NATIONAL LABORATORY OF THE ROCKIES

Optimizing Fleet Operations With Telematics

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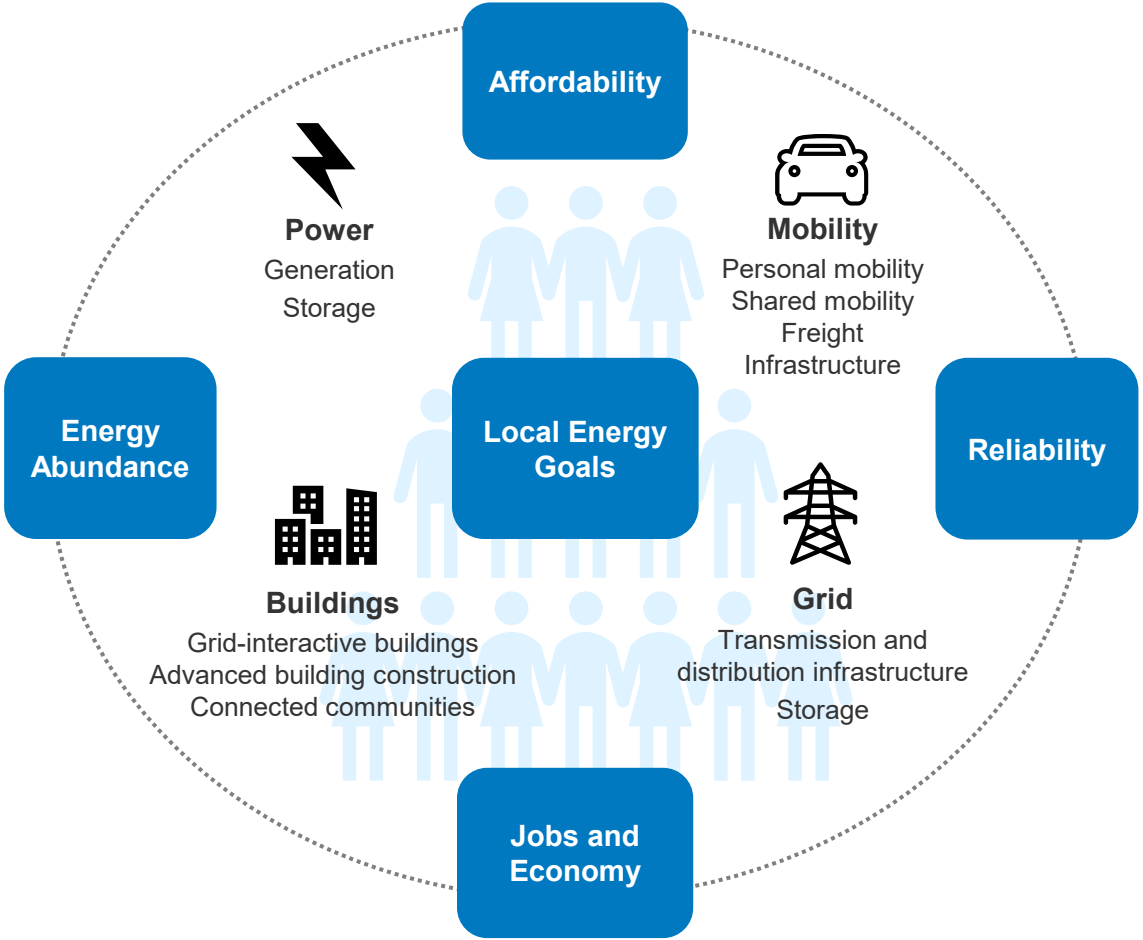
July 2025

This report was produced when the laboratory operated as the National Renewable Energy Laboratory (NREL). The laboratory is now the National Laboratory of the Rockies (NLR).

Energy to Communities (E2C) provides innovative, cross-cutting technical analysis to support local efforts to secure abundant, reliable, and affordable energy systems.



E2C Technical Assistance Opportunities

In-Depth Partnerships ~3 years

Multiyear partnership made up of teams (local governments, community-based organizations, and electric utilities) that work alongside national laboratory staff to apply robust modeling and analysis tools and simulate hardware in conditions that match communities' unique contexts to evaluate potential scenarios and strategies before full technology deployment.
Supports nine communities currently.

Peer-Learning Cohorts ~6 months

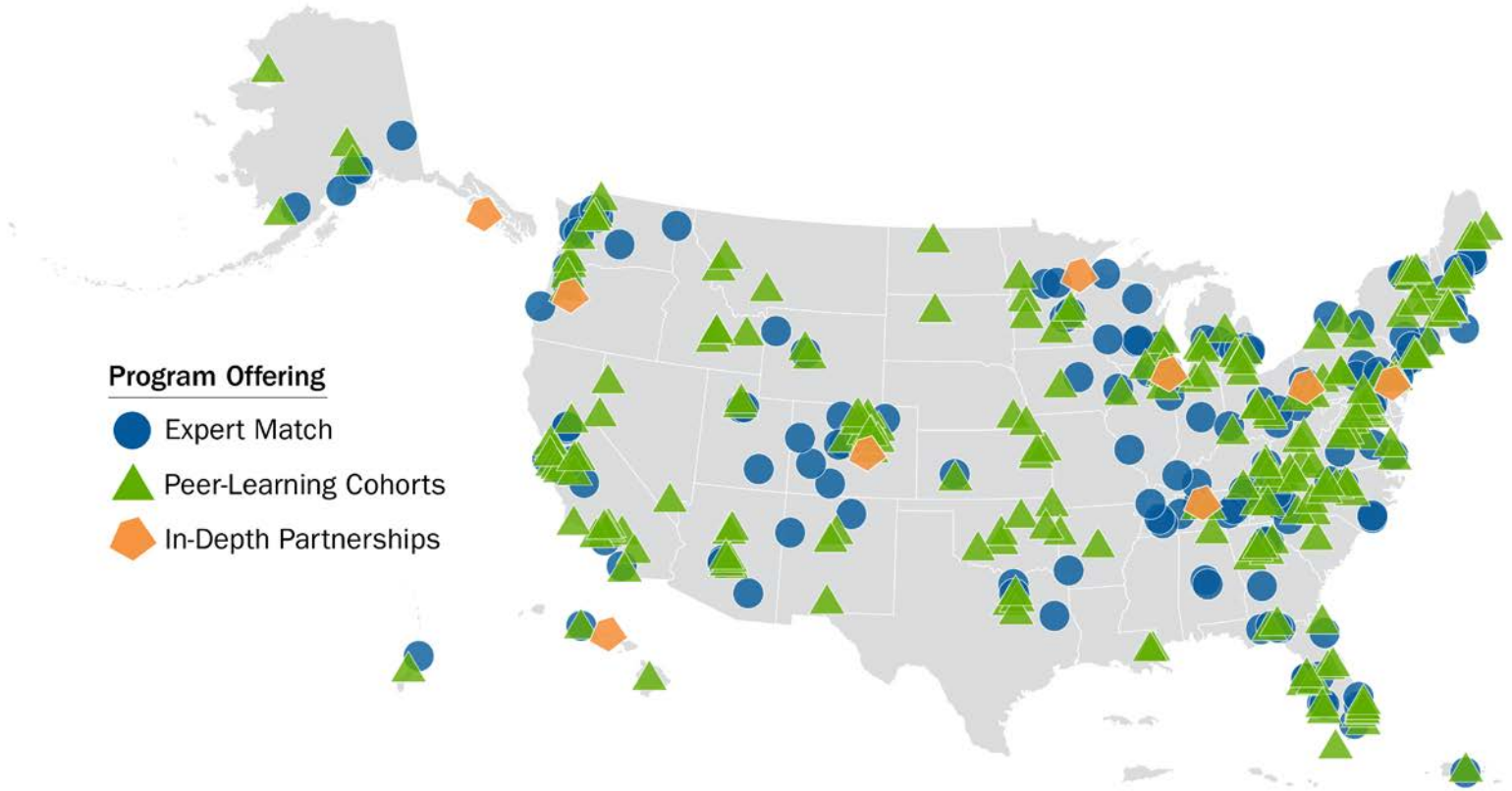
Six-months of regular convenings where cohorts of up to 15 participants exchange strategies and best practices, learn in a collaborative environment, and workshop plans and strategies to overcome challenges relating to a similar energy topic. Eligibility varies by cohort topic.
Supports about 100 communities per year.

Expert Match ~3 months

Short-term, no-cost technical assistance for communities seeking to answer near-term energy questions. Eligible entities include local governments, utilities, community-based organizations, schools, and nonprofits.
Supports about 200 communities per year. Applications are accepted all year on a rolling basis.

www.nrel.gov/e2c

E2C Program Participants

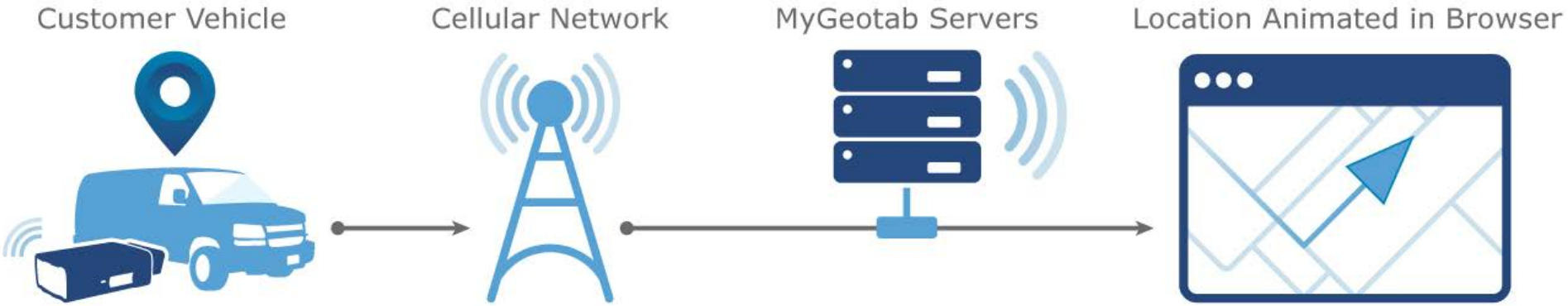


Objectives

During this Expert Match request, the National Laboratory of the Rockies (NLR) provided technical input to assess retrofitting considerations and develop a strategic plan for deploying EVs and EVSE. This presentation provides technical insight on how Prince William County (PWC) might optimize fleet operations through the integration of telematics data.

Telematics Overview

Type	Installed by	Best For	Example
Original Equipment Manufacturer (OEM)	Manufacturer	Homogeneous fleets	Ford Pro / GM OnStar
Aftermarket	Third-party	Long term management of fleets	Geotab, Samsara, Verizon Connect
Temporary	Use/fleet	Short-term use, trials	Verizon Connect



https://www.geotab.com/blog/what-is-telematics/

Telematics Data Elements

Safety and Driver Efficiency Features

- Driver coaching
- Driver safety applications
- Collision notification
- Aggressive driving
- Idling

Vehicle and Driver Tracking Features

- Real-Time GPS location
- Geofencing
- Driver identification
- Device tampering detection

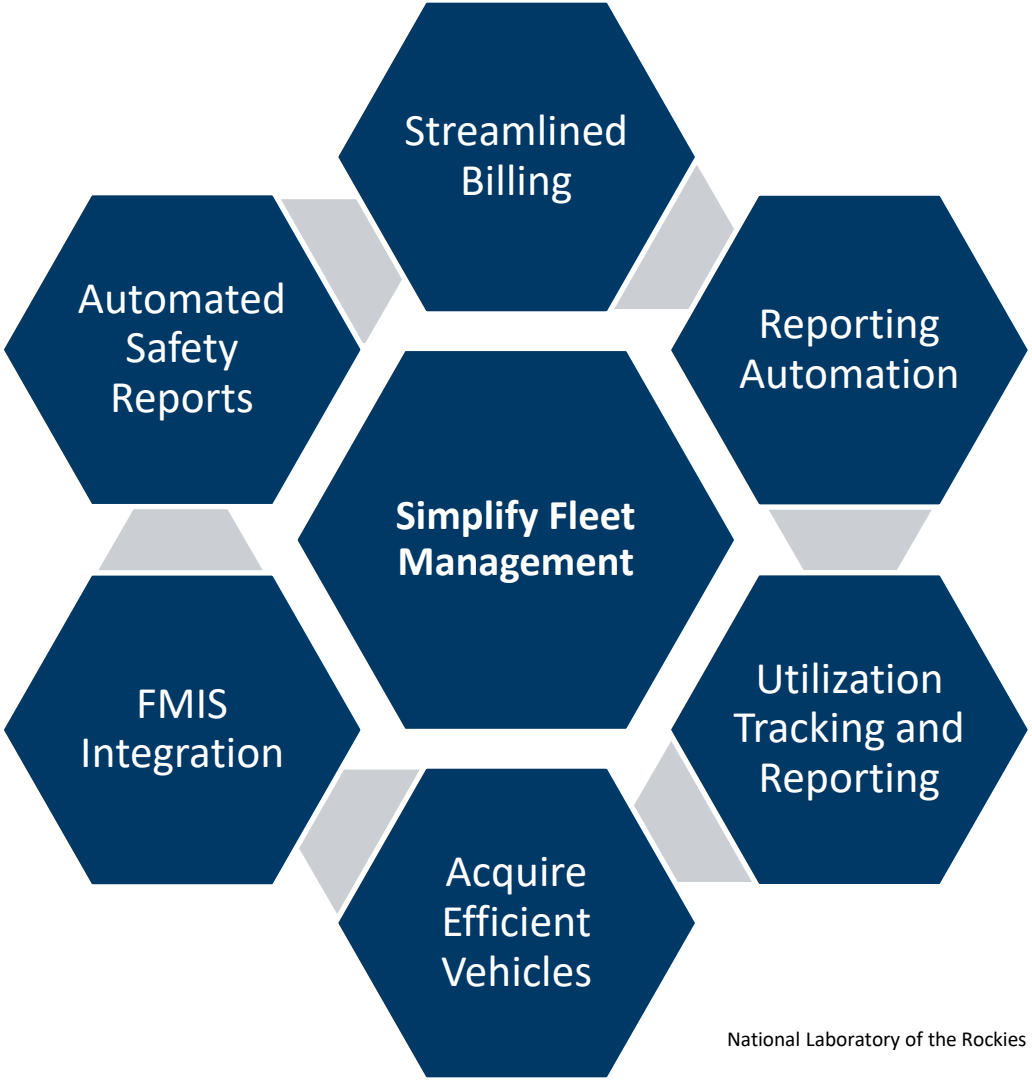
Utilization Features

- Miles traveled
- Number of days or trips used
- Total engine hours
- Fuel and energy Consumption

Vehicle Maintenance

- Vehicle fault data
- Battery and engine status
- Scheduled maintenance alerts

Telematics can make it easier to manage fleets by automating routine tasks and providing real-time data. This helps reduce paperwork, improve efficiency, and support smarter decision-making.



Using Telematics to Support Vehicle Acquisition Planning

Right-Sizing

Optimize fleet size and vehicle type to reduce acquisition/operating costs.

Motor Pool

Identify underutilized vehicles and support shared-use models to reduce redundant assets.

Transition to Electric Vehicles

Use tools like Geotab's electric vehicle suitability assessment to identify internal combustion engine vehicles that can be replaced by electric vehicles based on actual usage patterns.

Opportunities for Cost Savings

Fleet Oversight and Labor Savings

Driver Fuel Efficiency

Collision Rate Reduction

Maintenance Cost Reduction

Improved Compliance and Reporting Accuracy

Additional Information

- While older, NREL's 2017 report *Telematics Framework for Federal Agencies: Lessons from the Marine Corps Fleet* provides quantifiable examples of telematics cost savings. NREL organized this report into three primary components of telematics: safety and driver efficiency, simplifying fleet management, and vehicle acquisition support. For each of these three components, NREL provided a "Cost Savings" section that includes *potential* annual dollar savings per vehicle from using telematics.

Measure	Annual Cost Savings
Safety	$553
Idling	$143
Aggressive driving	$112
Reduced [Vehicle Miles Traveled]	$123
Maintenance	$99
Reporting	$312
Inventory optimization	$695
Total	**$2,307**

Table 12. "Potential Per-Vehicle Cost Savings from Telematics."

Additional Information

- U.S. Department of Transportation's Intelligent Transportation Systems Joint Program Office's *Telematics Technology Provides Many Benefits to Trucking Fleets* article discusses the benefits of an electronic logging device telematics system. From the "Findings" section:
  - *"Saving even a few minutes of idling time across a fleet leads to huge fuel savings. Better fleet and driver utilization can lift equipment availability to meet customer demand with existing assets. Connecting with drivers via cab-mounted tablets, fleet managers can instantaneously update drivers on detours, reroute them around heavy traffic and direct them to preferred fuel vendors."*

Telematics Implementation Case Studies

New Mexico Utility Sparks Change with Fleet Electrification (AFDC)

- This case study covers the Public Service Company of New Mexico, which, as of the case study's publication in March 2017, provided electricity for more than 500,000 residential, commercial, and tribal customers. **Public Service Company of New Mexico's telematics system—which is used to monitor fleet performance, track driver behavior, and inform driver training—has improved the fleet's average fuel economy by 15%.**

The Role of Telematics in Today's Government Fleet (Element)

- This report from Equalis Group's Element Fleet Management highlights three case studies. You may be particularly interested in the Seattle case study beginning on PDF page 7. In the "Results" section, Philip Saunders, Deputy Director of Logistics and Emergency Management and the Green Fleet Program, mentions saving $2 million in fuel because of telematics integration. You may also refer to the New York City case study on PDF page 9, which discusses cost savings from collision avoidance.

Budget Justification Example

- For an example of how one city justified expanding fleet telematics integration, you may refer to the City of San Francisco Board of Supervisors August 2020 *Policy Analysis Report: Vehicle Telematics Update*. This analysis organizes quantifiable cost savings data across several telematics categories: speeding, aggressive driving behavior, underutilized vehicles, emissions and maintenance, take-home vehicle and misuse, and rental vehicle use. It is important to note that the City's Budget and Legislative Analyst Office noted that simply installing the telematics devices did not lead to the highest potential cost saving, as robust reporting mechanisms for City departments and effective management and analysis of the data is required for the devices to be maximally effective.

Budget Justification Example (continued)

- For overarching cost savings, you may refer to the "Executive Summary" beginning on PDF page 1. Specifically, on PDF page 4:
  - *"More could be done to curb dangerous driving behavior, reduce vehicle emissions and lower spending and potential waste related to vehicle use. Combined, we estimate that these factors cost the City $10.5 million annually. These costs could be reduced if Central Shops reported and followed up on more detailed and effective metrics from the telematics system… To achieve this, we recommend that the Board of Supervisors consider requesting a minimum set of specific and detailed measures for Central Shops to track and report… Central Shops assume these duties with the addition of two staff positions costing an estimated $340,348 in annual salary and benefits. We expect that if our recommendations are implemented in full, that the cost of these added positions would pay for themselves by reducing annual savings related to vehicles use and liability claims across the City."*
- For an example of cost savings from a particular telematics component, you may refer to the "Underutilized Vehicles" section on PDF page 22, which discusses how reducing underutilized vehicles can save vehicle, fuel, and maintenance costs. Specifically:
  - *"Currently, Central Shops uses the telematics system to report on the use, frequency, and characteristics of vehicles. In their monthly reports to departments they classify vehicles according to their utilization rates of days used, trips taken, and mileage. Central Shops said that '33 vehicles have been identified as underutilized using telematics data and confirmed to have been taken out of their fleet during this process.' **Aside from the value of their vehicle and fuel savings, these reductions saved an average in annual maintenance costs of roughly $2,750 per turned-in vehicle, which results in an estimated maintenance cost savings of $90,750 per year."***

Thank you

NLR/OT-5400-98275

This work was authored by the National Laboratory of the Rockies for the U.S. Department of Energy (DOE), operated under Contract No. DE-AC36-08GO28308. Funding provided by the Energy Grid Integration Office within DOE's Office of Energy Efficiency and Renewable Energy. The views expressed in the article do not necessarily represent the views of the DOE or the U.S. Government. The U.S. Government retains and the publisher, by accepting the article for publication, acknowledges that the U.S. Government retains a nonexclusive, paid-up, irrevocable, worldwide license to publish or reproduce the published form of this work, or allow others to do so, for U.S. Government purposes.

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