

Progress on NJTPA Bicycle Travel Demand Model

RTAC Meeting

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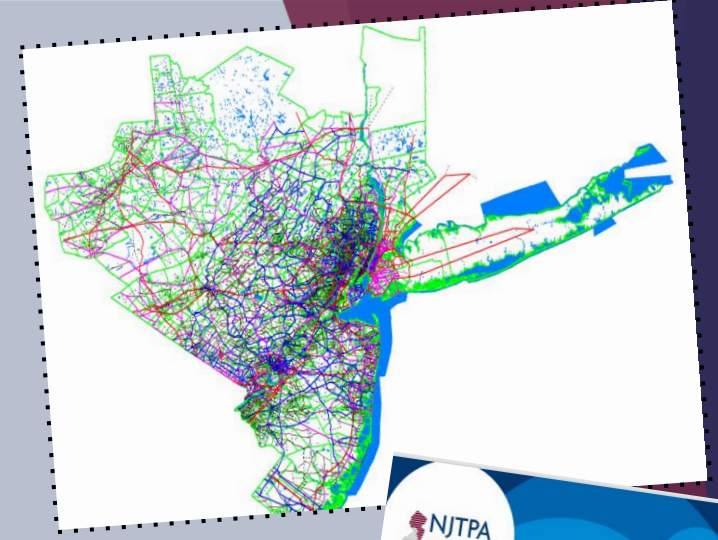
October 13, 2026

Background

- In FY 25, developed a **prototype bicycle travel demand** model with the support of the NJIT research team led by Professor Branislav Dimitrijevic

Trip generation -> Trip Distribution -> Trip Assignment

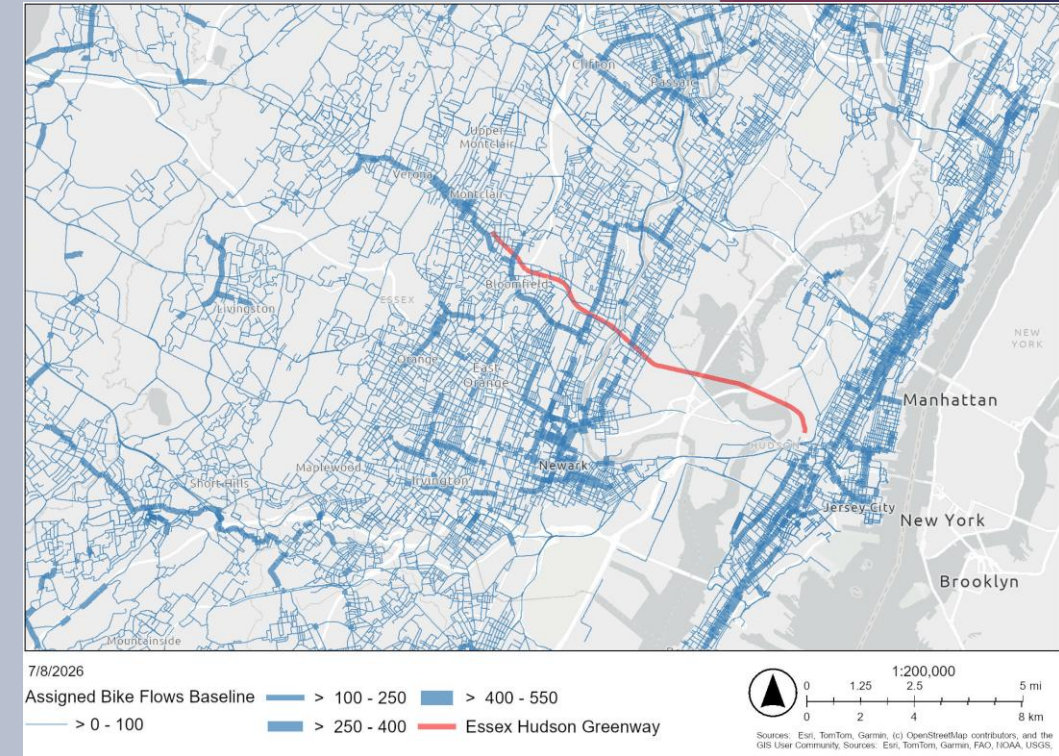
- Support **active transportation planning** initiatives
 - Estimate bicycle flows
 - Draw from North Jersey Regional Transportation Model (NJRTM-E) estimates
 - Apply [Replica data](#), [Level of Bicycle Compatibility](#)
 - Identify potential patterns for future scenarios
- **Follow-up project in FY 2026** further refined the model to support more realistic scenarios related to the **NJTPA Active Transportation Plan**



FY 2026 Scope

Improved modeled bicycle flows from prior prototype

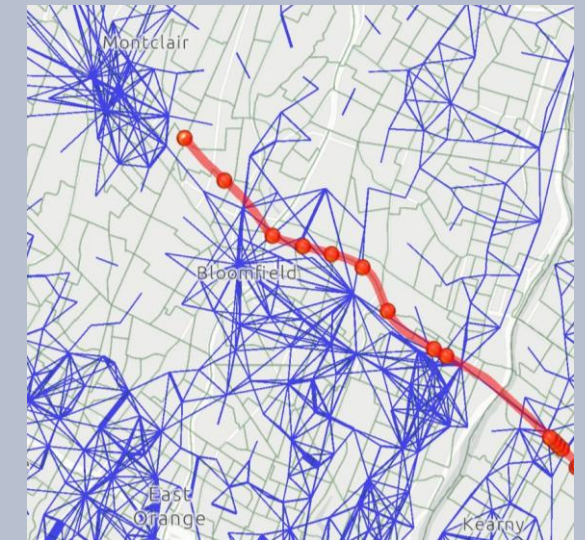
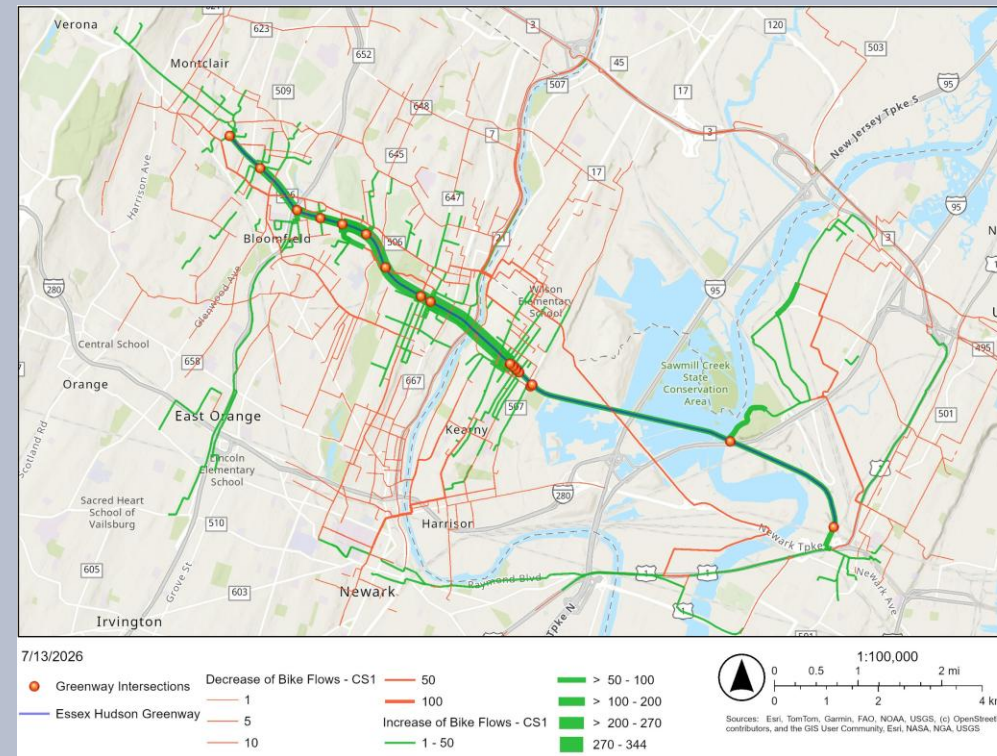
- Literature review and **model enhancements**
- Case studies, such as The Greenway (Jersey City-Montclair)
- For NJRTM-E, **explore** capabilities of new Bentley **OpenPaths Agent** software
- Convert the aggregate bicycle model to a disaggregate model with OpenPaths Agent to **estimate person-level travel behavior for bicyclists** in the NJTPA region



Case Study: The Greenway

Modeled bicycle flows and origin-destination patterns

- Maximum flows near parks
- Available data limits model accuracy, particularly for recreational trips



Agent Based Bicycle Model Prototype

- A first working pipeline to move from zone-level to person-based bicycle modeling
- Using OpenPaths AGENT – software provides a hybrid between 4-step and agent based modeling

Synthetic
population

Tour
frequency
by purpose

Insert bike
tours

Destination +
time choice

Trips → O-D
for assignment

Main improvement for planning

The ABM can evaluate not only where existing bicycle trips occur, but also better represent changes in trip making and tour patterns due to infrastructure, land use, accessibility, and traveler characteristics

Lessons Learned and Work in FY 2027

- **Data limitation:** Replica was essential to calibrate the model but contains outliers; the model needed to be refined by filtering out long distance bicycle trips
- **Leisure travel purpose:** Model should expand beyond commuting and shopping trips to capture recreational travel demand
- **Agent based modeling:** Adopt ABM to model trip tours, multimodal chains, and diverse trip purposes
- **Enhanced data sources:** Integrate STRAVA Metro and local bicycle count data to improve model accuracy and usability
- Further enhanced model will be applied more fully to Active Transportation Plan proposed trails
- Applicability of bicycle demand estimates will be assessed for other bicycle initiatives in the region
- RTAC will be updated as the FY 2027 work progresses
- NJRTM-E Users Group Meeting to be scheduled

Thank you!

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