



## ESTABLISHING GSTDM AND ARC ABM MODELING CONSISTENCY

ARC MUG: DECEMBER 1, 2023

# Agenda

- GSTDM & ARC Base Year Model Updates
- ARC to GSTDM
- GSTDM to ARC
- Q/A
- Acknowledgements

# GSTDM & ARC Base Year Model Updates

## GSTDM 2020 Base Year (released)

- Next generation of the GSTDM
- What's new?
  - Traffic analysis zone system
  - Socioeconomic data
  - True shape highway network
  - Emphasis on more data
  - All model components updated

## ARC 2020 Base Year (ongoing)

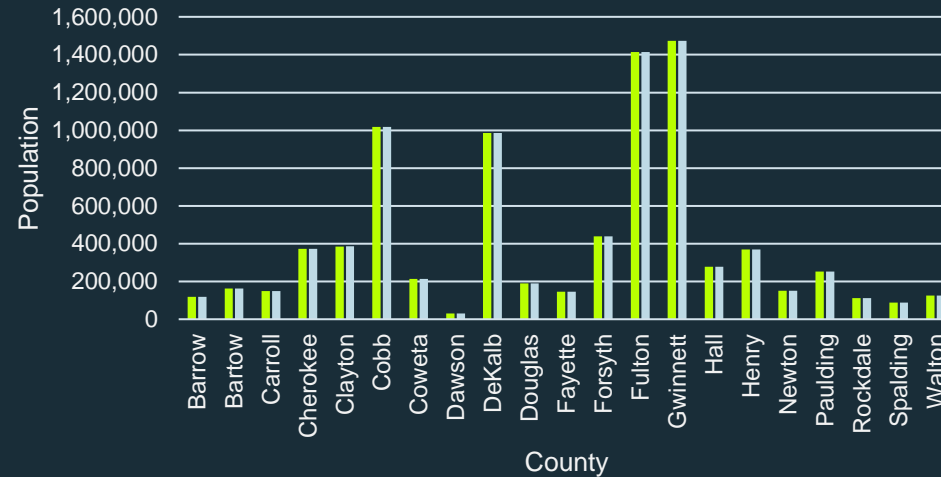
- Continuous enhancements to the ABM
- Planned updates
  - CT-RAMP re-calibration using NHTS
  - Progressing towards ActivitySim
  - Major university model
  - Air passenger model updates
  - Truck model updates
  - External model updates

# ARC to GSTDM

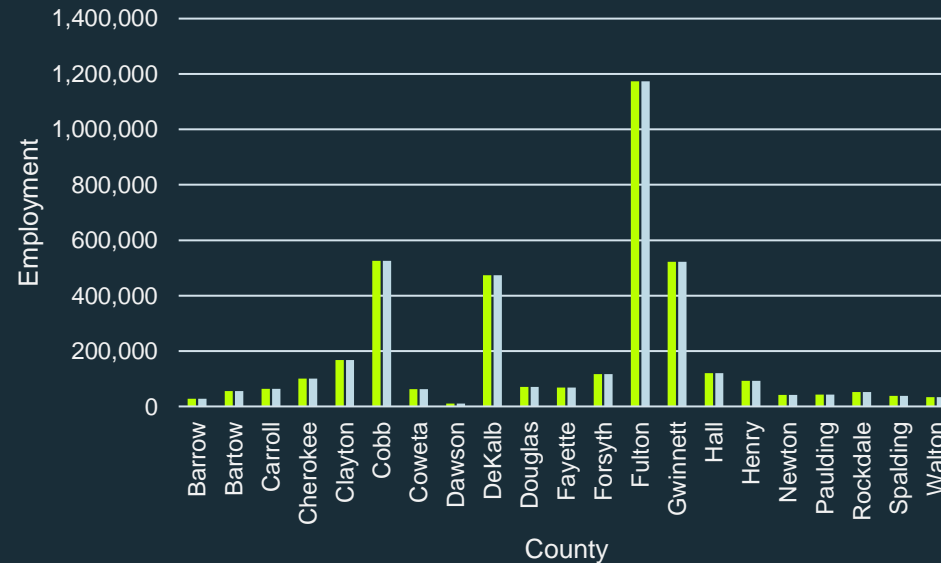
## Future Year SE Data

- ARC 2050 control totals used for population, households and employment in the GSTDM
- GIS overlay used to assign ARC TAZ to GSTDM TAZ
- ARC employment includes 2-digit NAICS code which was used to aggregate to the 4 categories for passenger employment

2050 County Population: GSTDM vs. ARC



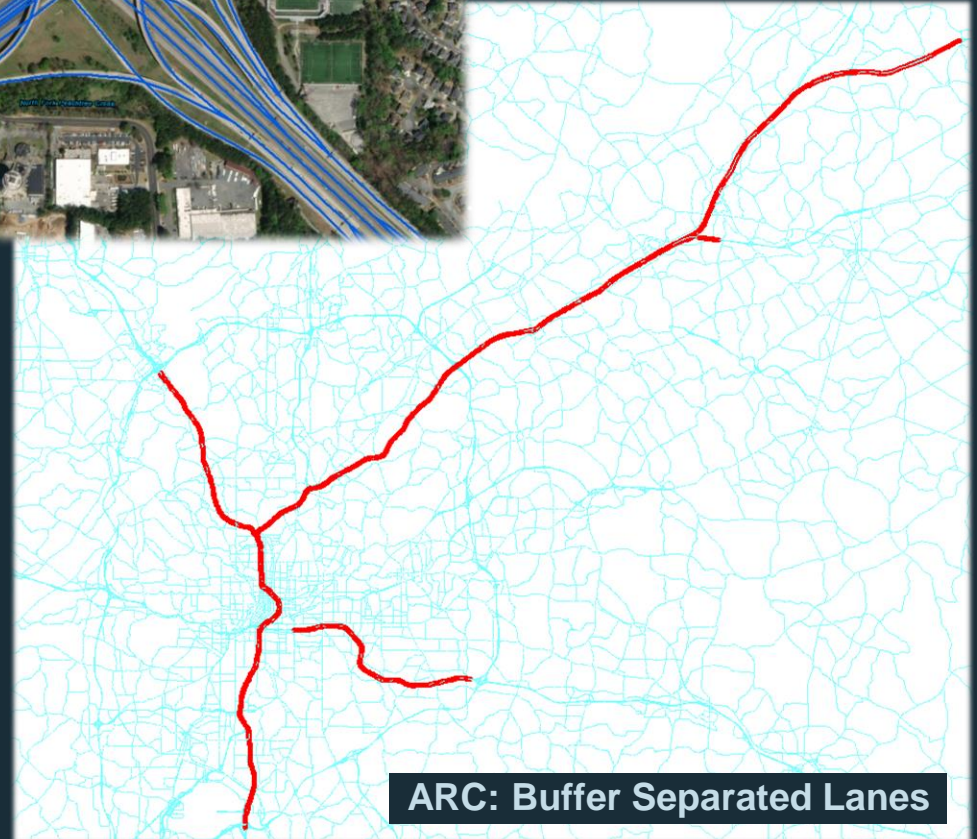
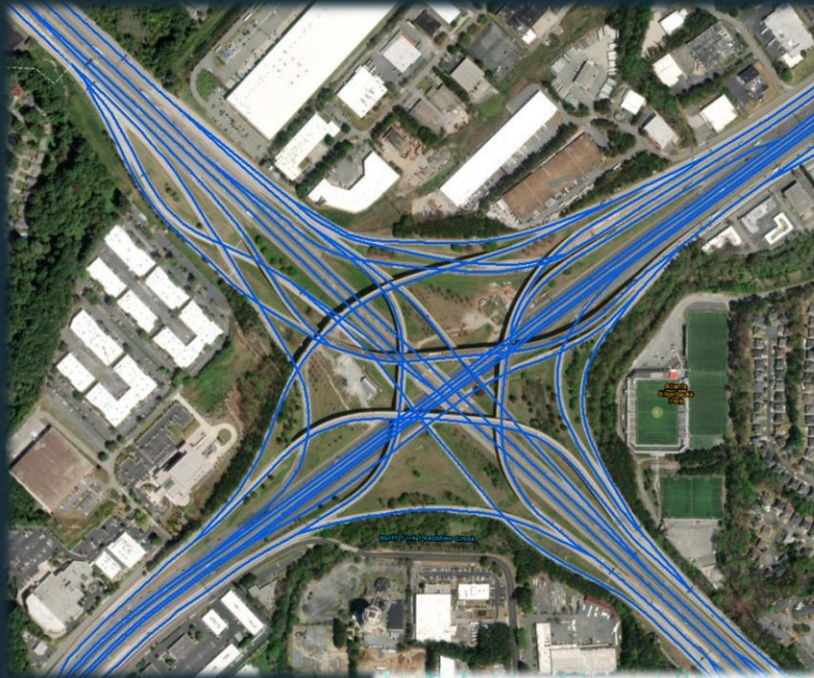
2050 County Employment: GSTDM vs. ARC



# ARC to GSTDM

## True Shape (Base Year)

- 2020 network geometry based on HERE data
- Parallel (buffer) separated HOV and express lanes not represented as separate “links” in HERE
- Process
  - Flag ARC buffer separated lanes and extract geometries (link shapes, nodes)
  - Renumber ARC links and nodes
  - Import to GSTDM and connect
  - Ensure proper lanes (HERE included the HOV lanes as part of the lane total)



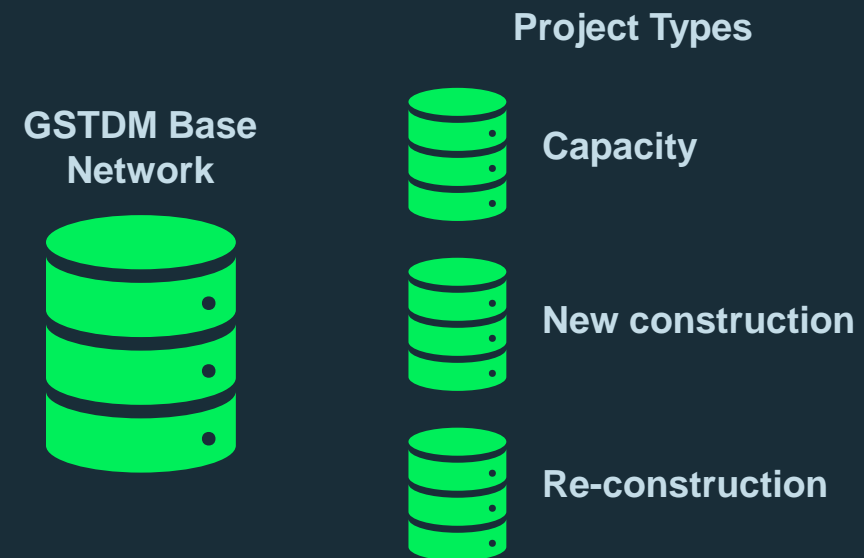
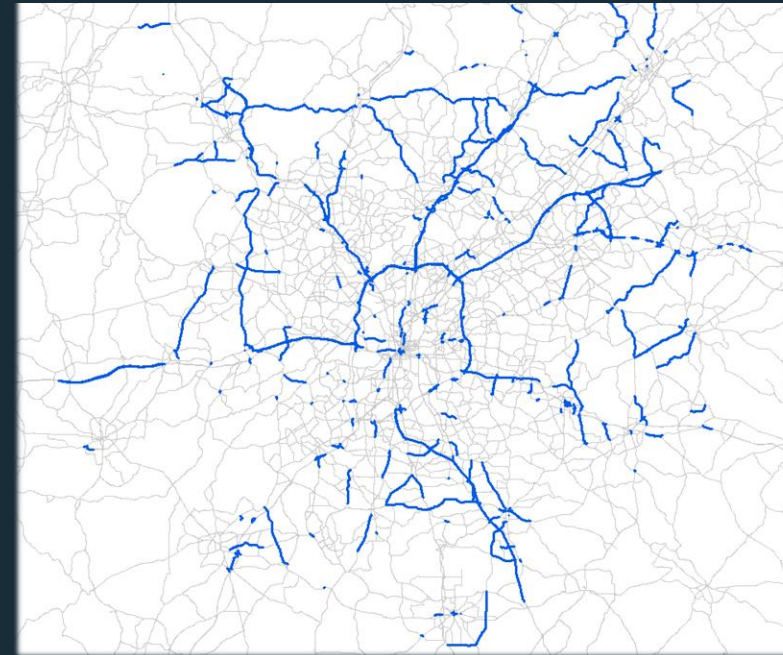
ARC: Buffer Separated Lanes

# ARC to GSTDM

## True Shape (Future)

- Project list and construction schedule (Do Nothing, E+C, STIP)
- Projects categorized into buckets:
  - Capacity only (i.e., widening)
  - New construction (i.e., express lanes)
  - Re-construction (i.e., interchanges)

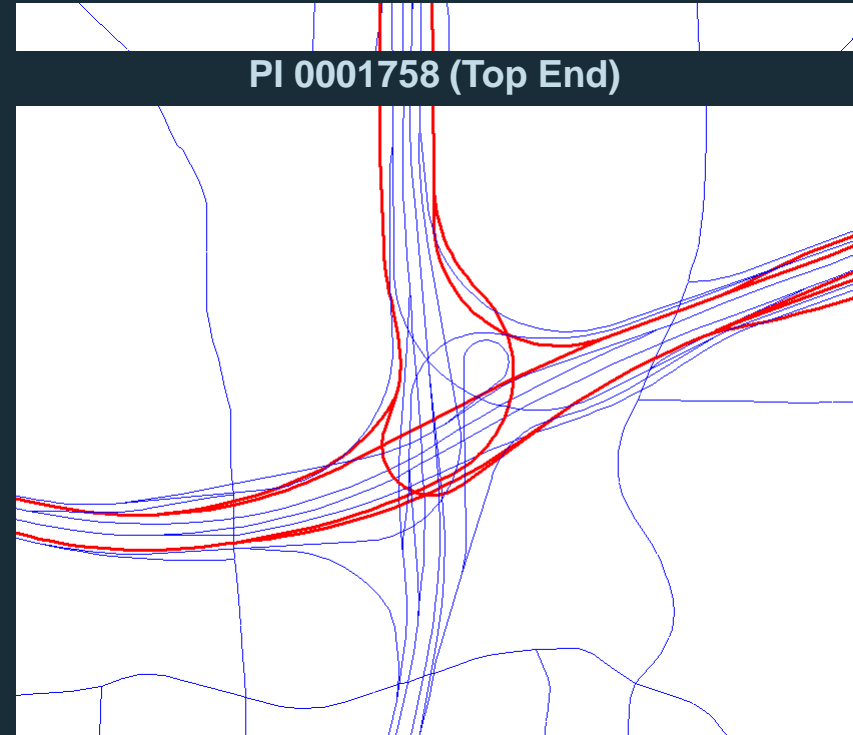
Projects identified in ARC network



# ARC to GSTDM

## True Shape (Future)

- New Construction Projects:
  - ARC staff spent considerable time developing the true shape geometries for new construction (no need to duplicate that effort)
  - Use similar process as extracting HOV lanes for Base Year network
    - Flag new construction projects and extract geometries (link shapes, nodes)
    - Renumber ARC links and nodes
    - Import to GSTDM and connect



# ARC to GSTDM

## True Shape (Future)

- Re-construction example: I-285 @ GA 400
  - Includes both re-construction and new construction
    - Some centerlines maintained
    - Some centerlines removed
    - Some centerlines added

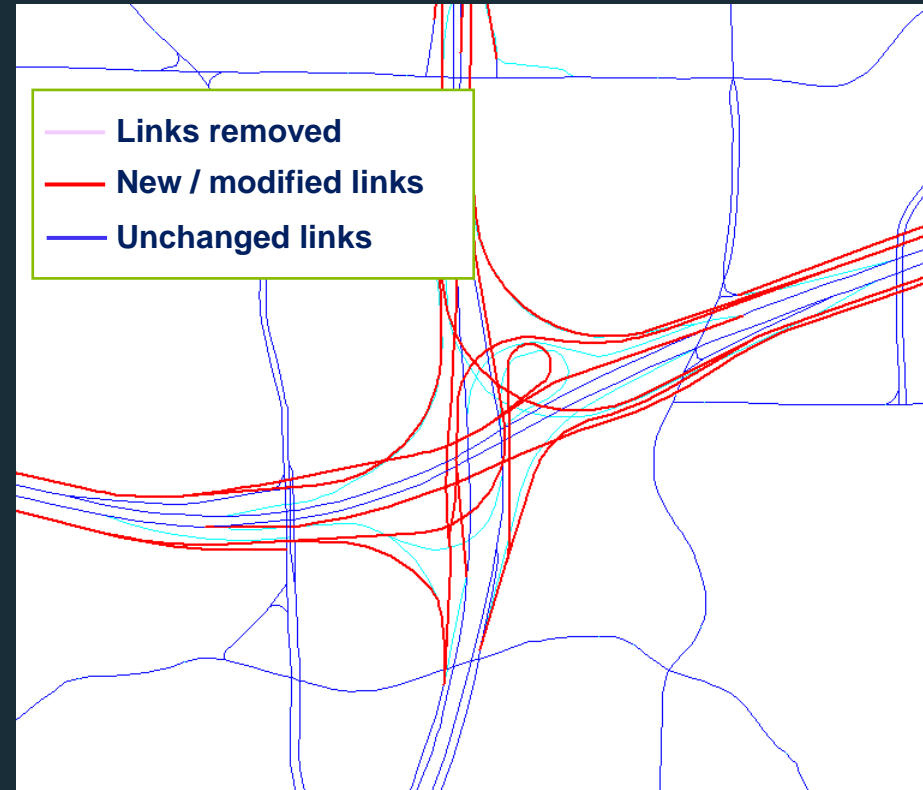




# ARC to GSTDM

## True Shape (Future)

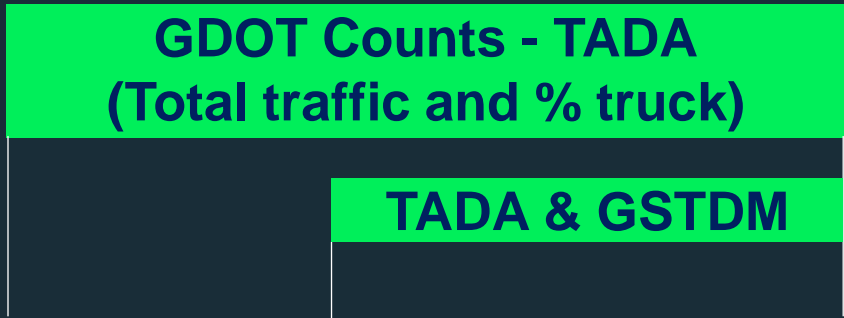
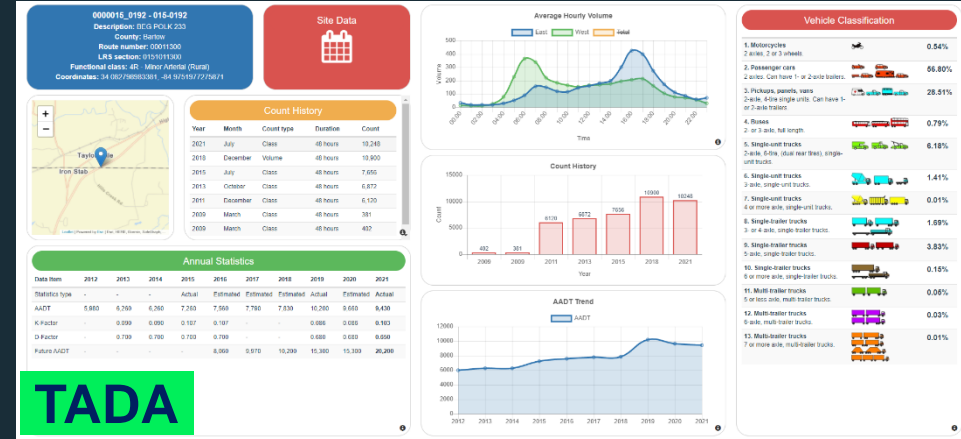
- Re-construction Projects Process:
  - Flag ARC links included for the project and extract geometries (renumber nodes)
  - Flag links in 2020 Base GSTDM to be removed
  - Script to add (import) and remove (delete) appropriate links
  - Ensure connectivity between imported ARC links and GSTDM links



# GSTDM to ARC

## External Model Update

- ARC External station inputs
  - GDOT vehicle classification counts (passenger car vs. trucks)
  - Percentage share of IE/EI vs. EE trips (medium and heavy truck)
  - EE seed matrix (medium and heavy truck)



NAME	FIPS	EXCNTSTA	AADT2020	AWDT2020	MTKIE	MTKEE	HTKIE	HTKEE
SR 113	15	192	10200	10870	0.0823	0.0016	0.0460	0.0116
Chulio Rd/Euhar	15	294	1200	1280	0.0803	0.0000	0.0092	0.0005
SR 20/US 411	15	134	17900	19080	0.0660	0.0003	0.0534	0.0219
SR 293	15	261	1780	1900	0.0664	0.0002	0.0130	0.0021
SR 140	15	203	12600	13430	0.0741	0.0021	0.0571	0.0105
Lancaster Rd	15	8162	570	610	0.0231	0.0000	0.0008	0.0000
US 41	15	132	8690	9260	0.0942	0.0011	0.0300	0.0041
I-75	15	283	68000	68200	0.0352	0.0000	0.1452	0.1048
US 411	15	189	5460	5820	0.0959	0.0014	0.0788	0.0236
SR 108	57	92	2970	3170	0.1007	0.0013	0.0198	0.0104
I-575 (SR 5)	227	235	30500	30590	0.0651	0.0000	0.0216	0.0181

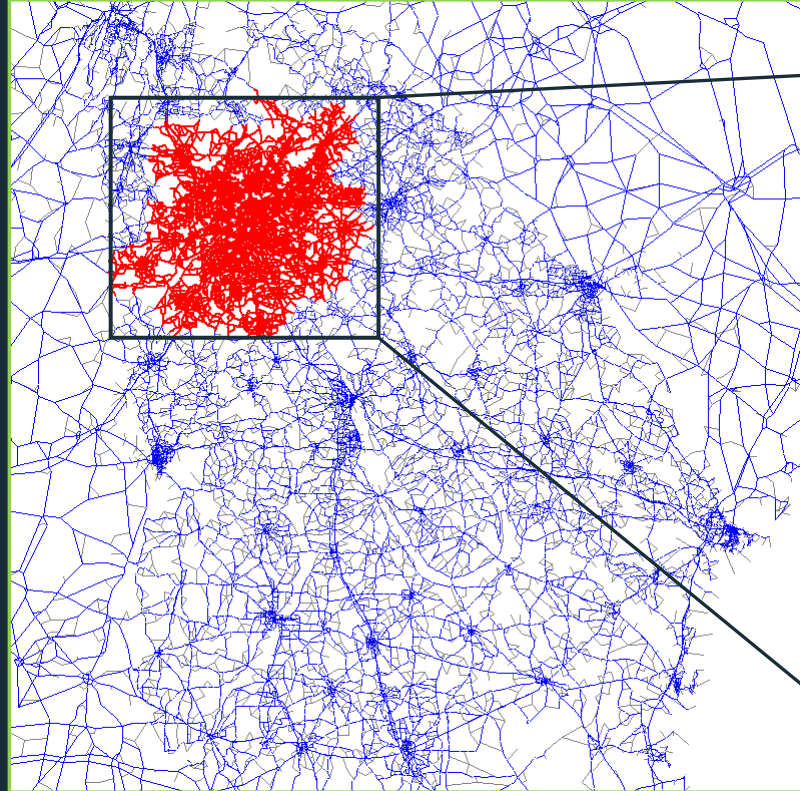


# GSTDM to ARC

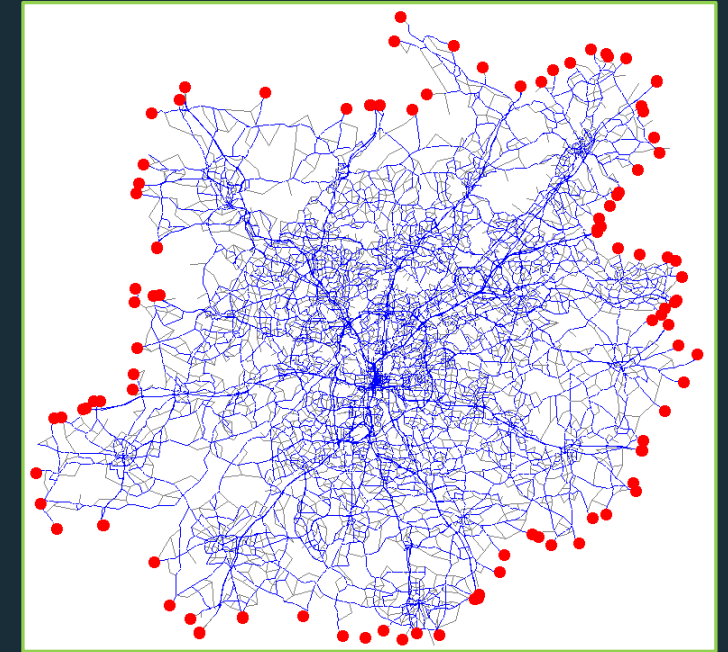
## External Model Update

- GSTDM
  - Captures vehicle trips that enter/exit the ARC model area
  - > 85% of ARC external stations represented in the GSTDM (missing locations are low volume facilities)
  - Sub-area network link extraction
  - Assignment using SUBMATO to extract truck IE/EI & EE trip tables

## GSTDM – ARC Flagging









## ARC SubNet (via GSTDM)

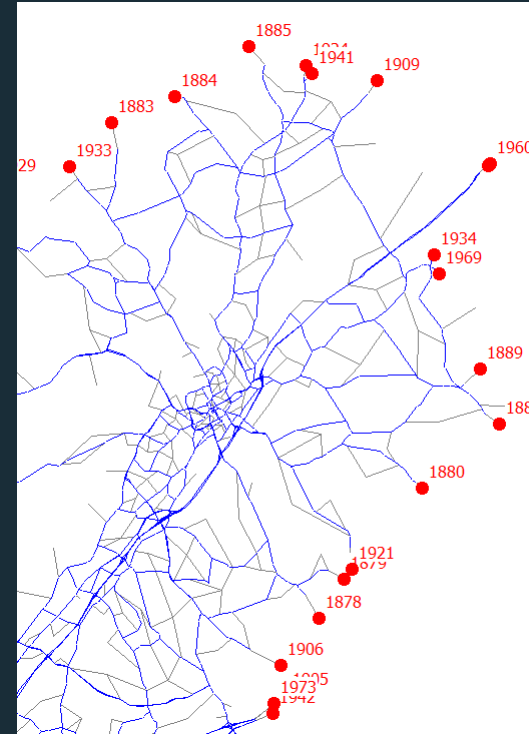


# GSTDM to ARC

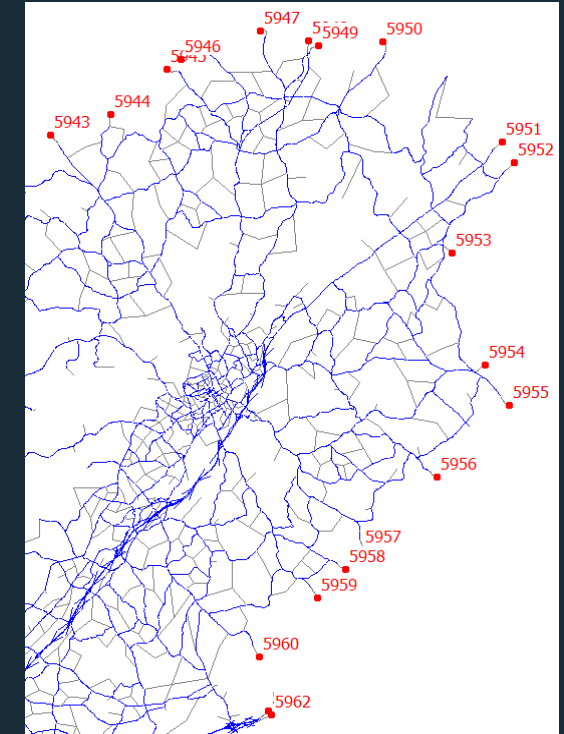
## GSTDM Sub-Area Extraction

-  Flag ARC links in GSTDM network
-  Extract sub-area network
-  CUBE Assignment / Sub-Mato
-  Subarea node / ARC station equivalency
-  IE/EI vs. EE Percentage Shares (medium and heavy truck)
-  Medium and heavy truck EE tables ("seed" matrix for ARC model)

GSTDM - SubNet



ARC



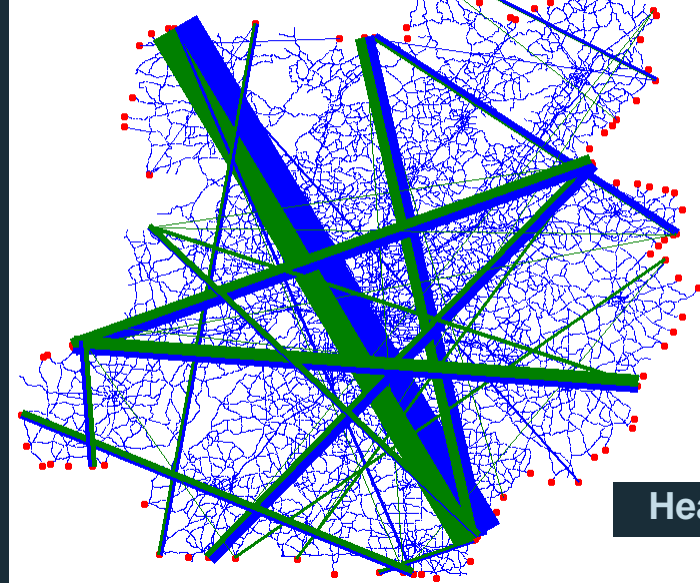
GSTDM Sub Node	ARC Station
1883	5944
1885	5947
1933	5943

# GSTDM to ARC

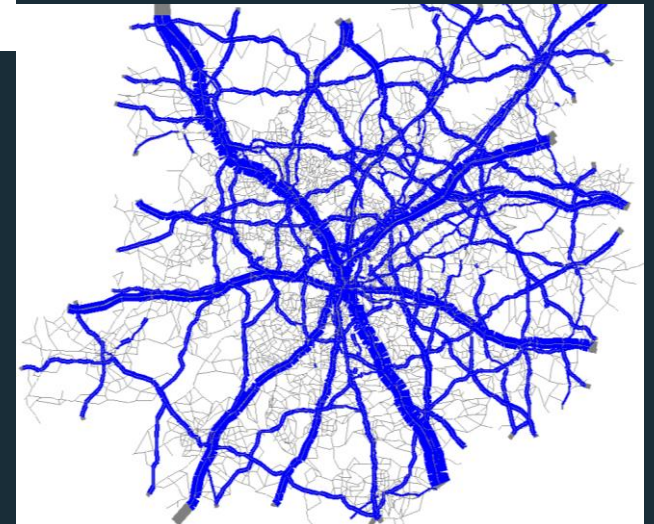
## GSTDM Sub-Area Extraction

- Review EE trip table desire lines
- All-or-nothing assignment IE/EI & EE truck volumes and review for reasonableness
- EI/IE vs. EE medium and heavy truck percentages updated
- New medium and heavy truck EE “seed” matrix

Heavy Truck EE Desire Lines



Heavy Truck EI/IE & EE Volumes



# Questions?



# Acknowledgements

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thank you