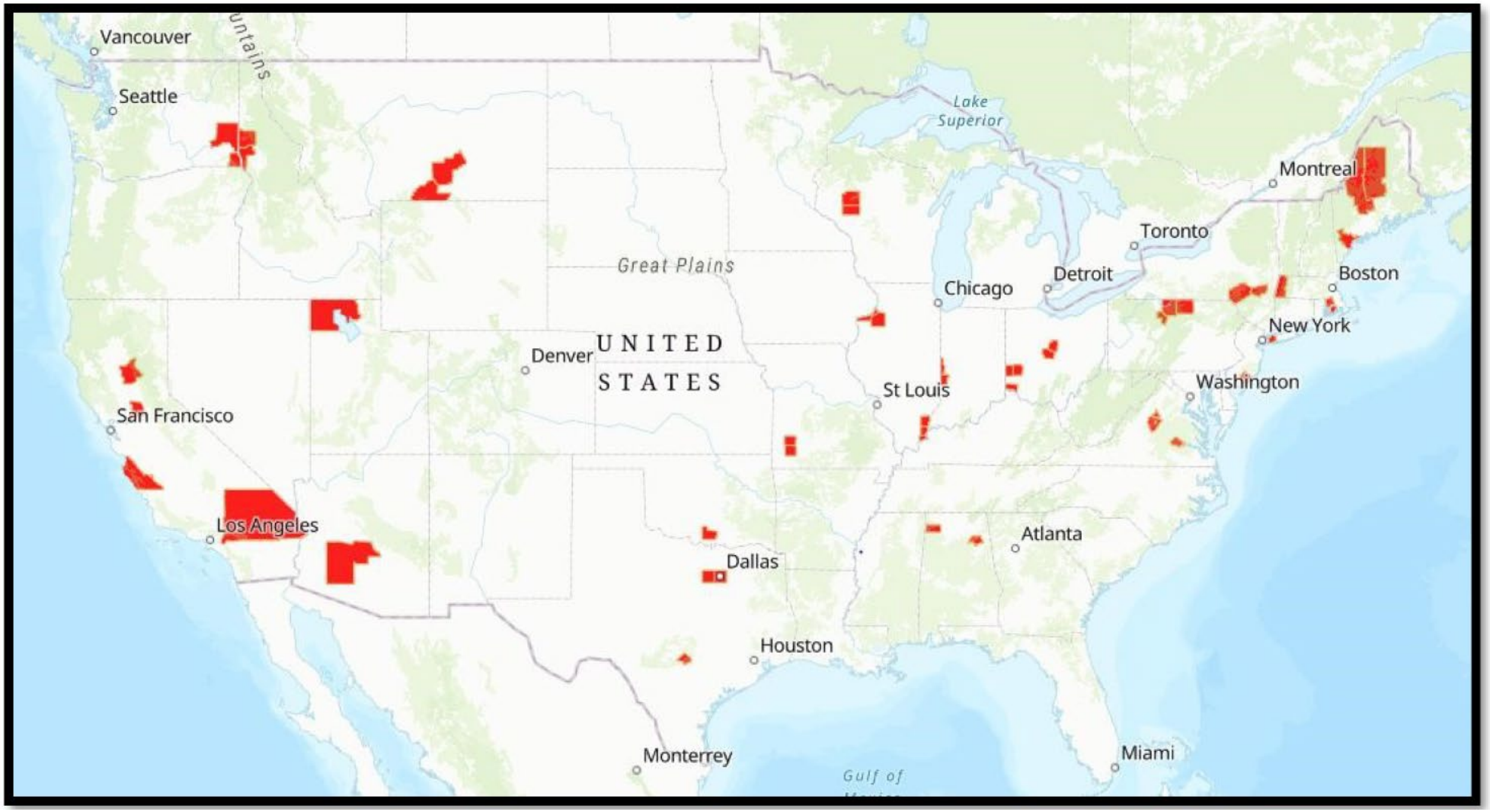
**An evolutionary focus moving from *crashworthiness* to *crash avoidance***

- For large truck crashes, enhancing crash avoidance would be transformative in terms of lives-saved
- Provides vital data on role of pre-crash factors like driving behaviors and novel technologies unavailable through other means
- Information gathered by a new LTCCFS could be used to:
  - Identify, develop, and deploy countermeasures to keep large truck crashes from occurring
  - Understand the role of new automation and fleet technologies
  - Drive potential rulemaking activities
- Program resources  developed for the LTCCFS could be reused for additional crash causal factors studies focusing on passenger vehicles

# Timeline

- RFI was released January 15, 2020 and closed for comment on March 16, 2020.
  - 167 comments received from industry, academia and various stakeholders
  - Strong support for nationally representative sampling design
  - Data should be first and foremost in any rulemaking and updated data are needed to support FMCSA's regulatory process (ATA).
- 4 Phases to the Study; 2,000 cases/crashes (Estimated Cost $30M):
  - Phase 1 (Current):
    - RFI
    - Study Planning
  - Phase 2:
    - IT Development
    - Study Design
    - OMB Clearance
    - Pilot Study
  - Phase 3:
    - Data Collection (2 years, 2,000 crashes)
  - Phase 4:
    - Detailed Analysis & Report Writing

# 32 PSU Locations



# Next Steps

- Finalizing Scope
- Drafting Research Questions
- Data collection estimated to begin January 2022

# Completing the Picture of Crashes

# Overview

- **Project Goal:** To supplement FMCSA crash data sets with additional sources of information, to complete the picture of large truck and bus crashes to better analyze trends and root causes.

- **Summary:** Will link existing FMCSA data sources, external data sets, to build a tool that will afford greater insight into crashes involving large trucks and buses.

# Approach

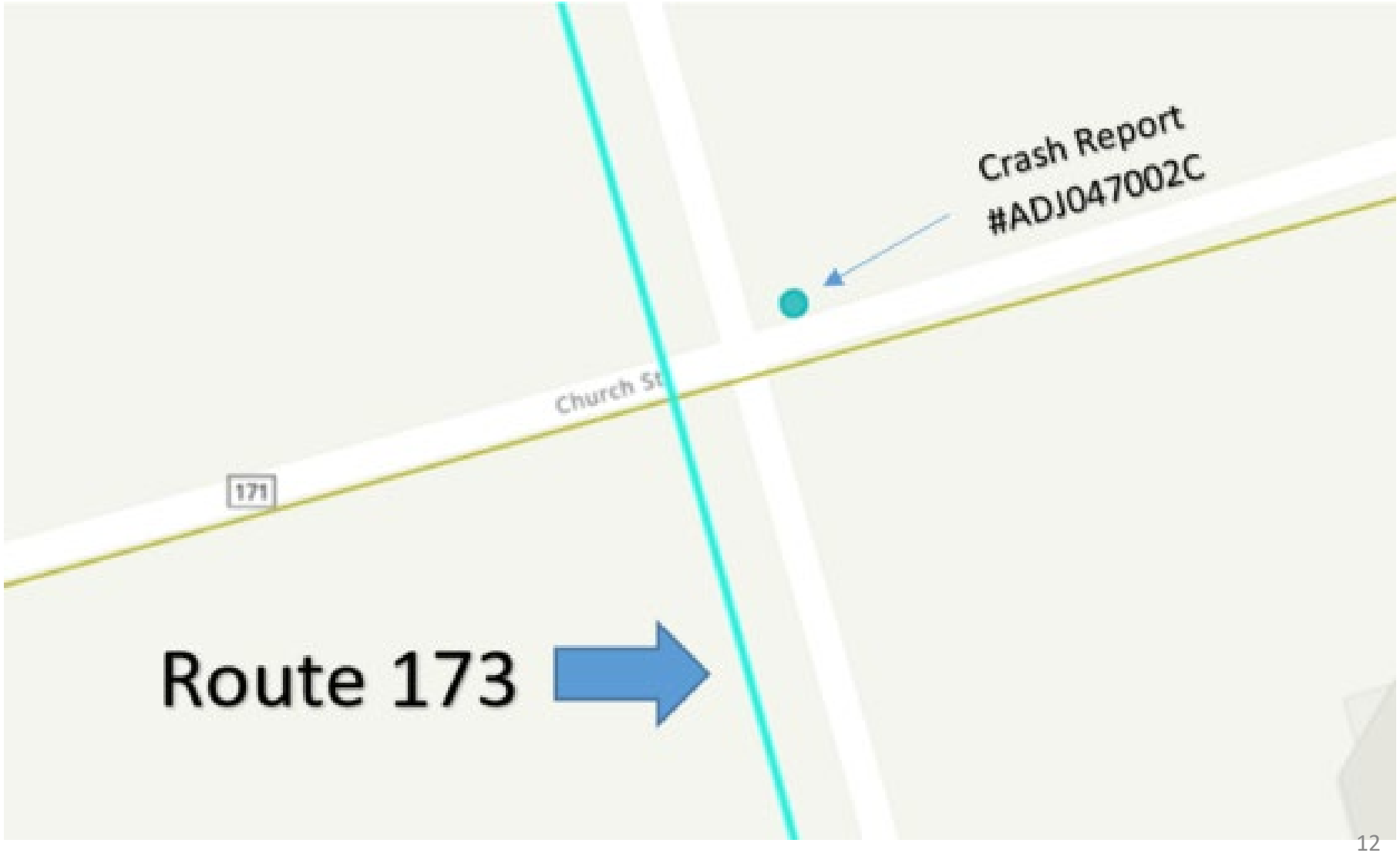
- Starting with proof-of-concept to test and refine methodology
- Merging multiple datasets:
  - 2018 crash data for Maryland and Connecticut (provided by the States)
  - Motor Carrier Management Information System (MCMIS) crash data
  - Federal Highway Administration (FHWA) Highway Performance Monitoring System (HPMS) data
- Developing prototype spatial analysis tool using ArcGIS
  - Prototype tool will identify crash hotspots, identify infrastructure characteristics in areas with high crash prevalence, and analyze trends
- Will incorporate additional States, datasets in phased approach
- Ultimate goal is to develop a tool that incorporates commercial motor vehicle (CMV) crash, infrastructure, weather, work zone, economic, and other data for all 50 States

# Accomplishments

- Matched Maryland crash data (all crashes) with MCMIS data, to identify CMV crashes
- Spatially matched the crashes in the CMV crash dataset to the closest Maryland HPMS infrastructure data segment using ArcGIS
  - Used spatial join in ArcGIS with a tolerance of 20 meters
- Validated the merged dataset, removing “bad” matches that could not be resolved
  - Examples of bad matches:
    - The route number in the Maryland crash data was different than the route number in the matched HPMS data
    - The latitude/longitude coordinates of the crash were not located near the identified route on HPMS.

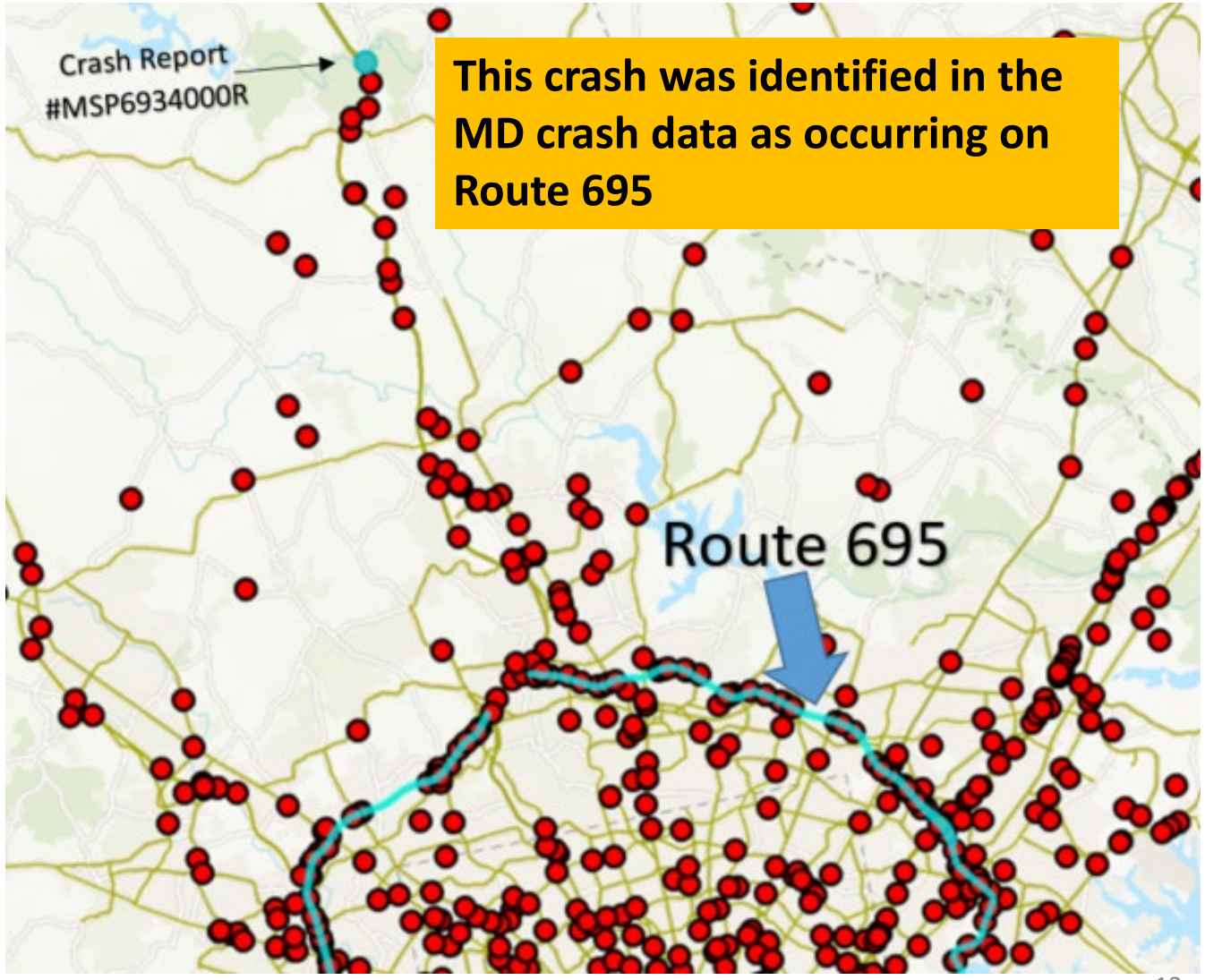
# Data Validation: Bad Match, Type 1 Error

- Crash occurred at an intersection, geographical coordinates in the MD crash data were located closer to the intersecting route rather than the one identified in the crash data
- Data validation team manually corrected these Type 1 errors



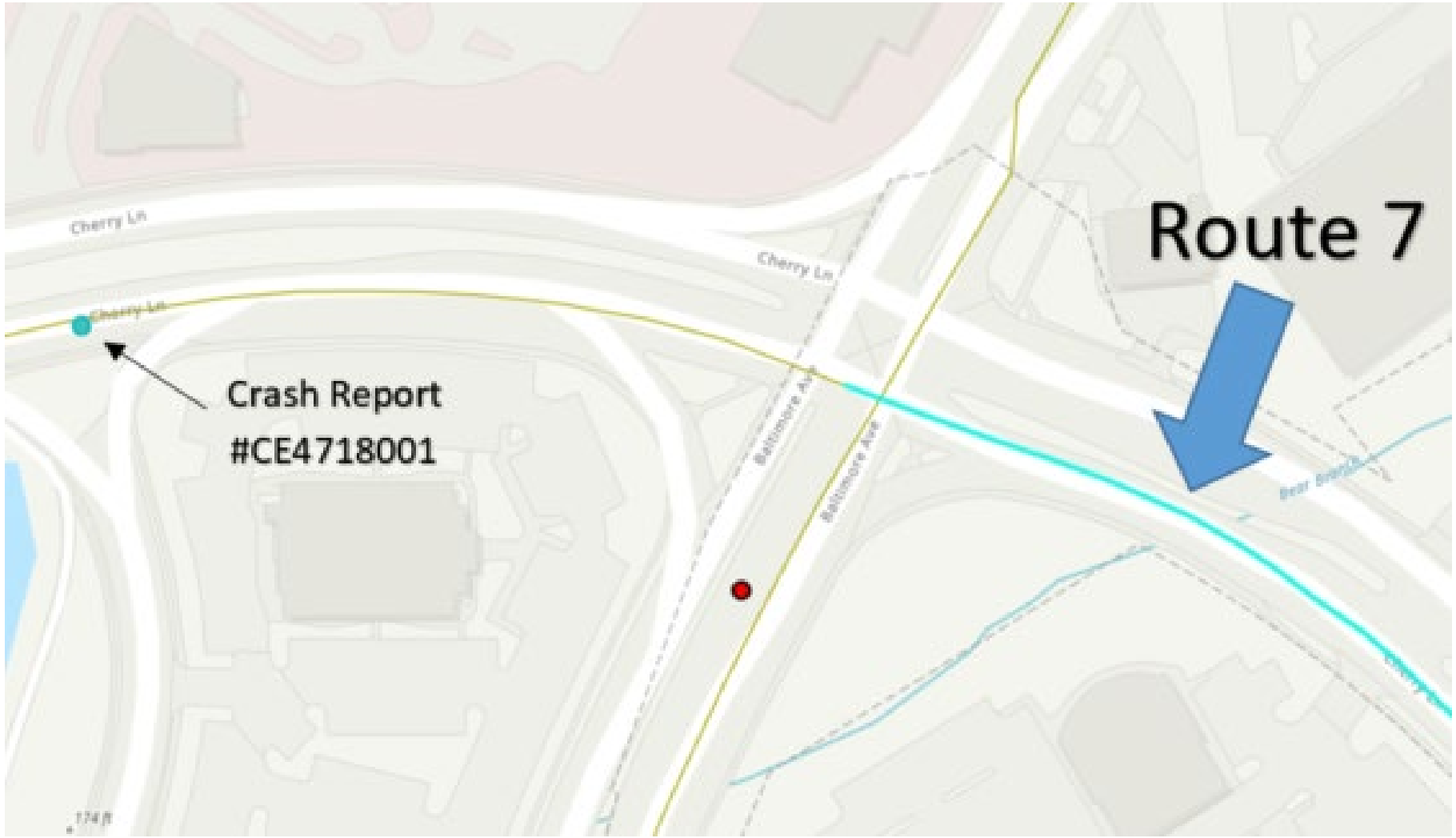
# Data Validation: Bad Match, Type 2 Error

- Geographical coordinates are inaccurate and listed away from the correct route in HPMS
- Data validation team could not resolve correct these Type 2 errors



# Data Validation: Bad Match, Type 3 Error

- Crash coordinates are located on the correct road, but were joined to a road segment with a different route number in the HPMS data
- Data validation team manually corrected these Type 3 errors



# Current Status

- Currently developing prototype tool in ArcGIS while simultaneously:
  - Conducting a literature review to understand known correlations between various infrastructure components and CMV crashes
  - Preparing Connecticut data for merging and validation process

# Contact Information

**Jenny Guarino, Statistician**
**Jenny.Guarino@dot.gov**