



# “Best Hometown in the Army”

---



## Fort Carson, The Mountain Post Sustainable Transportation Planning

Garrison Commander: COL Eugene B. Smith

Sustainability Planner: Christopher Juniper

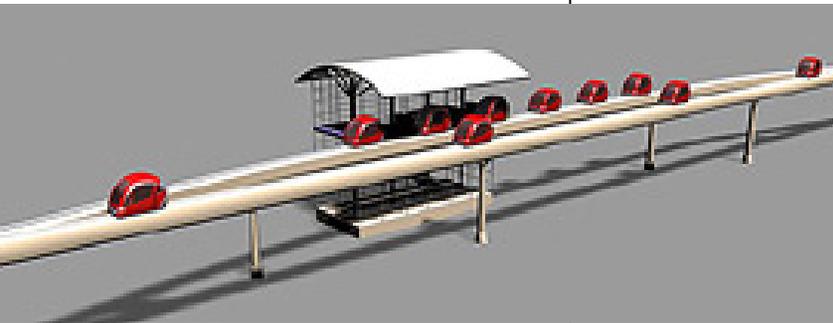
18 June 2008

***Our Mission: A professional team of teams dedicated to sustainable hometown management, community well-being, and mission readiness***

***Leading Change for Installation Excellence***



# Fort Carson Sustainability Leadership



***Our Mission:*** A professional, efficient, and sustainable approach to project management, community well-being, and mission readiness

***Leading Change for Installation Excellence***



# Fort Carson Sustainability Leadership

---



## Overview

Established 1942

Currently hosts 19,000 active duty military personnel in  
10 units

Planned growth: 30,000 personnel by 2011

Approx. 140,000 acres just south of Colorado Springs  
237,000 acres at Pinon Canyon Maneuver Site



## 2027 Sustainability Goals Established at 2002 Community Sustainability Conference

GC COL Trombitas Committed to 2027 Goals and  
Annual Public Reporting

Leading to Annual Sustainability Conferences  
and Annual Progress Report

Implemented Through SEMS  
(Sustainability and Environmental Mgmt System)

5-Yr Objectives

2-Yr Workplans



# Fort Carson Sustainability Leadership

---



## Adopted 2027 Sustainability Goals

### Performance Goals:

Zero Waste (solid waste, hazardous waste, wastewater)

100% Renewable Energy

75% Reduction Water Purchases

Sustainable Transportation

Sustainable Procurement

Sustain Mission Capability (land mgmt)



## Adopted 2027 Sustainability Goals Process Goals

Awareness and Competence Training

“Community of One” and Partnerships

Develop SEMS = Sustainability & Environmental  
Management System



## 2007: Integration with Fort Carson Strategic Plan

Mainstreams Sustainability Goals

Distributes Sustainability Leadership

### **5 Strategic Goals:**

Workforce Development

Mission Readiness

Community Well-being

Hometown Management

Sustainability



# Fort Carson Sustainability Leadership

---



## Sustainable Transportation: Context

### Executive Order 13423 (Jan 07)

“federal agencies...will conduct their activities...in a sustainable manner”

“reduce GHG emissions through reduction of energy intensity 3% annually through 2015 or 30% by 2015 relative to 2003”

“Agencies will reduce fleet consumption of petroleum products 2% annually, increase non-petroleum use 10% annually, and use plug-in hybrid vehicles when commercially available”



# Fort Carson Sustainability Leadership

---



## Sustainable Transportation: Context

### Department of Defense (DoD)

#### Green Procurement Plan

Procurement rules **REQUIRE** you to purchase green products and services in the following categories:

**Fleet vehicles and fleet maintenance products**



# Five Year Plan



## Objective 2.1: Reduce Single Occupant Vehicle (SOV) non-mission trips

- **Target by FY12** : SOV vehicle trips reduced 25% per capita, baseline 2008
- **Target by FY17** : SOV vehicle trips reduced 40% per capita

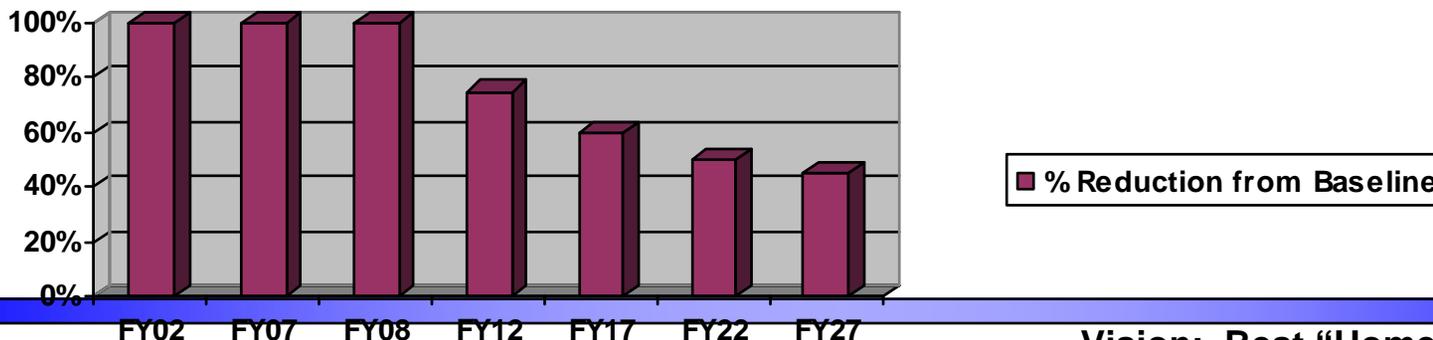
### Initiatives in Support of Objective 2.1 (FY08/FY09)

**Initiative 2.1.1:** Adopt a Sustainable Transportation Plan

**Initiative 2.1.2:** Integration of regional/state transportation planning

**Initiative 2.1.3:** Promote SOV alternatives

**Initiative 2.1.4:** Encourage and provide for use of mass transit





# Five Year Plan

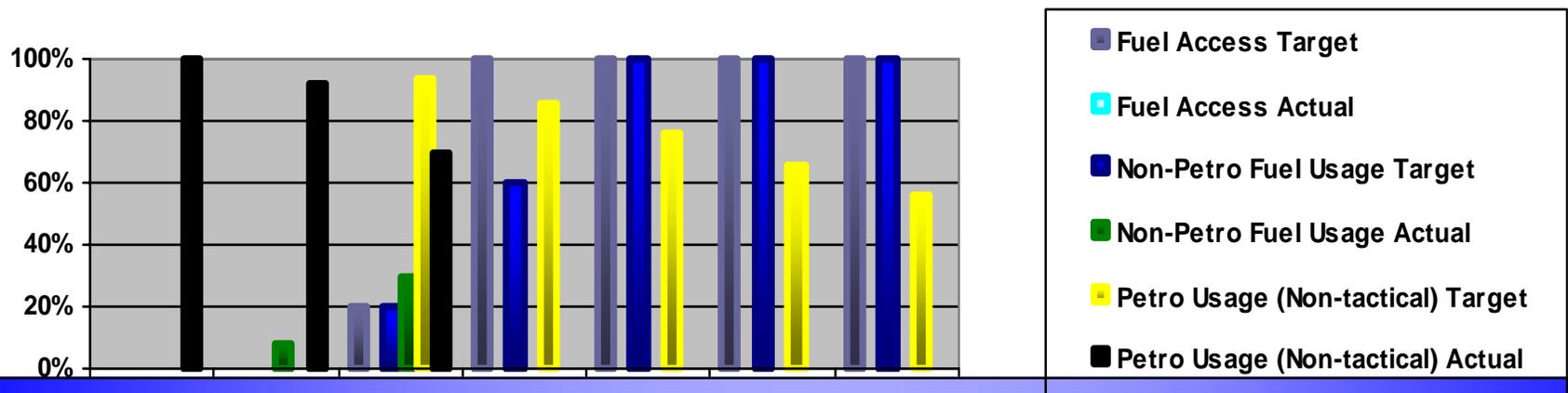


## Objective 2.2: Sustainable Transportation Fuels

- **Target by FY12:** (1) 100% Access by Fort Carson users to sustainable transportation fuels (2) 10% annual increase in non-petroleum fuel usage from 2006 baseline (3) 2% annual decline in petroleum usage by Fort Carson non-mission operations (from 2005 baseline).
- **Target by FY17:** Continue this level of performance

### Initiatives in Support of Objective 2.2 (FY08/FY09)

- Initiative 2.2.1:** Reduce lifecycle fossil fuel inputs and greenhouse gas
- Initiative 2.2.2:** Sustainable fuel infrastructure development
- Initiative 2.2.3:** Sustainable fuel pilot projects



Vision: Best "Hometown" in the Army



# Five Year Plan



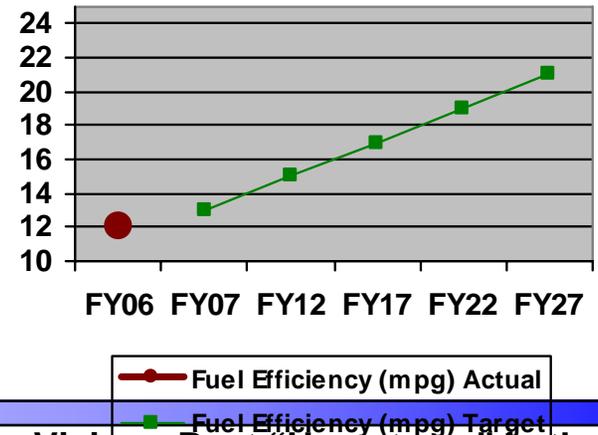
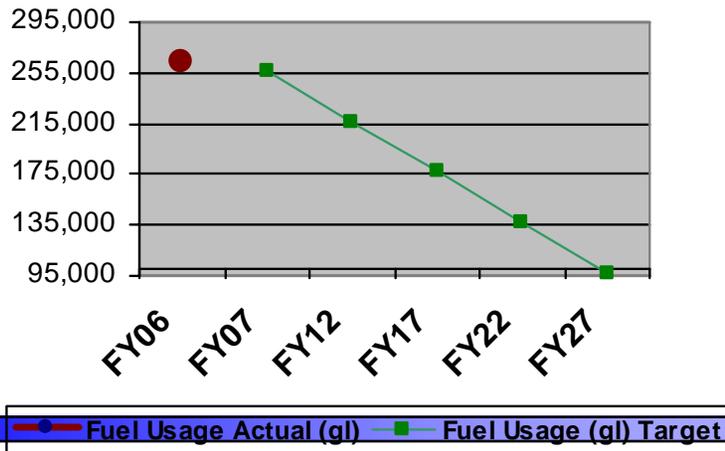
## Objective 2.3: Transportation Fuel Efficiency

- **Target by FY12:** (1) Improve non-tactical government fleet average fuel economy annually by at least 3% and (2) Improve non-tactical government actual fuel usage annually by at least 3% (baseline FY06)
- **Target by FY17:** Continue this level of performance

### Initiatives in Support of Objective 2.3 (FY08/FY09)

**Initiative 2.3.1:** Measure and manage government fleet average fuel economy (non-tactical)

**Initiative 2.3.2:** Continued conversion of government fleet





## 2027 Sustainable Transportation Plan

under development with partners - completion FY09

- Includes first Sustainability Life-Cycle Performance Analysis of potential vehicle fuels (social, economic and environmental impacts) - July 08
- Initiated pedestrian and bicycle (low-impact vehicle) whole-system planning
  - Partnering on congestion relief projects off-Post
    - Expanding alternative fuel fleet
  - Exploring advanced transit options including PRT



## 2027 Sustainable Transportation Plan

=

Traffic Congestion Plan

+

Bike and Low-Impact Vehicle Plan

+

Transit Plan

+

Sustainable Vehicle Fuels Life-cycle Performance  
Analysis and Infrastructure Development Plan

+

Fort Carson Sustainability Goal Plans

+

Regional Transportation Plans



## 2027 Sustainable Transportation Plan

### Sustainable Vehicle Fuels

Evaluated using customized Sustainability Performance Life-cycle Management System (Juniper, 2003)

Key questions: What is the life-cycle sustainability performance of likely vehicle fuels, including ways of using them (e.g. ICE, batteries, air compression, etc.)????

What vehicle fuel infrastructure should be built to support sustainable transportation?



## 2027 Sustainable Transportation Plan

### Sustainable Vehicle Fuels

#### Fuels Analyzed:

Electricity from nuclear, coal, natural gas, renewables

Diesel from petroleum, sustainable biodiesel, biodiesel

Ethanol from sustainable sources, and “ethanol”

Gasoline from petroleum, coal



## 2027 Sustainable Transportation Plan

### Sustainable Vehicle Fuels

#### Qualitative Analysis Categories

Nature: Climate change; Water; Ecological health

Economy: Life-cycle energy efficiency; Economic impacts; Employment impacts

Well-being: Pikes Peak region human health; Lifecycle human health

Society: National security; Environmental justice



## 2027 Sustainable Transportation Plan

### Sustainable Vehicle Fuels

GREET Model - Argonne National Labs  
Embedded Life-cycle energy and emissions

#### Well to Wheel Total Energy, BTUs/mile

|                        |        |
|------------------------|--------|
| Gasoline               | 6,027  |
| Ethanol                | 10,835 |
| Diesel                 | 4,889  |
| B20 Diesel/biodiesel   | 5,078  |
| Electricity            | 3,766  |
| Hydrogen (gaseous)     | 3,790  |
| Compressed Natural Gas | 6,061  |



## 2027 Sustainable Transportation Plan

### Sustainable Vehicle Fuels

GREET Model - Argonne National Labs  
Embedded Life-cycle energy and emissions

#### Well to Wheel GHG Emissions, grams/mile

|                        |     |
|------------------------|-----|
| Gasoline               | 484 |
| Ethanol                | 410 |
| Diesel                 | 402 |
| B20 Diesel/biodiesel   | 352 |
| Electricity            | 326 |
| Hydrogen (gaseous)     | 260 |
| Compressed Natural Gas | 320 |



# Fort Carson Sustainability Leadership



## Sustainable Transportation Leadership Initiatives

### 2 MW Solar Array – Earned Governor’s Renewable Energy Award for 2007





## Sustainable Transportation Leadership Initiatives

### **2007-08: ColoSpgs Military Installations (CSMI)**

are promoting major private electricity purchasers  
to make supporting commitments  
to purchase wind power  
through CS Utilities' upcoming Request for Proposal

Fort Carson aiming to replace RECs with wind  
purchase commitment

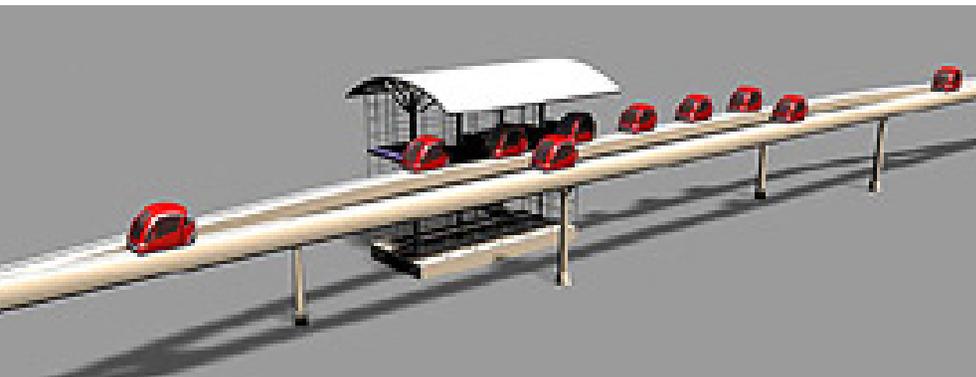
Fort Carson participates on Springs Utilities'  
Technical Advisory Group



# Fort Carson Sustainability Leadership

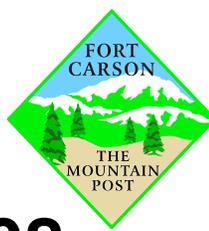


## Personal Rapid Transit Feasibility Study 2008





# Fort Carson Sustainability Leadership



## Pedestrian and Low Impact Vehicle Plan 2008



Vision: Best "Hometown" in the Army

# Fort Carson Sustainability Leadership



## Fort Carson - Pedestrian and Low-Impact System Design Master Plan



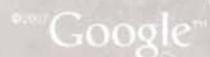
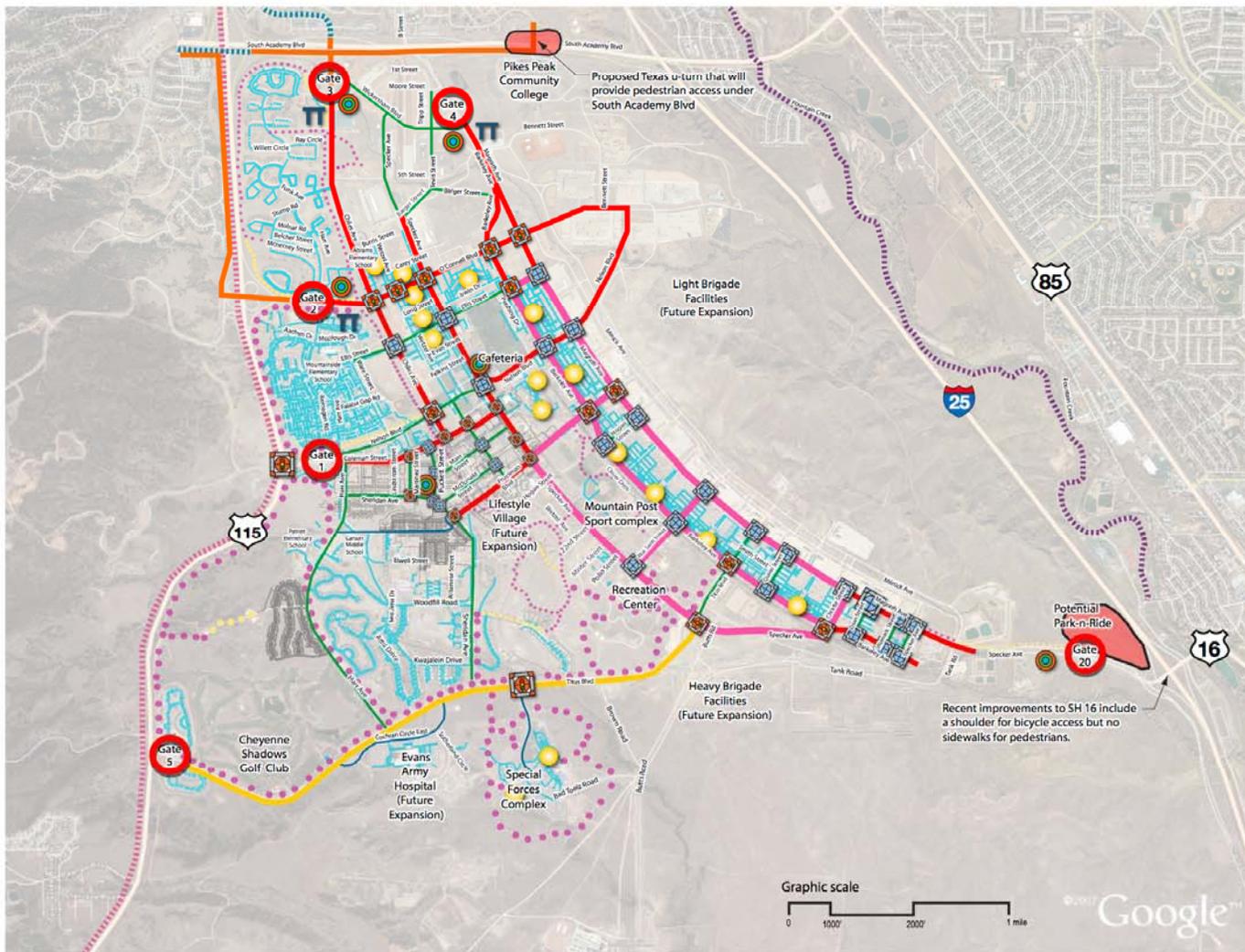
### Legend

- Gateway entrance
- Bike share location
- Secured bicycle storage
- Pedestrian gate access
- Signalized intersection
- Non-signalized intersection

- Existing Circulation patterns
- Existing sidewalk to remain
  - Existing primary recreation connection
  - Existing secondary recreation connection

- Regional connections
- Trail
  - On street bike lane
  - On street bike route

- Proposed circulation patterns
- Primary connection with troop running trail
  - Primary connection
  - Secondary connection
  - On street bicycle/ low impact vehicle lane
  - Primary recreation connection
  - Secondary recreation connection
  - Off post missing connection
  - Sidewalk connection





# Fort Carson Sustainability Partnerships

---



**Garrison Commander  
COL Eugene B. Smith**

Sustainability Program Leaders:  
Tom Warren and Mary Barber

---

Christopher Juniper

Email: [CJuniper@natcapsolutions.org](mailto:CJuniper@natcapsolutions.org)

720-278-1763

***Our Mission: A professional team of teams dedicated to sustainable hometown management, community well-being, and mission readiness***

***Leading Change for Installation Excellence***