

# *National Deployment Strategy for Truck Stop Electrification*

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*Presented to Blue Skyways Collaborative*

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# *Defining the Problem*

- 500,000 long haul trucks
- 500 tons of NO<sub>x</sub> per day
- 300,000 gallons of diesel per day



# *How To Reduce Idling*

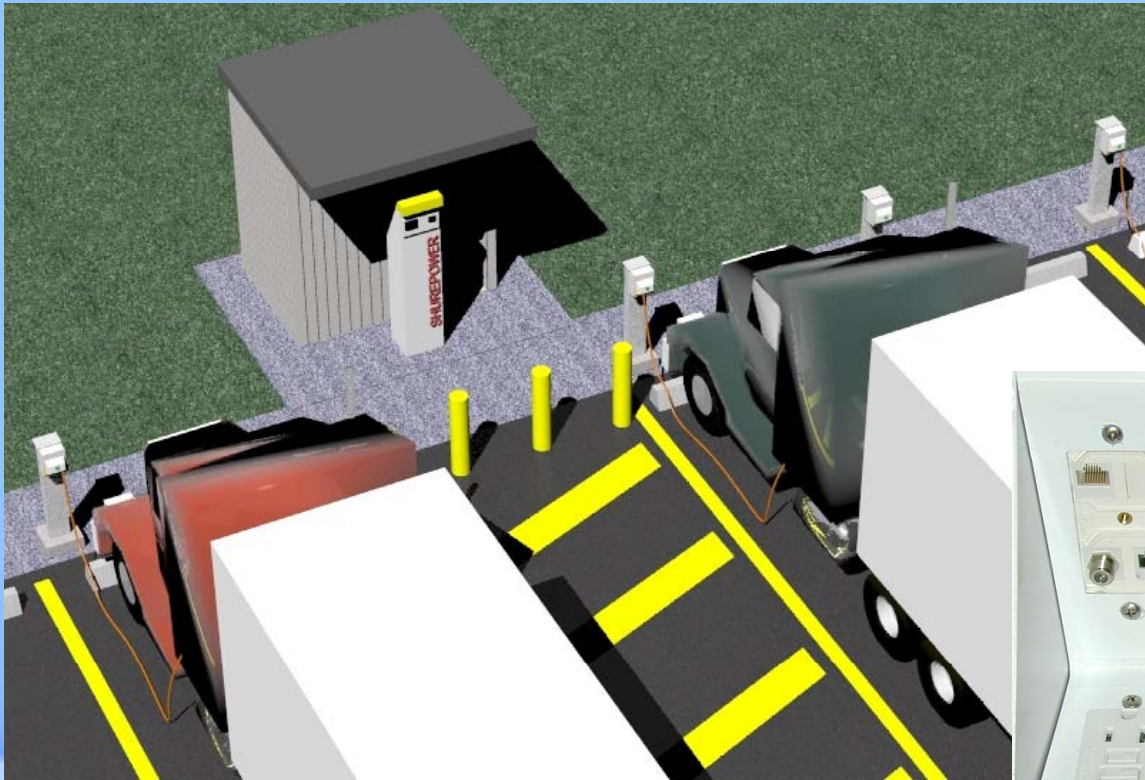
- Education
- Incentives
- Laws
- Idle reduction technologies
  - Mobile (on-board)
  - Stationary (off-board)
  - Combination



# *Stationary (Off-Board)*



# *Combination (Stationary and Mobile)*



# ***This Grant***

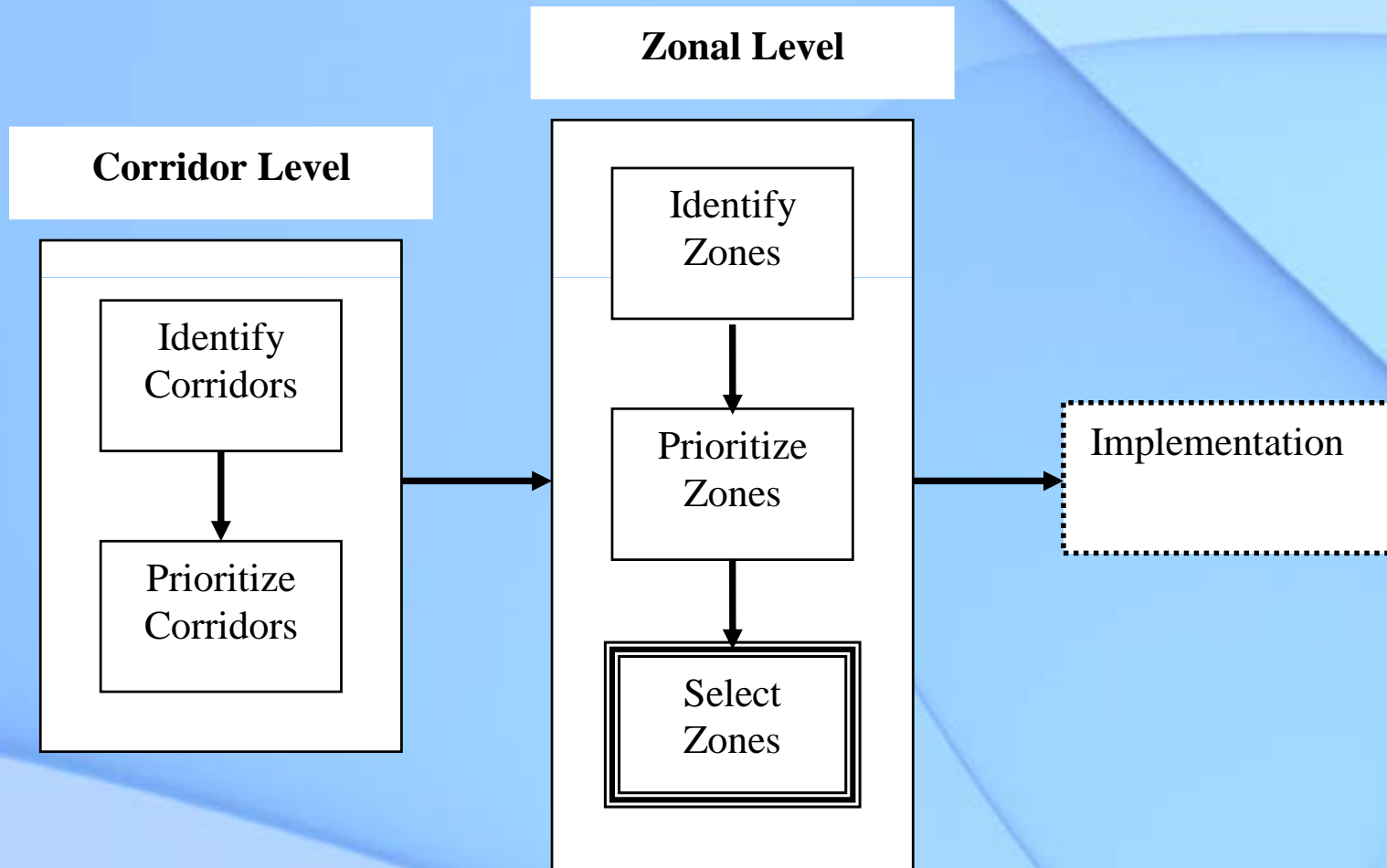
- **EPA OTAQ SmartWay Program**
- **Multiple grants \$5 million**
- **TTI received \$3 million**
  - **Corridor**
  - **Port**
  - **Research**
  - **Implementation**

# Overall Goals

- Develop a network
- Locations with greatest idle reduction
- Locations with greatest impact



# Corridor Approach



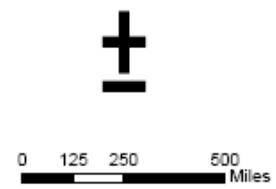
# National Truck Corridors



Selected Major U.S. Truck Corridors

**Legend**

- Corridor A
- Corridor B
- Corridor C
- Corridor D
- Corridor E
- Corridor F
- Corridor G
- Corridor H
- Corridor I
- Corridor J
- Corridor K
- Corridor L
- Corridor M
- Corridor N
- Corridor O
- EPA Corridor Option
- Non-Attainment: Ozone & PM



# Corridor Descriptions

Number	Origin/Destination	Freeways
Corridor A	New York - Minneapolis	I80-I90-I94
Corridor B	Boston - Birmingham	I95-I85-I20
Corridor C	Chicago -Miami	I65-I24-I75-Turnpike
Corridor D	Boston - Miami	I95
Corridor E	San Antonio - Jacksonville	I10
Corridor F	Kansas City - New York	I70-I78
Corridor G	Detroit - Miami	I75
Corridor H	Laredo - Raleigh	I35-I30-I40
Corridor I	San Diego - Seattle	I5
Corridor J	Los Angeles - Chicago	I15-I80-I55
Corridor K	Los Angeles - El Paso	I10
Corridor L	Chicago - Mobile	I65
Corridor M	Dallas - Raleigh	I20-I85
Corridor N	Knoxville - Harrisburg	I81
Corridor O	New Orleans - Baltimore	I10-I65-I85-I95

# Blue Skyways Corridors



# *Evaluation Criteria*

<b>Number</b>	<b>Measure</b>	<b>Description</b>
1	Corridor length	From origin to destination
2	Major activity centers	Activity centers such as major urbanized areas
3	Average daily truck volume	Class 8 truck volume
4	Truck traffic growth rates	Estimated annual truck growth rate
5	Non-attainment areas	Number of ozone and PM nonattainment areas
6	Existing TSE sites	Existing TSE sites
7	Number of truck stops	Number of truck stops with more than 75 spaces
8	Corridor temperature	% corridor above 90 <sup>0</sup> F or below 40 <sup>0</sup> F
9	Number of major intersections	Number of major freeway to freeway interchanges

# *Evaluation Technique (MAUT)*

$$U_j = \sum_{k=1}^{n_k} w_k n_{kj}$$

Where:

$U_j$  = utility of alternative  $j$ ;

$w_k$  = weight of the  $k^{th}$  criterion;

$n_{kj}$  = normalized criterion  $k$  value for alternative  $j$ ;



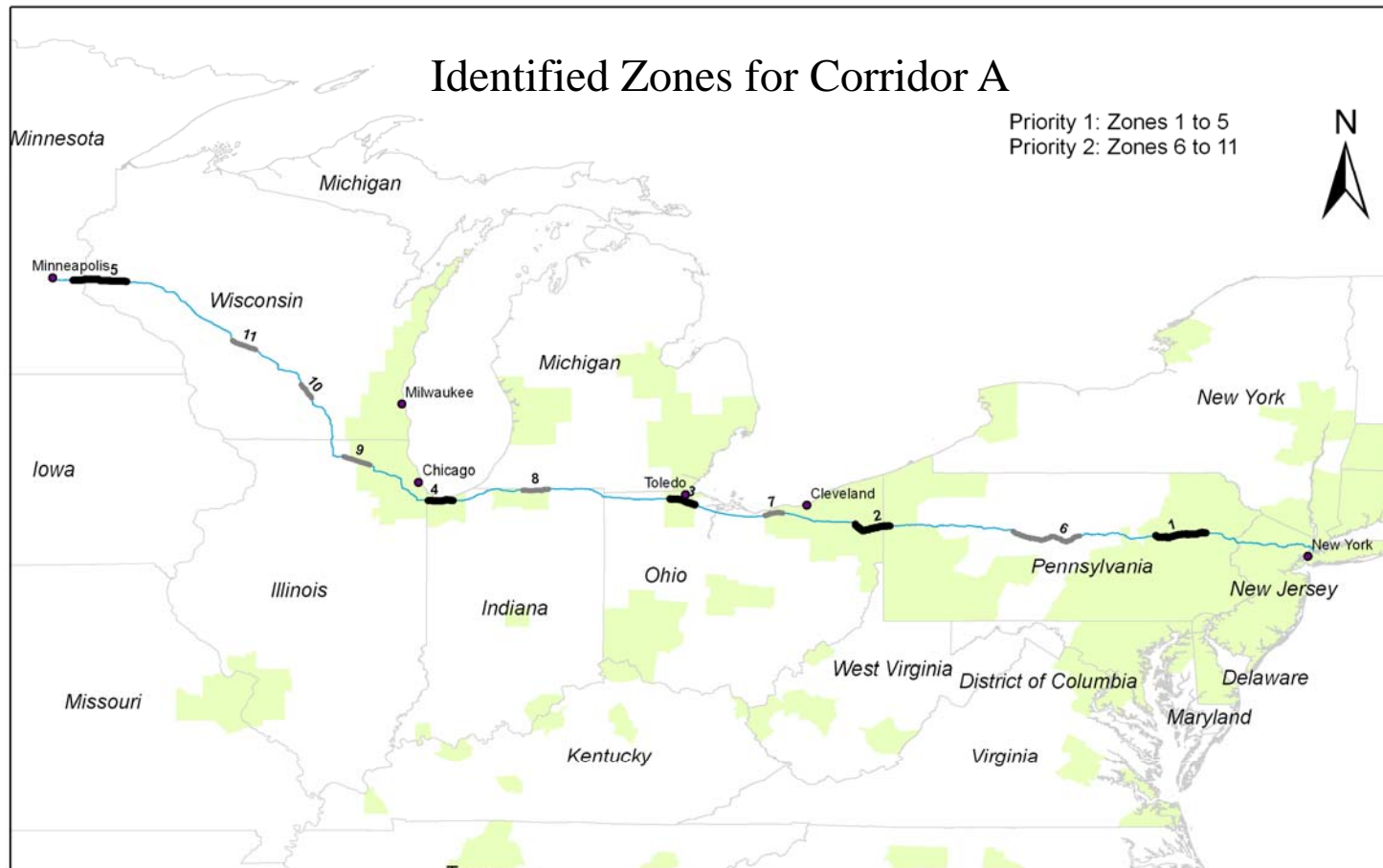
# Corridor Ranking

Ranking	Corridor	Origin-Destination	Utility Value
1	A	New York - Minneapolis	0.67
2	H	Laredo - Raleigh	0.62
3	C	Chicago - Miami	0.60
4	D	Boston - Miami	0.60
5	F	Kansas City - New York	0.59
6	G	Detroit - Miami	0.58
7	M	Dallas - Raleigh	0.57
8	B	Boston - Birmingham	0.54
9	I	San Diego - Seattle	0.51
10	O	New Orleans - Baltimore	0.51
11	J	Salt Lake - Chicago	0.46
12	L	Chicago - Mobile	0.45
13	E	San Antonio - Jacksonville	0.41
14	K	Los Angeles - El Paso	0.39
15	N	Knoxville - Harrisburg	0.25

# *Zone Selection*

- **Approximately 20 miles in length**
- **Same ranking procedure**
- **Primary zones – 200 to 300 miles**
- **Secondary zones – 100 to 150 miles**
- **Implement one truck stop per zone**

# Corridor and Zone Example



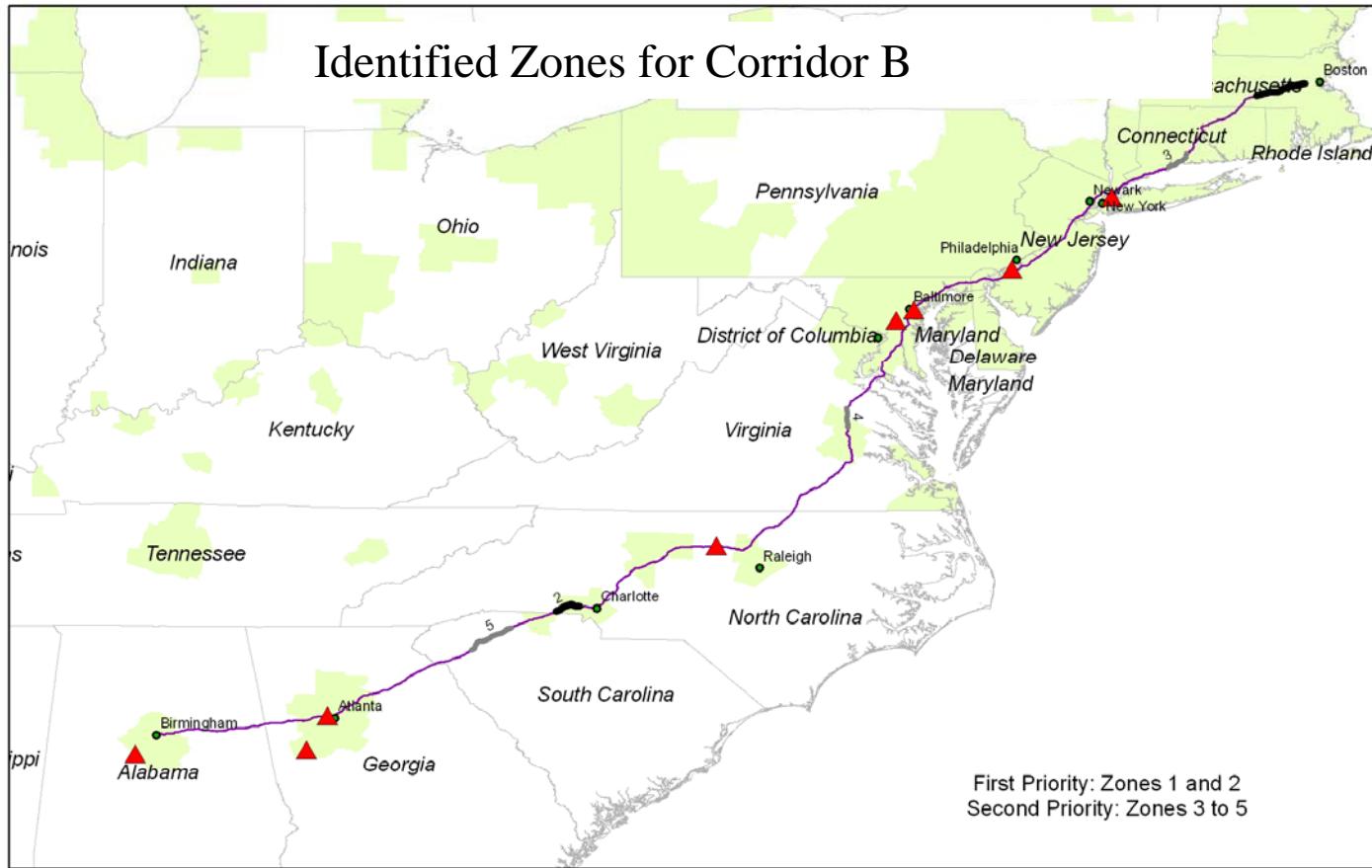
### Legend

- Implementation Steps
  - First Priority (thick black line)
  - Second Priority (thin grey line)
- State (white box)
- Non-attainment Areas\_Ozone (light green box)
- Corridor A (blue line)

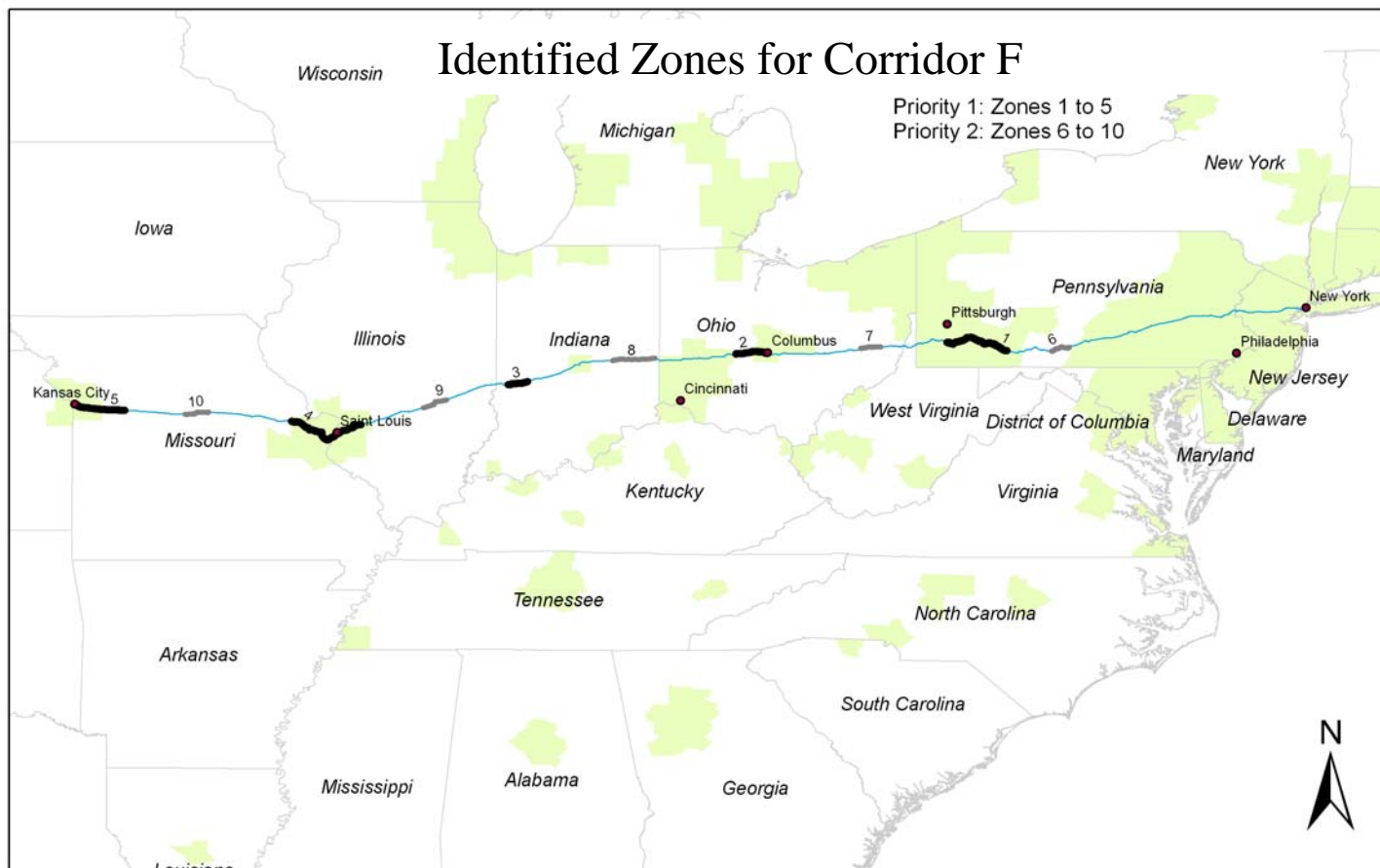
• Large Cities on Corridors



# Corridor and Zone Example



# Corridor and Zone Example



## Legend

### Implementaion Steps

- First Priority
- Second Priority
- Corridor F

- State
- Non-attainment Areas\_Ozone
- Corridor F

- Large Cities in Corridor



# Associated Information

Corridor A							
Priority	Zones	Highway	Length (miles)	Description (West – East)		Coordinates	
				From	To	Beginning	End
1	1	I-80	43.66	Blakeslee, PA	Mifflinville, PA	-75.5718, 41.0755	-76.346, 41.0369
	2	I-80	32.72	West Middlesex, PA	Newton Falls, OH	-80.4214, 41.1808	-80.9496, 41.2098
	3	I-80/90	21.29	Genoa, OH	Swanton, OH	-83.4128, 41.5091	-83.7982, 41.5991
	4	I-80/94	20.41	Crocker, IN	Munster, IN	-87.1245, 41.5733	-87.505, 41.5741
	5	I-94	40.95	Wilson, WI	Saint Paul, MN	-92.1382, 44.9305	-92.9534, 44.9474

Corridor A				
Zone	Travel Center	# Spaces	Address	Directions
1	Hickory Run Truck Plaza	75	I-80 Exit 41 NW, White Haven, PA	I-80 Exit 274 (PA 534)
	Bandit Truck Stop #2	80	I-80 Exit 41 (Rt 534), White Haven, PA 18661	I-80 Exit 41 (PA 534)
	Brennan's Auto/Truck Plaza	75	I-80 Exit 37, Mifflinville, PA 18631	I-80 Exit 37 (PA 339)

# *Final Product*

- Interactive planning tool
  - Corridors
  - Zones
  - Information
- Report

