



Population Movements

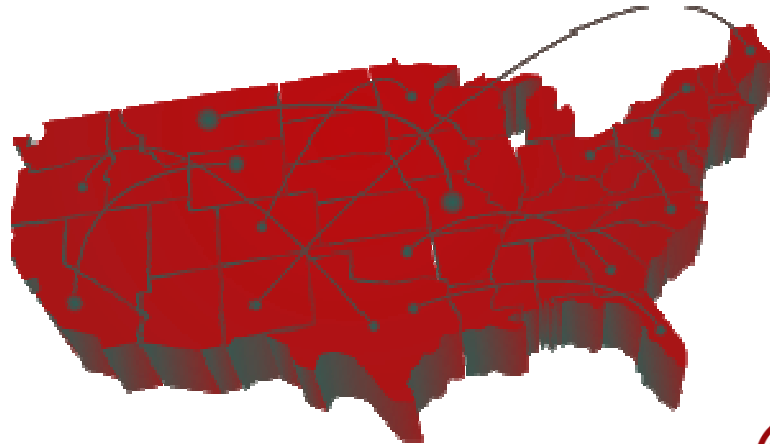
Data Solutions for your Transportation Studies

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AirSage Company Overview

- Five U.S. patents Awarded
- Billions of Activity points per day
- Million of mobile devices
- Consumer privacy protection



AirSage – Local Presence

Fuquay Varina

710 S. Main Street



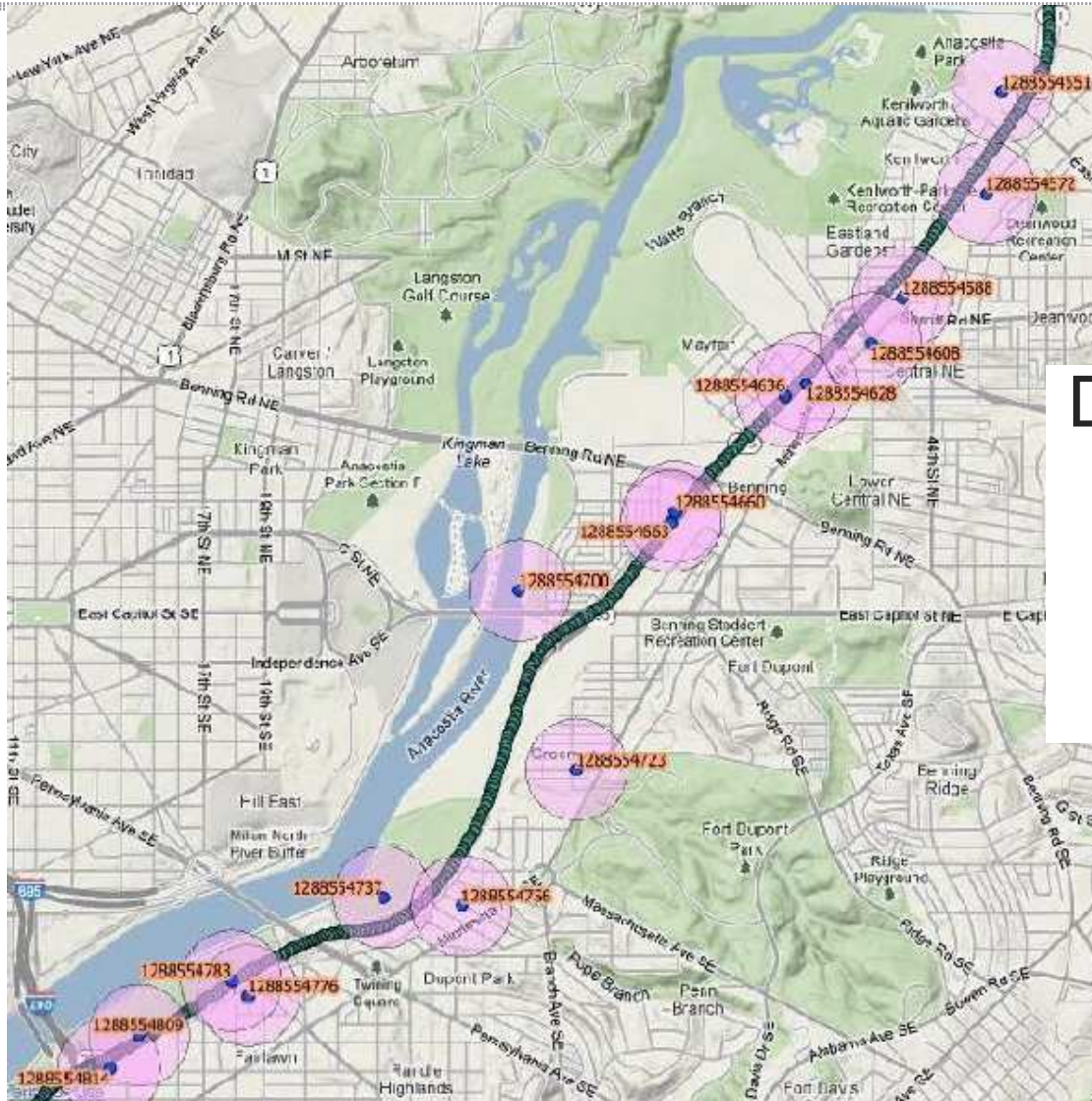
The power of where and when

When are locations processed?

AirSage processes and archives a location each time a mobile device interacts with the network...



Devices on the Move



Devices on the move create Transient Points.



The power of where and when

How is each new location handled?

Each location is analyzed and compared to other locations.



Devices at the Same Area

Devices remaining at the same area (over 5 minutes – 300 meters) create Activity Points whose location is refined and then analyzed for:

- Arrival time at location
- Departure time from location
- Activity duration

Understanding Activity Patterns

Activity Points are records of a visit to an area of activity.

Activity Patterns:

- Cluster frequency summarized
- Cluster schedule summarized
- Cluster purpose assigned

Understanding Activity Patterns

Activity Points are examined to determine the most common nighttime location.

This is deemed the “Home Location”

A penetration analysis is done at the Census Tract level to determine the extrapolation factor for each device

The sample is then scaled to represent the movements of 100% of the Population.

Understanding Activity Patterns

Activity Points are examined to determine:

- Home Location
- Work Location

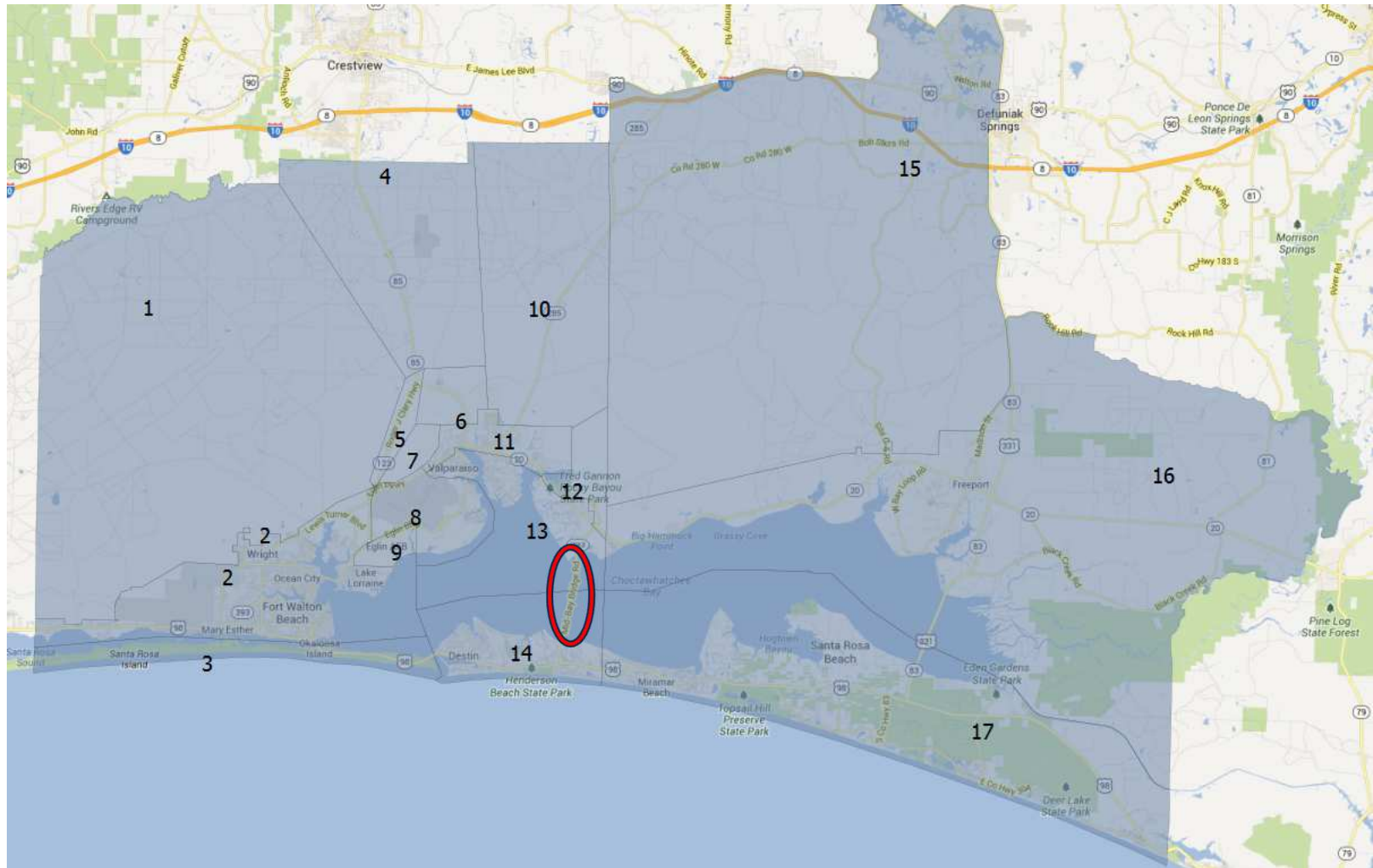
And then Linked to generate Trips by

- Daypart by Type (Home, Work, Other)
- Time of Day Information (Minimum 3hr bracket)
- Resident Classifications (Resident Worker, Home Worker, Inbound Commuter, Outbound Commuter, Short-Term Visitor, Long-Term Visitor)



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Bridge Crossing: Niceville, FL



The power of where and when

Niceville, FL: Results

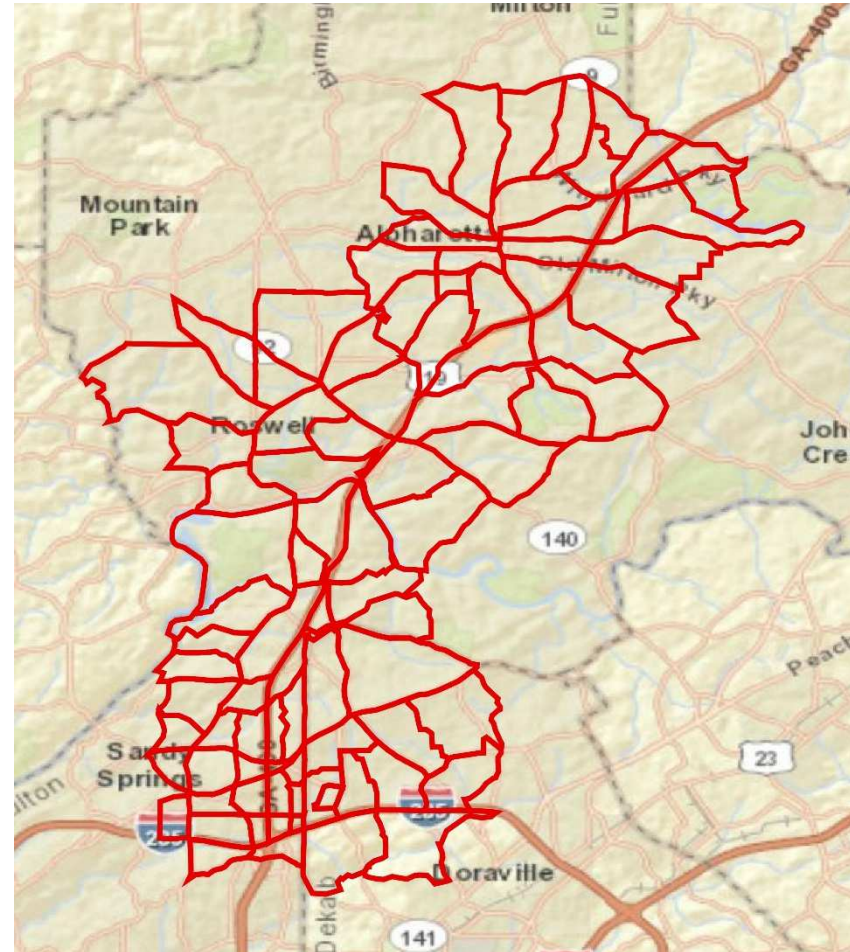
*“The estimation of traffic flows using the **AirSage data compares within 3% of the average daily machine counts** for the same period. This is within range of counter error and provides **very good correlation with the origin and destination data.**”*

Tom Hiles, HDR

Transit Example - MARTA

2012 SR 400 Corridor
extension of MARTA for:

AECOM
Atkins

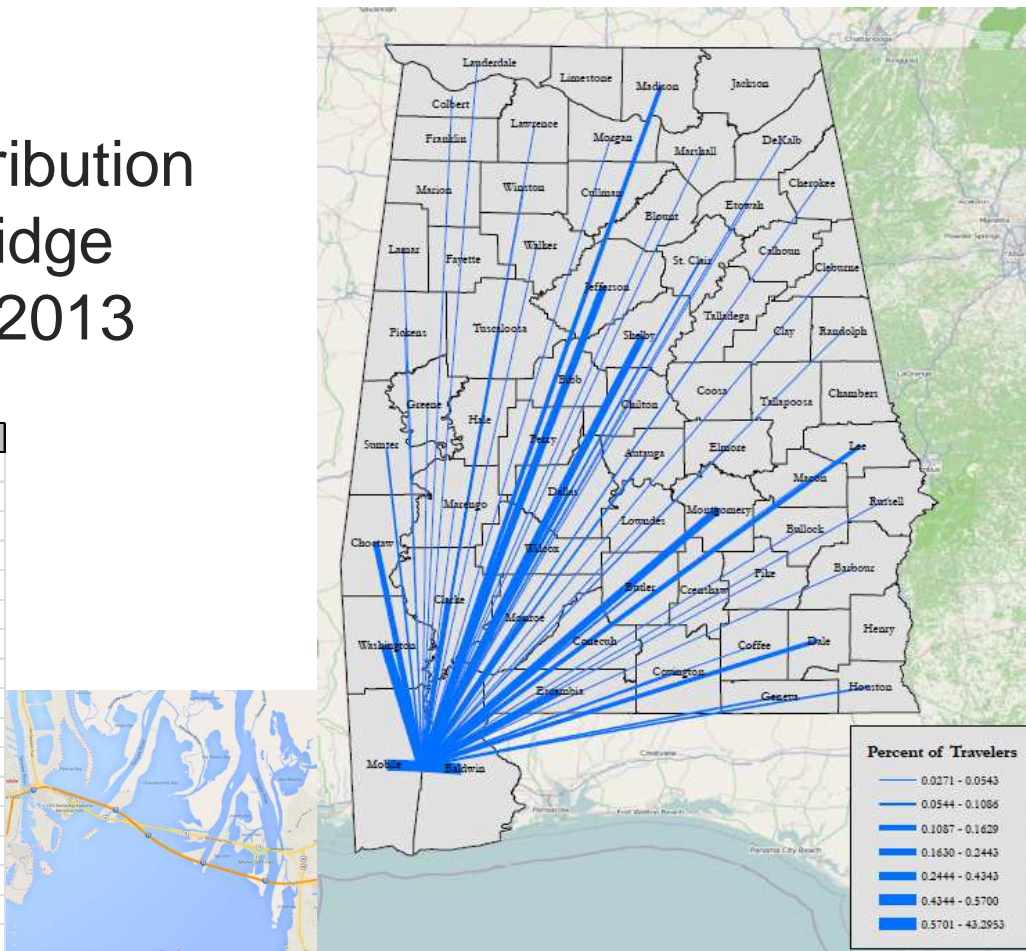


The power of where and when

Select Zone Analysis

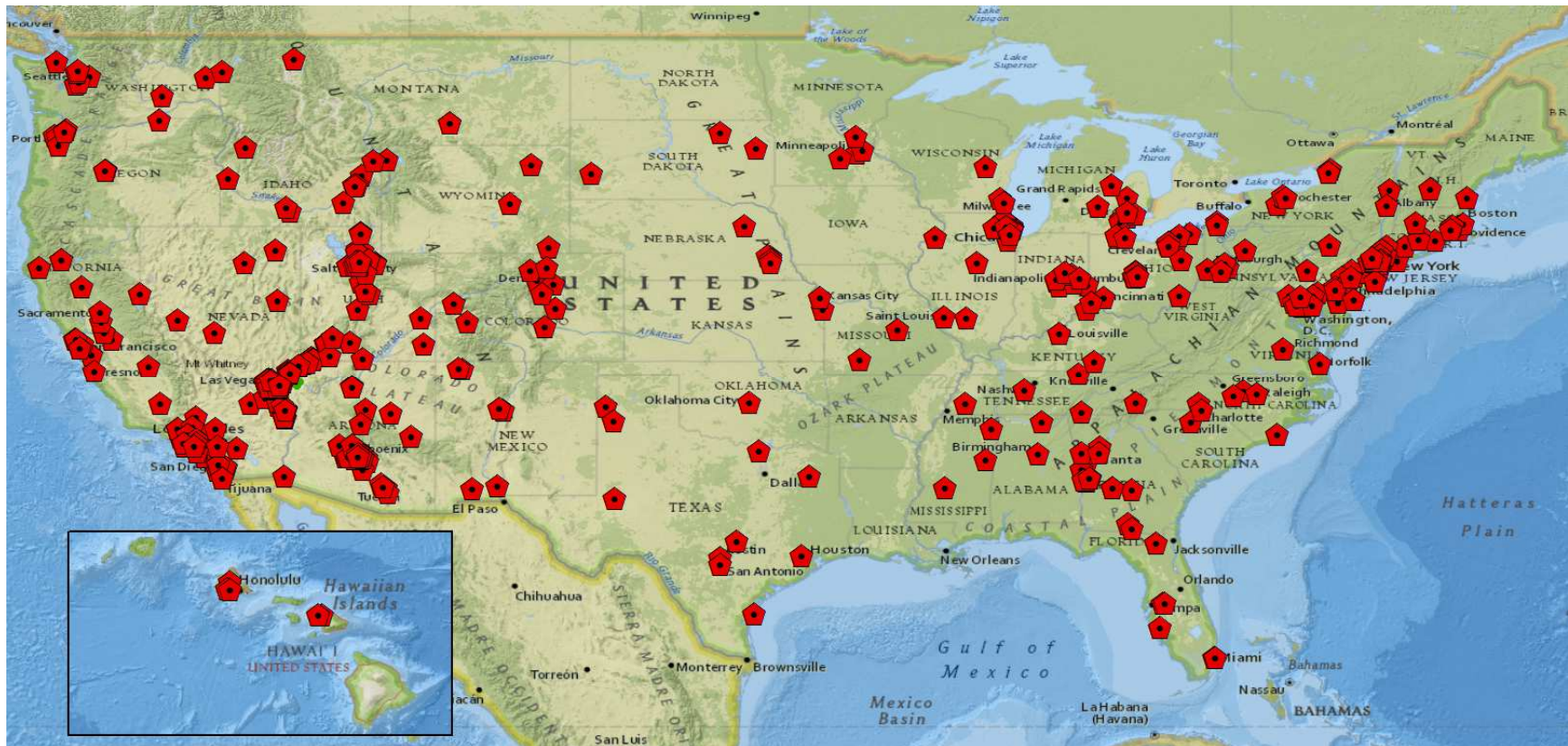
Proportional Distribution Mobile Bay Bridge November 13, 2013

stateID	STATE	countyID	COUNTY	End	Proportion
01	Alabama	001	Autauga	Home	0.04%
01	Alabama	003	Baldwin	Home	21.58%
01	Alabama	005	Barbour	Home	0.03%
01	Alabama	009	Blount	Home	0.03%
01	Alabama	011	Bullock	Home	0.01%
01	Alabama	013	Butler	Home	0.04%
01	Alabama	019	Cherokee	Home	0.01%
01	Alabama	021	Chilton	Home	0.01%
01	Alabama	023	Choctaw	Home	0.11%
01	Alabama	025	Clarke	Home	0.08%
01	Alabama	031	Coffee	Home	0.03%
01	Alabama	033	Colbert	Home	0.01%
01	Alabama	035	Conecuh	Home	0.01%
01	Alabama	039	Covington	Home	0.05%
01	Alabama	045	Dale	Home	0.07%
01	Alabama	047	Dallas	Home	0.05%
01	Alabama	049	DeKalb	Home	0.03%



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Home Locations



Sampled Lake Mead Visitors
October 13, 2012

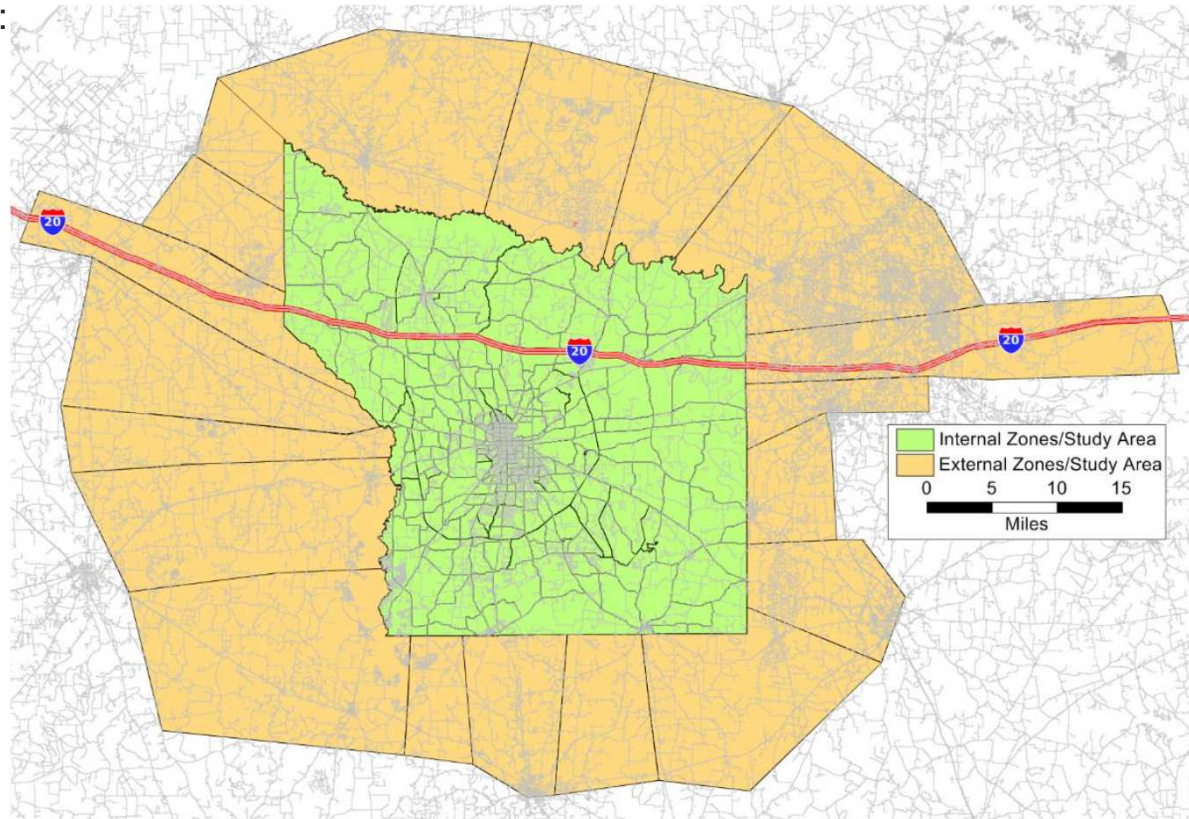
External Trips Matrix

For an **Internal & External** Study Area Analysis containing:

- **More than 1** type of geography for internal and external zones (ex. Internal –census tract, External - county)

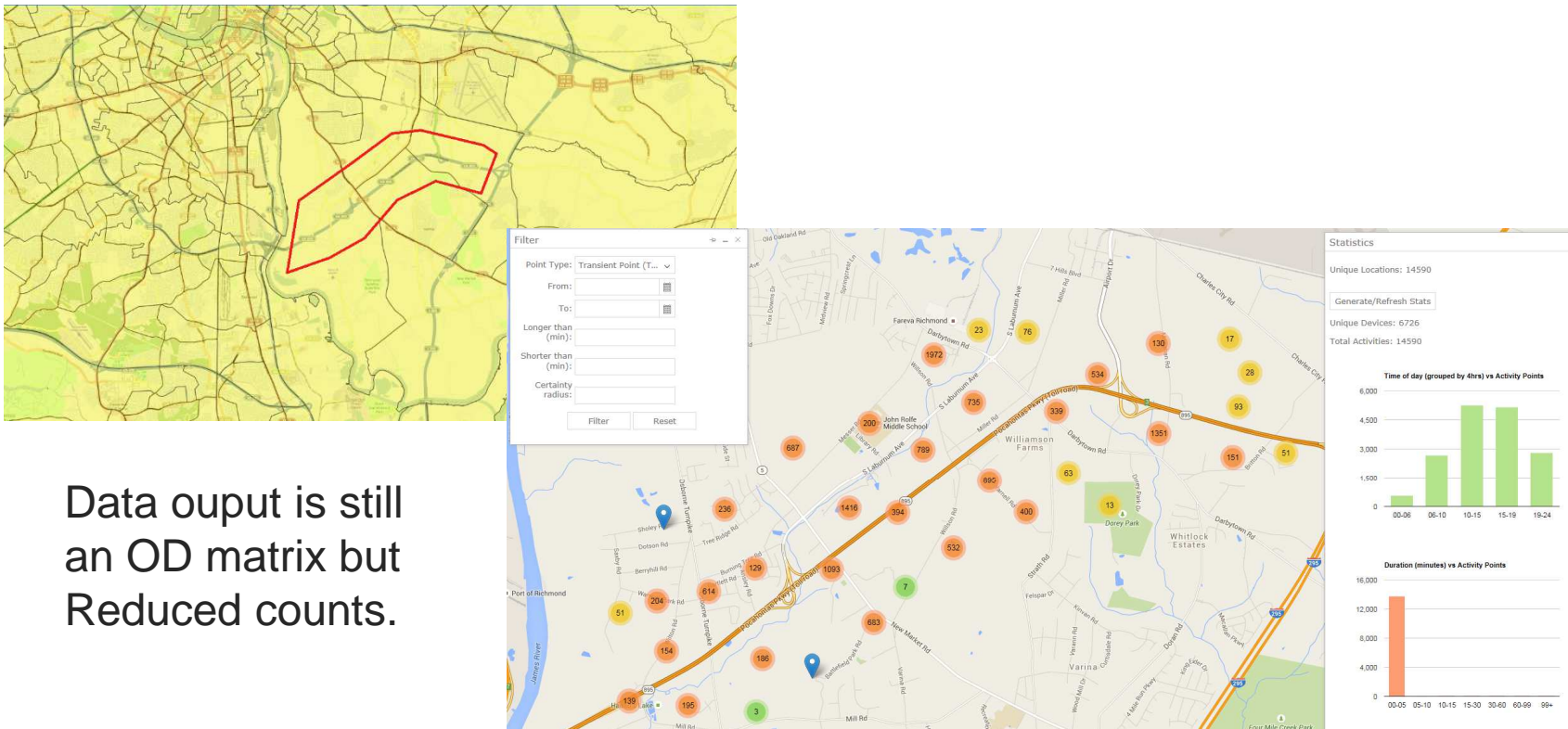
Includes:

- ✓ **Internal – Internal Trips**
- ✓ **Internal – External Trips**
- ✓ **External – Internal Trips**



Sub Zone Analysis

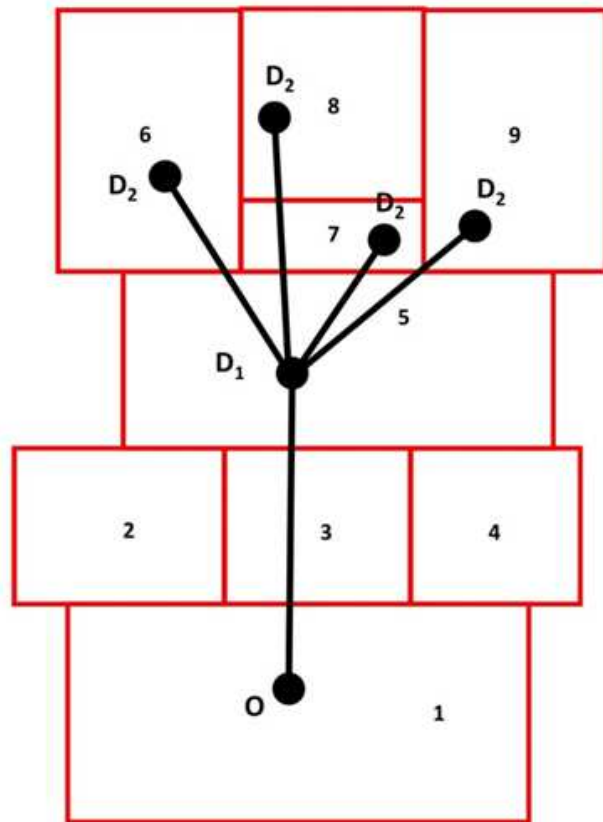
Filter the Regional OD data shown previously to ONLY trips that have Transient Points in the Transient Zone below:



Data output is still an OD matrix but Reduced counts.

Super Matrix

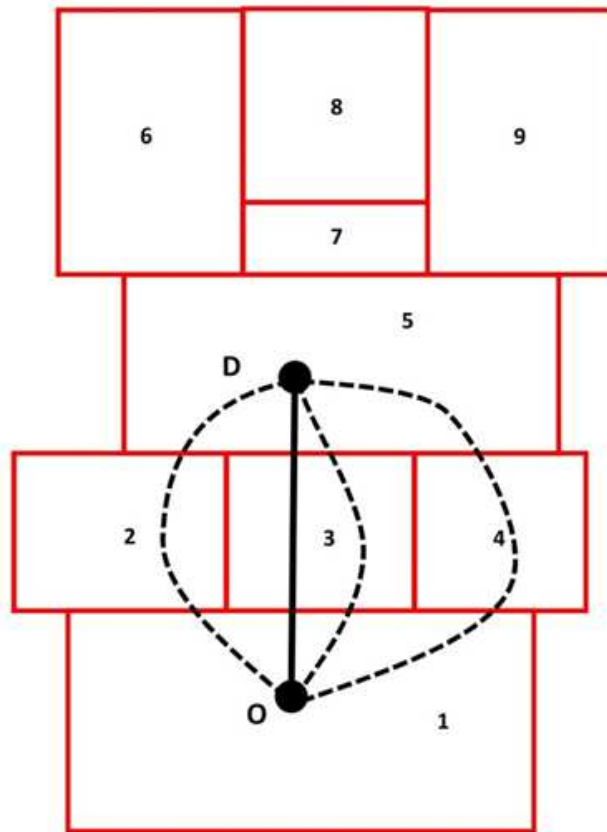
Super Matrix



- Super Matrix is a breakdown of trips that were made after a completed trip leg.
- EXAMPLE: For the Zone 1 to Zone 5 trip leg, the count or % of subsequent trips. The subsequent trips have an origin D_1 and new destination D_2 .

Sub Matrix

Sub Matrix



- Submatrix is a breakdown of trips that were made through any new zones between the origin and destination.
- EXAMPLE: For the Zone 1 to Zone 5 trip leg, the count or % of trips that pass through intermediate Zones 2, 3, and 4.

Long Distance

Standard Trip Leg (No Filter)



Three trip legs with 3 separate origin (O1, O2, O3) and 3 separate destination (D1, D2, D3) points.

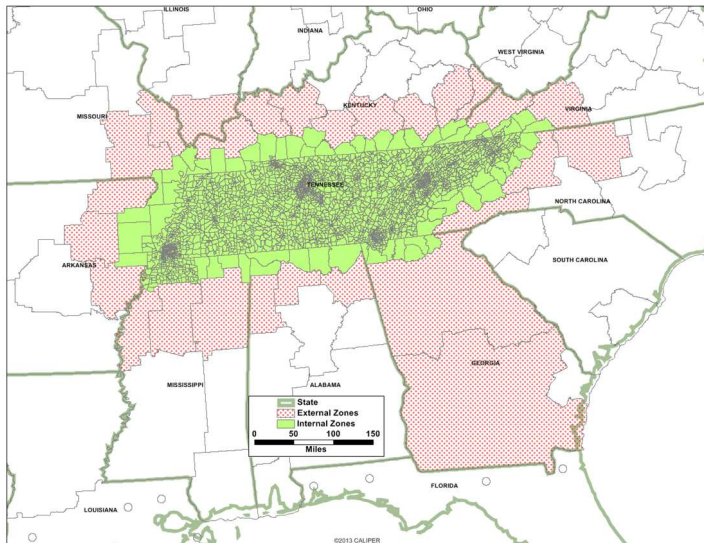
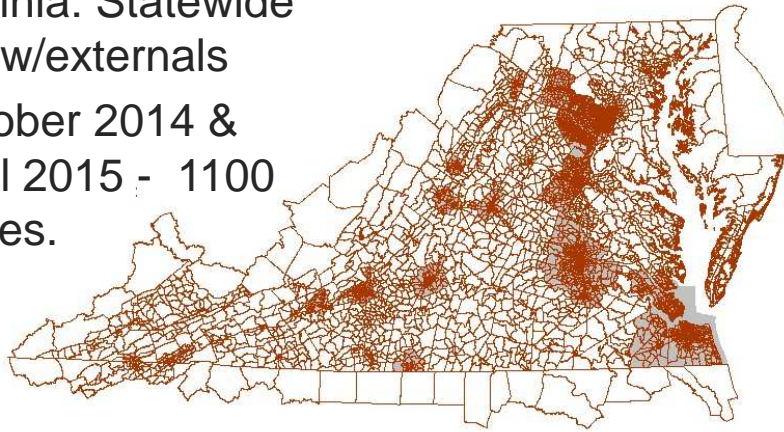
Long Distance Trip Leg (Filter Applied)



Single trip leg with one origin (O1) and one destination (D1) point.

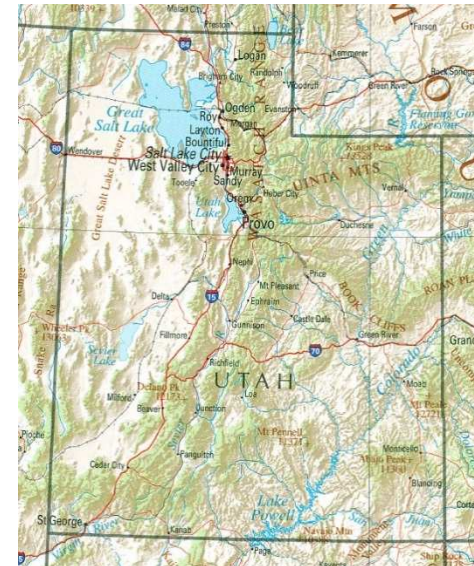
Statewide Models

Virginia: Statewide
OD w/externals
October 2014 &
April 2015 - 1100
Zones.



UTAH: Statewide OD

- Study Seasonal Variation
- Sep 2012 and Jan-Feb 2013



Also:
Mississippi
Idaho
Maryland

Tennessee: Statewide OD w/externals

- October 2014 - 1225 Zones.



The power of where and when

Sample of Data Format

	A	B	C	D	E	F	G	H	I
1	Origin_Zone	Destination_Zone	Start_Date	End_Date	Aggregation	Subscriber_Type	Purpose	Time_of_Day	Count
2	94	37	20130702	20130731	WD	Visitor	OO	H00:H24	5.08
3	420	343	20130702	20130731	WD	Resident	HW	H00:H24	1.49
4	548	33	20130702	20130731	WD	Resident	WO	H00:H24	5.01
5	68	164	20130702	20130731	WD	Resident	OO	H00:H24	4.96
6	256	400	20130702	20130731	WD	Resident	HO	H00:H24	5.97
7	498	62	20130702	20130731	WD	Resident	HW	H00:H24	4.37
8	1	176	20130702	20130731	WD	Resident	OH	H00:H24	4.71
9	54	33	20130702	20130731	WD	Resident	OO	H00:H24	18.54
10	255	311	20130702	20130731	WD	Resident	HO	H00:H24	1.65
11	543	85	20130702	20130731	WD	Resident	HO	H00:H24	1.19
12	268	62	20130702	20130731	WD	Resident	OH	H00:H24	25
13	110	425	20130702	20130731	WD	Resident	WH	H00:H24	0.41
14	1005	249	20130702	20130731	WD	Resident	WH	H00:H24	2.63
15	1003	3	20130702	20130731	WD	Visitor	HO	H00:H24	4.36
16	221	102	20130702	20130731	WD	Resident	HO	H00:H24	1.82
17	12	45	20130702	20130731	WD	Resident	HH	H00:H24	2.97
18	290	286	20130702	20130731	WD	Visitor	OO	H00:H24	2.59
19	400	593	20130702	20130731	WD	Visitor	OO	H00:H24	0.46
20	122	160	20130702	20130731	WD	Resident	HO	H00:H24	1.26



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Sample of Data Format

Origin Zone	Destination Zone	Home Blockgroup	Start Date	End Date	Aggregation	Subscriber Class	Purpose	Time of_Day	Count
9	20	60014009002	20151001	20151029	WD	Resident	HBW	H00:H24	14.21
17	15	280590429001	20151001	20151029	WD	Visitor	NHB	H00:H24	6.31
103	4	120330036111	20151001	20151029	WD	Resident	HBO	H00:H24	1.51
9	3	120330009002	20151001	20151029	WD	Visitor	NHB	H00:H24	0.73
attribute fields will represent unique district ids		attribute field will represent the home block group				Resident - with home location inside the state; Visitor - with home location outside the state			



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