



Amp Up Your Fleet: 2009 Advancing the Choice

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Idle Reduction Strategies

By

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Defining the Problem

- **500,000 long haul trucks**
- **500 tons of NO_x per day**
- **300,000 gallons of diesel per day**
- **3,000 tons of CO₂ per day**





How To Reduce Idling

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





Stationary (Off-Board)



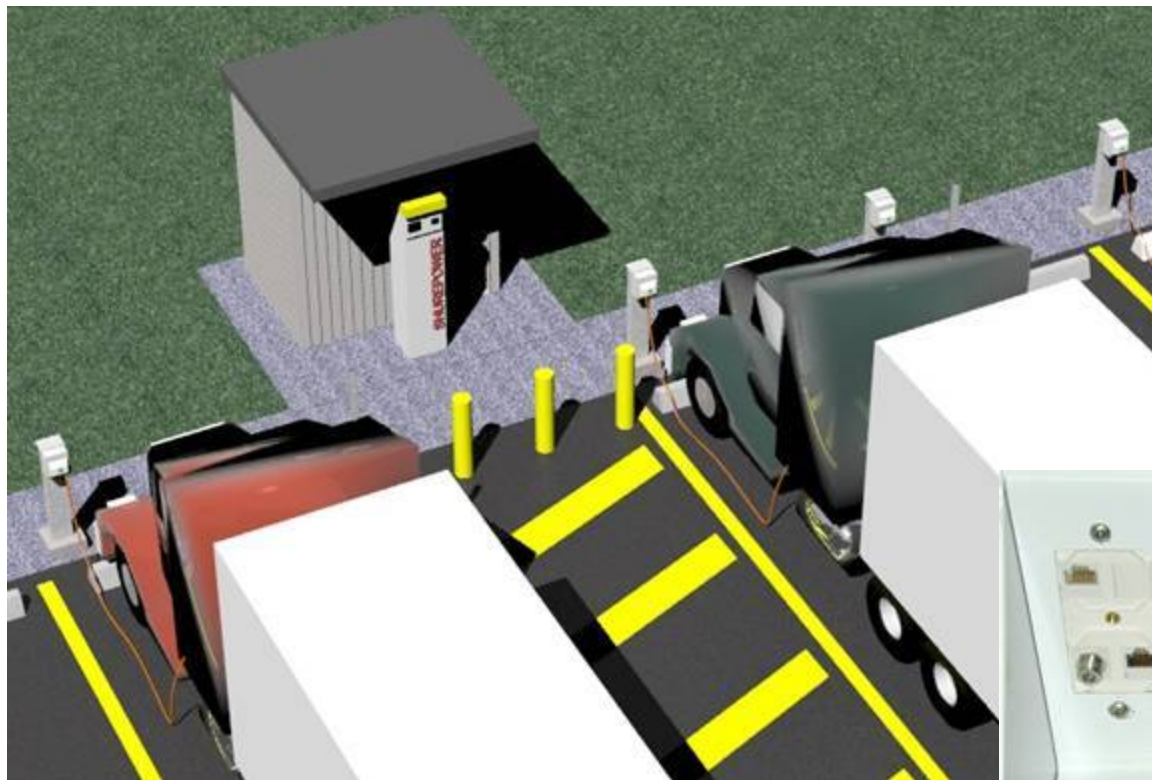


Mobile (On-Board)





Combination (Stationary and Mobile)





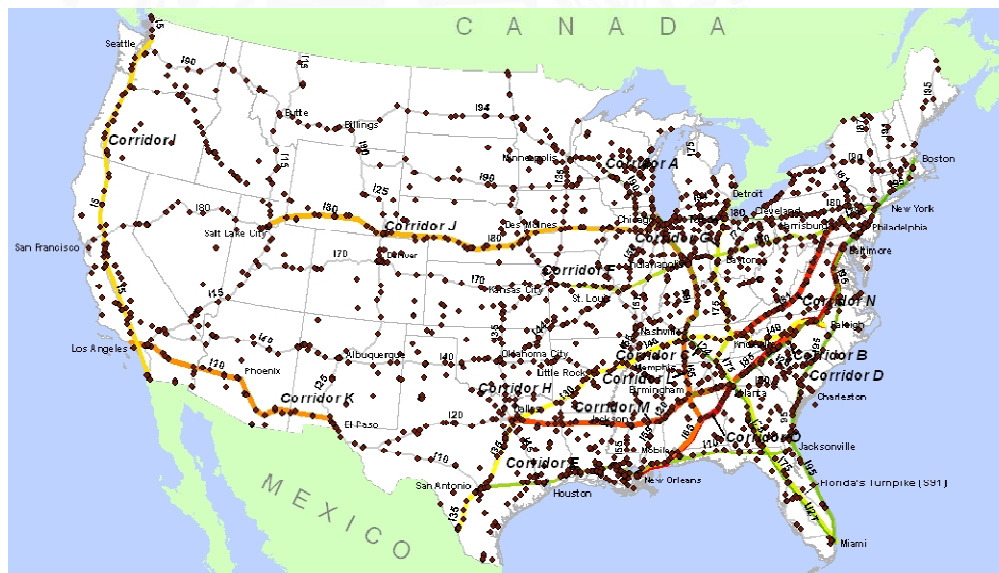
TTI Grants

- **EPA (OTAQ) - \$3 million**
- **HARC (NTRD) - \$750,000**
 - **National deployment strategy**
 - **Corridor deployment**
 - **APU Verification protocol**
 - **APU testing**



National Deployment Strategy

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



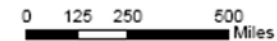
National Truck Corridors



Selected Major U.S. Truck Corridors

Legend

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





Evaluation Criteria

Number	Measure	Description
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 ⁰ F or below 40 ⁰ 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
- Demand per zone

National Deployment Strategy for Truck Stop Electrification

project by the [Texas Transportation Institute](#) with funding provided by the [United States Environmental Protection Agency](#)

Interactive Map

[How to Use the Interactive Map](#) | [Return to Home](#) | [Change to the Fixed-Size Map](#)

To adjust your view, you may zoom and drag the map, or choose a state or corridor:

Choose a State

Choose a Corridor

Major Truck Corridors First Priority Zones Second Priority Zones Ozone Nonattainment Areas

<http://tse.tamu.edu/>



CORRIDOR:

[View/Print Full Corridor Info](#)

ZONE:

Priority:

Highway(s):

Length:

From:

To:

Start Lat/Long:

End Lat/Long:

ZONE TRUCK STOPS:

RESET MAP

Zoom Out

ADJUST MAP SCALE

Zoom In

Interactive Map

[How to Use the Interactive Map](#) | [Return to Home](#) | [Change to the Fixed-Size Map](#)

To adjust your view, you may zoom and and drag the map, or choose a state or corridor:

Choose a State

Salt Lake City - Chicago

Major Truck Corridors First Priority Zones Second Priority Zones Ozone Nonattainment Areas



CLICK NOW to focus on this zone

CORRIDOR:
CORRIDOR: Salt Lake City - Chicago
FREEWAYS: I80-I55
CITIES: Salt Lake City-Des

[View/Print Full Corridor Info](#)

ZONE:
Priority: 1
Highway(s): I-80
Length: 40.66 miles
From: Maxwell, NE
To: Sutherland, NE
Start Lat/Long: 41.05, -100.52 End Lat/Long: 41.12, -101.27

ZONE TRUCK STOPS:
In this zone, there are 2 truck stops of 75 or more spaces. There are no existing electrified truckstops.

CANDIDATE TRUCKSTOPS:

RESET MAP





APU Verification

○ Categories

- diesel APUs
- battery APUs
- direct-fired heaters
- thermal storage cooling units

○ Tasks

- Protocol development
- Performance testing (emissions, fuel, noise, energy use, performance, and infiltration)



Chamber Specifications

- **Dimensions – 75X22X22**
- **Temperature range of -25C to +50C**
- **Humidity range of 20% to 70%**
- **Solar and wind simulation**

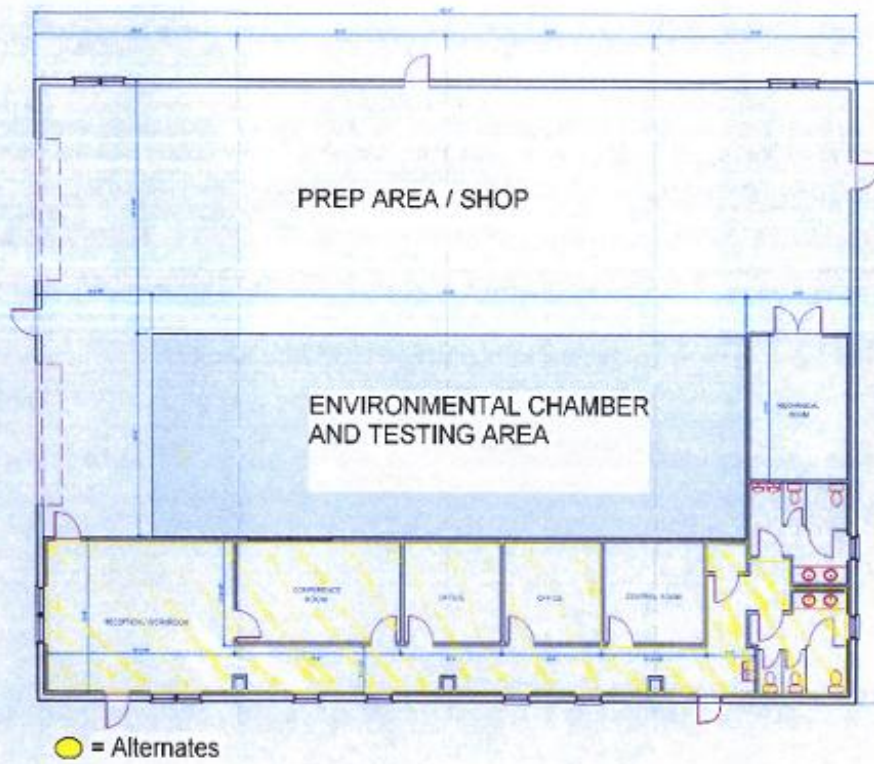


TTI Riverside Campus Complex





Facility Layout





Conclusions

- **Extended idling is a considerable problem**
- **Several mitigation strategies**
- **TTI developed national deployment strategy**
- **Developing protocol for APU testing**
- **Testing to be performed in test chamber**
- **Produce consumer report**