



Infrastructure Data for Smart Planning and Investments: *Regional Perspective*

Vladimir Livshits, Ph.D.

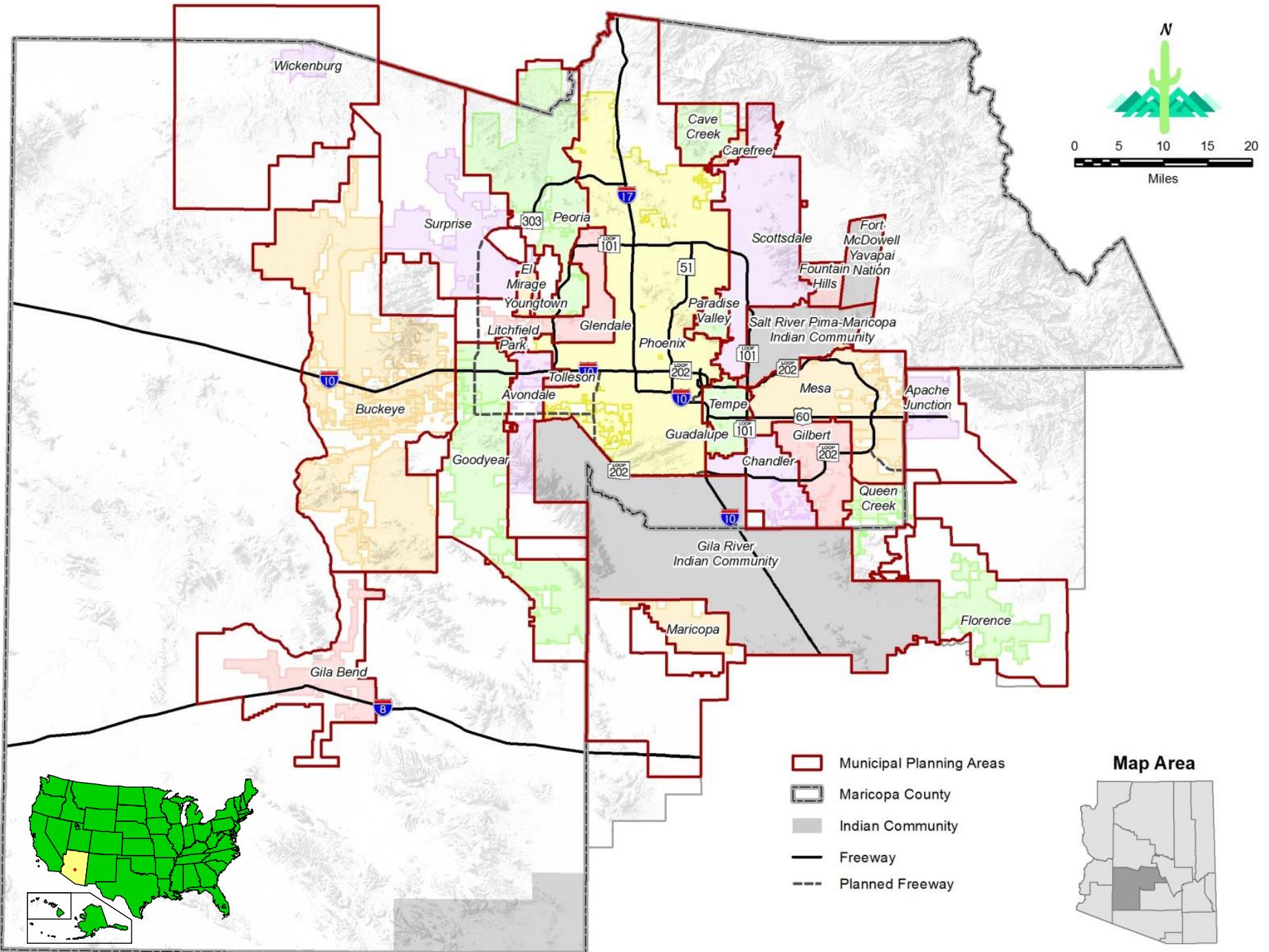
MAG System Analysis Program Manager

Tuesday, May 1, 2018

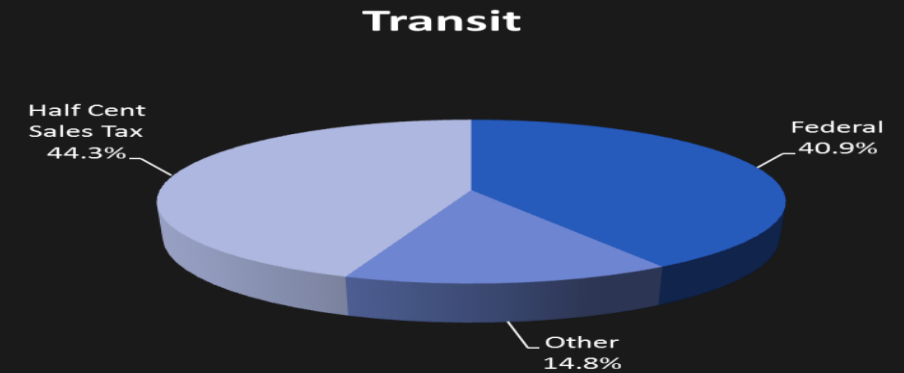
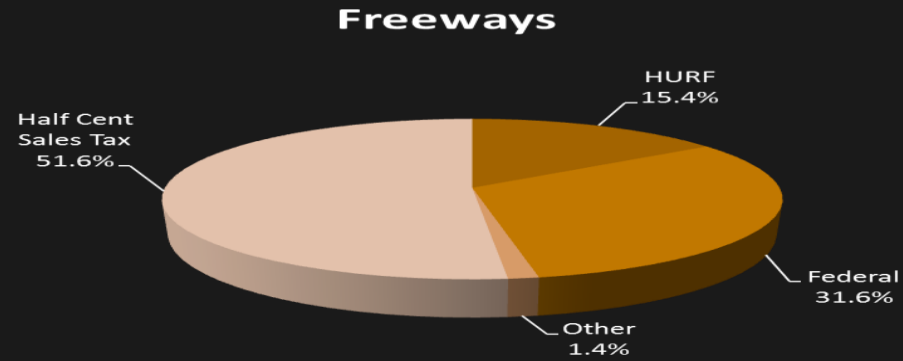
ASU

Tempe, Arizona

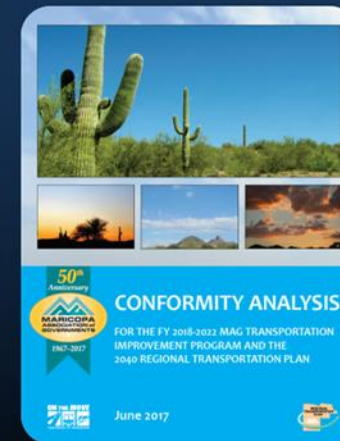
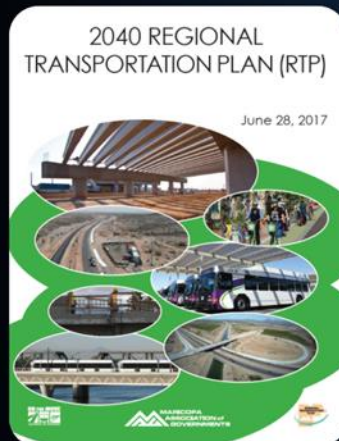
MAG Membership



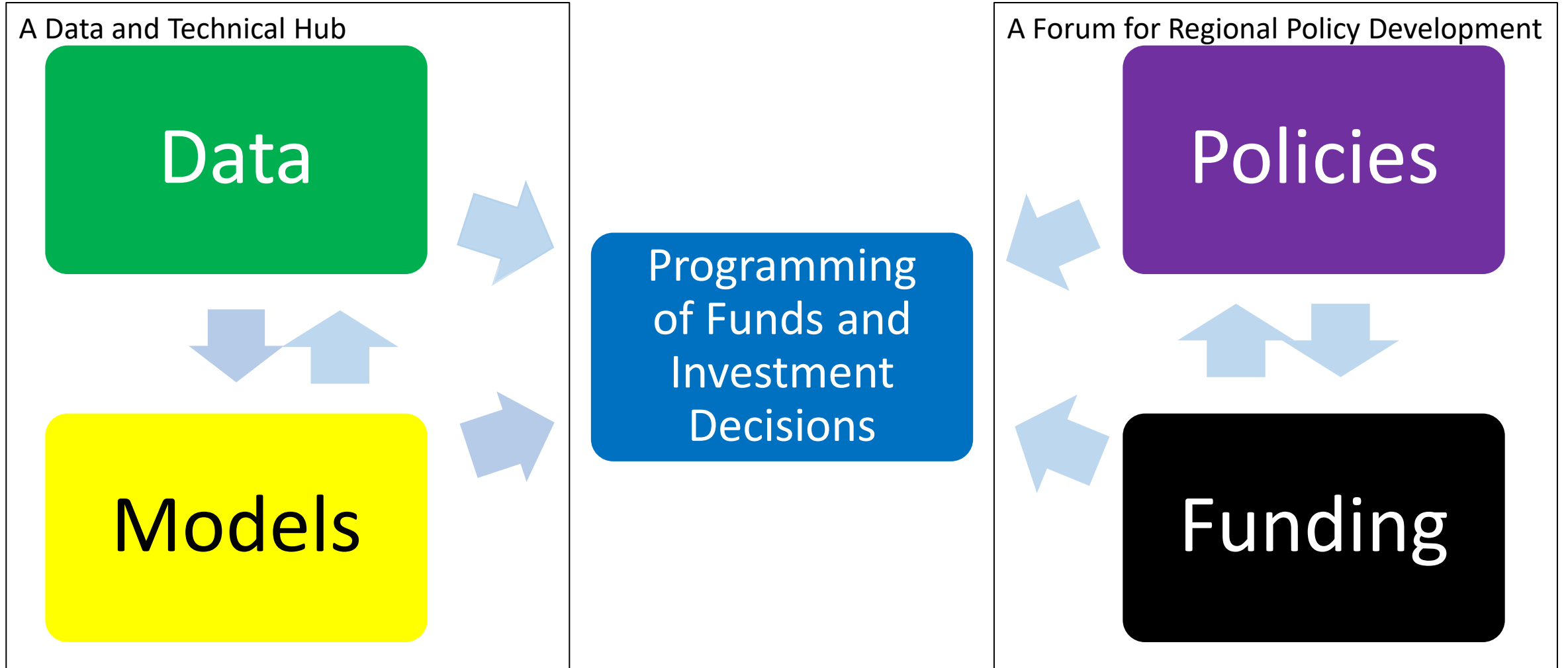
Informed Investment Decisions are at the Core of the Regional Planning Processes



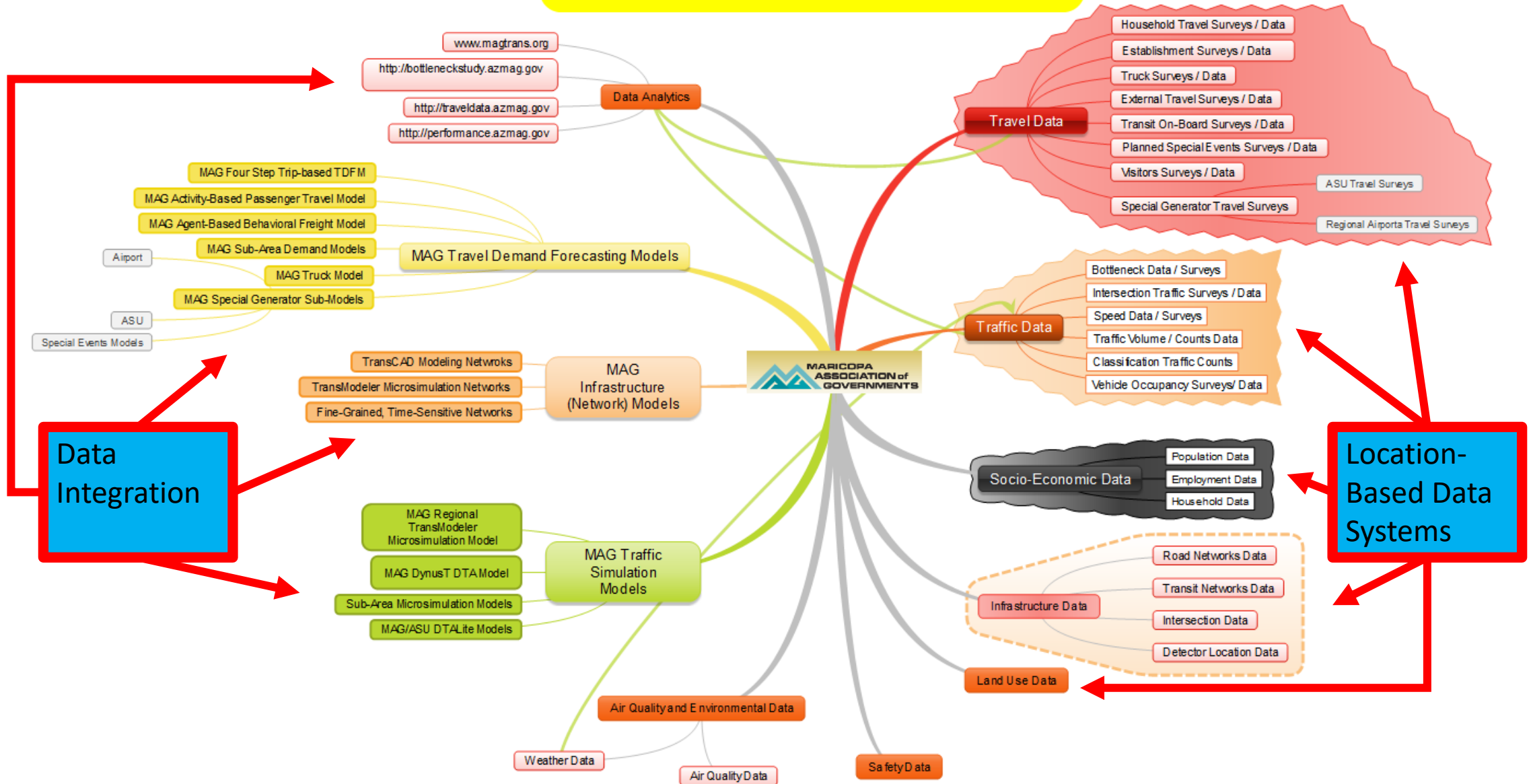
Core Planning Roles Required by Federal Transportation Law



Informed Transportation Planning and Investment Decisions: Where Policies Meet Data



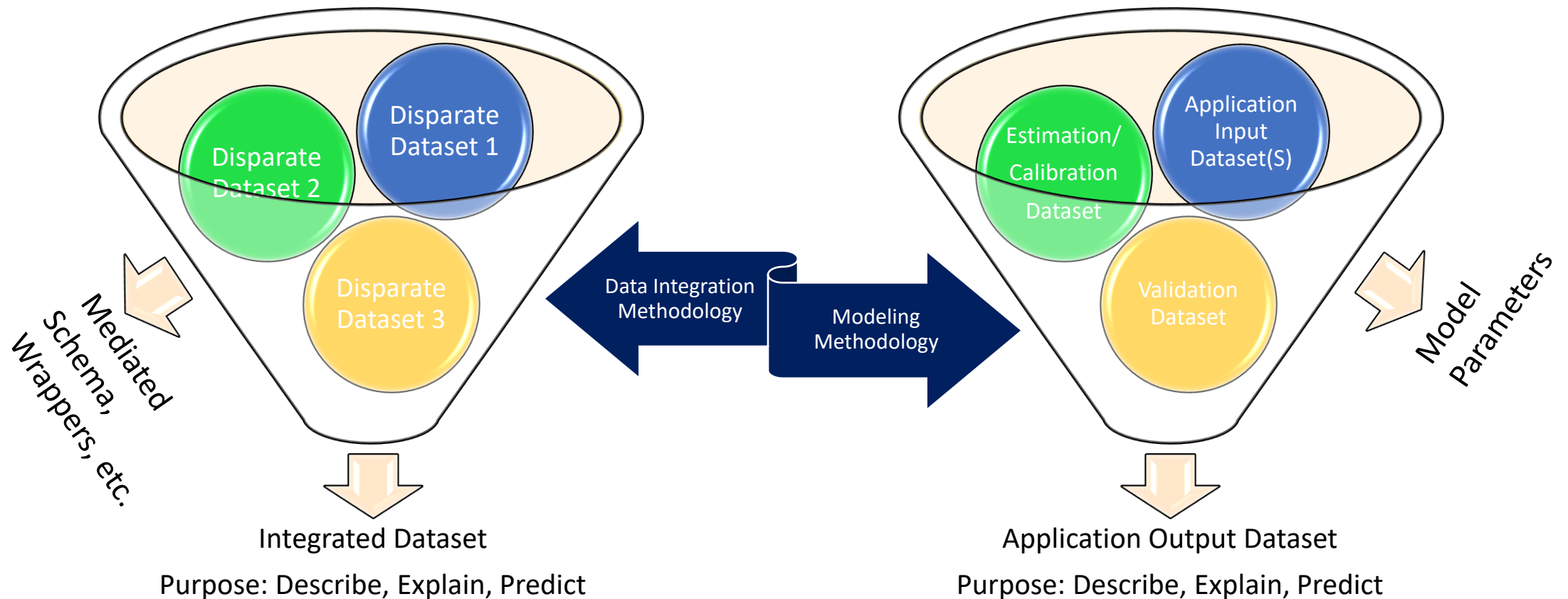
MAG Transportation Data and Models



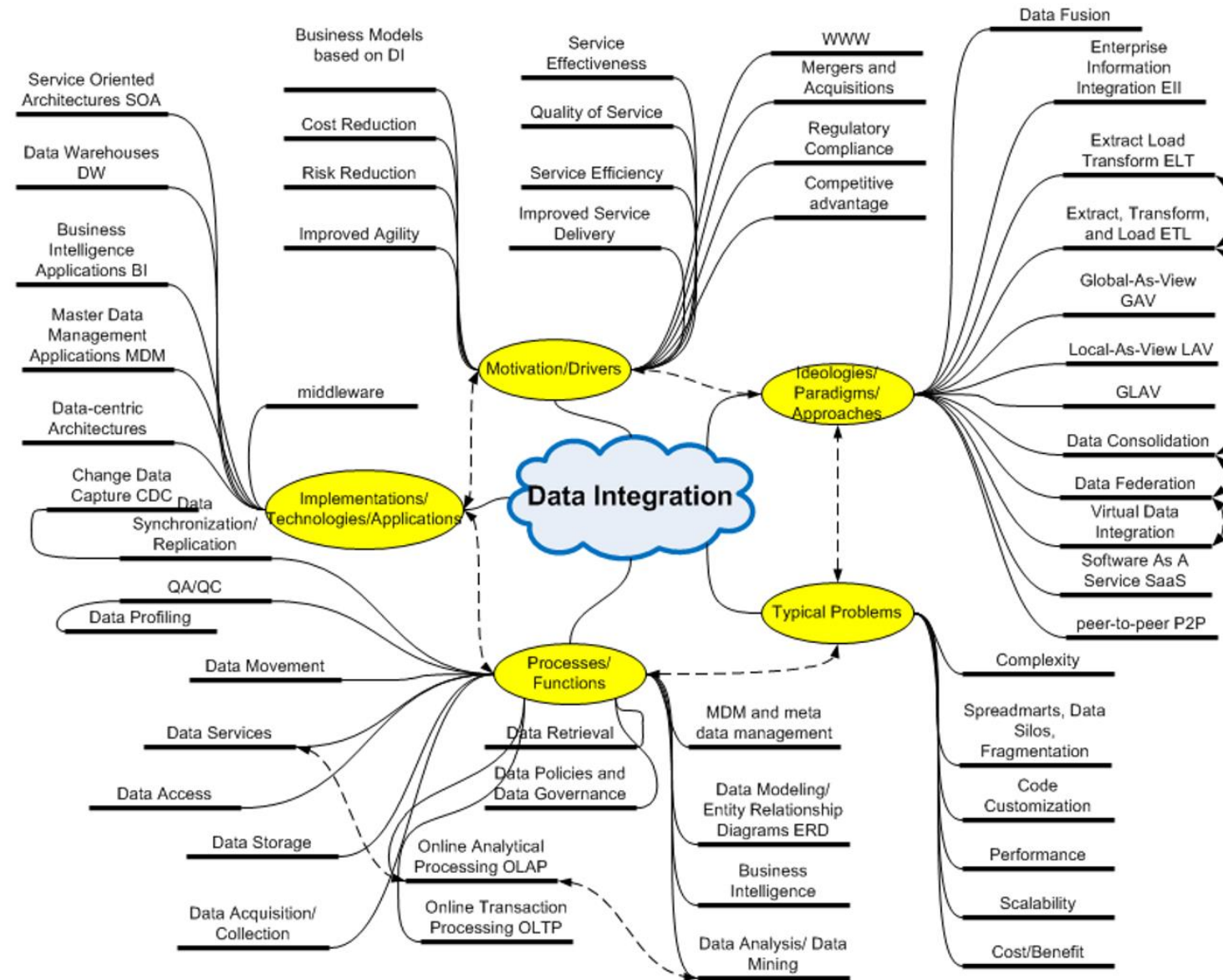
Vladimir Livshits, Maricopa Association of Governments, MAG Models v2.0mm April 2017

Models are natural data integrators

...and data integration tools are, essentially, models



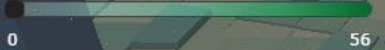
Data Integration Problems are often Unstructured Problems: Mind Map of Issues



- ☒ Firm Synthesis
- ☒ Commodity Flow (TRANSEARCH)
- ☐ Supply Chain Model (20161208)
- ☒ Truck Tour Model (20161208)

- ☒ Heavy
- ☐ Medium
- ☐ Light

- ☒ Production
- ☐ Attraction



- ☒ Megaregion
- ☐ MAG
- ☐ PAG

- ☒ Import
- ☐ Export

- ☒ Total Tons
- ☐ Trips

All Commodities



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Program Manager
Maricopa Association of Governments

Advanced Freight Models as Data Integrators: 5 TAKEAWAYS

Results of SHRP2 C20 IAP Pilot Study and MAG Behavioral Freight Model
development

Behavior-Based Freight Model

St. George



Components:

- ☒ Firm Synthesis
- ☐ Commodity Flow (TRANSEARCH)
- ☐ Supply Chain Model (20161208)
- ☐ Truck Tour Model (20161208)

Number of

- ☒ Simulated Employment

Industry (NAICS 2-digit):

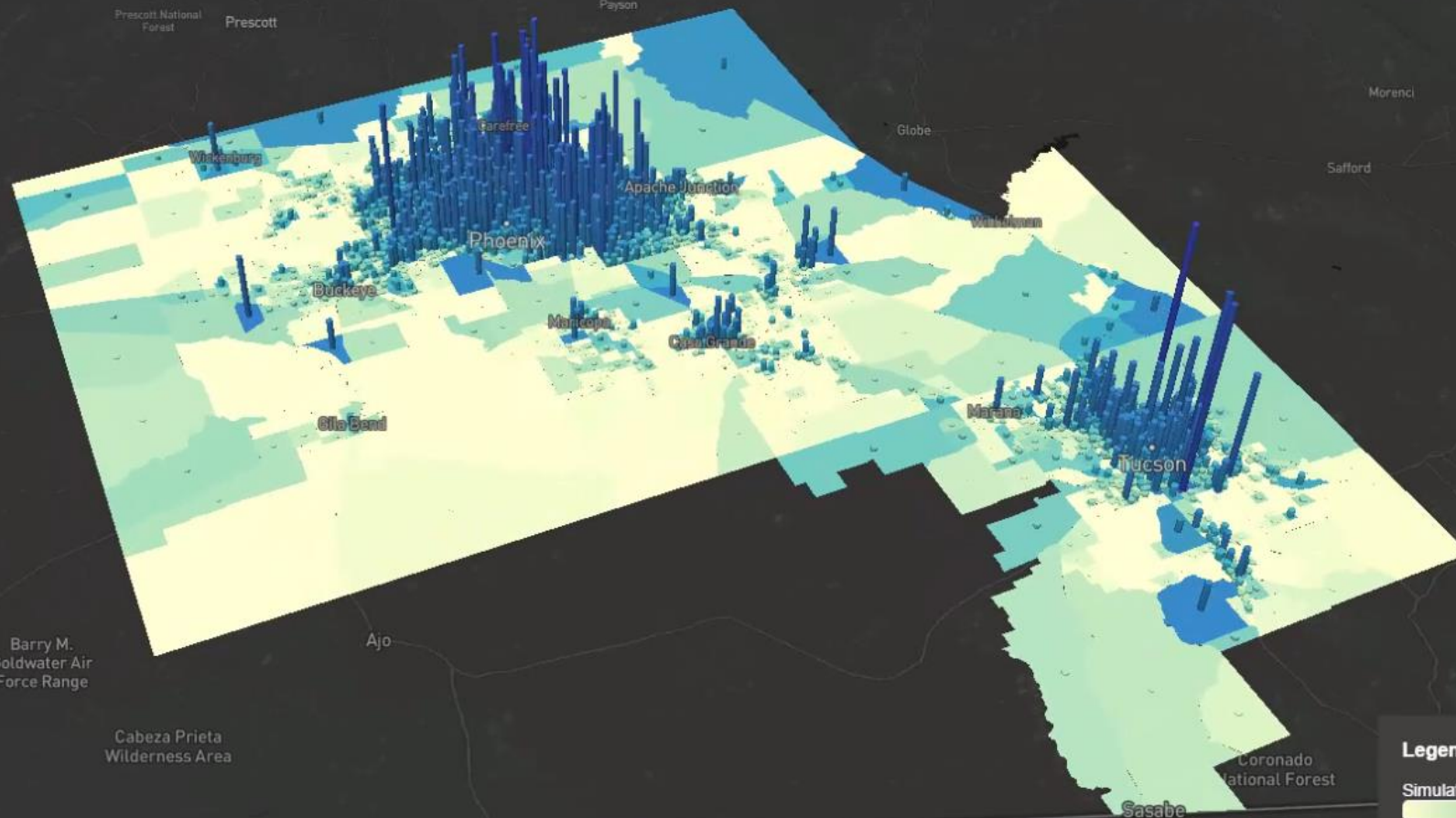
All Industries

Perspective:

- ☐ 2D
- ☒ 3D

C

Adjust 3D Scale:



Legend

Simulated Employment



00:07



Behavior-Based Freight Model

Components:

- ☒ Firm Synthesis
- ☐ Commodity Flow (TRANSEARCH)
- ☐ Supply Chain Model (20161208)
- ☐ Truck Tour Model (20161208)

Number of

☒ Simulated Employment

Industry (NAICS 2-digit):

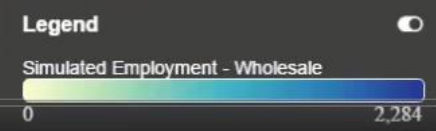
42-Wholesale

Perspective:

☐ 2D ☒ 3D

Adjust 3D Scale:

100%



Behavior-Based Freight Model

Components:

- ☒ Firm Synthesis
- ☐ Commodity Flow (TRANSEARCH)
- ☐ Supply Chain Model (20161208)
- ☐ Truck Tour Model (20161208)

Number of

☒ Simulated Employment

Industry (NAICS 2-digit):

42-Wholesale

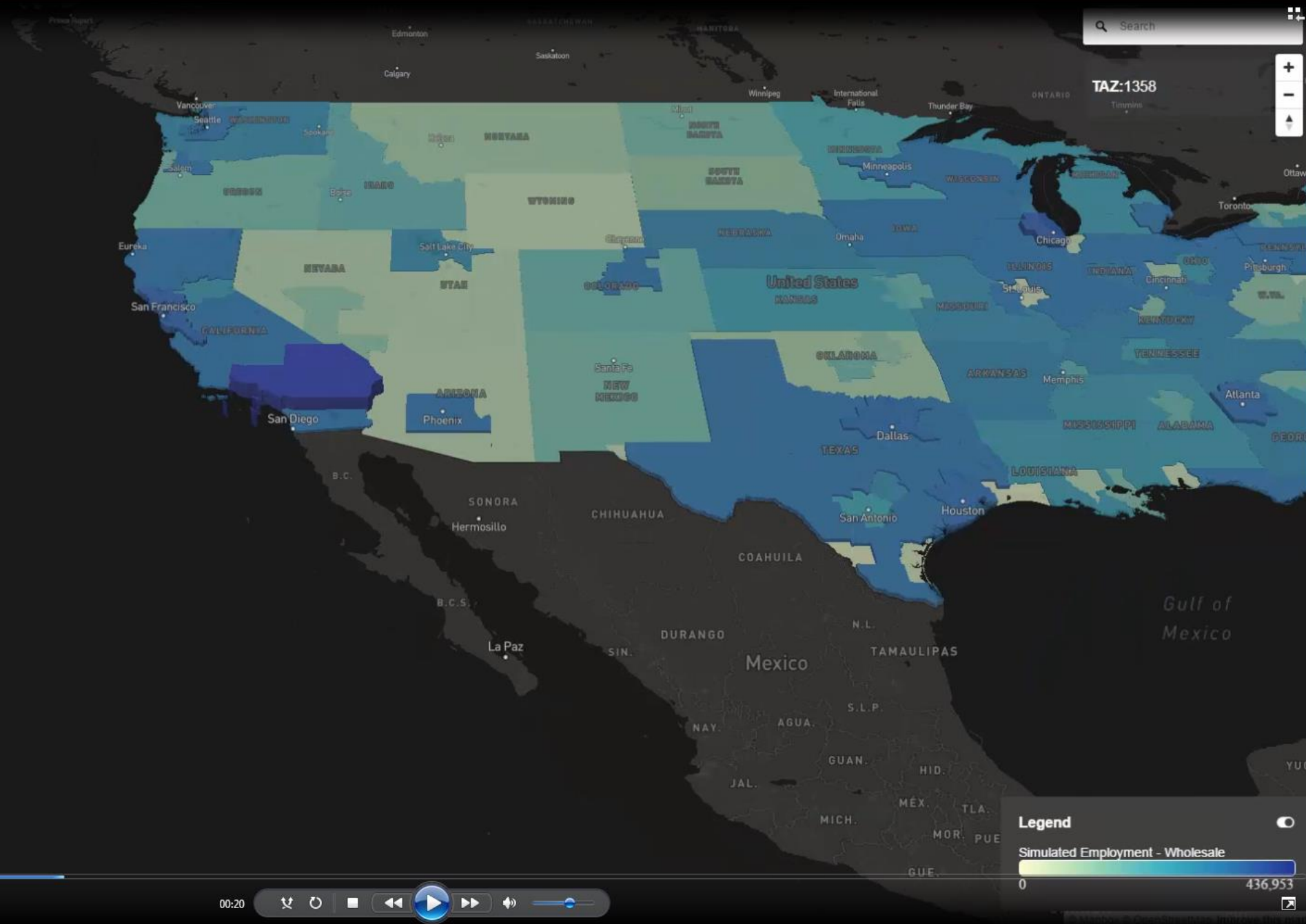
Perspective:

☐ 2D ☒ 3D

C

Adjust 3D Scale:

100m



Behavior-Based Freight Model

Components:

☐ Firm Synthesis

☒ Commodity Flow (TRANSEARCH)

☐ Supply Chain Model (20161208)

☐ Truck Tour Model (20161208)

Direction:

☒ Import

☐ Export

Unit:

☒ Total Tons

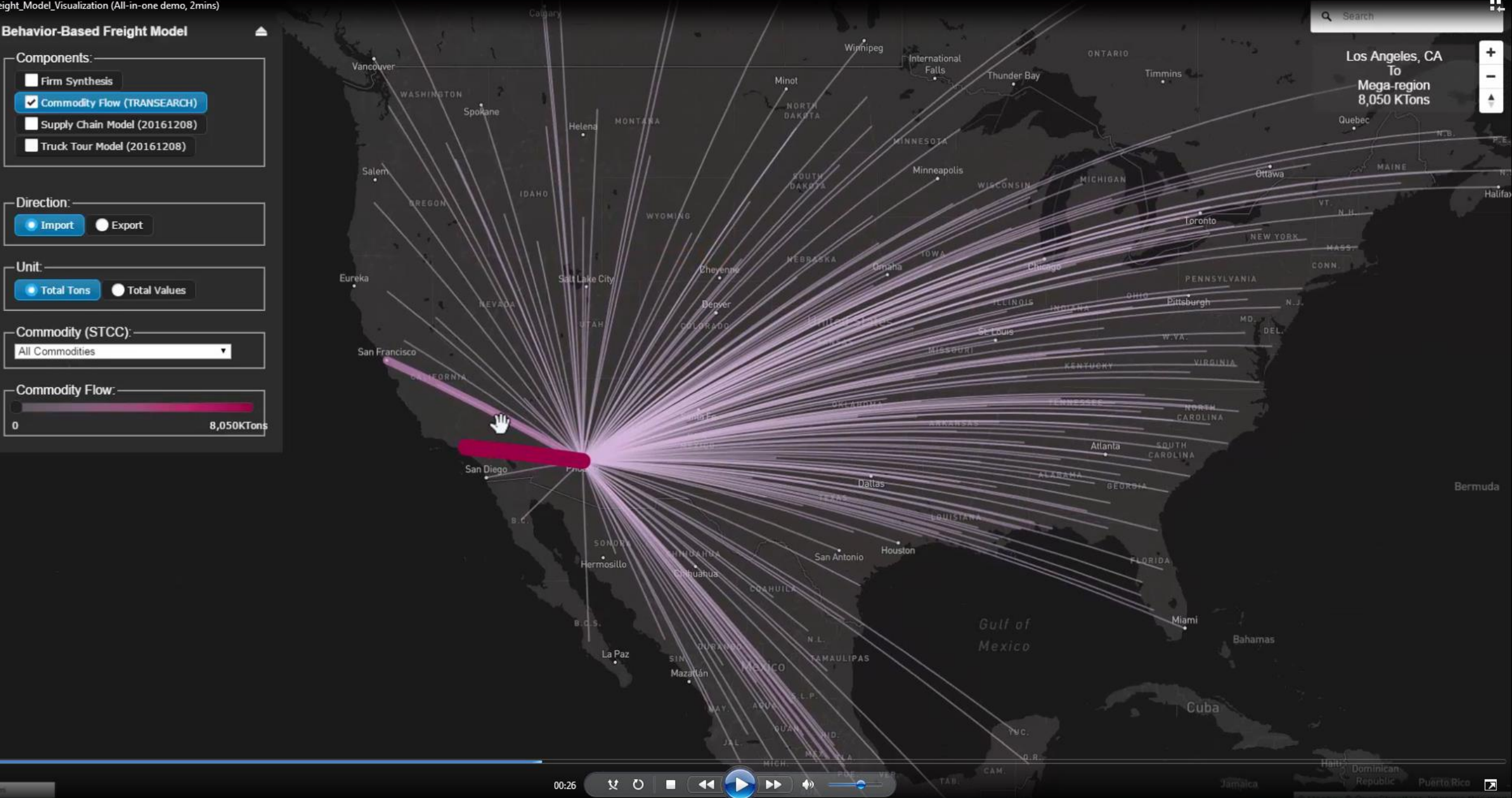
☐ Total Values

Commodity (STCC):

All Commodities

Commodity Flow:

08,050KTons



Behavior-Based Freight Model

Components:

☐ Firm Synthesis

☒ Commodity Flow (TRANSEARCH)

☐ Supply Chain Model (20161208)

☐ Truck Tour Model (20161208)

Direction:

☒ Import

☐ Export

Unit:

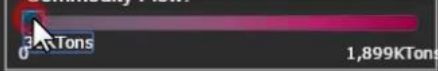
☒ Total Tons

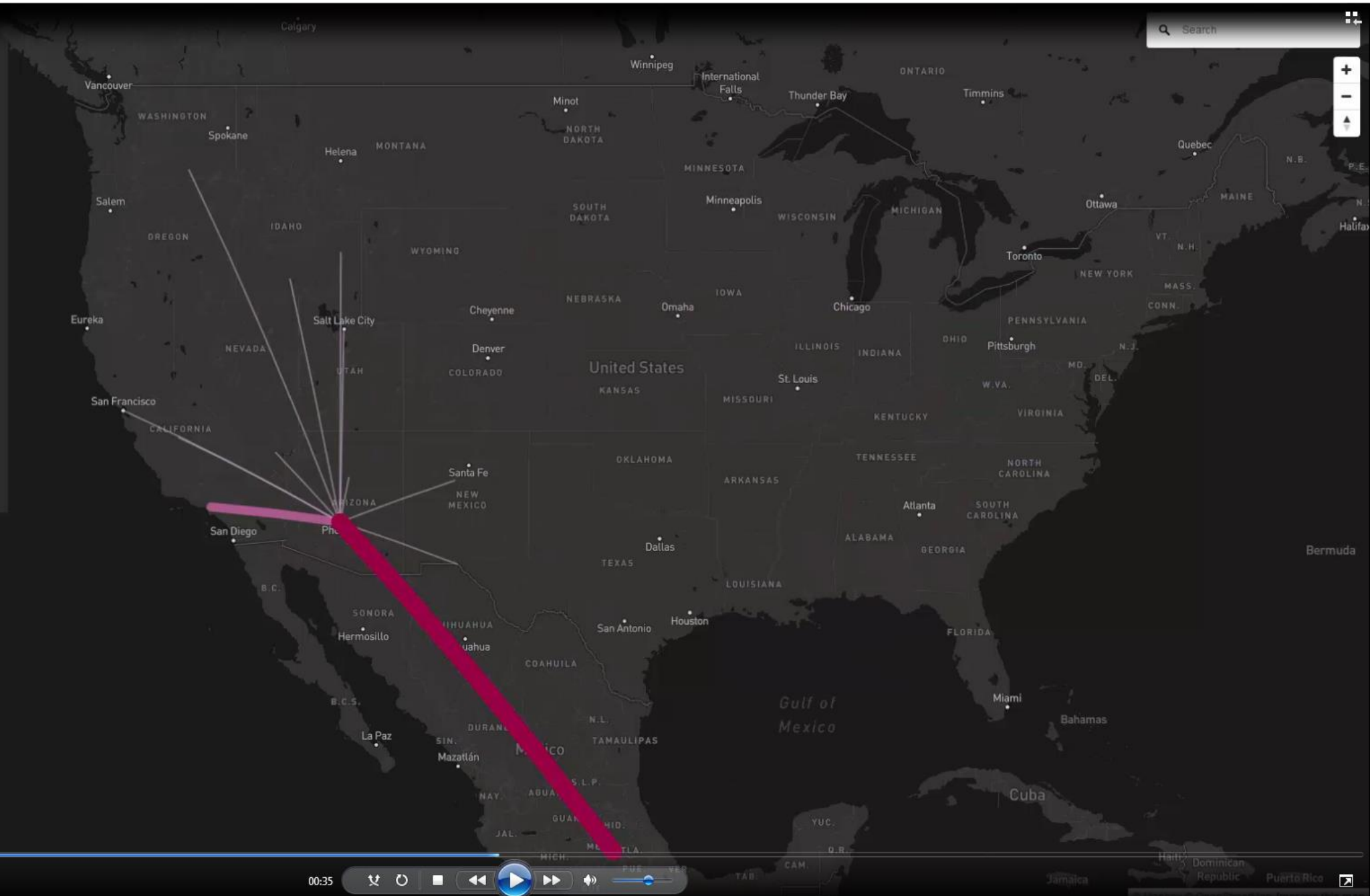
☐ Total Values

Commodity (STCC):

01-Farm Products

Commodity Flow:





Behavior-Based Freight Model

Components:

- ☐ Firm Synthesis
- ☐ Commodity Flow (TRANSEARCH)
- ☐ Supply Chain Model (20161208)
- ☒ Truck Tour Model (20161208)

Truck Type:

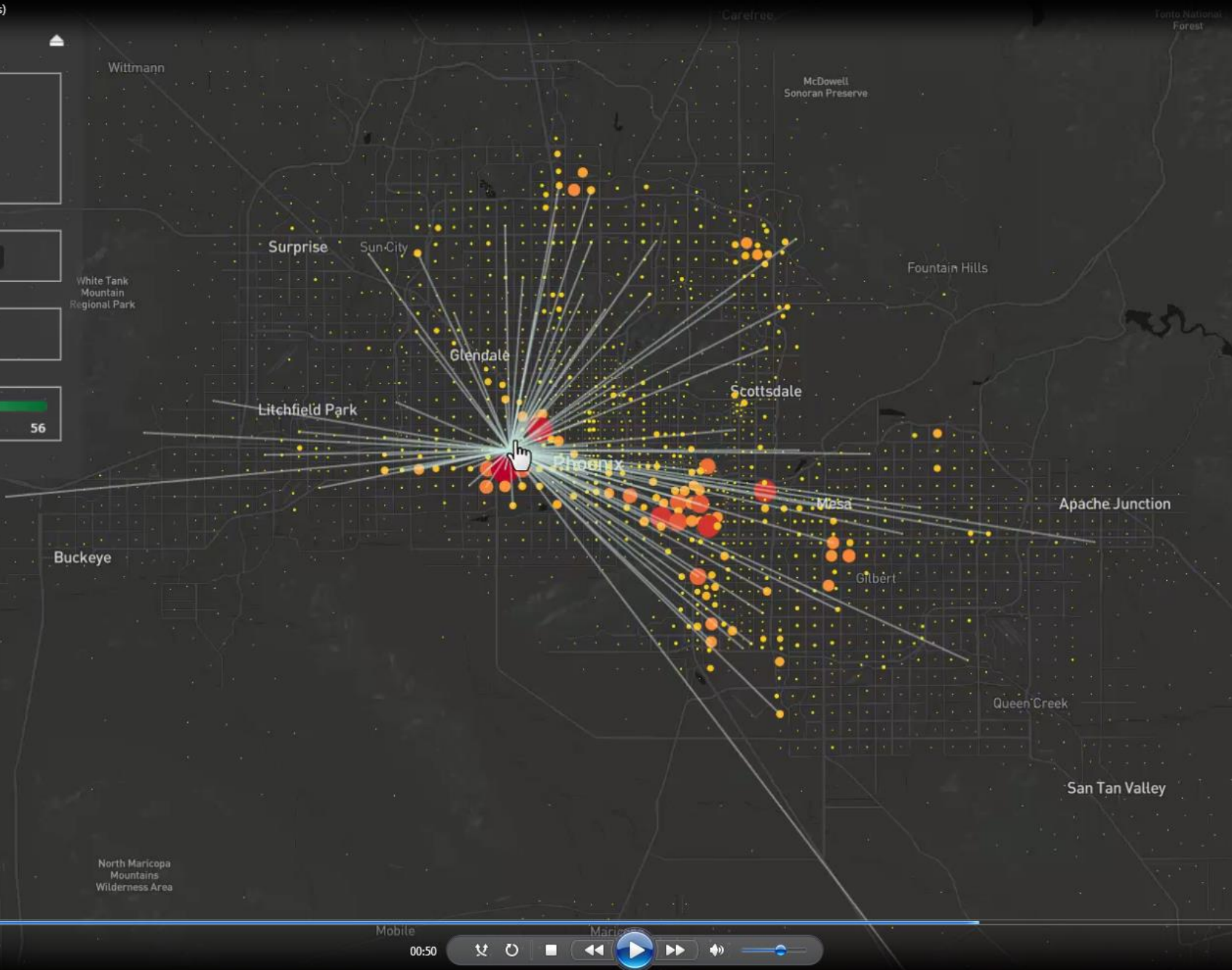
- ☒ Heavy
- ☐ Medium
- ☐ Light

Modeled Trip:

- ☒ Production
- ☐ Attraction

Flow Volume:

0 56



Search

TAZ:3100

Total HT Outbound:139

Total HT Inbound:135

Total MT Outbound:408

Total MT Inbound:469

Total LT Outbound:1,133

Total LT Inbound:1,592

Total Simulated Firms:174

Total Simulated Employment:1,084

Superstition Wilderness Area

Legend

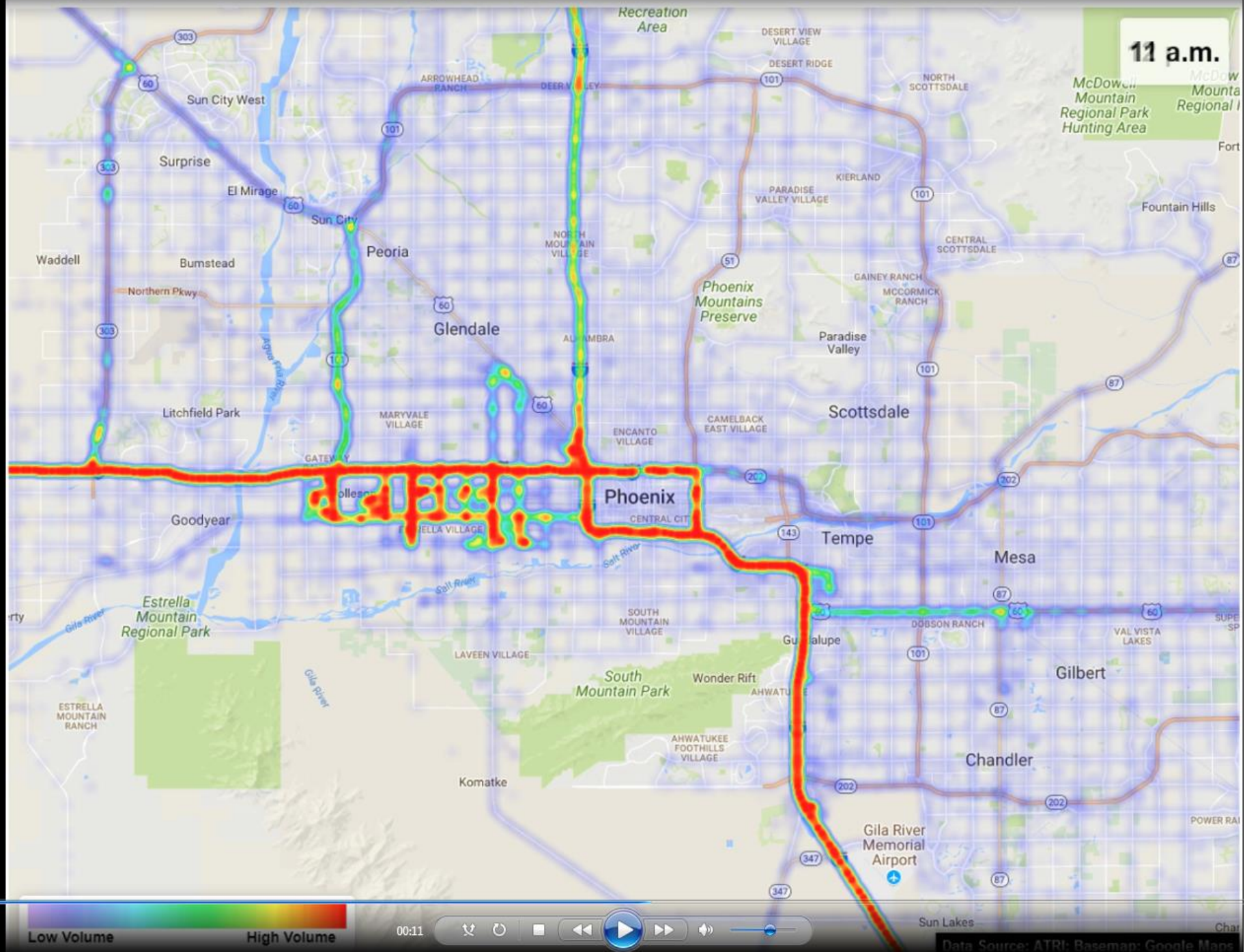
Heavy Truck - Total Daily Outbound Trips

1 339 678

Mobile

00:50

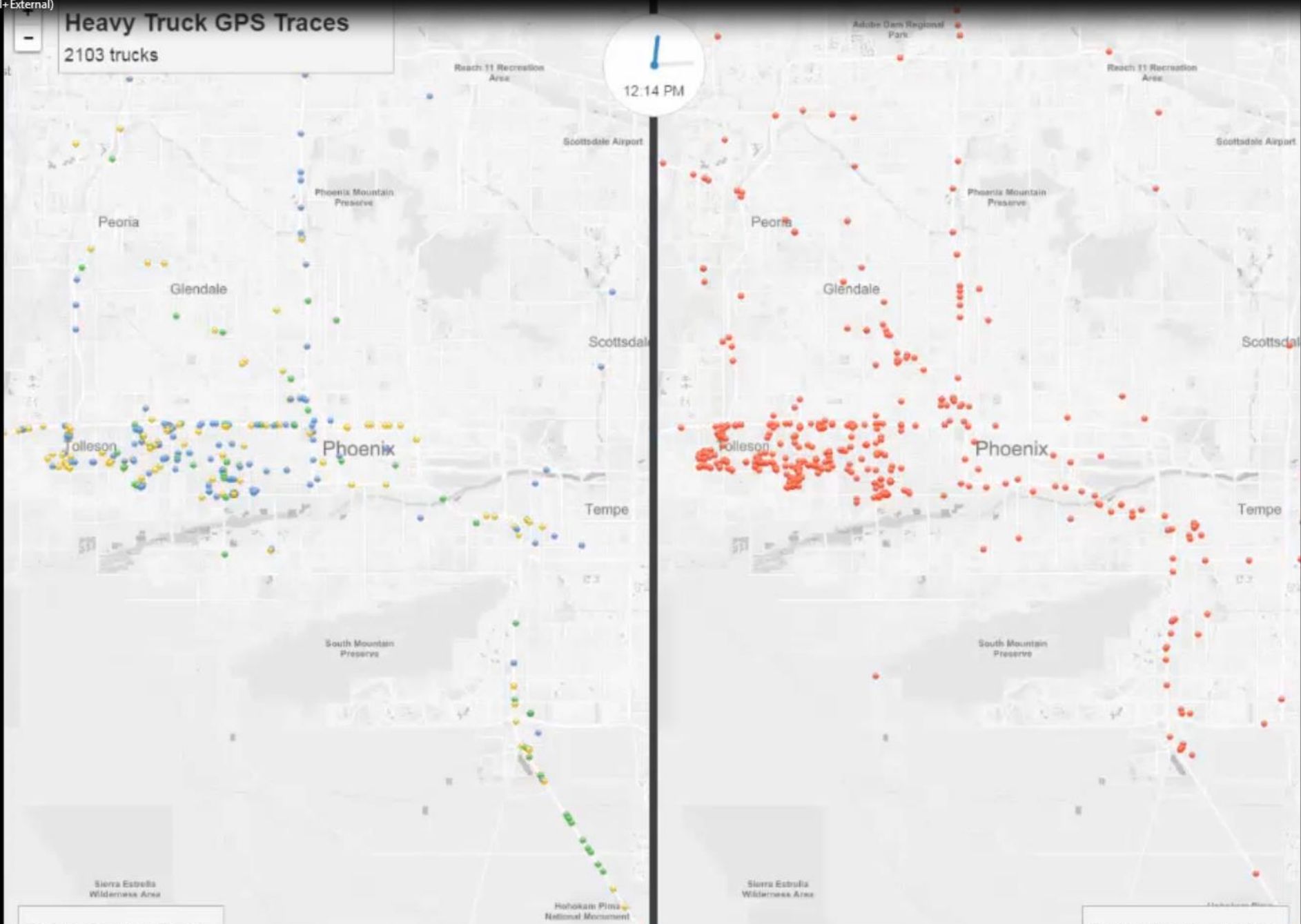
Navigation controls: back, forward, play, pause, volume, and a progress bar.



Heavy Truck GPS Traces

2103 trucks

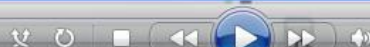
12:14 PM



Trucks Coming From Outside of the Region

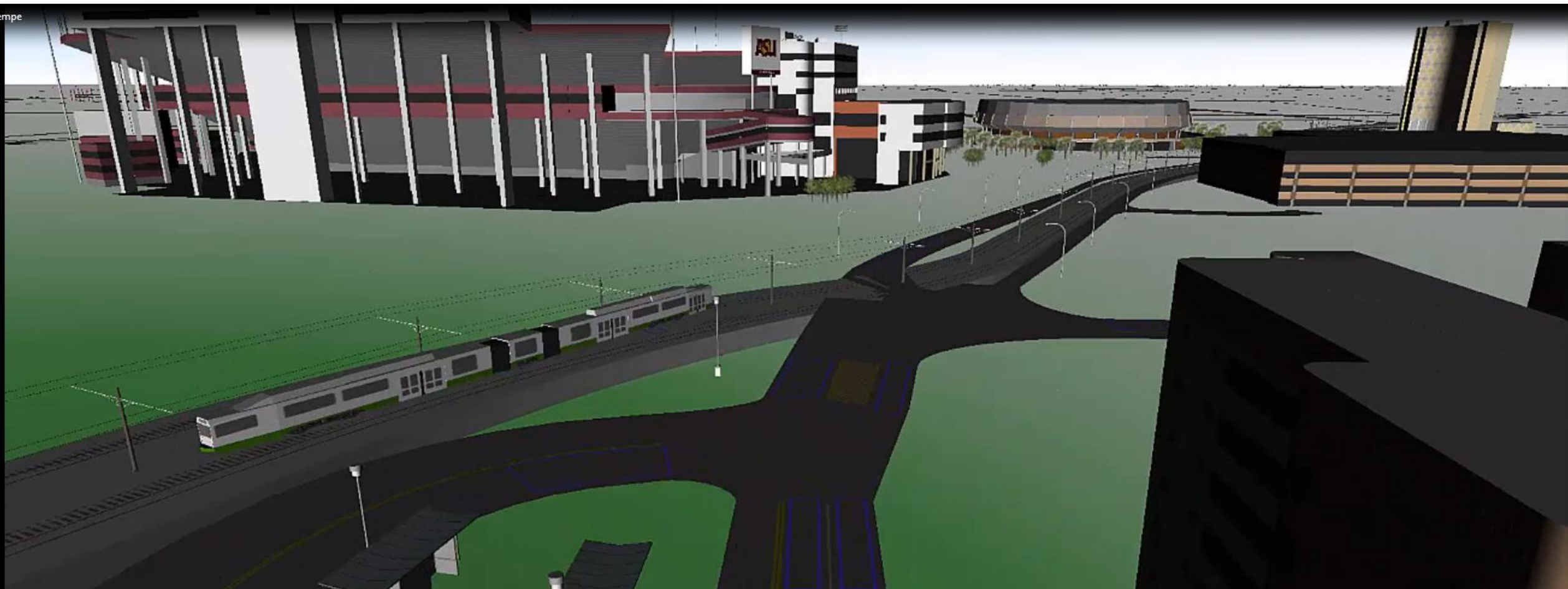
2014 Oct

00:14



300x

Trucks Starting within the Region





school:	155771
0: home	2358097
1: work	788384
work-related:	139259
2: university:	29043
411: school d.o./p.u. by workers:	39558
412: school d.o./p.u. by non-workers:	16100
42: non-school d.o./p.u.	53106
shopping:	257683
household errands:	150654
7: eating out:	47546
71: breakfast:	8536
72: lunch:	46318
73: dinner:	11246
8: social:	38406
other discretionary:	92124
10: special event:	0

16:17

66x

00:11



For more information...

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