SMART METRO

SYSTEMS INTEGRATION

Transforming Our Region with AI and Advanced Analytics

USDOT Strengthening Mobility and Revolutionizing Transportation (SMART) discretionary grant program

Project Overview

- **$2 million to develop SMART METRO prototype**, an advanced digital twin platform powered by AI and analytics
- **Purpose:** To create a virtual representation of our region, enabling smarter, efficient, holistic planning, decision-making, and investments.

Today's Discussion:

- The Vision
- SMART METRO Overview
- AI in Transportation
- Use Case Projects
- Innovation Group & Partnerships
- Project to Date

Broward MPO
Metropolitan Planning Organization

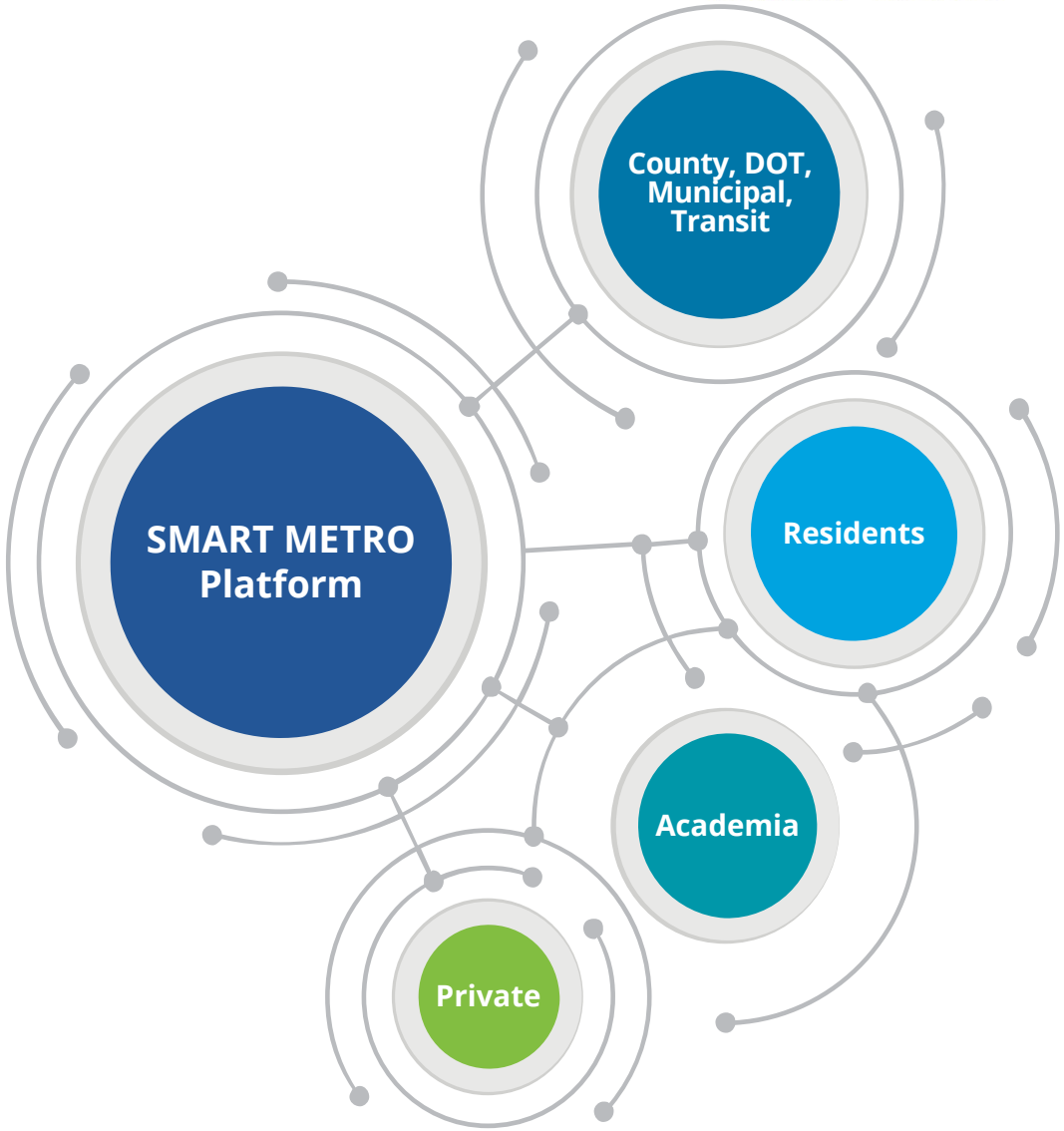
VISION

A Vision for the Future

Accelerating threats to **resiliency** and impacts of **congestion** and **population growth** pose risks for Broward County's welfare and economic growth.

Fragmented processes make it difficult to achieve collaborative and rapid decisions. **Siloed** data, **limited** models, and **disjointed** systems inhibit more data-driven planning and operations.

MPOs have a massive opportunity to evolve their current methods of operations and continuously provide "Planning as a Service" powered by AI.



BMPO's Advanced Analytics and AI Journey

2020-2022	2023 – 2024	2024	2024 – 2025	2025
Digital Twin Research and Fort Lauderdale Pilot	Grant Application and Data / Transportation Analytics RFP	Proof-of-Concept Platform Design	Initial Use Case Project Implementations	Anticipated Platform Development

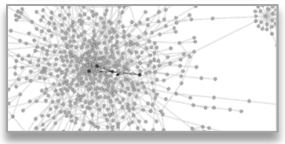
SMART METRO

Platform Overview

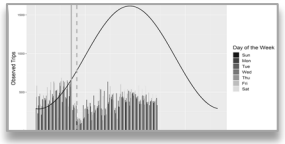
What is involved in a system-of-systems approach?

Experience

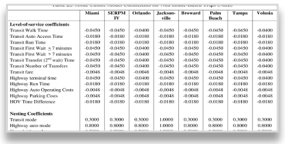
Intention



Analysis / Simulations

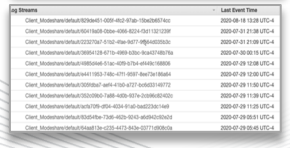


Activity

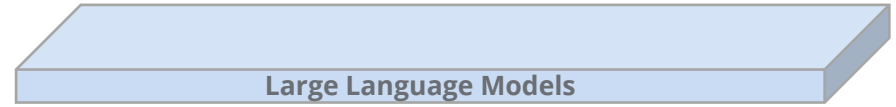


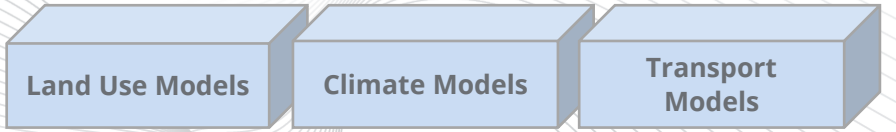
Models

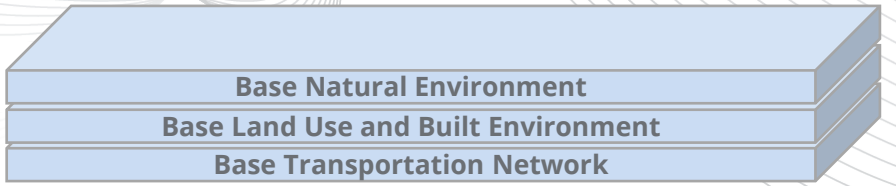
Network Maps



Data Sources





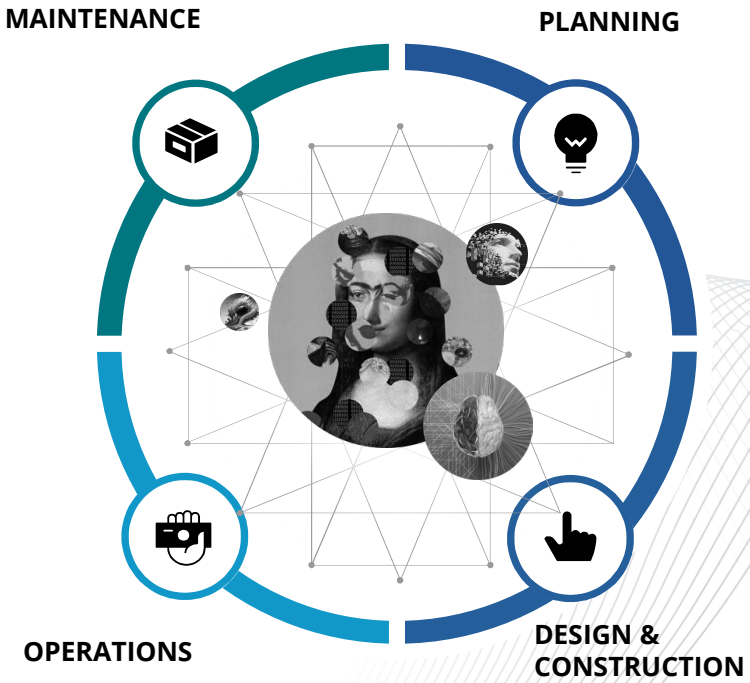


SMART METRO

AI in Transportation

AI can play a critical role in all aspects of transportation infrastructure planning and operations.

Transportation Infrastructure Lifecycle



Classification of AI Methodologies

AUTOMATE *Intelligent Automation*	*Execute document review or data entry processes that require little human judgement*
SIMULATE *Agent-Based Simulation*	*Simulate millions of travel decisions and trip patterns to evaluate impacts of projects and policies*
INTERACT *Gen AI and Assistants*	*Engage with humans in real-time, enable two-way dialogue, reference authoritative sources for advanced recommendations*
PREDICT *Predictive Analytics*	*Use traffic data to train machine learning models to anticipate future travel conditions and detect congestion*
DETECT *Computer Vision*	*Analyze traffic patterns through analysis of CCTV streams or identify potential infrastructure defects via LIDAR scans*
INTERPRET *Natural Language*	*Train algorithms to read department manuals, policy documents, and contracts and derive insights*
CREATE *Gen AI*	*Create new content, including infrastructure plans, designs, and operational recommendations*

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SMART METRO

Micro & Macro Proof-of-Concept Applications

What do we already know about our use case projects? What are our desired outcomes from each use case project?

1 HISTORIC MIRAMAR REDEVELOPMENT

TRANSPORTATION & RESILIENCY IMPACTS

Miramar updated land use to accommodate higher density and planned **Miramar Innovation & Technology Village**.

The plan does not include transit upgrades to meet anticipated demand, so the City wants to understand impacts of **potential transportation** investments.

The platform will **help answer**:

- What transit options **best meet community** needs?
- What **complementary land use changes** should be adjacent?
- How will new infrastructure impact **flood risks**?

2 BMPO INVESTMENT ANALYSIS

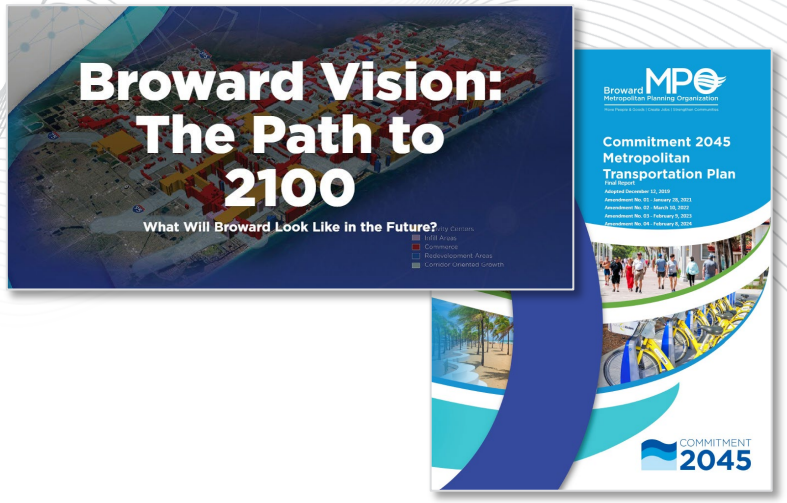
HOUSING, RESILIENCY, & TRANSPORTATION IMPACTS

BMPO is looking to **leverage investments** related to housing, resiliency, and transportation to increase efficiencies.

The platform aims to lend guidance for potential investments so that BMPO can understand areas to **prioritize transportation** investments.

The platform will **help answer**:

- Where are **underutilized sites** along transit corridors?
- What are the most **"climate-aligned"** investments?
- What **transportation options** best meet new housing needs?



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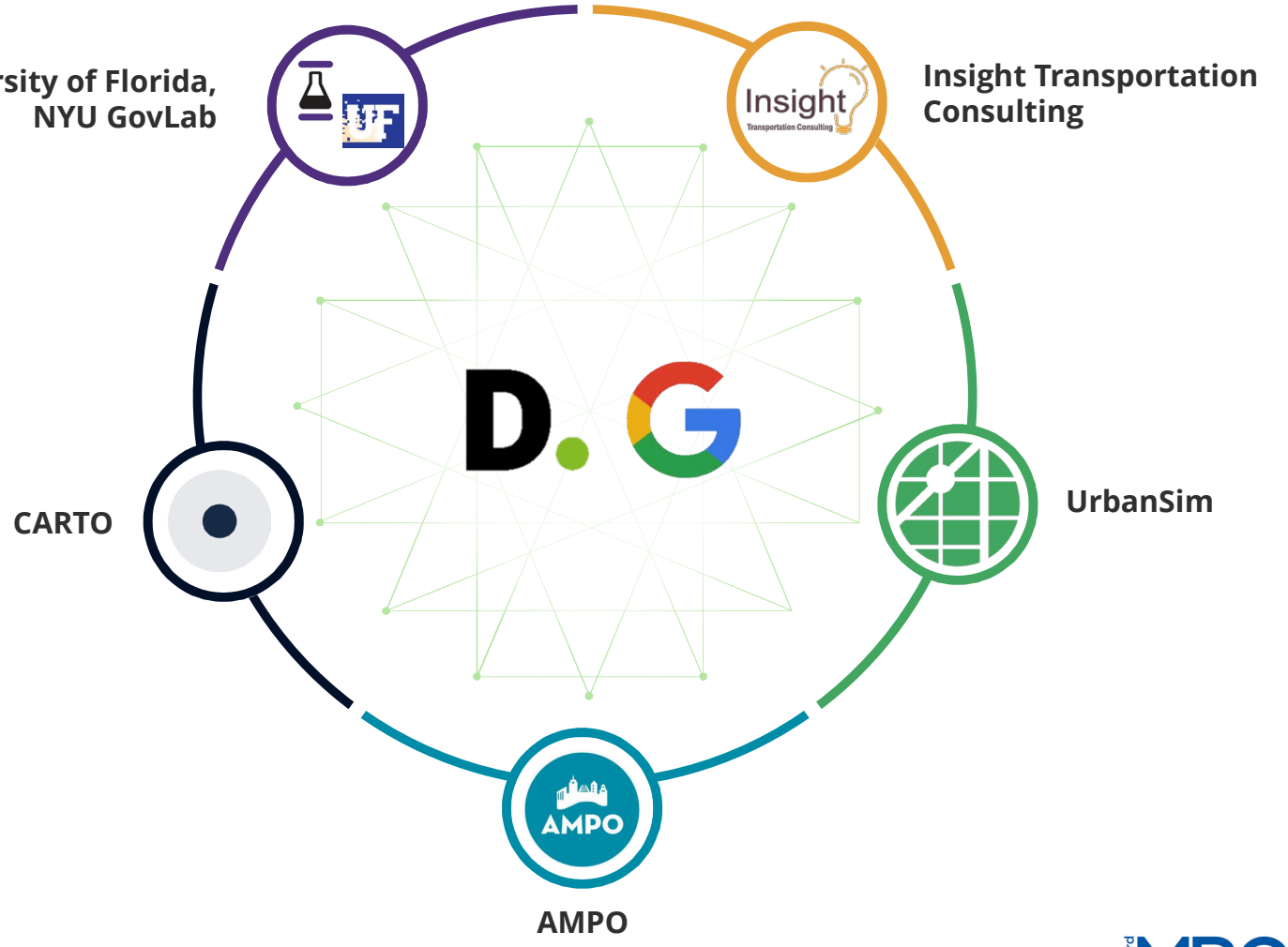
PARTNERS

SMART METRO: Innovation Group

Private and public partnerships for SMART METRO.



UF & NYU

Unparalleled understanding of computational science, data science, and data collaboration.

- Data Governance
- Modeling & Data Science

CARTO

Dedicated to unlocking the power of spatial analytics through a software as a service location intelligence platform.

- Spatial Analytics
- Geospatial Visualization

Annual Metropolitan Planning Organization (AMPO)

Help communities thrive by strengthening MPOs that plan for safe, reliable, and equitable multi-modal transportation networks that are accessible to all.

- Technical Assistance and Training
- Collaborative Peer-Exchange Network

UrbanSim

Provides open-source simulation systems for land use, transportation, and environmental planning.

- Land Use Modeling & Data Science
- Product Design

Insight Transportation Consulting

Florida-based transportation modeling firm with experience in both regional and federal models.

- Travel Demand Modeling
- Modeling & Data Science

PARTNERS

SMART METRO: Partnerships

Private and public partnerships for SMART METRO.

MUSEUM OF DISCOVERY & SCIENCE
AUTONATION IMAX THEATER

MIRAMAR
BEAUTY AND PROGRESS
EST 1955

SMART

Established 1915
BROWARD
County Public Schools

Broward MPO
Metropolitan Planning Organization

MODS & BCPS

Leadership in STEM and preparing future workforce.

- Workforce & Training
- Design Training Materials and Training Pilot Program

City of Miramar

Dedicated to providing resources and data to evaluate potential investments.

- Miramar Innovation & Technology Village Use Case
- Micro Proof-of-Concept

USDOT Office of Secretary for Research and Technology

Help grantees thrive by providing subject matter expertise, lessons from the field, and engagement.

- Technical Assistance & Capacity Building
- Subject Matter Experts

Others

Regional subject matter experts in Housing Finance, Resilience, Water Management, Land Use, etc.

- Subject Matter Experts for Macro Proof-of-Concept
- Data & Modeling for ingestion into the SMART METRO

SMART METRO

Project to Date

What is the latest timeline and anticipated Stage II approach?

USDOT SMART Stage 1 Grant
Prototype

USDOT SMART Stage 2 Grant
Implementation

AI Exploration & Pilots

Vision 2100 a paradigm shift. **Experimented** with digital twin technology and analyzed potential transit corridors

2020 – 2022

TWO #1 Research & Plan

Aligned on SMART METRO platform need, design, and key stakeholders

Nov 2023 – Aug 2024

TWO #2 Mobilize & Design

Refined requirements, coordinated with national stakeholders, and prepped development tasks

Sept 2024 – Nov 2024

TWO #3 Develop & Delivery

Deliver SMART Stage 1, build proof-of-concept platform, and analyze initial use case projects

Dec 2024 – Jan 2026

TWO #4 Implement & Expand

Deliver Grant Stage 2, scale proof-of-concept, and analyze additional use cases on regional / national scale

Jan 2026+

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SMART METRO

SYSTEMS INTEGRATION

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https://www.browardmpo.org/major-initiatives/transformation

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