

Model Information eXchange System (MIXS)

Presented to
MTF

Presented by
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Problem




- Different models in overlapping geographic areas use different network representation of the same physical network
- We have FSUTMS standards but we lack a standard/common network
- Difficult to share common input data elements
 - Speed, Number of Lanes, Volume, Direction etc.
- Difficult to view and compare future projections




Problem: Different Networks

State Level Network




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Problem: Different Networks

State & Regional Level Network




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Problem: Different Networks

State, Regional & Local Level Network


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Research Goal

- Facilitate **network** information exchange among models

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Proposed Solution - **Concept**



- Models should use a **common/unified geographically accurate network**
- **Pros:**
 - Shared network links can be easily established
 - Maintenance is easier than when networks are different
 - Eliminates data redundancies
 - Enables data sharing
 - Leverages state's investment (Navteq unified basemap)
 - Serves as platform to add new data
- **Cons:**
 - Requires one-time network conflation to the common network
 - Some maintenance will still be needed

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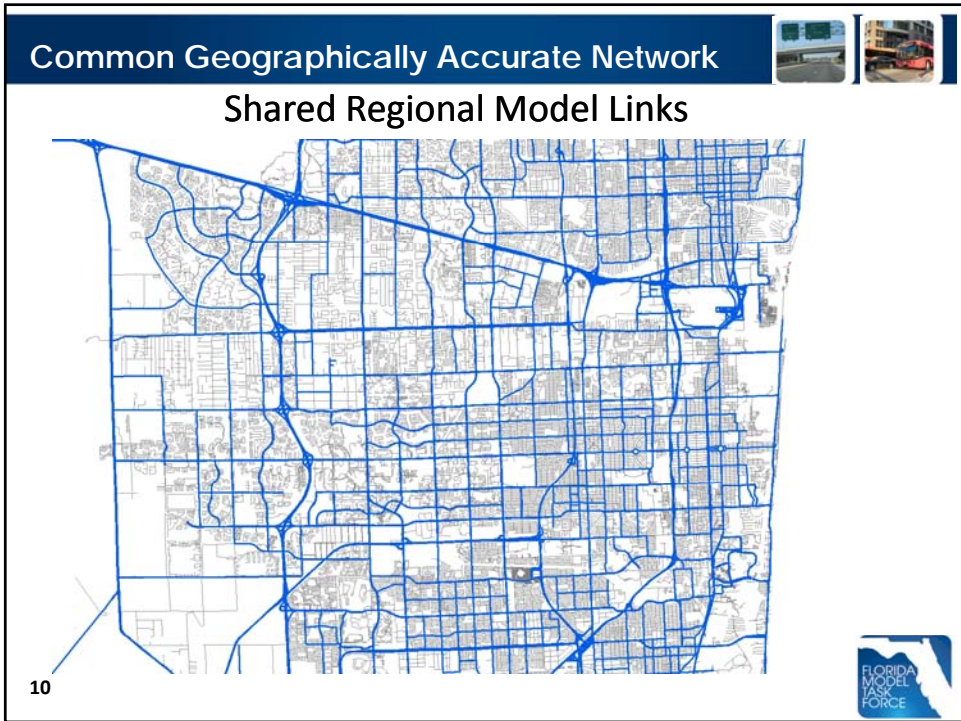
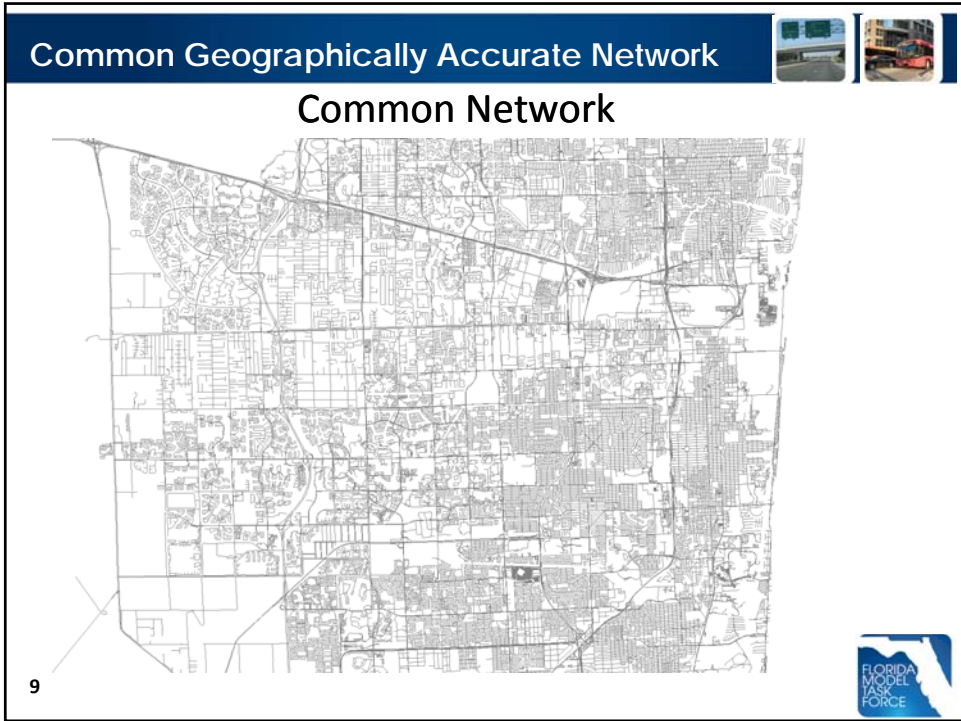
Information Exchange: **Benefits**



- Less need for data processing
- Reduction of duplicate efforts
- Ability to easily compare future demand projections from multiple models on the same GIS planning network
- Easier to find potential errors on shared links
- Facilitates coordination of agencies that rely on the same network - MPO, FDOT, Transit Agencies, Toll Operators


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Common Geographically Accurate Network Shared State & Regional Model Links

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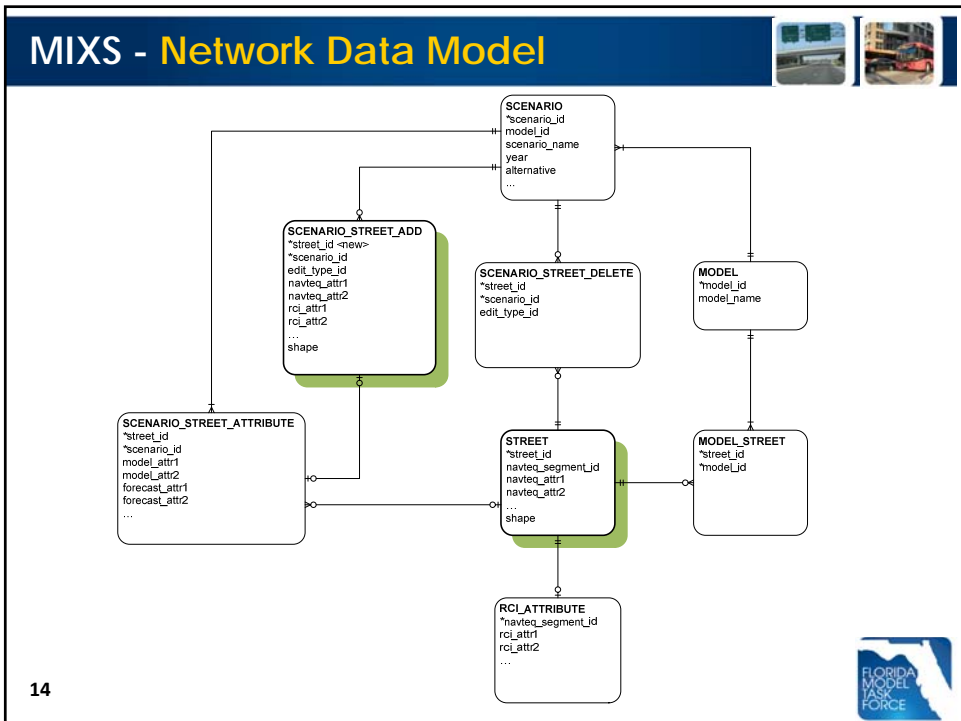
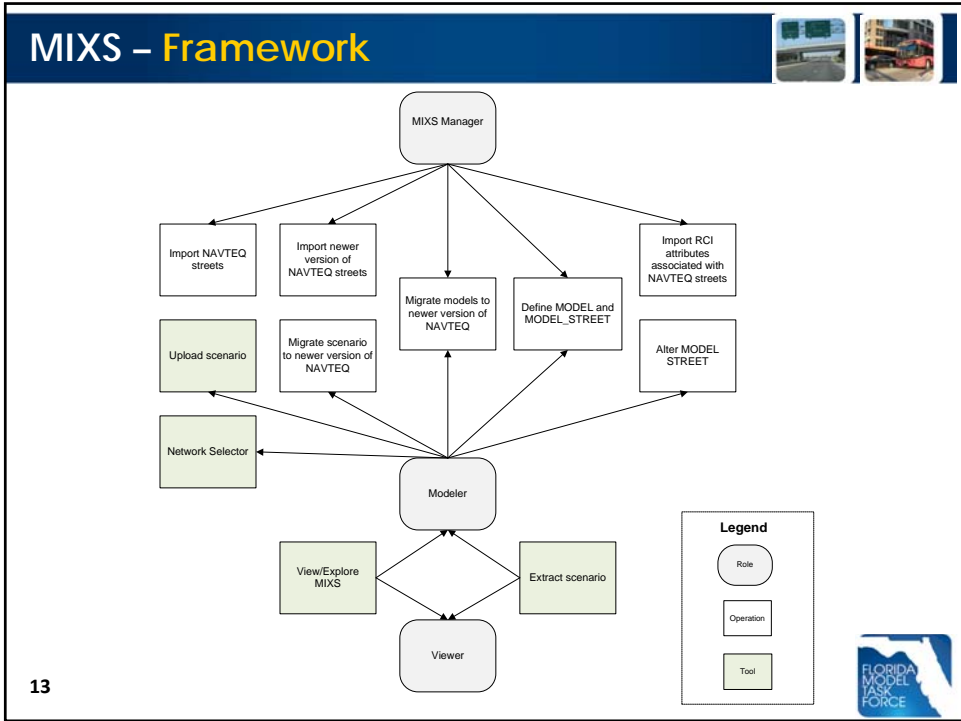
Proposed Solution – MIXS

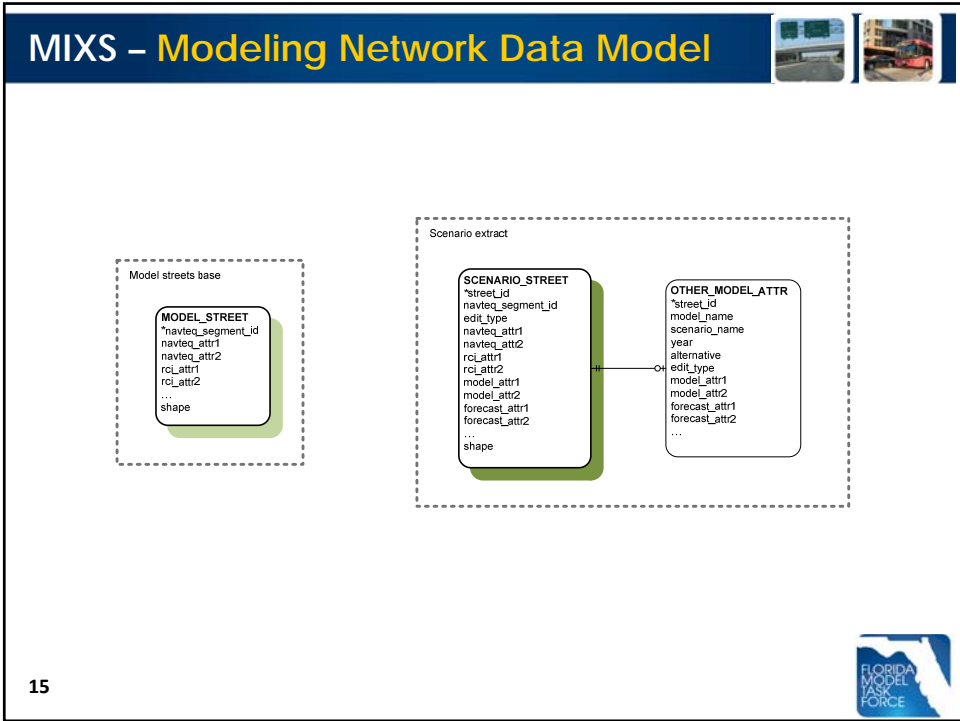
- To accomplish this we propose
MIXS –Model Exchange Information System: a Data Model, a Set of Tools and Organizational Protocols

```
graph TD; MIXS((MIXS Common network for all model levels)); STATE_GIS[STATE LEVEL GIS NETWORK]; REGIONAL_GIS[REGIONAL LEVEL GIS NETWORK]; STATE_CUBE[STATE LEVEL MODEL/CUBE  
• FUTURE Projections]; REGIONAL_CUBE[REGIONAL LEVEL MODEL/CUBE  
• FUTURE Projections]; MIXS -- EXTRACT --> STATE_GIS; MIXS -- EXTRACT --> REGIONAL_GIS; STATE_CUBE -- INPUT --> STATE_GIS; REGIONAL_CUBE -- INPUT --> REGIONAL_GIS; STATE_GIS -- OUTPUT --> STATE_CUBE; REGIONAL_GIS -- OUTPUT --> REGIONAL_CUBE; STATE_GIS -- UPLOAD --> MIXS; REGIONAL_GIS -- UPLOAD --> MIXS;
```

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MIXS

Proof of Concept Demonstration

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MIXS Process - How it works?

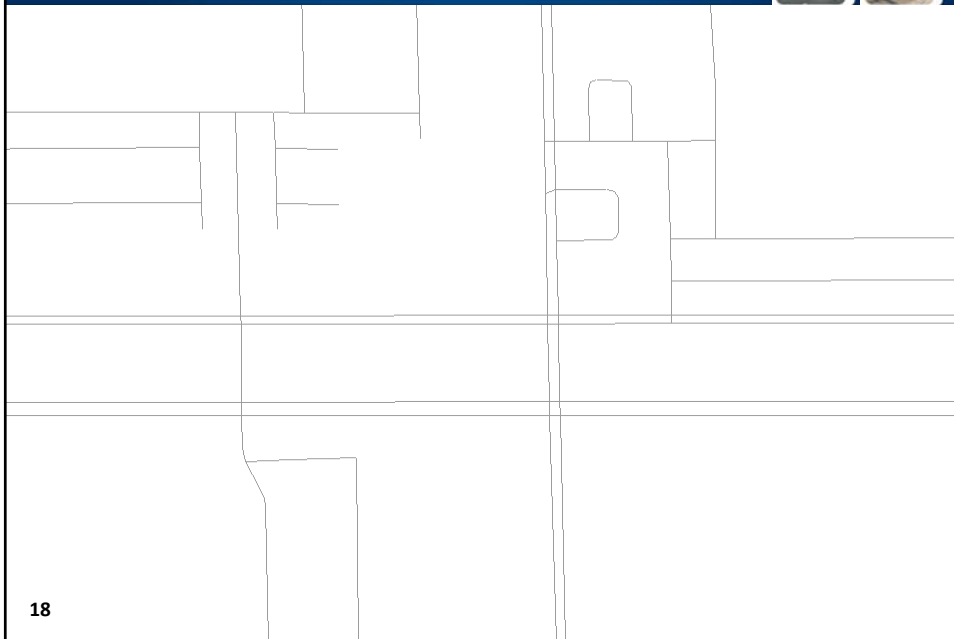


- **Initial MIXS Database**
- Extract Network for Modeling
- Modify Network in Modeling
- Upload Modified Network in MIXS
- Update MIXS database periodically

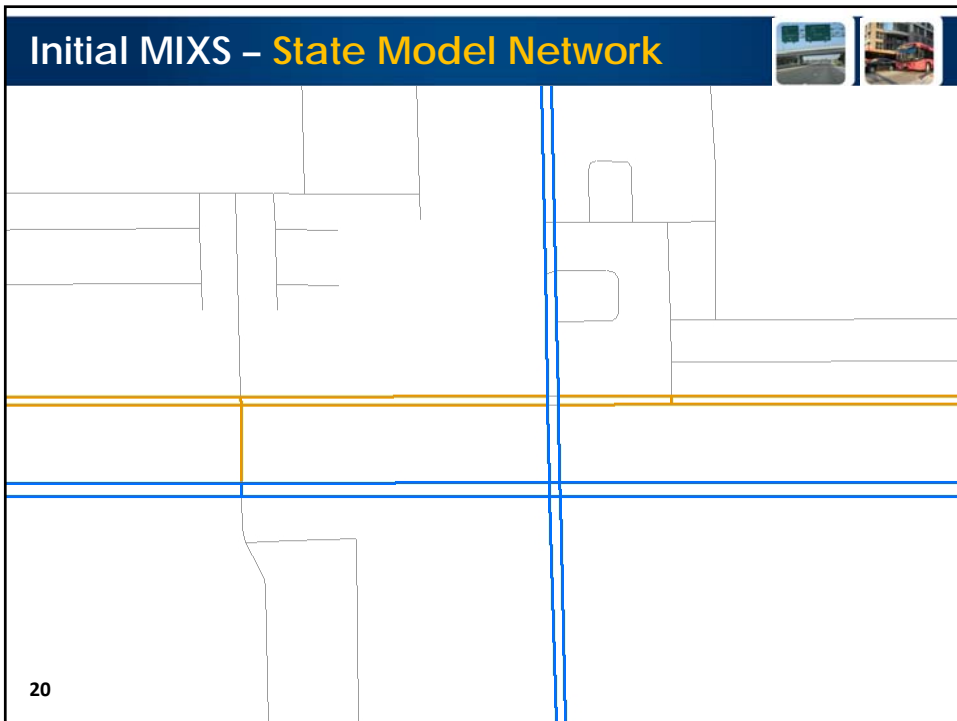
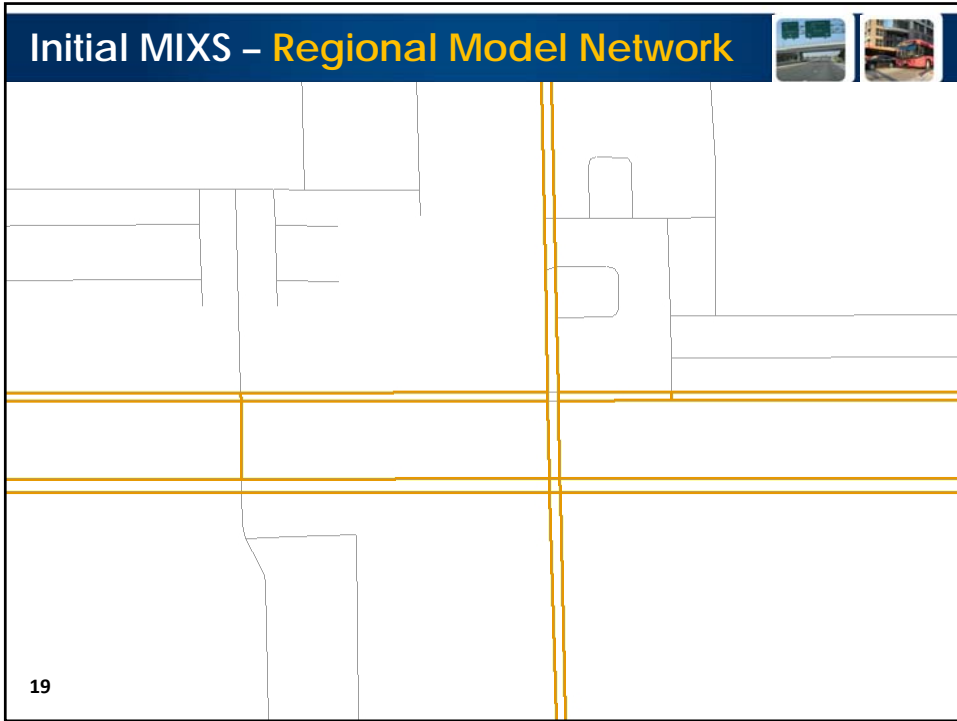
17



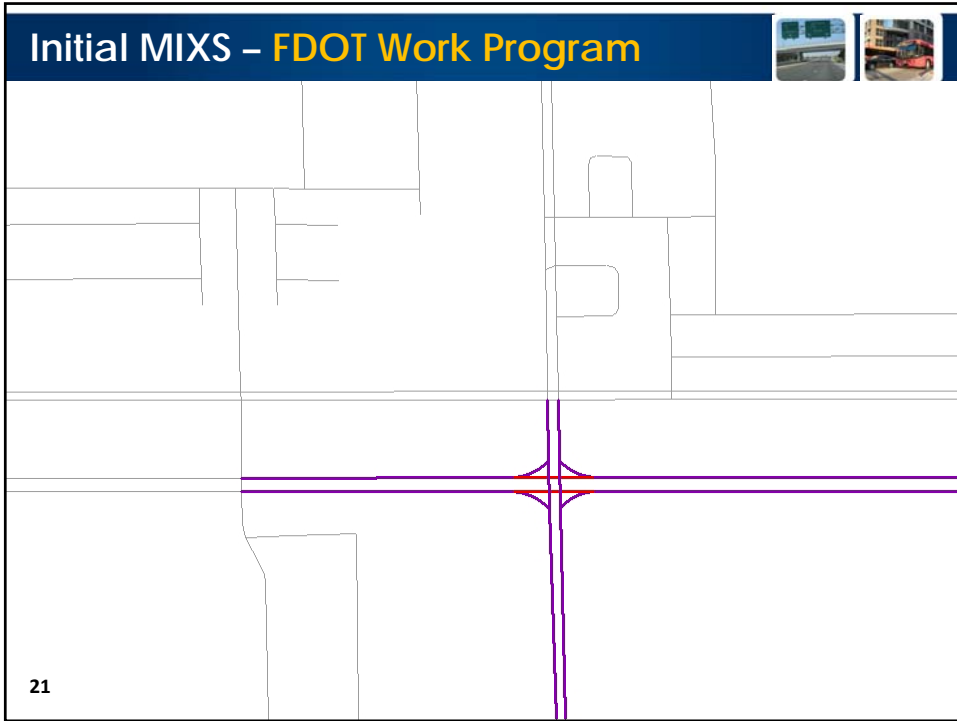
Initial MIXS – Unified Model Network



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Initial MIXS – FDOT Work Program



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MIXS Process – How it works?

- Initial MIXS Database
- **Extract Network for Modeling**
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Network Extract – Tool Specifications



- Inputs
 - Select model, scenario, year, alternative
 - Select attributes/links from other shared models
- Output
 - Network layer
 - Optionally attributes of other models for the shared links
 - Zones & centroid connectors

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MIXS –Network Extract - cont.

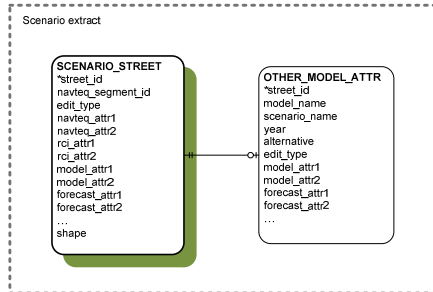
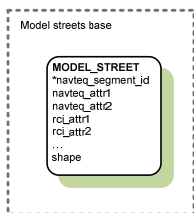


Extract scenario
 This step exports all scenario-specific customizations to your model streets. This includes the network, scenario attributes, and forecast attributes.

Model name
 NERPM

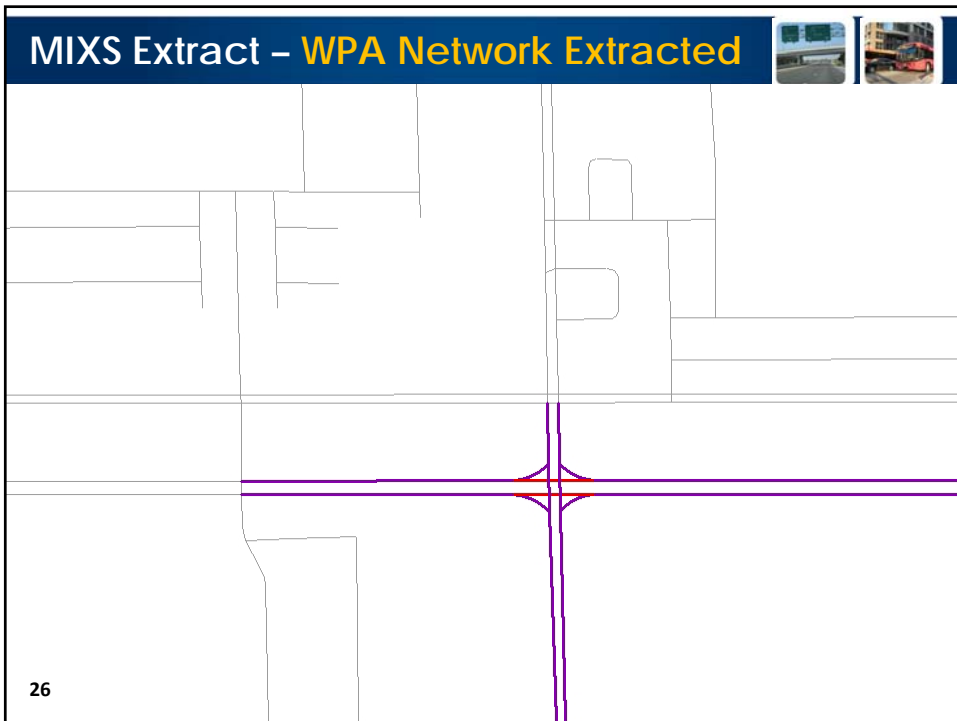
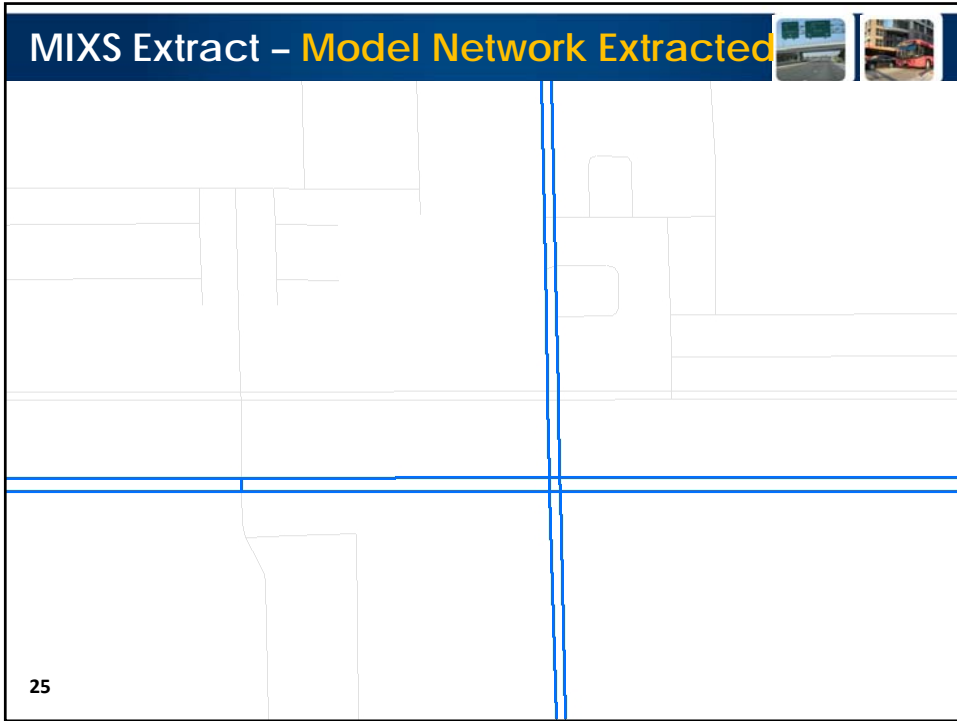
Scenario year Alternative
 2020 A

Target shapefile
 c:\data\nerpm.shp



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MIXS Process - How it works?

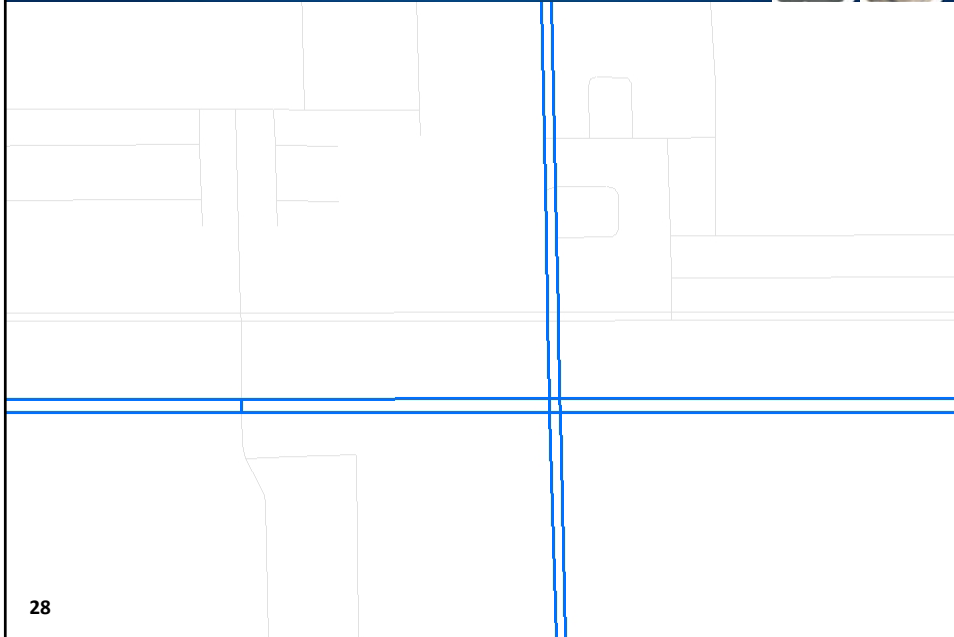


- Initial MIXS Database
- Extract Network for Modeling
- **Modify Network in Modeling**
- Upload Modified Network in MIXS
- Update MIXS database periodically

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Modeling – Network Editing - Input



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Modeling – Network Editing – Input WPA

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This diagram shows a network layout with a central intersection. A vertical purple line runs through the center, and a horizontal purple line crosses it. At the intersection, there are red curved lines indicating a specific configuration. The background shows a grid of grey lines representing other network paths.

Modeling – Network Editing, Scenario A

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This diagram shows the same network layout as slide 29, but with green lines. A vertical green line runs through the center, and a horizontal green line crosses it. At the intersection, there are green curved lines. The background grid of grey lines is identical to the previous slide.

Modeling – Network Editing, Scenario B

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MIXS Process - How it works?

- Initial MIXS Database
- Extract Network for Modeling
- Modify Network in Modeling
- **Upload Modified Network in MIXS**
- Update MIXS database periodically



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MIXS – Network Upload cont.

Import scenario
This step imports all scenario-specific customizations to your model streets. This includes linework, scenario attributes, and forecast attributes.

Model name

Scenario year Alternative

Model streets shapefile

Street ID field

Navteq segment ID field


Edit type field

Allowed values: BASE, EXTERNAL, LOCAL, PLANNED, FUTURE


Model attribute 1 Forecast attribute 1

Model attribute N Forecast attribute N

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MIXS Updated – Before...



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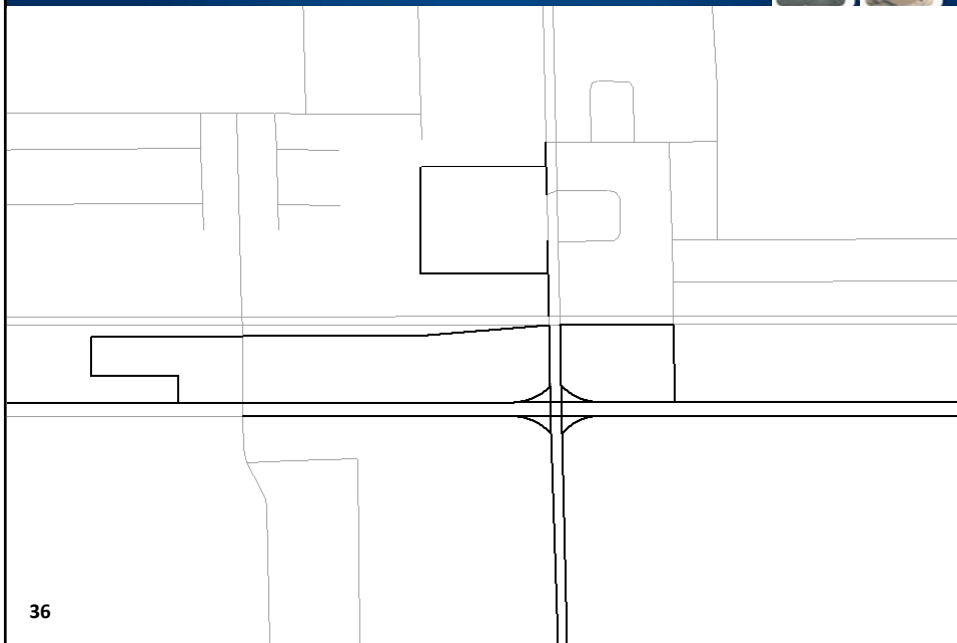
MIXS Updated – After...



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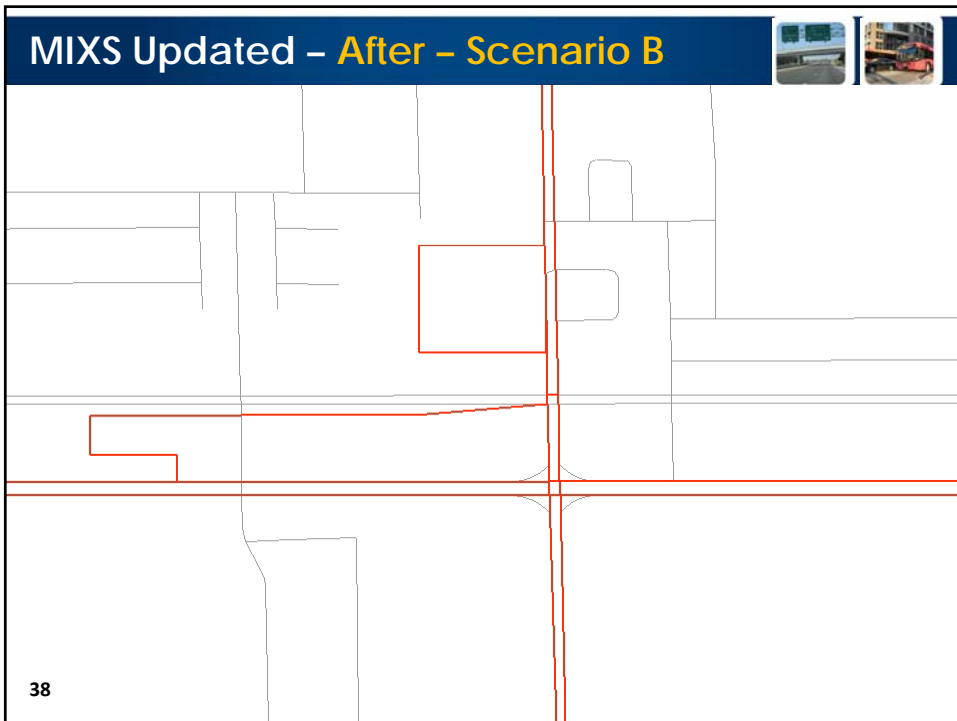
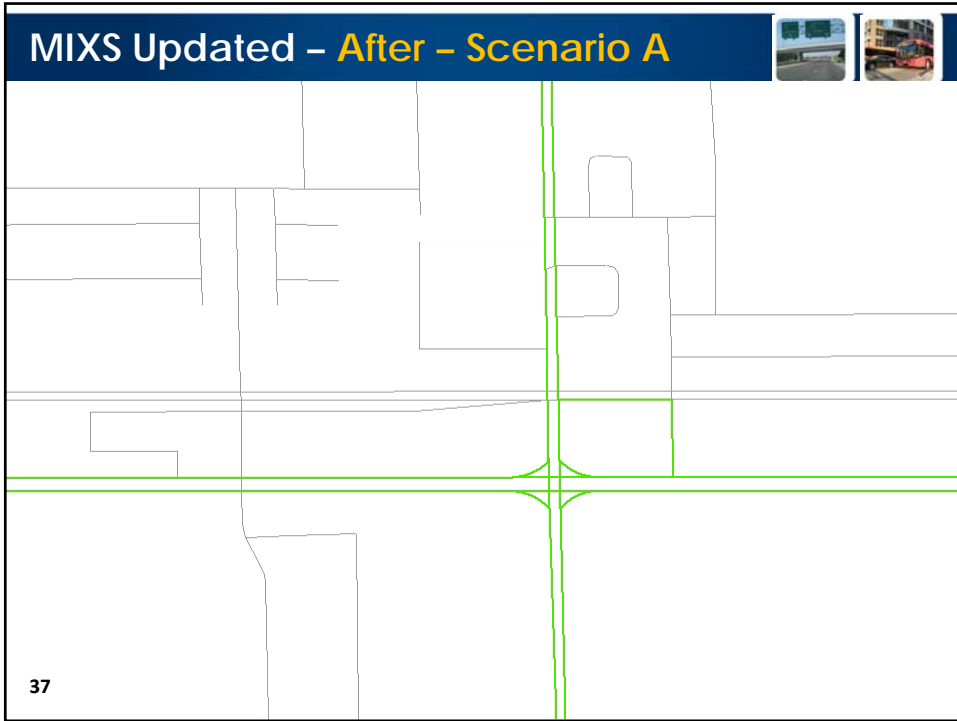
This slide displays a site plan diagram. The title bar at the top reads "MIXS Updated – After...". The diagram shows a street grid with a prominent vertical road in the center. To the right of this road, there is a building footprint. The slide number "35" is located in the bottom-left corner. Two small inset photographs in the top-right corner show a street scene with a building and a street view.

MIXS Updated – After - Changes



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This slide displays a site plan diagram, similar to slide 35. The title bar at the top reads "MIXS Updated – After - Changes". The diagram shows the same street grid, but the building footprint on the right side of the central road is different in shape and position. The slide number "36" is located in the bottom-left corner. Two small inset photographs in the top-right corner show a street scene with a building and a street view.



MIXS Process - How it works?



- Initial MIXS Database
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- Upload Modified Network in MIXS
- **Update MIXS database periodically**

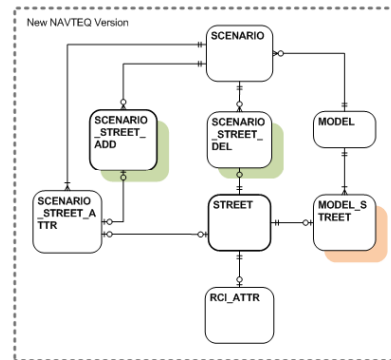
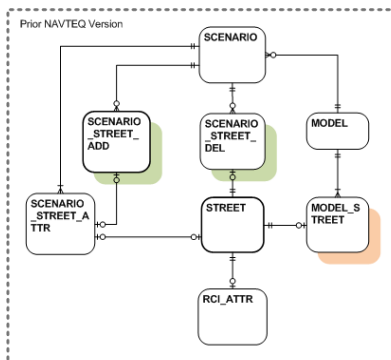
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MIXS Database Update



- Necessary to reflect updates in RCI & Navteq
- Updates can improve the network



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MIXS – What's Next?



Proposal for Implementation

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MIXS Implementation – Objective/Tasks



- Populate MIXS database with models
- Proposed initial models to load:
 - State Level : Turnpike & Statewide
 - Regional Level : SERPM (including transit)
 - Future Work Program: start with 5-year adopted;
- Develop the proposed web-based tools
 - MIXS Explorer/Viewer, Extract & Network Selector, Upload, Versioning
- Revise Cube training to replace Olympus with a Navteq-based model
- Develop a training module to use the MIXS
- Explore feasibility and implementation of future integration of MIXS & Cube Cloud

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Questions / Comments ?

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