THE COST-EFFECTIVENESS OF ZERO-EMISSION VEHICLES FOR MILITARY POLICE PATROL

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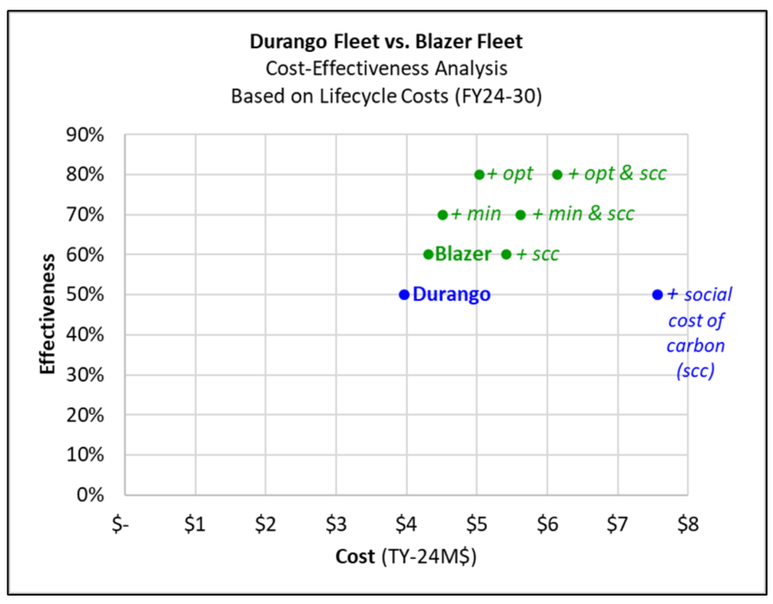
Abstract

Executive Order 14057 directs all federal agencies to transition to vehicles that do not generate carbon pollutant emissions. This order uniquely impacts military police patrol vehicles, which are extensively used to patrol and secure military installations. My research examines the changes Marine Corps Base Camp Pendleton may realize in transitioning to a zero-emission patrol fleet by comparing the predominant gasoline-powered patrol vehicle to a zero-emission patrol vehicle.

What is the change in cost-effectiveness when the Marine Corps transitions from this gas vehicle to a zero-emission one?

Methods

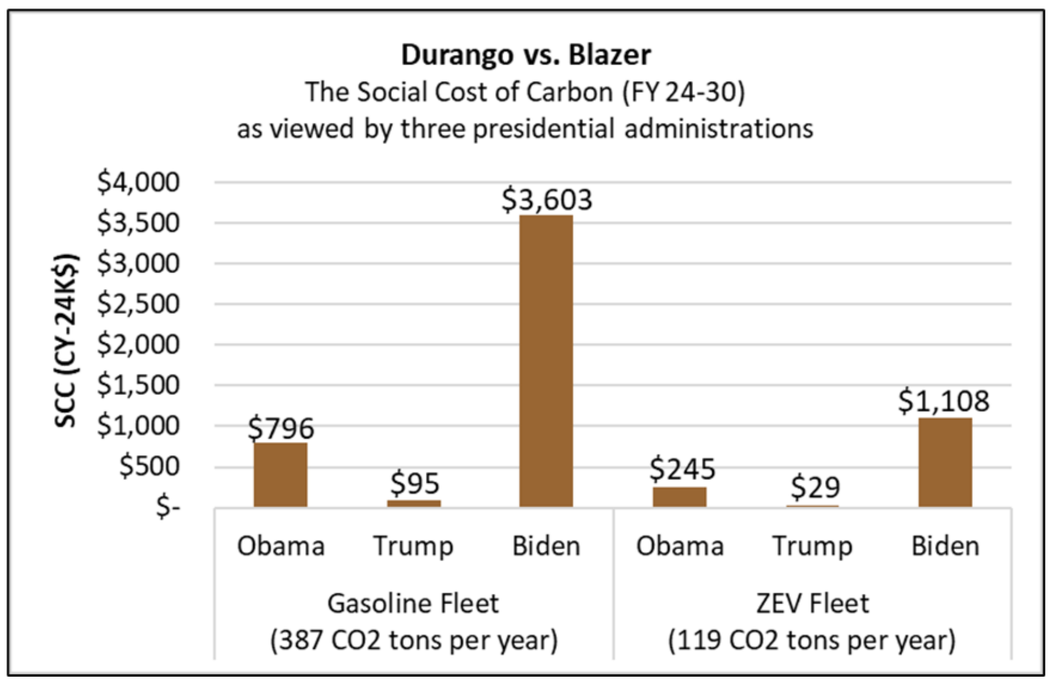
My research is a cost-effectiveness analysis that compares the Dodge Durango Police Pursuit Vehicle (PPV), the most common gasoline-vehicle in use by the Marine Corps, to the Chevrolet Blazer PPV, a new zero-emission PPV. I analyze cost data from the General Services Administration and account for the social cost of carbon. I analyze vehicle dynamics, acceleration, braking, ergonomics, and range using nationally-recognized vehicle test data by Michigan State Police for model year 2024 police vehicles.



Fleet Cost of Ownership (7-Year Period), Inflation-adjusted

Results & Their Impact

My analysis finds that the fleet of Blazer PPVs will cost at least $537,149 more than the status quo over the next seven years (14% increase), but this will provide Camp Pendleton with a vehicle that is 40% 'more effective.' Furthermore, if the optimal charging infrastructure is procured, the differential will increase from $537-thousand to nearly $1.2-million (+27%) and the Blazer's overall measure of effectiveness will increase another 10 percentage points. The cost estimate shifts in favor of the ZEV fleet when the social cost of carbon is considered



Each Fleet's Social Cost of Carbon (7-Year Period) per The Last Three Presidential Administration

Recommendations

I recommend a pilot with a small quantity of Blazer PPVs and validating carbon emissions avoided before the Marine Corps commits to full-scale implementation of a zero-emission fleet.

My results outline a fiscal decision point for Marine Corps officials charged with ZEV implementation as my analysis looks at the cost of the ZEV transition in isolation of competing budgetary requirements.

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