



Digital Roadway Data, AI, and PEPS Contracts

2023 PEPS Conference

Ben McCulloch, Strategic Data Scientist

December 5, 2023

What is Digital Roadway Data?

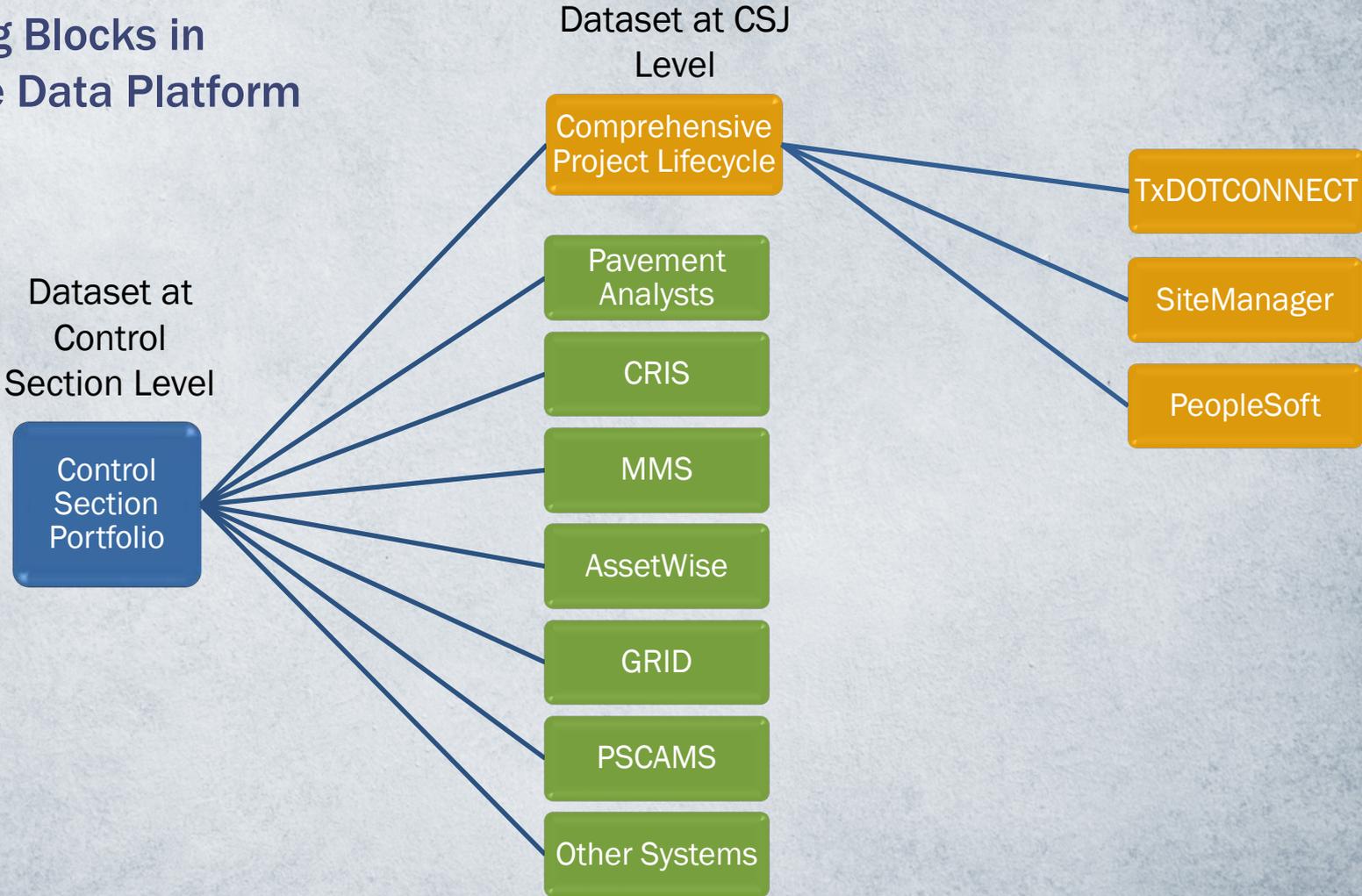


Data that describes a roadway. It can be from vehicles (V2X), infrastructure (I2X), crash data, pavement data, bridge data, traffic counts, geospatial data, geometric data, and a lot more.

- Access to several data sources.
- Next steps:
 - Define the architecture
 - Define use cases and cultivate tools:
 - user friendly – easy to use and learn;
 - increases productivity while reducing workloads; and,
 - solves use cases



Building Blocks in Enterprise Data Platform





- ✓ Comprehensive Project Lifecycle data set joins TxDOTCONNECT, PeopleSoft, and SiteManager.

- ✓ Refreshed Nightly
 - TxDOTCONNECT Project Details
 - PeopleSoft has Total Expenditures.
 - SiteManager has current expended amounts



- ✓ Released to Enterprise Data Platform (EDP) Production October 2nd.
- ✓ Sets groundwork for Control Section Portfolio which will join data sets like: PSCAMS, Pavement Analyst, CRIS, Lonestar, Stars 2, AssetWise, MMS, and RULIS.

AI Strategic Plan

The AI/ML Strategic Plan will provide three primary objectives.

- 1. What is the current state of data at TxDOT this includes data architecture, quality, and accessibility?*
- 2. What AI/ML efforts should the agency prioritize in the next 3 years based on our current readiness?*
- 3. What efforts do we need to take to improve our data quality and readiness over the next 3 years?*



Questions

- Where are we currently?
- Where do we want to be in 3-years?
- How do we achieve our goals within 3-years?

01



Why 3-years?

With the pace of change of technology, especially for AI, the strategic plan will encompass planning for this timeframe allowing for updates as technology advances.

02



AI Focus Groups

- STR and ITD will meet with all divisions from September and early October
- 7 regional meetings for districts from mid-October to early-November

03



Strategic Report

- The plan will be around 15-pages and delivered in January 2024.
- 3-year strategic plan for AI with a reassessment in Fall 2025.
- Performance measures on goal attainment will be included.

04



Engineer's estimate bid item analysis

TPD, Enterprise Risk, STR

Estimating the cost of bid items using indexes, inflation rates, and geographic impacts rather than historical bid item cost.

PEPS Invoice and contract analysis

PEPS, STR, TPD, ITD

Conduct a comparison between invoices and the master contract within OnBase to ensure accuracy of rates and quality control.



Traffic Management and Optimization

- Detect Incidents from either connected vehicle data or video feeds.

Accident Prevention and Safety Enhancement

- Analyze roadway design and influences to **detect hot spots** and recommended remedies.
- Asset Management and Predictive Maintenance
- Using **LIDAR and Video** collect, process, categorize, and store asset information in a database that provides details about the assets such as height of guardrails to know if you are following FHWA's recommended heights.
- Using traffic patterns, weigh in motion, and pavement type provide better **prediction** of when **pavement** will need rehabilitation or maintenance.

Budget Optimization

- Recommend funding categories on the entire UTP portfolio of projects to **maximize** all available **funds** and minimize the use of category 1 on non-preventative maintenance projects.





Good Government policy is informed by quality data and innovative data communication. The proper tools in the hands of many people leads to better decision making and a diffusion of knowledge and insight.



HELP #EndTheStreakTX

End the streak of daily deaths on Texas roadways.

[TxDOT.gov](https://www.txdot.gov) (Keyword: #EndTheStreakTX)



#EndTheStreakTX Toolkit



Questions and Discussion



Ben McCulloch

TxDOT | STR Data Scientist



Benjamin.McCulloch@txdot.gov



(512) 949-0170