PUTTING TxDOT
ON THE MAP

Value of Data Integration Across the Project Lifecycle

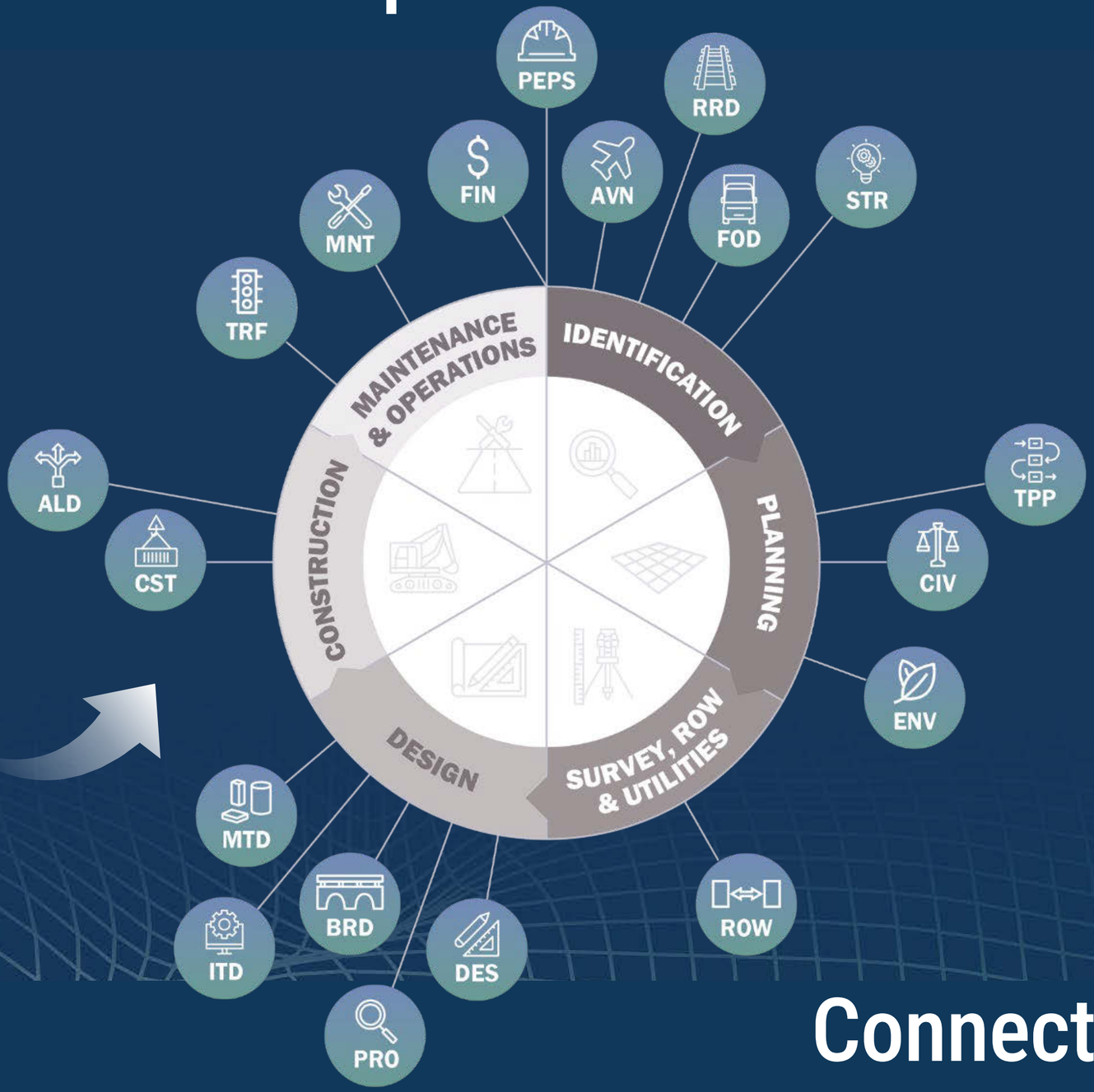
TXDOT | TPP – GIM
Jenn Lash, PMP

Connecting TxDOT People

Data Vision

Leverage technology advancements to meet business needs for data governance and inter-departmental coordination.

Generating new projects



How We Do It:

Statewide stakeholders engage in developing a shared vision for data collaboration and quality

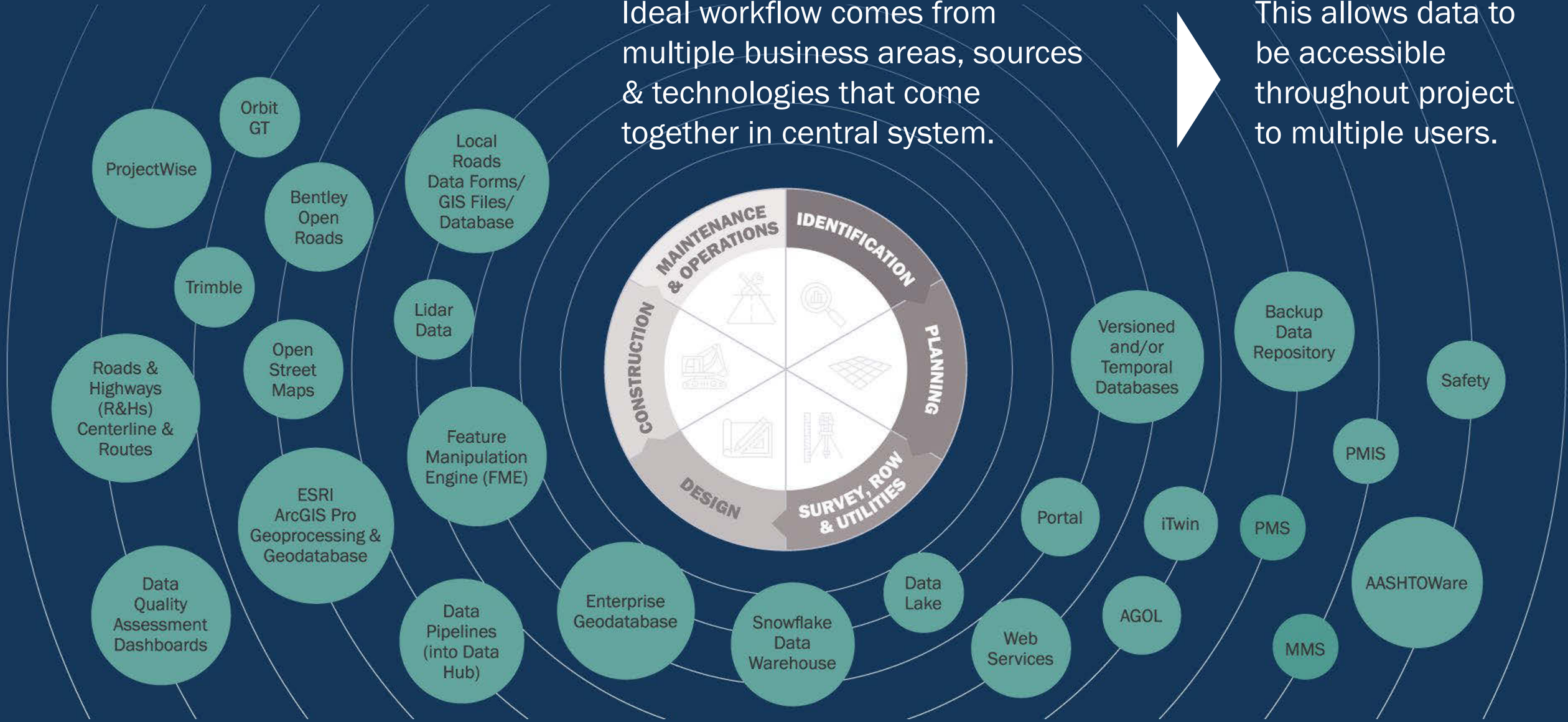
Key programs align with shared goals, visions, and effective communication and collaboration to develop strong business cases/ROI for growth and consolidation

Connecting TxDOT Data

Data Workflow Through the Project Lifecycle

Ideal workflow comes from multiple business areas, sources & technologies that come together in central system.

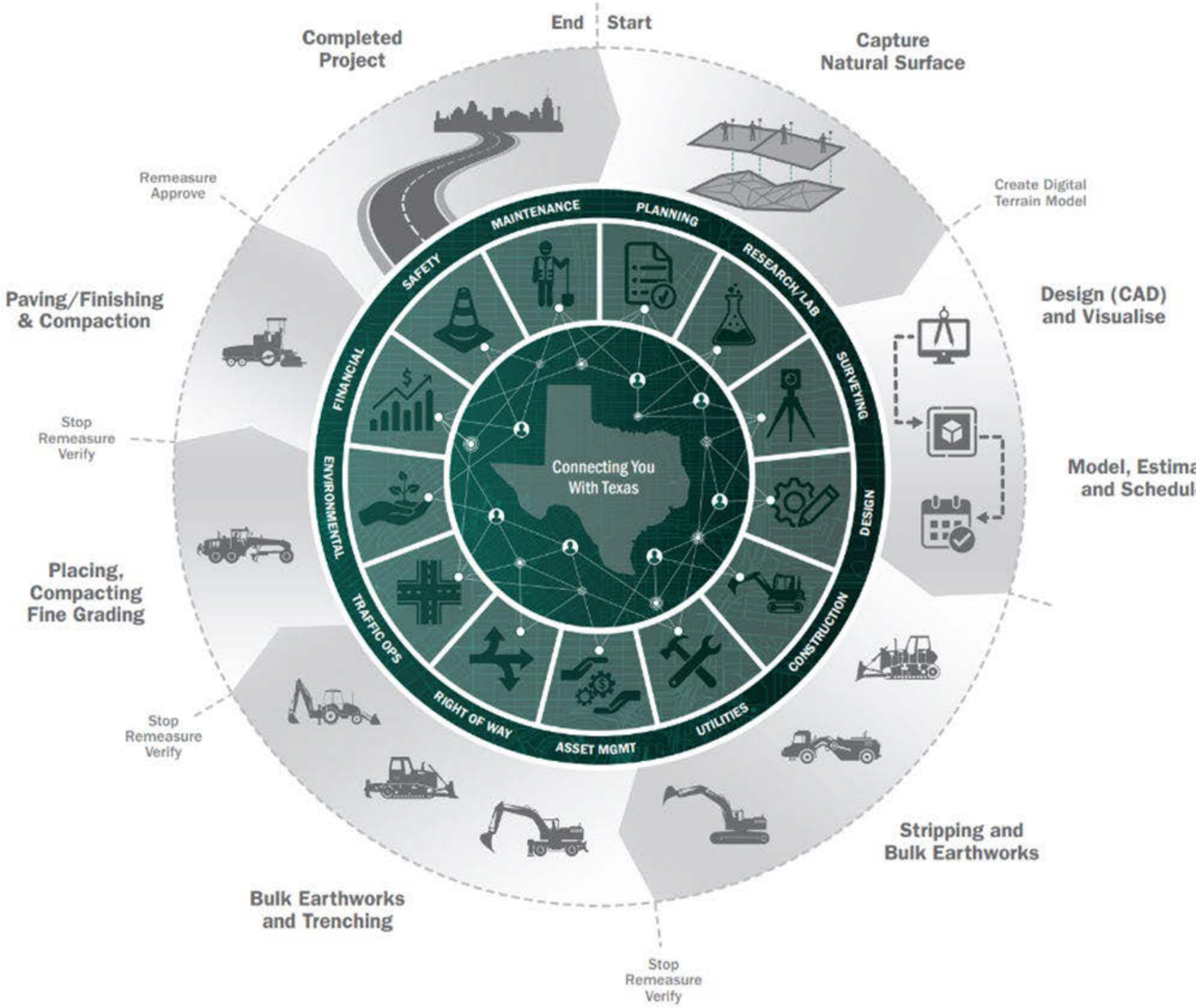
This allows data to be accessible throughout project to multiple users.



Let’s get into it...

Data Workflows

- Our Business is SPATIAL
- Engineering Data → GIS Mapping
  - Survey
  - Engineering Design
  - Construction Activities
  - Maintenance
  - Planning



Project JEDI

JOURNEY TO ENTERPRISE DATA INTEGRATION

Goal

is to build a mature, comprehensive, and reliable repository of roadway asset data and information.

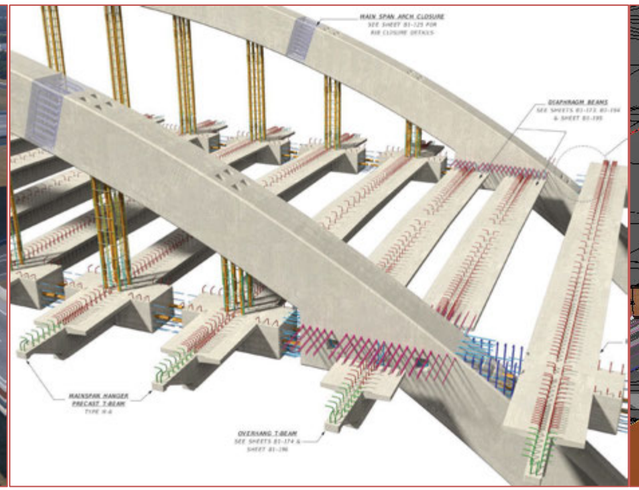
Key to Success

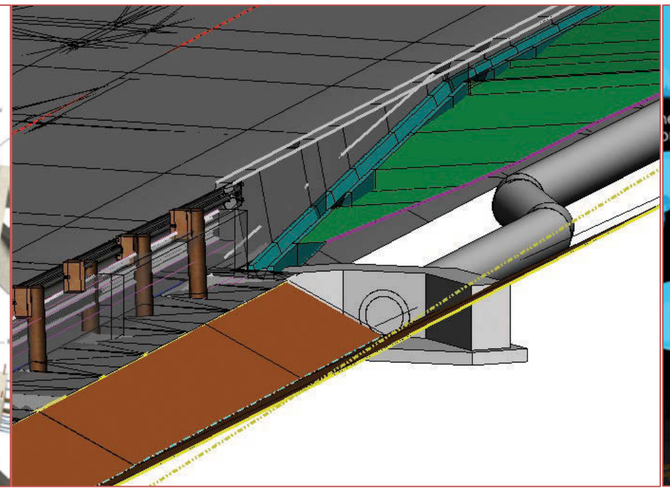
A thorough understanding of current data usage, requirements, processes, and resources.

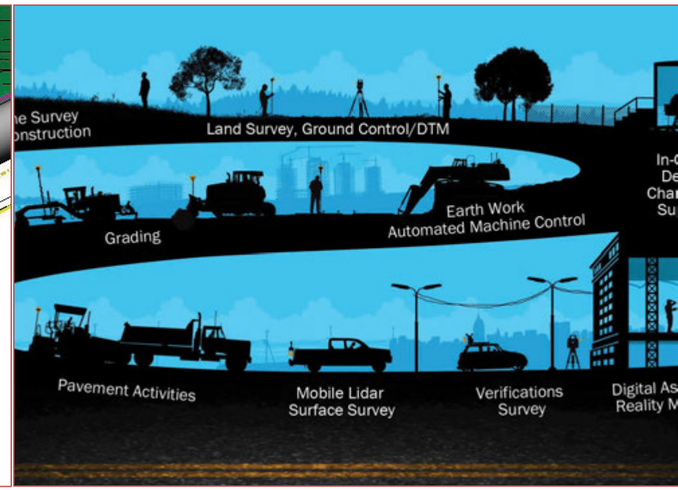
Outcome

Development of a data strategic plan, addressing data management, system integration, and governance for both geospatial and linearly referenced data.

Data Use Cases







Planning

During the planning process, data is collected from sources such as used to develop realistic simulations.

Traffic, Resiliency, Response.

Design/ Environmental

Detailed design data like dimensions, beam types, and gore points can be used to develop 2D and 3D data.

Survey, ROW, Utilities

Data for subsurface utilities can be collected from digital as-builts and modeled in design and GIS software products.

Construction

Data collected to produce digital as-builts can be utilized throughout the project lifecycle in multiple formats (e.g., CADD, BIM, GIS).

Data Integration from the Field

use cases for

Survey

Safety

- Digital Technology, LiDAR, UAVs

Integration

- Survey standards, data integration for design and Digital Delivery/BIM

Accuracy

- High precision instrumentation, data processing

Cost

- Accurate site data, early clash detection, optimized design

Digital Delivery to Data Integration eConstruction

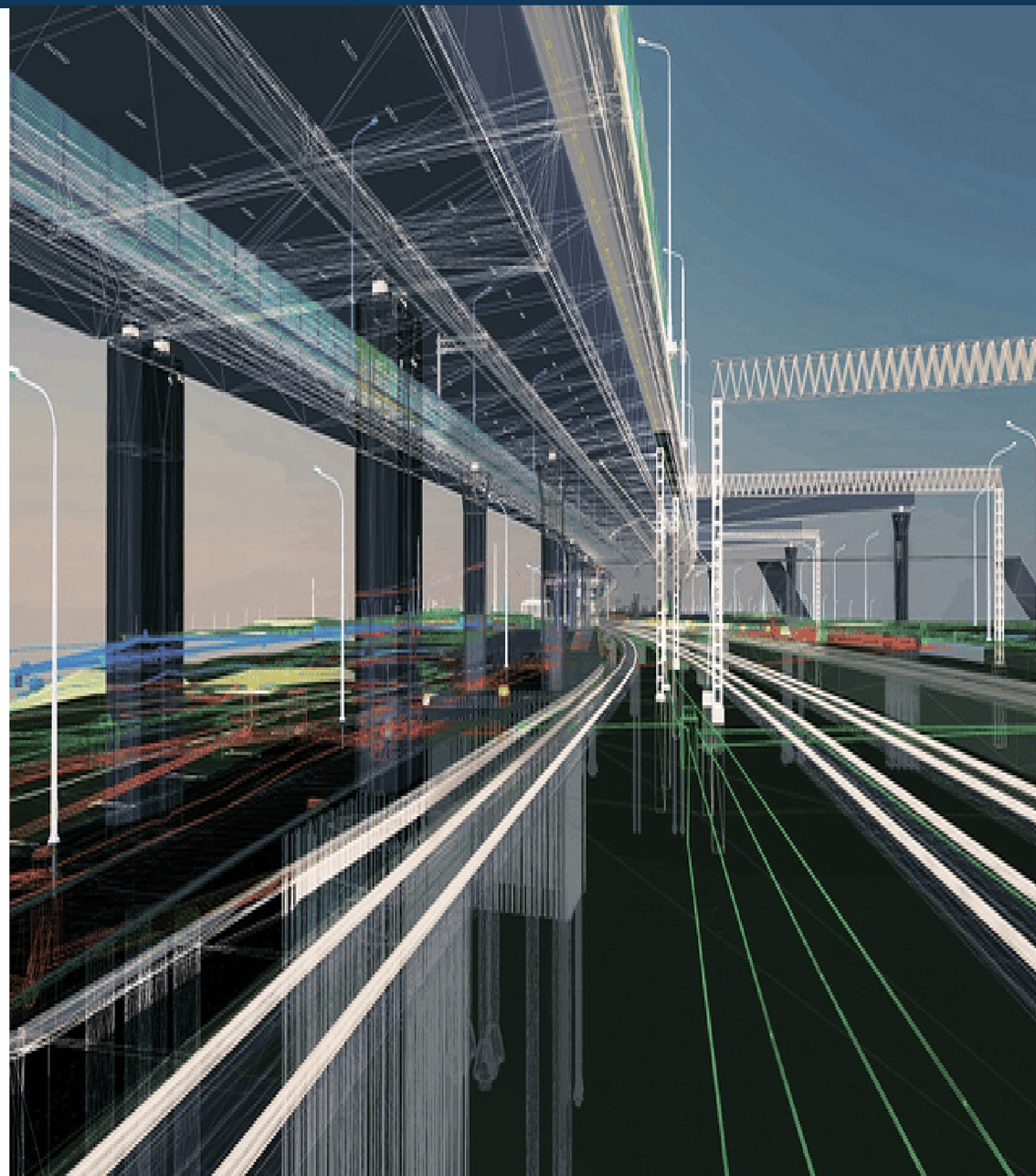
use cases for
Construction

Collaboration
- Construction Integrated Into Design/Plan Review

Error Reduction
- Reduce Errors = Fewer Change Orders
- Fewer Change Orders = Smoother Construction Phases

Plan Review
- Find Errors Easily and Earlier

Measure And Calculation Improvements



https://www.novatr.com/blog/bim-in-civil-engineering-explained

Data Integration with GIS

use cases for Planning

Better Data

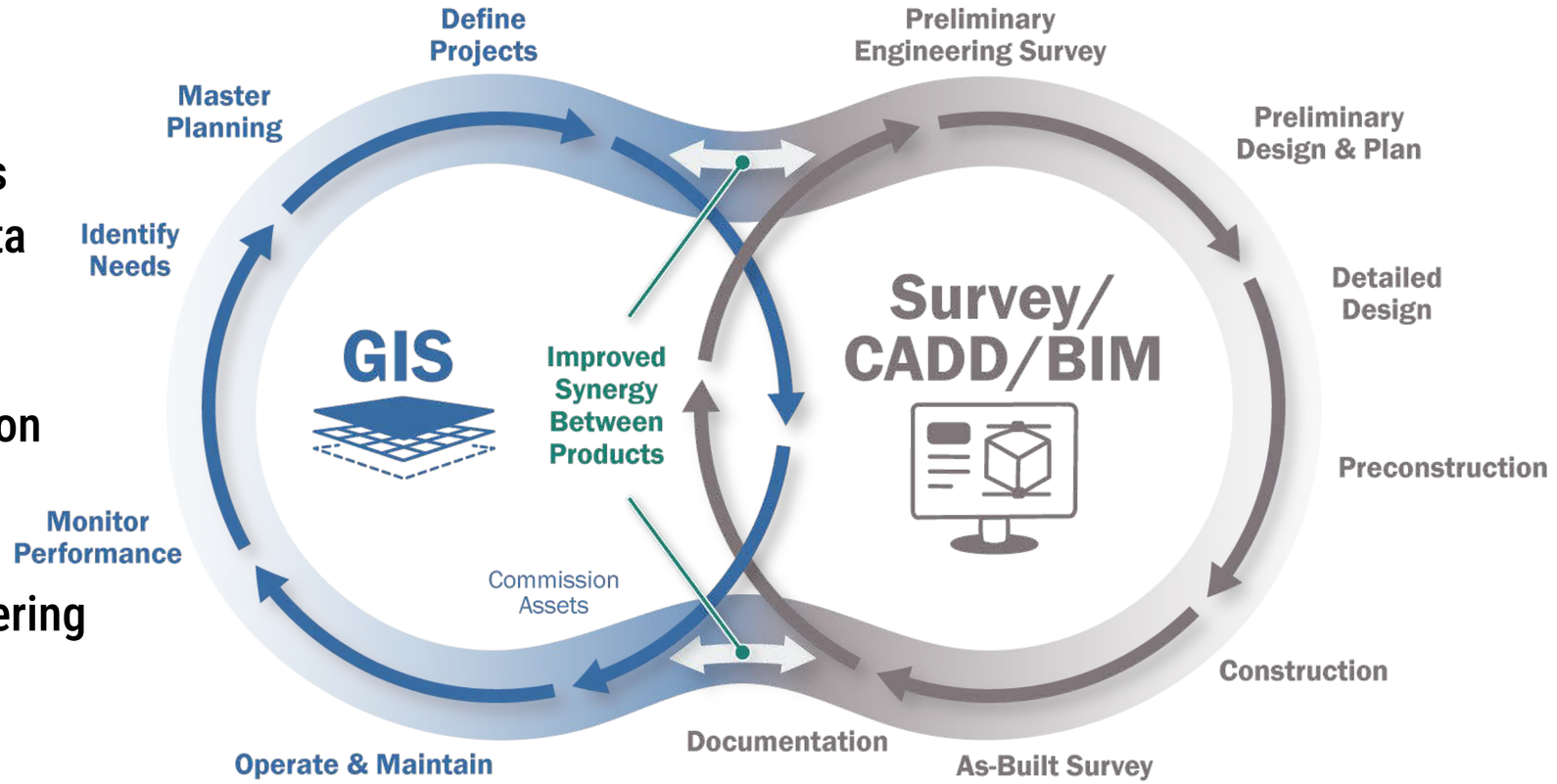
- Comprehensive Assets, Conditions, Roadway Characteristics, and Trends
- Improved reporting and data extent across the highway network
- Minimize Manual Digitization

Integration

- Integrated LRS and Engineering (CAD to GIS)

Resiliency

- Accurate condition and performance data



Data Integration with GIS

use cases for

Maintenance

Optimized Systems

- Predictive Maintenance
- Rapid Response Post-Emergency
- Data-Driven Decision Making

Enhanced Asset Management

- Paperless Field Support
- Efficient Workflows
- Real-Time Updates in the Field
- Field Mobility and Data Capture

Mobile Mapping to Data Integration with GIS

use cases for

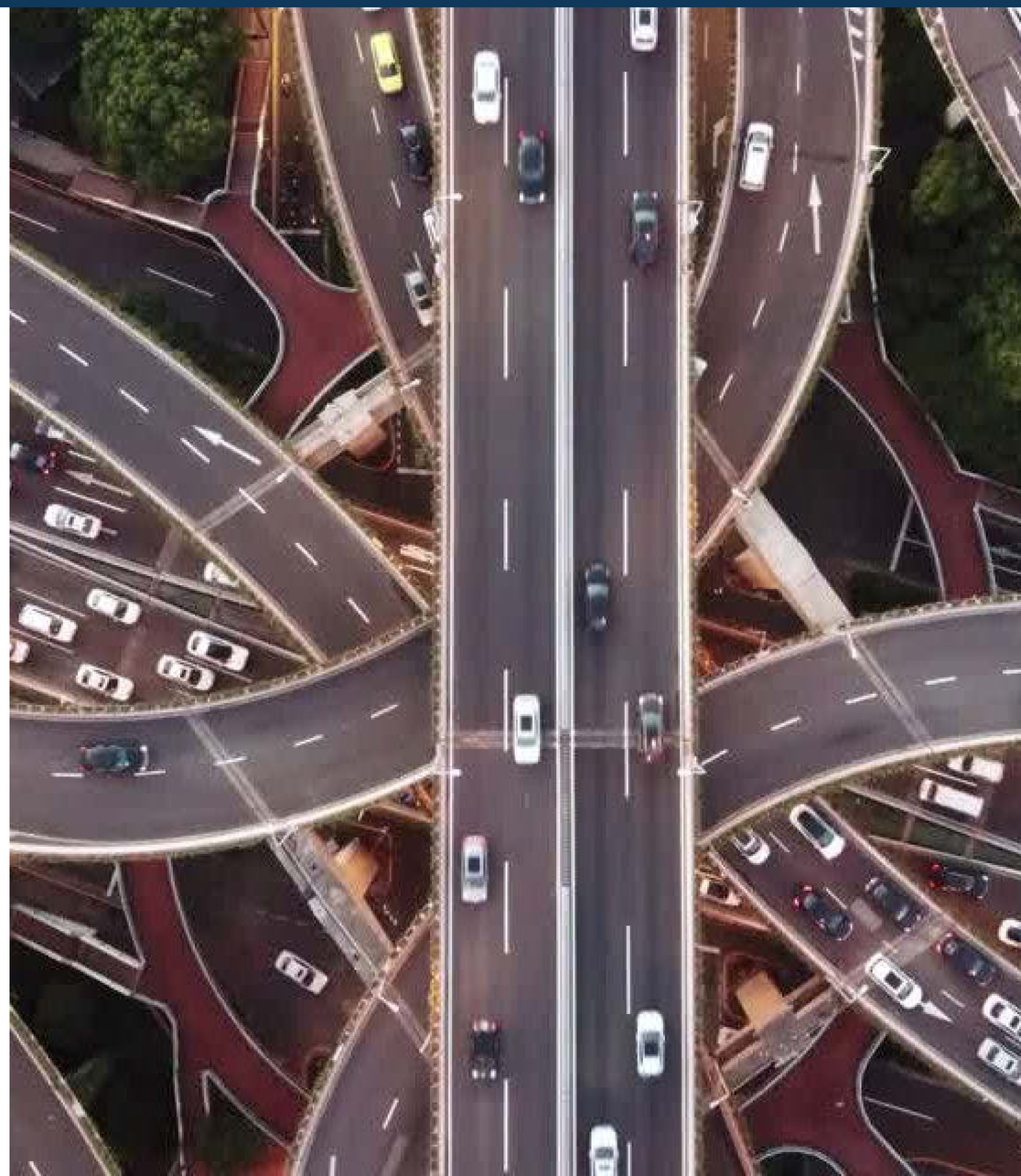
Asset Inventory & Management

RIVaL Project

- Statewide Mobile Mapping
- GRID Data Quality Baseline
- Planning-Grade Digital Assets
- Optimize Workflow and Intake for GRID Activities
- Statewide Data Extraction Opportunity

Enterprise Mobile Mapping:

- Pre-Letting scans → Validate Design → Reduce Change Orders
- Asset Identification & Extraction
- Data Collected to Support Machine Learning/AI = New Opportunities



Data Integration & Digital Roadway Information

use cases for

Project Data

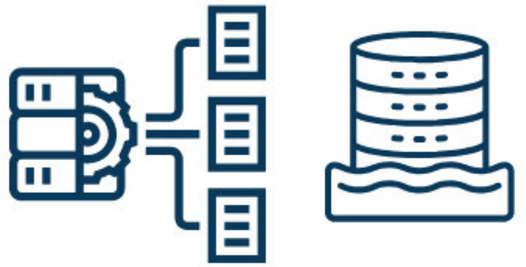
Digital Delivery

- Survey Grade Data
- Digital As-builts
- Streamlined Distribution of Data
- Agency Access and Agency Transparency
- Data Available for Downstream Project Lifecycle Processes

Enterprise Data Warehouse

- Trusted & Quality Data
- High Speed Storage
- Data Analysis from Previously Siloed TxDOT Systems
- Connecting TxDOT

DATA WAREHOUSE



TxDOT Databases & Data Lake

snowflake®

Query, Analytics, Reporting

BUSINESS INTELLIGENCE

TxDOT CONNECT

tableau

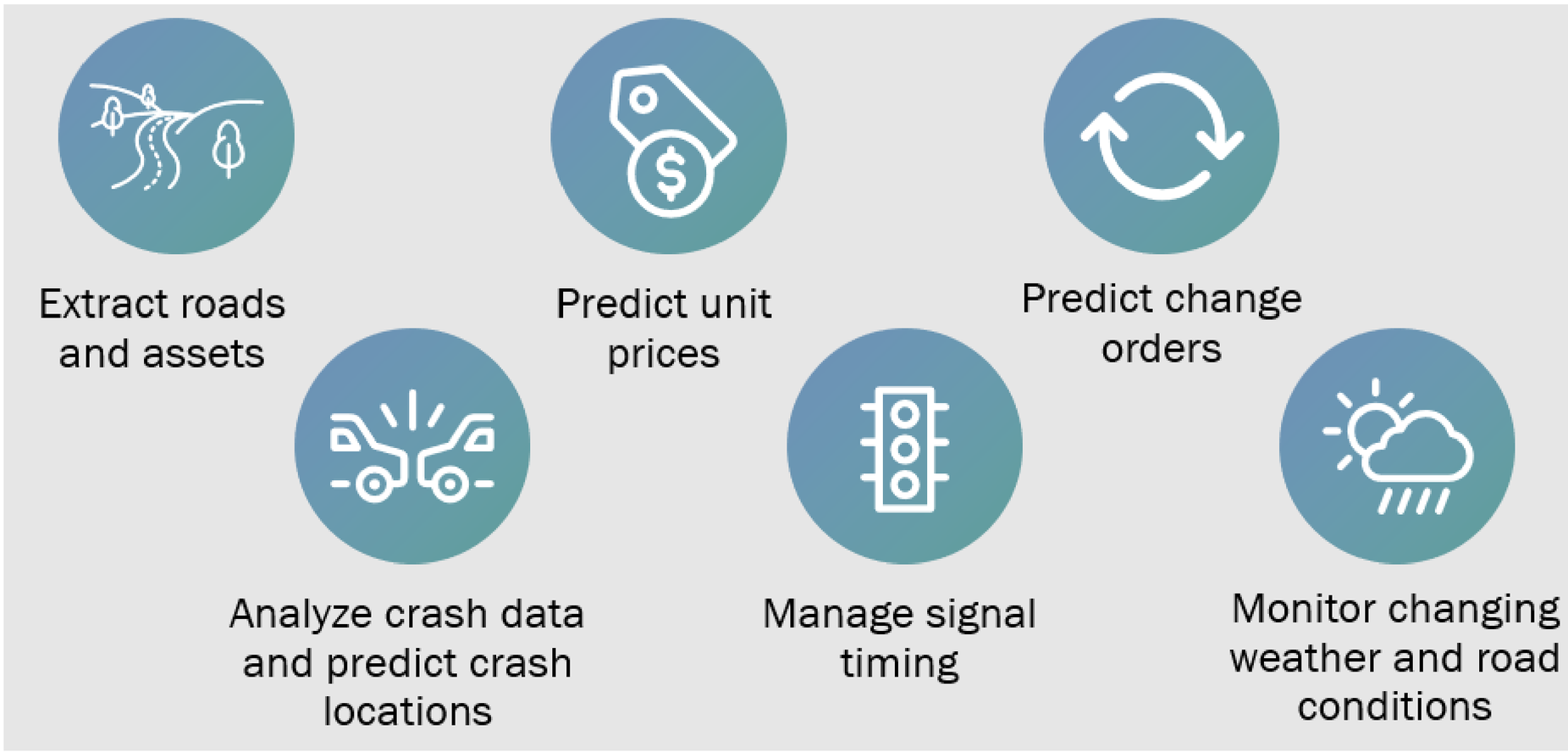
ESRI Insights

Data Integration with GIS

use cases for

Artificial Intelligence/Machine Learning (AI/ML)

- Data Strategy & Governance
- Data Lifecycles & Data Flows
- Data Architecture & Integration
- Data Sharing & Publication
- Data Analytics



Implementation & Scaling

ASSESS TxDOT's current state of enterprise geospatial maturity

IDENTIFY Geospatial data resources and supply chain opportunities

LEVERAGE Digital processes

DEVELOP geospatial data asset roadmap and data lifecycle

DETERMINE key enterprise GIS data integration needs

IMPROVE data exchange

FOSTER collaboration and information modeling to support the enterprise

Implementation Tools

- **Pilot Projects**
- **Development Databases**
- **Day Forward Approach**
- **Multi-Technology Data Capture**
- **Common Data Model**
- **Training and Education**

PUTTING TxDOT
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Thank You

TPP – Geographic Information

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