Municipal fleets and plug-in vehicles in Indianapolis

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Introductions

Manuel Mendez
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Operational lead for Indianapolis Freedom Fleet project

Manages day to day operations of Freedom Fleet

Will St. Clair
Vice President

Vision Fleet

Works at Vision Fleet – Indy’s partner for the Freedom Fleet

Partners with public fleets considering EV/AFVs
Agenda

• Introduction to Indianapolis’s “Freedom Fleet”

• Case for change: Electric vehicle economics

• Barriers to EV adoption and Indy’s solutions

• So what? What does this mean for me?
By 2025, Indy will have a 100% post-oil fleet of non-pursuit vehicles.

Mayor Greg Ballard signed Executive Order #6 in December 2012, making Indianapolis the first major city in the US to pledge to convert its entire municipal non-police fleet to alternative fueled vehicles by 2025.
Looking back: Indianapolis’ starting point

- Fleet operations fragmented across departments
- Limited and unreliable data on operations and costs
- Old, fuel inefficient vehicles
- Average of 16.6 MPG
- Costly to maintain vehicles
- Minimal experience with EVs
- 5 under-utilized THINK EVs in fleet prior to launching post-oil effort
- Overall, budget cutbacks had left fleet in a tough spot
Fast forward to 2015: Indianapolis’ results

Largest ever public fleet EV project in US

425 EVs planned across city departments

113 EVs deployed as of March 2015

18,000 gallons of gas avoided to-date
100+ of planned 425 EVs already deployed in Indianapolis departments – remainder will be deployed by early 2016

Number of Freedom Fleet vehicles

- Leaf
- Fusion
- Volt

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Vehicles have traveled 400k miles as of March 2015, 47% of those on electricity and offset 18k gallons of gas as a result.

Cumulative vehicle miles traveled: electric and gas (thousands)

Cumulative gallons of gasoline offset (thousands)
Why is tracking and monitoring so critical for PHEVs?
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When does it make sense to deploy EVs economically? When fuel savings sufficient to offset higher initial purchase price

Key elements driving a fleet vehicle’s total cost of ownership (TCO)

- Fuel
- Infrastructure
- Maintenance
- Telematics
- Financing
- Depreciation

TCO comparison of gas vs. electric (high VMT)

- Higher purchase price
- Lower fuel cost
EVs can economically replace high mileage vehicles 1-for-1 and low mileage vehicles if combined with right-sizing.

**TCO per mile of annual VMT for a representative municipal fleet**

1. **Low VMT vehicles (<6k annual VMT)**: These vehicles can be right-sized through pooled use to fewer, higher utilized EVs at a lower cost per-mile.

2. **Mid VMT vehicles (6-10k annual VMT)**: These vehicles are generally left as-is; EV fuel savings are not high enough to cover the additional capital cost.

3. **High VMT vehicles (>10k annual VMT)**: These vehicles often can be replaced 1-for-1 with EVs: fuel savings sufficient to cover additional capital cost.
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Context setting: Fleets should be an ideal fit for electric vehicles

- Total cost of ownership mindset
- Route predictability
- High vehicle utilization
- Central parking facilities
- Low electricity rates
Why aren’t more fleets doing this? Numerous constraints – in financing, deploying and operating EVs – hold back adoption.

- Uncertain operational savings
- Higher upfront costs / Lack of financing
- Tax credit availability
- Deployment complexity / Infrastructure
- Suboptimal driver behaviors
- Lack of bandwidth for new projects
- Low confidence in service levels
- Limited EV experience

For further discussion
Indianapolis’ solutions (I): Deployment complexity/Infrastructure

**Obstacle(s)**

- Deployment complexity / Infrastructure

**Solutions in Indy**

- Strategic site selection
- Systems-level optimization
- Use of existing charging infrastructure
- At-home charging at level I
- Few behind-the-meter upgrades
Indianapolis charging: Level I at-home charging used extensively
Indianapolis’ solutions (II): Higher upfront capital cost; Tax credits

Obstacle(s)

Higher upfront costs / Lack of financing

Tax credit availability

Solutions in Indy

Private project partner

Tax credit pass-through

Lease / Rental agreement model

Low upfront payments

Right-sizing of underutilized vehicles

Right-typing to match vehicle with use case
How to address these obstacles? Look to other markets that faced similar challenges

Residential solar PV capacity installed in CSI Program
(nameplate capacity – megawatts)

By bundling costs of owning and operating a solar system, assuming operational responsibility and promising a lower rate, key obstacles were eliminated

Source: California Solar Initiative data; Dates based on first CSI filing for each project
Indianapolis' solutions (III): Uncertain operational savings

Obstacle(s):

Uncertain operational savings

Solutions in Indy:

- Rigorous total cost of ownership baseline
- EV costs (cars, fuel, mtce) below baseline
- 3rd party guarantees vehicle performance
- Shared savings for higher efficiency
- Detailed tracking through telematics
Indianapolis’ solutions (IV): Suboptimal driver behaviors

Obstacle(s)

Suboptimal driver behaviors

Solutions in Indy

- Up-front one-on-one training for drivers
- Detailed monitoring through telematics
- Real-time access to data by fleet managers
- Regular ‘score-cards’ of driver efficiency
- Incentive for higher efficiency (giftcards)
- Consistent communication(s) & education
Detailed monitoring through telematics
Indianapolis’ solutions (V): Low confidence in service levels

Obstacle(s)

- Low confidence in service levels

Solutions in Indy

- Pilot efforts up front to validate plans
- Driver focus groups and engagement
- Careful selection of use cases
- Up-fits as appropriate (e.g. gun safe)
- EV champions in each department
- Responsive and flexible in resolving issues
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Summarizing it all: Learnings from Indianapolis

- New technology requires a new approach
- Difficult to achieve bold goals acting alone – find capable partners
- Comprehensive strategy needed – can’t just hope for success
- Data and monitoring is critical to delivering expected value
- Technology is proven – good, battle-tested EV options available
- Potential financial benefits are substantial when done right