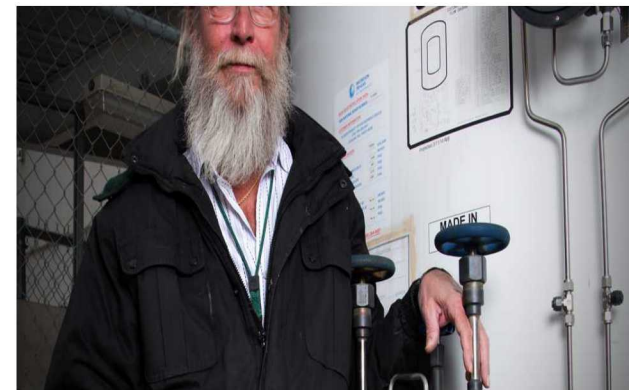
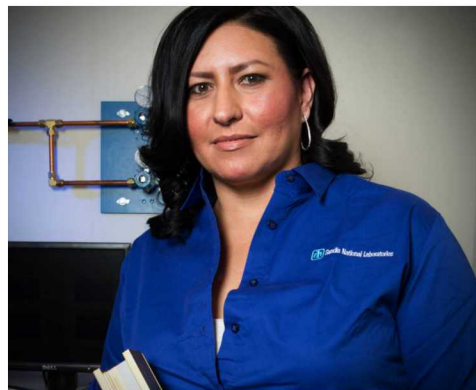


*Exceptional service in the national interest*



# Increasing the Accuracy of Employee Commuting Scope 3 Greenhouse Gas Data Using Software and Environmental Objectives

Presented by Che Shu-Nyamboli  
at the 2019 Federal Environmental Symposium, Bethesda, MD



*Sandia National Laboratories is a multimission laboratory managed and operated by National Technology & Engineering Solutions of Sandia, LLC, a wholly owned subsidiary of Honeywell International Inc., for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-NA0003525.*

# Commuter Profile. What is it?

- It is a web-based tool that calculates Scope 3 Greenhouse Gas (GHG) emissions from employee commuting.  
  
**Note:** Scope 3 GHG emissions are from sources that are not owned or directly controlled by a facility but are related to the facility's activities, e.g., employee commuting or air travel.
- The Sandia National Laboratories Environmental Management System (EMS) team and their embedded IT service team developed the tool.
- The tool is used to report commuter GHG emissions to the U.S. Department of Energy (DOE).

# Commuter Profile. How it works

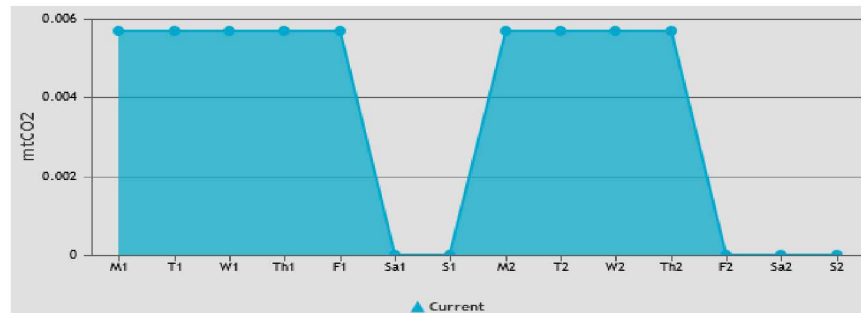
- A Member of the Workforce creates a commuter profile that includes:
  - Mode of transportation: bike, bus, carpool, mass transit, or car
  - Vehicle information: make, model, and year
  - Distance of daily commute
  - Work schedule

# Commuter Profile. How it works

## My Profile

### My Commuting Impact

#### Two Week Greenhouse Gas (GHG) Emissions



#### Annual GHG Emissions

**Current:** 1.33 metric tons

#### Think you can do better?

1. Edit some of your commuting options below to more eco-friendly commuting methods.
2. The graph will show you a comparison of your current commuting methods to your potential commuting methods.
3. Click "Save Schedule" to alter your commute schedule or "Cancel" to return to your saved schedule.

### My Commute Schedule

#### WEEK 1

Mon	2006 Volkswagen Passat ▼
Tues	2006 Volkswagen Passat ▼
Wed	2006 Volkswagen Passat ▼
Thur	2006 Volkswagen Passat ▼
Fri	2006 Volkswagen Passat ▼
Sat	Off ▼
Sun	Off ▼

#### WEEK 2

Mon	2006 Volkswagen Passat ▼
Tues	2006 Volkswagen Passat ▼
Wed	2006 Volkswagen Passat ▼
Thur	2006 Volkswagen Passat ▼
Fri	Off ▼
Sat	Off ▼
Sun	Off ▼

# Commuter Profile. How it works



## My Information

One Way Miles Traveled

Parking Lot

Starting Location

7

Bldg 823

Northeast Albuquerque

Edit

## My Vehicles

Year	Make	Model	Options	Actions
2006	Volkswagen	Passat	Auto (S6), 4 cyl, 2.0 L, Turbo	<a href="#">Edit</a> <a href="#">Delete</a>

Add New Vehicle +

# Commuter Profile. How it works

- The tool collects data inputs from Members of the Workforce and then groups vehicles into various classes based on vehicle year, make, and model:
  - Examples: large cars, midsize cars, small pickup trucks 2WD, small pickup trucks 4WD, SUV 4WD, standard pickup trucks
- The tool also groups vehicles by fuel type:
  - Examples: gasoline, electricity, diesel, compressed natural gas

# Commuter Profile. How it Works



- The tool uses U.S. Environmental Protection Agency vehicle emission factors and Commuter Profile data inputs to compute each commuter's GHG emissions.
- For carpools, the tool computes average emissions for all the carpools participants' vehicles and divides it by the number of participants.

# Commuter Profile. How it Works



- Members of the Workforce can also:
  - Join an existing carpool or vanpool
  - Start a new carpool or vanpool
  - Look up resources for biking: biking routes, bike safety, etc.
  - Look up alternative means for commuting: e.g., buses or trains
  - Obtain information about charging personal electronic vehicles

# Commuter Profile. How it Works

## Carpool / Vanpool Application

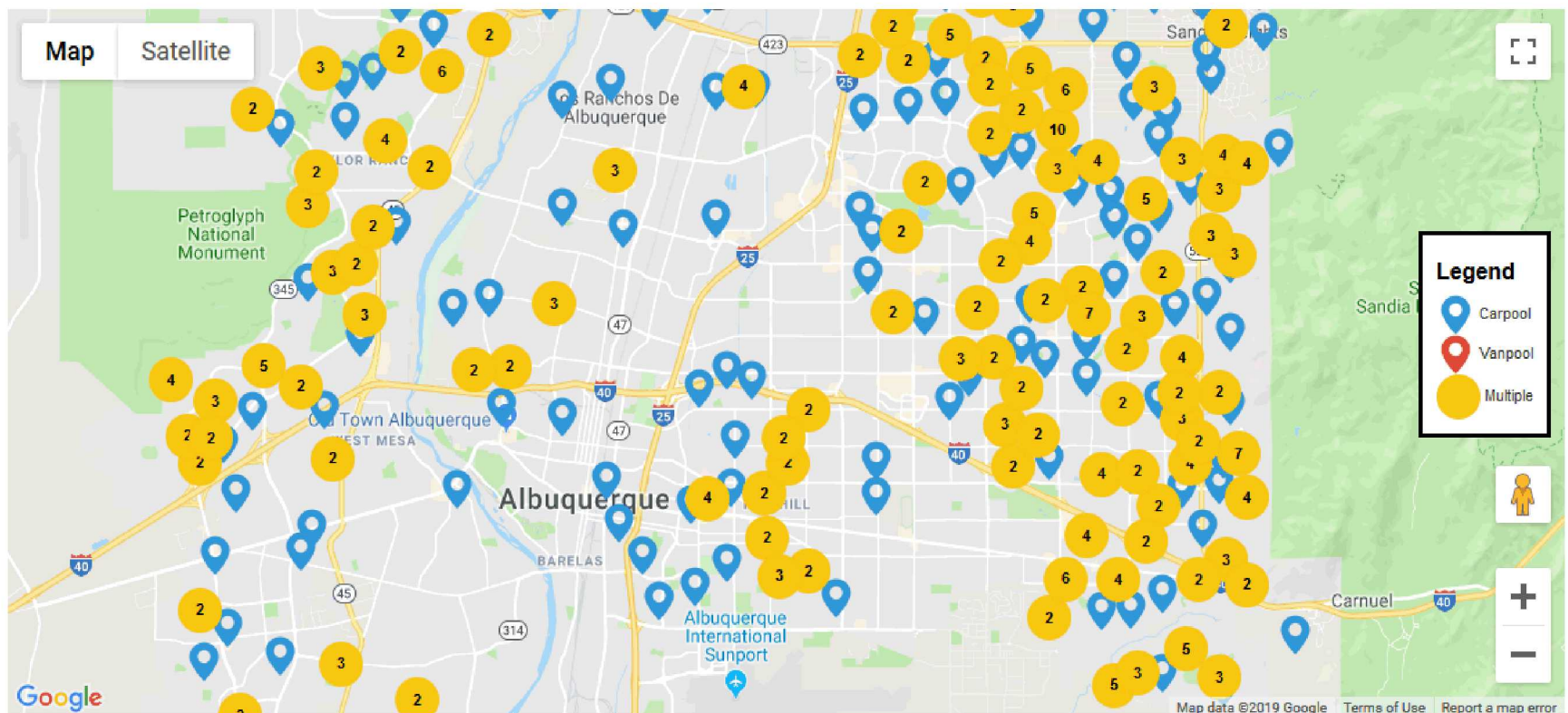
Join an existing personal carpool / formal vanpool or start a new one.

### INSTRUCTIONS:

VIEW existing pools by clicking on the pins on the map below.

To JOIN a pool, review the [carpool rules and regulations](#), then click on the contact's email address to start a discussion about joining their carpool.

To START a new pool, click [here](#).



# Commuter Profile. How it Works



## Start a new carpool/vanpool:

1. Select the type of pool

Carpool



2. Enter the starting address for your pool:

ex. 1515 Eubank Blvd SE, Albuquerque, NM 87123

*(Consider using a nearby store or the street name only if you don't want a marker directly over your home address)*

3. Which vehicle is **your** primary vehicle for use in the pool?

2006 Volkswagen Passat



4. Enter a name for the pool:

By clicking "Submit" you are committing to be the Coordinator for this pool. Your pool will be visible to Sandia's MOWs and they will be able to contact you about joining your pool.

Submit

Cancel

# Benefits of using Commuter Profile



- Is more accurate than surveys, which tend to have:
  - Nonparticipation bias
  - Poor resolution
  - Small sample sizes
- Collects data at the individual vehicle level instead of collecting aggregated information about vehicles
- Provides flexibility, such as accounting for different modes of transportation
- Updates in real time

# Benefits of using Commuter Profile



- Is easy to deploy and promote:
  - It can be introduced during the new employee onboarding process.
  - Divisions have set EMS environmental objectives to increase employee participation in using Commuter Profile.
  - Setting environmental objectives around employee participation gets management's support, which drives user participation.

# Benefits of using Commuter Profile



Year	Percent of Workforce Participation
2008–2016	< 10%
2017*	16.9%
<b>2018**</b>	<b>11.7%</b>
<b>2019***</b>	<b>22.3%</b>

\*The 2017 survey data was skewed toward SNL/CA.

\*\*Commuter Profile was initially rolled out in 2018.

\*\*\*The 2019 data is partial.

Total workforce population: 14,300

# Commuter Profile: Lessons Learned



- Outputs are in GHGs (mtCO<sub>2</sub> per year).
- The DOE reporting tool (SPO Dashboard) requires population and miles driven by vehicle and fuel type.
  - Requires further analysis of outputs from Commuter Profile
- There is a misconception that the system is collecting personal information.
- There is a misconception that commuters will be required to change their driving habits.

# Questions?

Email: [cshunya@sandia.gov](mailto:cshunya@sandia.gov)