AGENDA

Electric Vehicles North Texas (EVNT)
Stakeholder Meeting

North Central Texas Council of Governments
Regional Forum Room
Tuesday, February 16, 2016
10:00am – 11:30am

1. **Introduction**
   Rachel Linnewiel, NCTCOG

2. Recent Developments:
   a. **EVNT Update**
      Rachel Linnewiel, NCTCOG

   b. **City of Houston's Electric Vehicles FleetShare: Transportation By The Plug**
      Jedediah Greenfield, City of Houston

   c. **Alternative Deployment Strategies for Alternative Fuel Vehicles**
      James Tillman, VisionFleet

3. **Discussion: Overcoming Barriers to EV Adoption in Fleets**
   All

4. **Other Items**
   All

5. **Adjourn**
   Rachel Linnewiel, NCTCOG

EVNT Goals, 2015-2016

1. Increase EV registration in the 10-county nonattainment area by 100% over September 2015 levels by the end of September 2016.
2. Coordinate with EVNT stakeholders to host one National Drive Electric Week event between September 10-18, 2016, with an overall goal of increasing attendance to 200 EVs and 400 total attendees.
3. Develop region-specific outreach materials with emphasis on economic benefits in addition to air quality/environmental benefits. Materials may include region-specific fact sheets; an infographic on financial return on investment, job creation through EV development and sales; and updated website resources.
4. Produce at least one video for educational/marketing purposes.
5. Identify and disseminate best management practices related to integrating EV-Ready guidelines into building codes for both residential and commercial properties, with particular focus on multifamily residential properties, with a goal of hosting at least one workshop/meeting on the topic.
6. Assess infrastructure “gaps” and coordinate with industry partners to identify solutions, with data to be presented by GIS map and a white paper addressing EV-based business case studies. This may be completed by conducting geographic information system (GIS) analysis of EV registration data versus existing EVSE sites; target analyses include evaluating the locations of major employment centers and typical EV range. Integrate feedback from EV-based businesses. DFWCC has established a goal of 2 DC fast charger EVSEs being installed at or adjacent to the airports.
7. Engage local businesses in the Workplace Charging Challenge with a goal to sign up 5 additional business, for a total of 12 partners from the DFW area. Maintain momentum on the topic in follow-up to the July 30, 2015, Workshop.
8. Establish partnerships with rental car facilities and service centers to incentivize use of EVs as rental/loaner vehicles and increase driver exposure and, consequently, adoption.
9. Identify barriers to EV adoption among regional fleets and document EV adoption among 5 local fleets. Reach out to 3 fleets that already use EVs to engage in helping relay best practices.
10. Attend at least one North Texas Electric Auto Association meeting each quarter to provide updates on EVNT activities as well as to receive feedback from members on critical issues, barriers, and opportunities and engage with other local interest groups as appropriate.
11. Goals for the next three-to-five years are: develop multiple videos for educational and marketing purposes, develop an intracity electrification network between the DFW, Houston, and Austin-San Antonio urban centers, pursue additional infrastructure deployment if needed, and engage transit agencies and universities in future infrastructure/rental/car loan projects. Additional goals will be developed as 1 year goals are completed and analysis indicates areas of additional needs.

Meeting Summary
North Texas Solar Ordinance Roundtable Meeting

North Central Texas Council of Governments
Transportation Council Room
Tuesday, February 16, 2016
10:00 a.m. – 11:30 a.m.

Attendees:

Cliff Mauvais – Eastfield College
Michael Brantley – Eastfield College
John Gunter – Eastfield College
Barry Stevens – TBD America
Craig Eppling – General Motors
Rick Maybury – General Motors
Santiago Solis – City of Dallas
Israel Blanco – City of Dallas
Arthur Groethe – City of Dallas
Dave Aasheim – Chargepoint
Rick Bollar – North Texas Electric Auto Association
Tom Anthony – Oncor
Huey Hamilton – Oncor
James Orenstein – independent
Wayne Corum – City of Fort Worth
Jay Squyres – Apex Express
Emily Conway – DFW Airport

Agenda Items:

1. Introductions
2. EVNT Update
3. City of Houston's Electric Vehicles FleetShare: Transportation By the Plug
4. Alternative Deployment Strategies for Alternative Fuel Vehicles (Vendor Presentation, VisionFleet)
5. Roundtable Discussion: Overcoming Barriers to EV Adoption in Fleets
6. Conclusion

Action Items:

1. Distribute meeting presentations by posting to EVNT website – *NCTCOG Staff*
2. Continue development of Fact Sheet (economics focus) and EVSE Gap Analysis – *NCTCOG Staff*

Additional Notes:

- Houston's FleetShare program is a success largely due to in-house training, dedicated staff, and ongoing follow-up.
- The VisionFleet Program does not have a "hard minimum" for fleet size. The preference is for a minimum of 20 vehicles, but smaller fleets would be considered on a case-by-case basis.
- There is no minimum purchase for Nissan's fleet incentive of $8,000.
- Plano is considering replacing turn-over vehicles with EVs.

Electric Vehicles North Texas (EVNT) Update

EVNT Stakeholder Meeting

Rachel Linnewiel, Transportation Planner

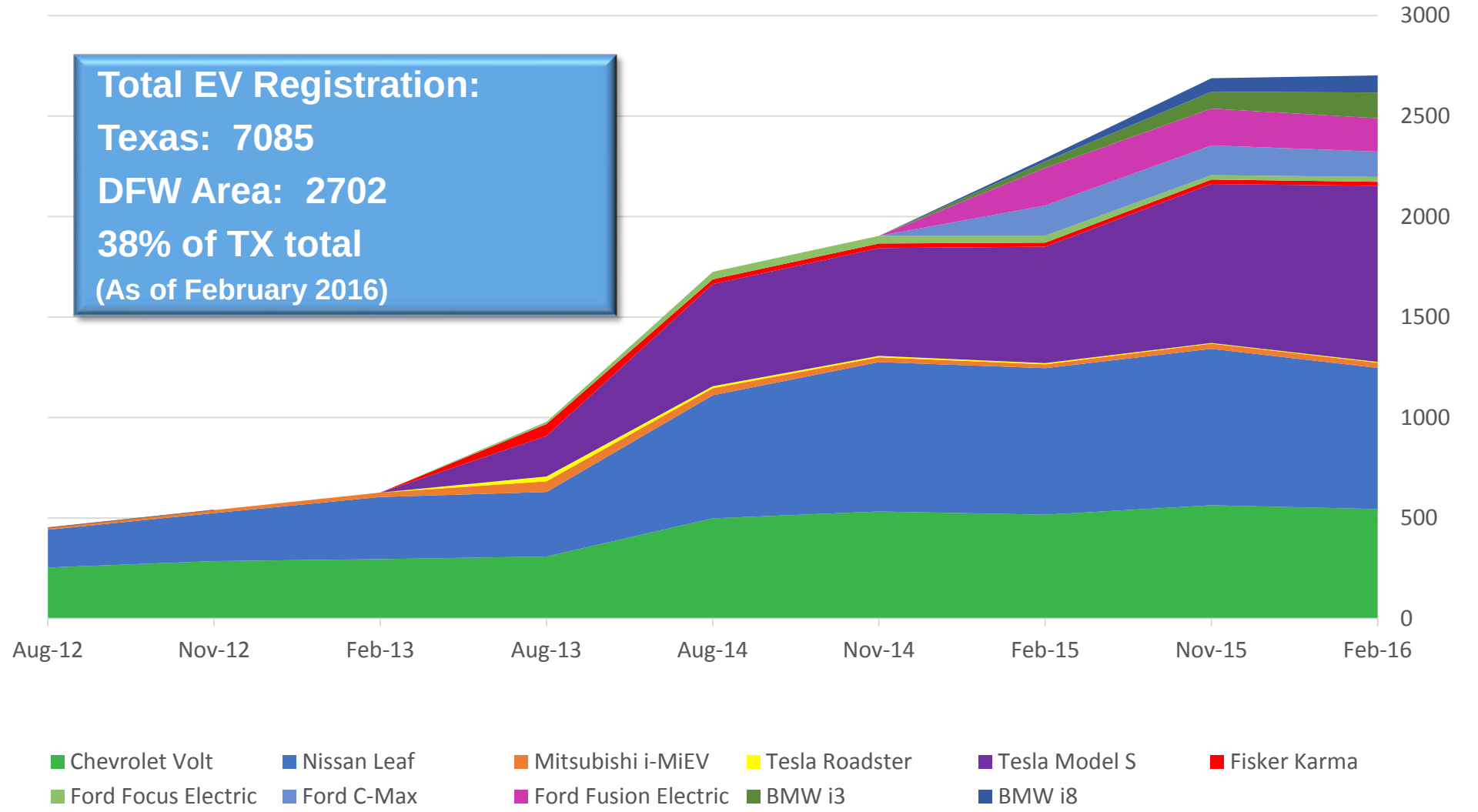
February 16, 2016

evnt
Electric Vehicles North Texas

North Central Texas Council of Governments

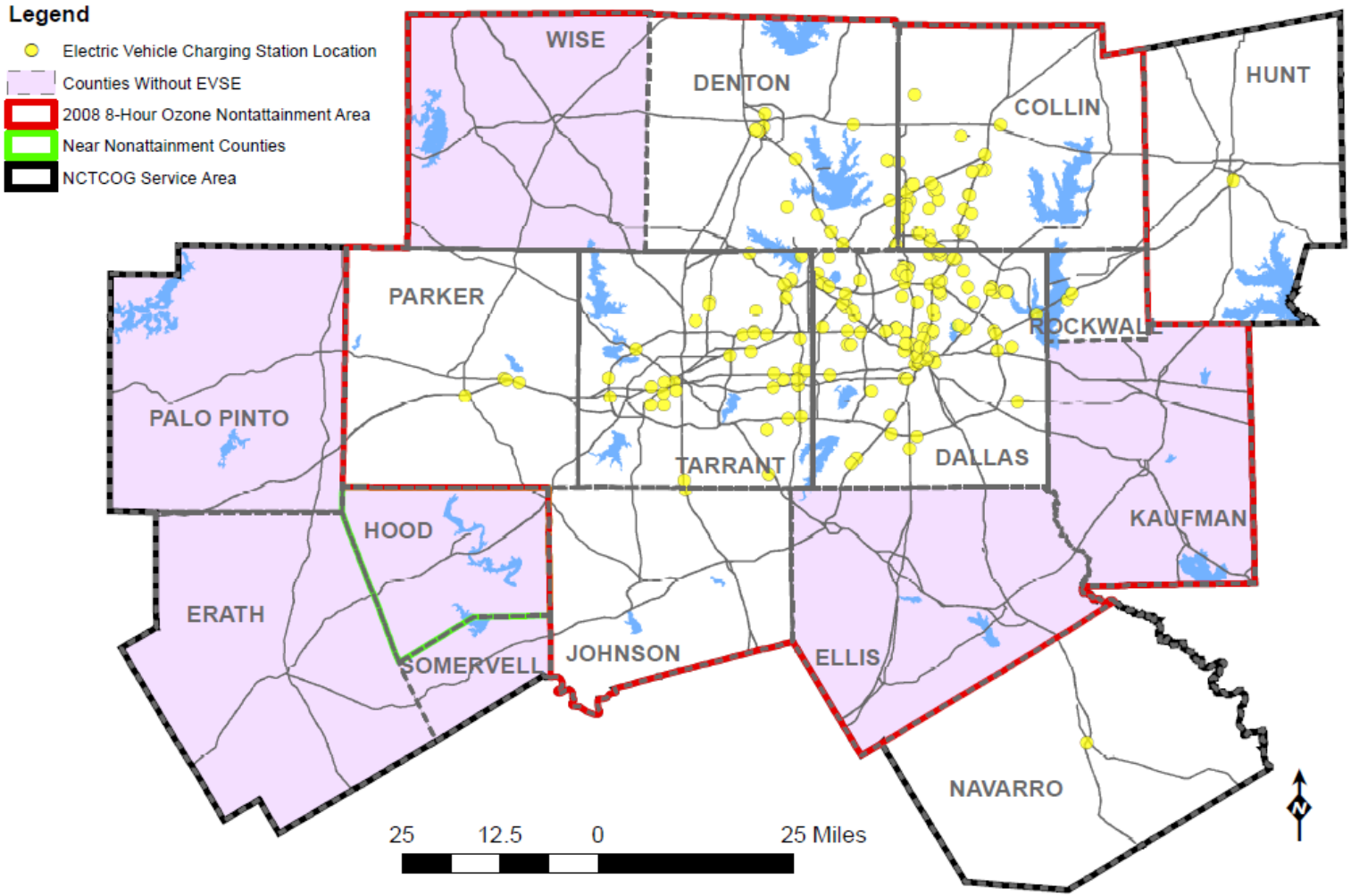
Dallas-Fort Worth CLEAN CITIES

Registration by Electric Vehicle (EV) Model in North Texas

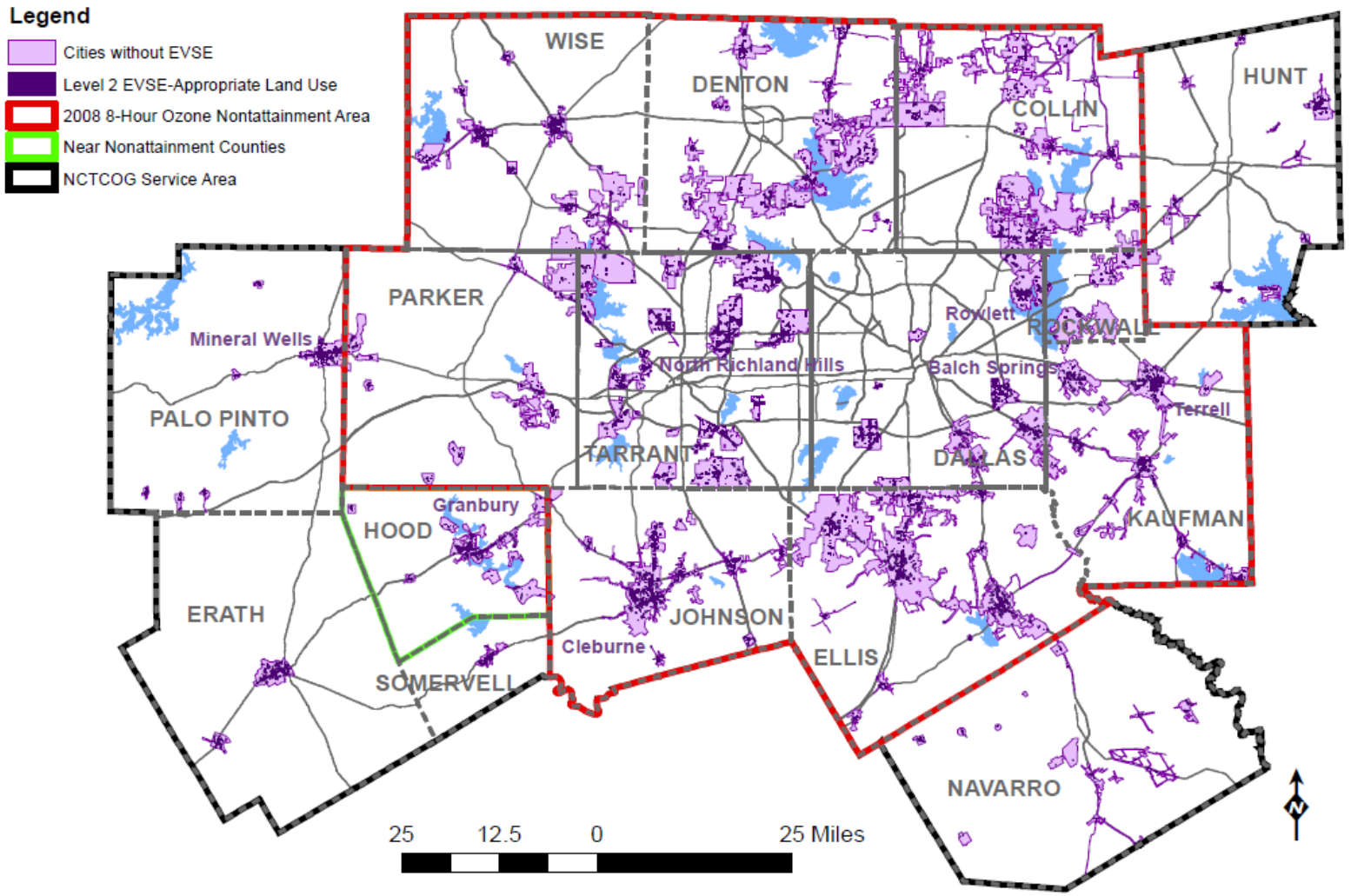


*NCTCOG staff plans to include additional models including: Cadillac ELR, Chevrolet Spark, Fiat 500e, Honda Accord Plug-In & Fit EV, Toyota Plug In Prius, & RAV4 EV

North Texas EVSE Distribution Gaps: Counties



North Texas EVSE Distribution Gaps: Cities



Economics-Focused Fact Sheet

- Comparison of maintenance needs/cost for ICE vs EV in first 100,000 miles
- Statistics about job creation resulting from EV market
- Information about battery replacement technology and costs
- Additional ideas?
- Additional fact sheets?

AFDC Station Locator Update

- Database overall increased by 28% in 2015
- Updated Daily with information directly from the following companies
  - AeroVironment
  - Blink/CarCharging
  - Chargepoint
  - EVgo
  - GE
  - SemaConnect

Alternative Fuel Vehicle Preferred Parking Signs Available

Contact Information

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www.dfwcleancities.org/evnt

Electric Vehicles North Texas

North Central Texas Council of Governments

Dallas-Fort Worth CLEAN CITIES

Other Items?

City of Houston EV's

Transportation by the plug

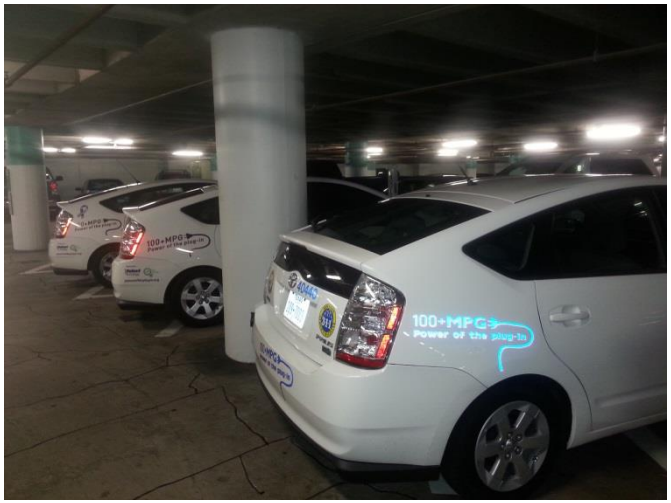
EVNT Presentation

February 16, 2016

Jedediah Greenfield, MPA
Fleet Management Department
City of Houston

Vision of the future

Overview of City of Houston Alt. Fuel



- EV's
  - 27 - Nissan Leafs
- PHEV's
  - 15 Toyota Prius (Hymotion)
- Hybrid
  - 757
    - Prius, Escape, Malibu, Tahoe
    - 2 Recycling trucks
- CNG
  - Refuse truck (Pilot)
- Propane
  - 3 Ford F series
  - 20 mowers

Approximate Total Vehicles – 12,000

Electric Vehicle Supply Equipment (EVSE)

The City of Houston has a total of 110 EVSE's at City facilities

- Blink Network and GridBot Network
- DC Fast Charger
- 37 are dedicated for FleetShare vehicles

City of Houston EV's

FleetShare

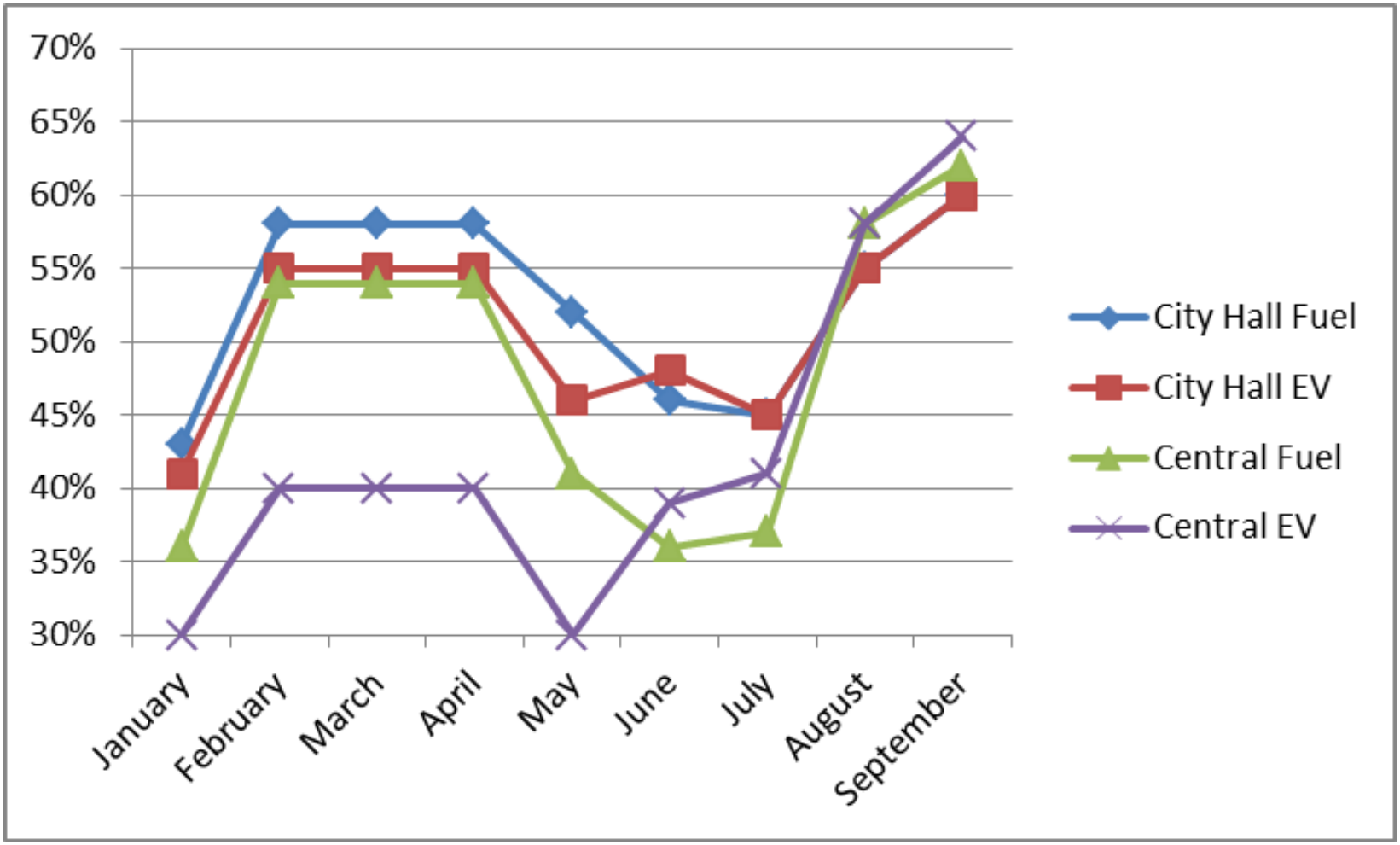
- Online reservation vehicle pool managed by the Fleet Management Department
  - Fast Fleet by Zipcar

EV Management Best Practices

- Ownership
  - Central Fleet Department
- Monitoring
  - Car attendant
  - Carwings app used to ensure full charge
- Education (leading by example)
  - Training class and videos
  - Analyze driving behavior and offer corrections
  - Ride alongs

Vehicle Utilization
Fuel vs. EV

Monday to Friday – 8 a.m. to 5 p.m.



City of Houston
600 Square Miles

Jedediah Greenfield, MPA
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City of Houston
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Alternative Deployment Strategies for Alternative Fueled Vehicles

Vision Fleet Capital, LLC

February 2016

Agenda

- **EV opportunities and challenges**
- **What's involved?**
- **Total Cost of Ownership "TCO"**
- **Working with Vision Fleet**

Agenda

- **EV opportunities and challenges**
- What's involved?
- Total Cost of Ownership "TCO"
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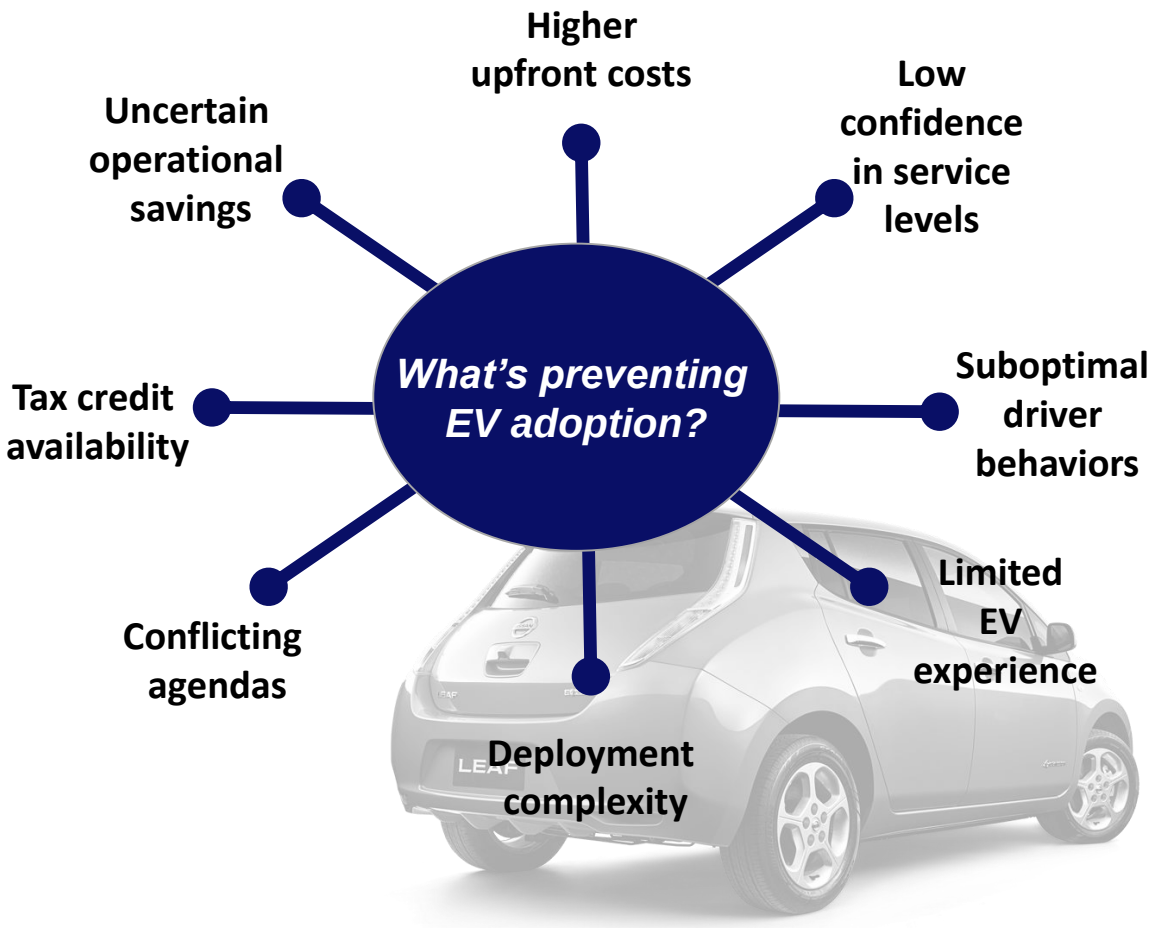
EV Fleets: Opportunities, Obstacles, and Public-Sector Specifics

EVs, on paper, make a lot of sense for fleets,..

- ☑ TCO Mindset
- ☑ Predictable Routes
- ☑ Control Mechanisms
- ☑ Centralized Operations
- ☑ Data-Rich Environment



*Based on hundreds of interviews and "deep dives" with government and commercial fleet managers

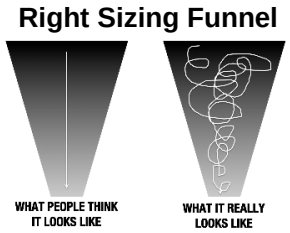
Agenda

- EV opportunities and challenges
- **What's involved?**
- Total Cost of Ownership "TCO"
- Working with Vision Fleet

Deploying EVs without an experienced partner brings about many questions and challenges

Right Sizing –

- How do I crunch the numbers?
- Will departments willingly give up their cars and further reduce numbers?
- What if I need more or less cars?
- Is it just cheaper to keep cars that are already paid for?



RFP Vehicles –

- Which ones best suit our needs for the right price?
- PHEV, BEV, EREV, HEV???
- Fast charging enabled? Which standard?
- How do I monetize tax credits?
- Will leasing companies accept self insurance?

RFP EVSE –

- What features do I need in a station?
- L1, L2, or DCFC and what standard?
- How many do I need? What's the right ratio?
- What if there are not enough?
- What if there are too many resulting in unused parking spaces?
- What about take home vehicles?

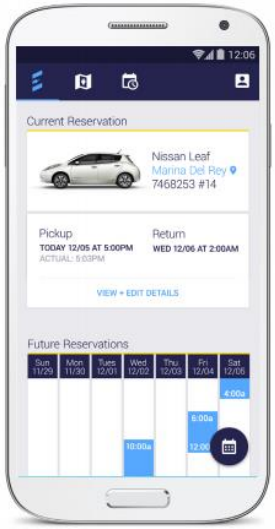
Deploying EVs without an experienced partner brings about many questions and challenges

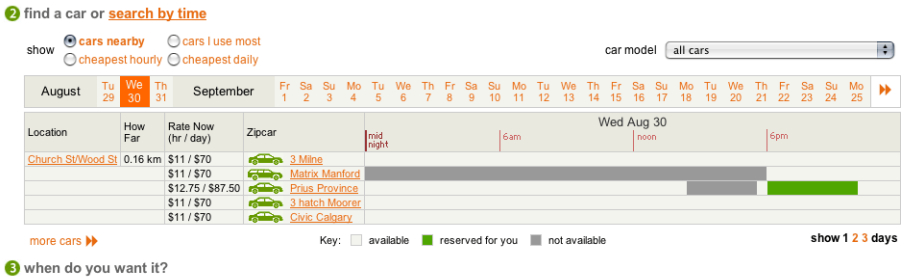
EVSE Installation –

- Do we have adequate power needs?
- How do we upgrade if necessary?
- How do I know if I'm getting a good deal?
- What about take home vehicles? Can they just plug into the wall?
- How do we leverage public infrastructure?

RFP Telematics & Carsharing Platforms–

- How do I weigh hard costs with networking costs?
- Do I need a key machine or other access system?
- Web based? Mobile App?
- On the spot reservations?

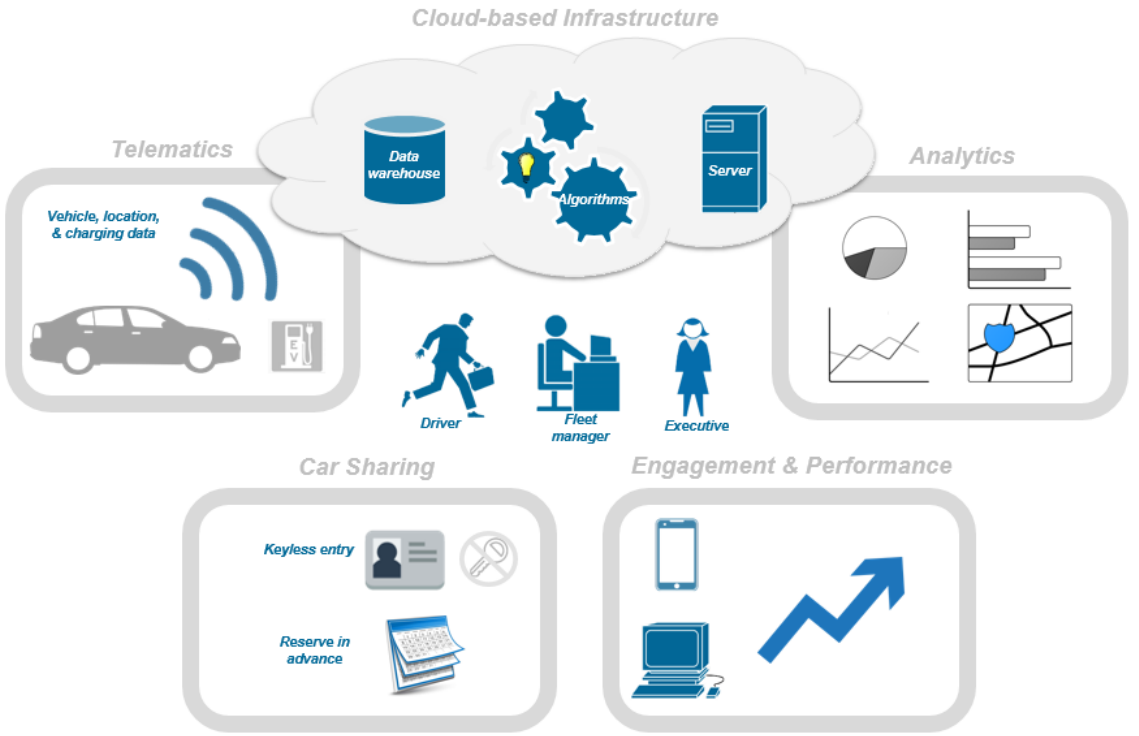




Deploying EVs without an experienced partner brings about many questions and challenges

General Challenges –

- How Do I make everything talk to each other?
- Will it tie into my existing Asset Management System
- What about Sustainability reporting?
- How do we pay for fuel/electricity?
- What about maintenance?
- How do I get people to plug in?
- What if costs come in higher than budgeted?
- How do I show savings?



Do I have the resources to make this work?

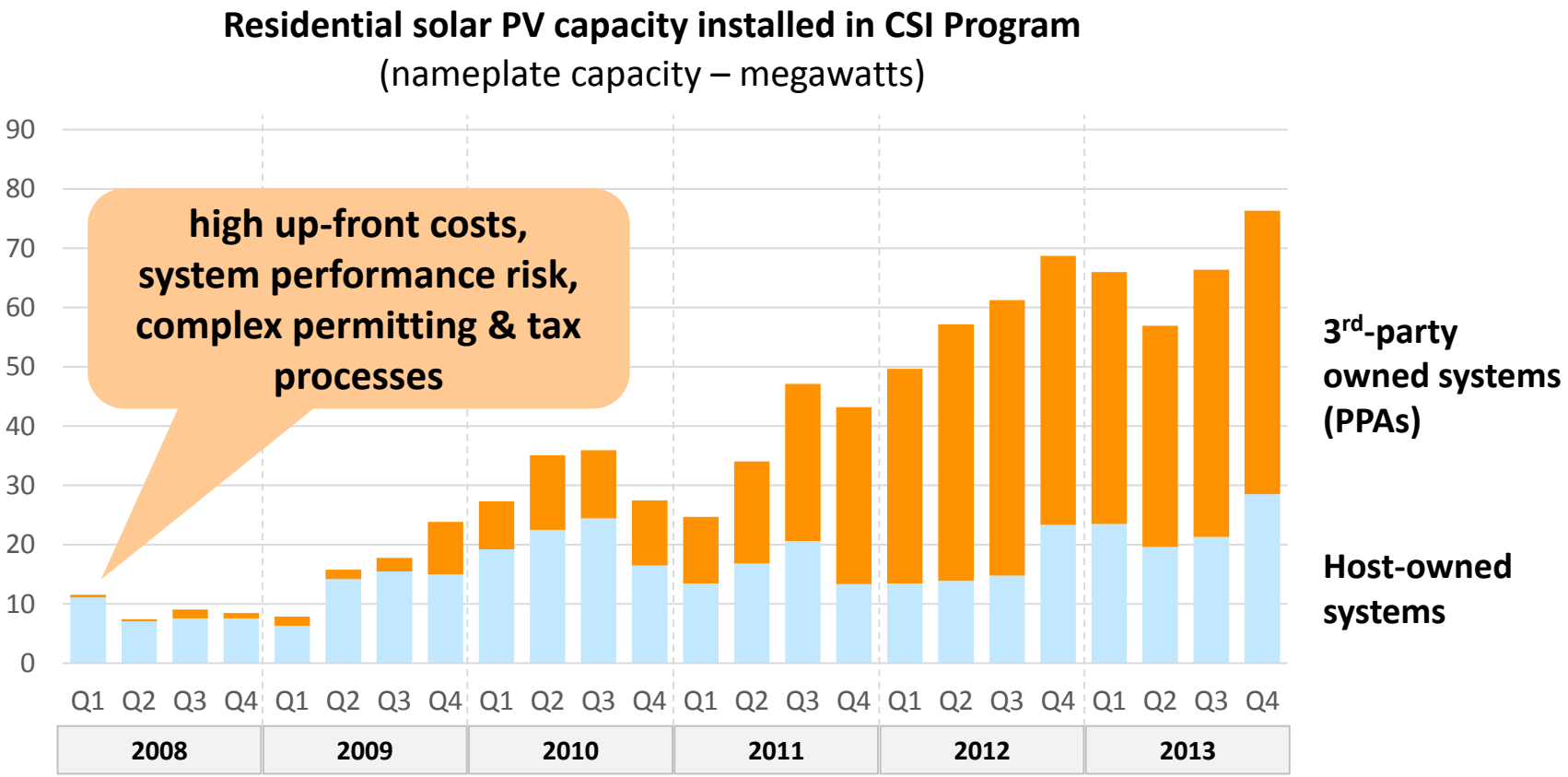
Agenda

- EV opportunities and challenges
- What's involved?
- **Total Cost of Ownership "TCO"**
- Working with Vision Fleet

TCO approach provides an accurate, holistic comparison of conventional & plug-in vehicle replacement strategies

What is TCO?	**Total cost of owning and operating a vehicle**
How is TCO measured?	**Cost-per-mile – utilization (miles driven) is a critical metric for managing fleet costs**
Why is TCO important?	**It enables consistent comparison of true costs associated with an existing fleet versus an alternative.**

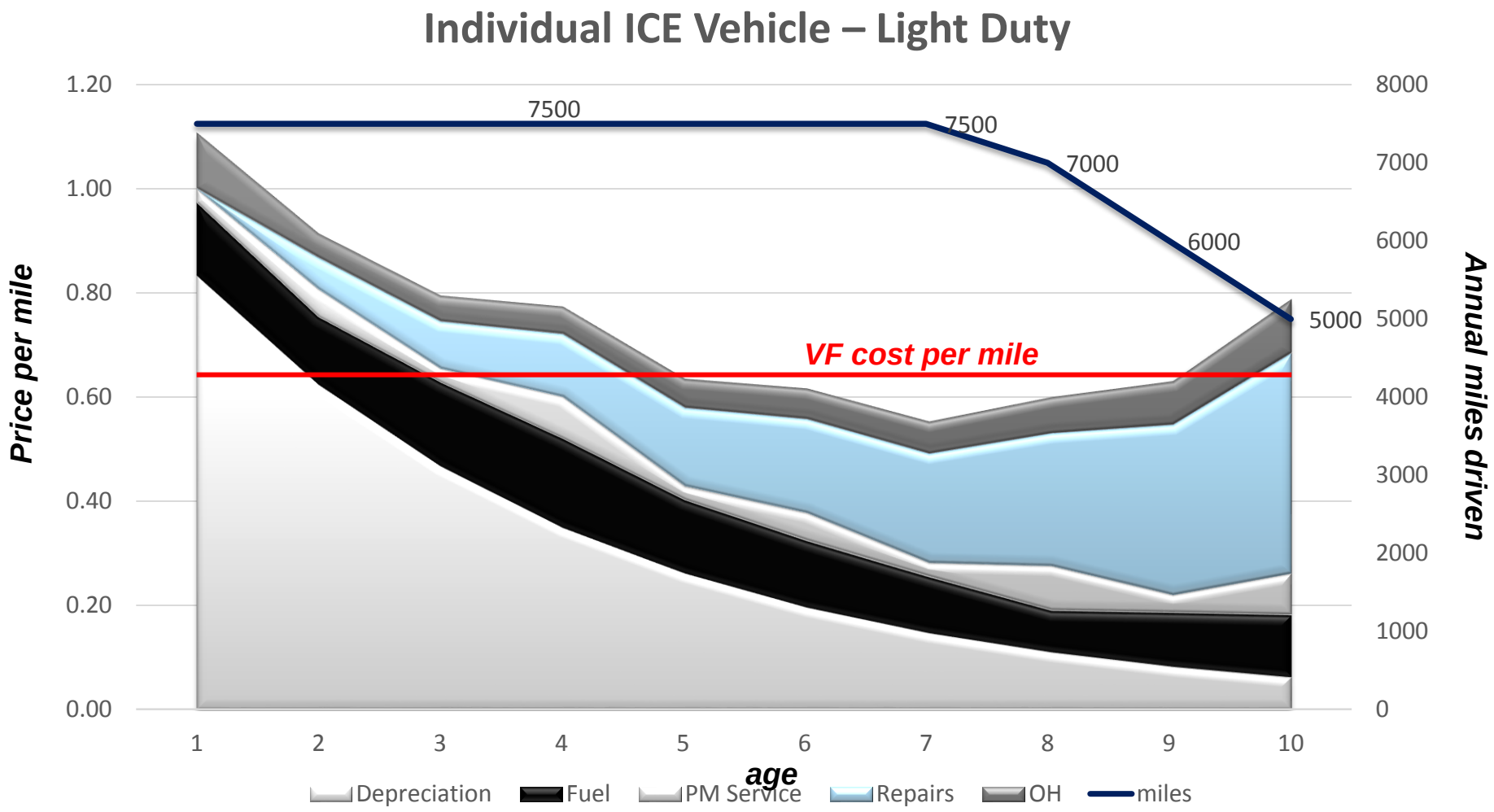
How to address these obstacles? We look to analogous markets…



By bundling costs of owning and operating a solar system + assuming operational responsibility, market grew by 2.5x

Source: California Solar Initiative data; Dates based on first CSI filing for each project

TCO Example Micro Level



Key assumptions: $25,000 purchase price, 25mpg, Scheduled PM
Does not include: parking, insurance, or repairs resulting from accidents

TCO/mi $0.90

Agenda

- EV opportunities and challenges
- What's involved?
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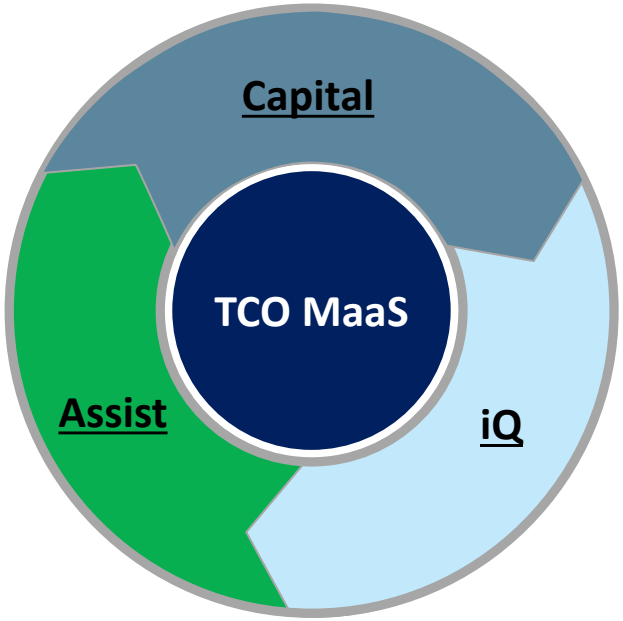
- **Working with Vision Fleet**

Vision Fleet's offering: TCO Miles as a Service (TCO MaaS)

Delivering "miles as a service" at a lower cost than operating a conventional fleet

VF CAPITAL™
Financing & Risk Management



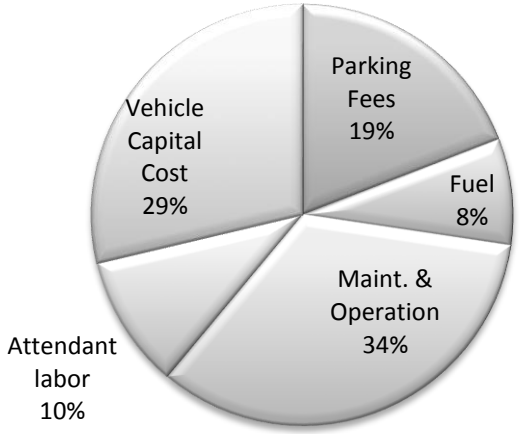
VF Assist™
Deployment & Operations

VF iQ™
Technology & Analytics

Miles as a service offering includes vehicles, infrastructure, fuel, maintenance, telematics, advising, & more

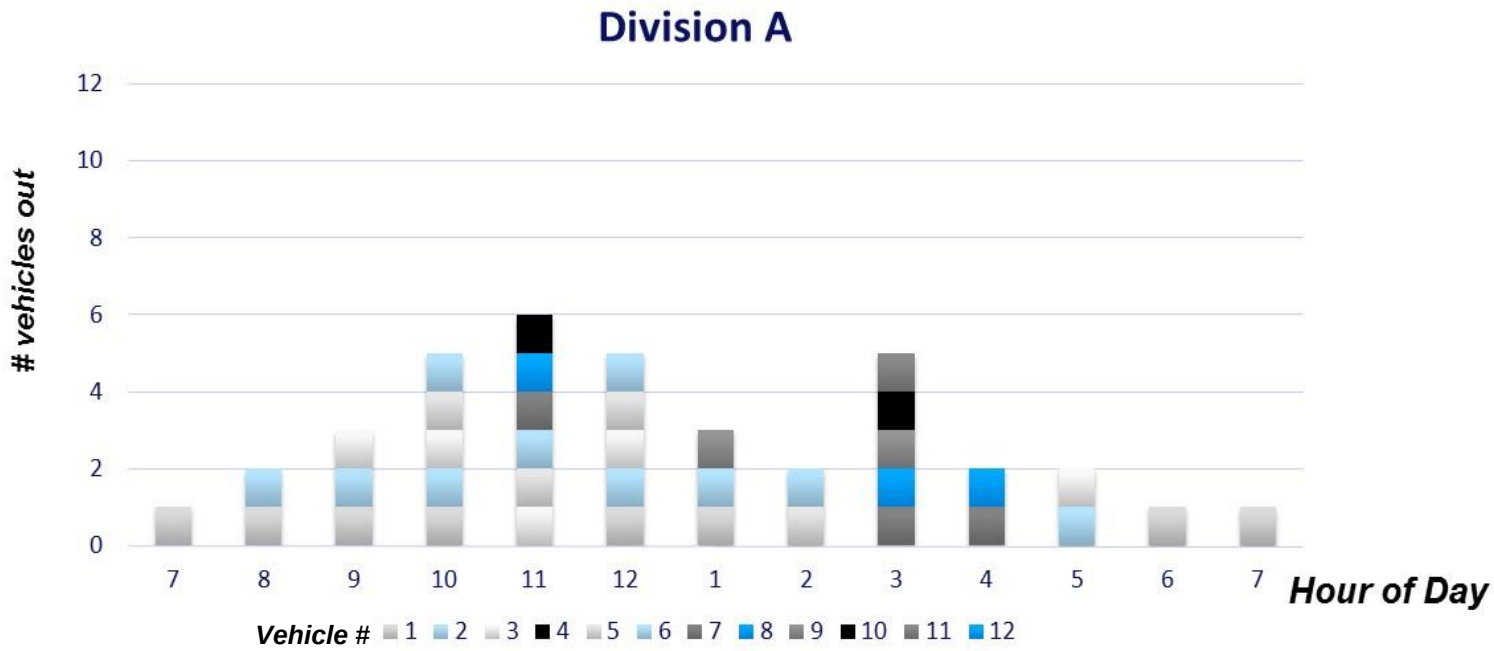
Motorpools - Business As Usual (BAU)

Current Motorpool Vehicle Statistics	
# of Vehicles	100
Average Utilization Per Vehicle	25%
Utilization Hours Per Vehicle	528
Motorpool Fleet Peak Utilization %	61%
Total Annual Usage (Miles)	448,585
Usage/Vehicle	4,486
Maintenance $ Per Mile	$ 0.42
Average Age/Vehicle	11.28
Average Odometer/Vehicle	70,077
Annual Maintenance Cost/Vehicle	$ 1,882
Fuel Cost/Vehicle	$ 473
Parking Cost/Vehicle	$ 1,111
Administrative Cost/Vehicle	$ 901



- *Current Motorpool Utilization*
- Usage Simulation
  - **Simulation of 57 cars over twenty years b*ased on actual department data***
  - ***Results*: Average daily peak use of 35%, and maximum of 56% (32 out of 57 vehicles – only one occurrence)**

Fleet Rightsizing a Consolidated View - Managing the Peaks

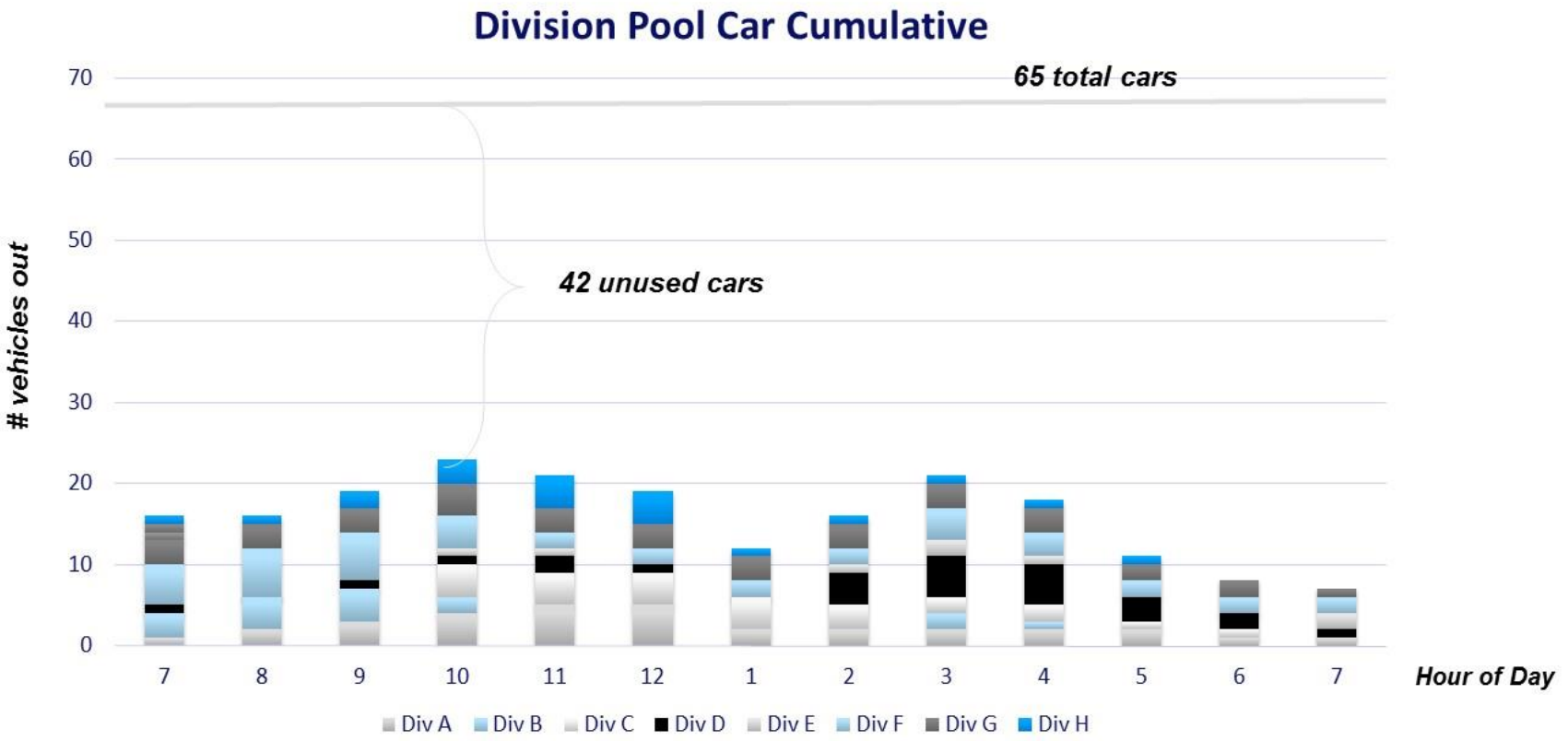


Division A

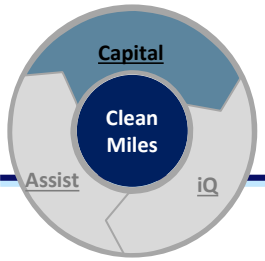
- 12 pool cars
- Mostly hand me downs from PD and PW
- Car 4 & 12 haven't been driven in months. Does anyone know where they are?
- Everyone loves to drive cars 1, 2, 3 because they are newer or the least worse
- Two employees have unofficially made car 5 & 10 their assigned cars
- In the last 2 years there has never been more than 8 cars out at one time
- Still some employees opt to take their own car and submit miles
- Employees often attend the same meetings taking multiple cars

Multiple departments/divisions geographically clustered with the same user experience

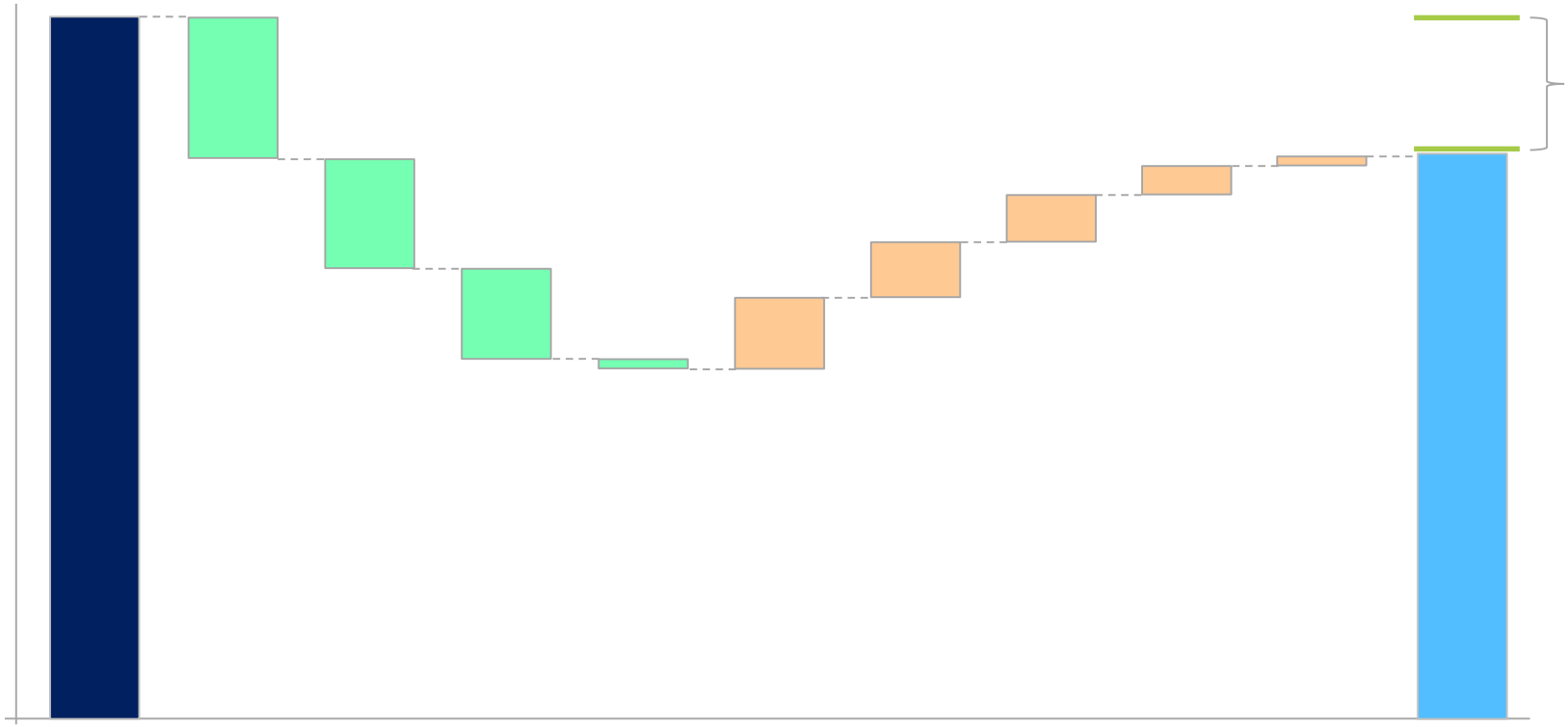
Fleet Rightsizing a Consolidated View - Managing the Peaks



- Redundant and inefficient use of assets
- VF Proprietary optimization software will right size the fleet
- Reservation systems will allow people to better plan their day and locate cars quickly
- Disposition of excess assets will offset upfront costs
- Telematics will further reduce pool car abuse
- Eliminate employee mileage reimbursement unless preapproved use of personal car is granted
- VF manages everything so you can focus on more important issues



VF Capital™ guarantees lower TCO to the customer



VF iQ™: proprietary analytics and intelligence to lower TCO

IQ Dashboard
City of Indianapolis

Download Printable Report | November 2014 | Hi Andrew

Overview | Deployment | Charging | Efficiency | Maintenance | Recommendations

ALL | SHARED | ASSIGNED | TAKE-HOME

BEV VMT: 3,567 / 4,000 Miles

PHEV VMT: 2,452 / 3,000 Miles

BATTERY UTILIZATION: 0% 50% 100% 150% 200%

HERO SCORE: 4.3 / 5

EFFICIENCY SCORE: 3.2 / 5

67% E Miles | 345 Gallons Saved

Car	Status	Model	Dept	Assigned	VMT	% Baseline	Miles/Day AVG	Miles/Mo. AVG	% Gas	% Electric	Gallons Saved	Hero	Efficiency
140804	OK	Leaf	IMPD	Shared	1,043	20%	25.3	1,345.4	20%	20%	25.3	5	3.2
140805	In Shop	Leaf	IFD	Assigned	1,239	40%	35.6	1,345.4	20%	40%	35.6	2.3	5
140806	OK	Prius	IMPD	Assigned	652	20%	13.2	1,345.4	20%	20%	13.2	3.1	4
140807	OK	Volt	IMPD	Shared	1,043	20%	25.3	1,345.4	20%	20%	25.3	5	3.2
140808	In Shop	Leaf	IFD	Assigned	1,239	40%	35.6	1,345.4	40%	20%	35.6	2.3	5
140809	OK	Prius	IMPD	Assigned	652	20%	13.2	1,345.4	20%	20%	13.2	3.1	4
140810	OK	Volt	IMPD	Shared	1,043	20%	25.3	1,345.4	20%	20%	25.3	5	3.2
140811	In Shop	Leaf	IFD	Assigned	1,239	40%	35.6	1,345.4	40%	20%	35.6	2.3	5

Car 140804

HERO SCORE: 4.3 / 5

EFFICIENCY SCORE: 3.2 / 5

BEV VMT: 3,567 / 4,000 Miles

CHARGING TIME DISTRIBUTION: Home, Work

BATTERY UTILIZATION: 0% 50% 100% 150% 200%

Charging | Full | Not Charging

Map | Satellite

Map data ©2015 Google Terms of Use Report a map error

VFiQ™: proprietary analytics and intelligence to lower TCO

Weekly Utilization Report - September 8, 2015

VMT Summary

Two weeks ago	Last week
49,782.7	49,229.4

Charging Summary (# of Events)

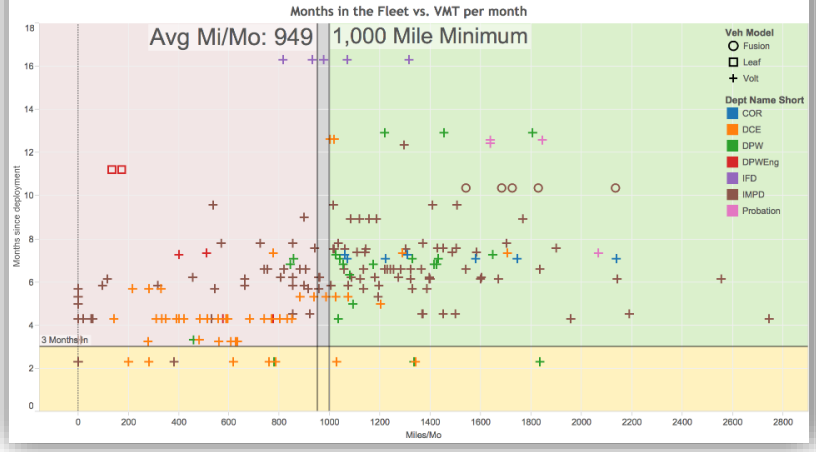
Chg Level	Two weeks ago	Last week
L1	274	335
L2	341	351

Minimum Mileage Metrics

Dept Name Short	Vehicles Deployed	0 Mile Vehicles	0 Mile Vehicles %	Vehicles w/ < 1k miles/month	Vehicles w/ < 1k mi/mo %
IMPD	124	21	17%	34	27%
DCE	45			36	80%
DPW	21			4	19%
COR	7				
DPWEng	6			6	100%
IFD	5			3	60%
Probation	4				

Date of Last FC Upload & VMT

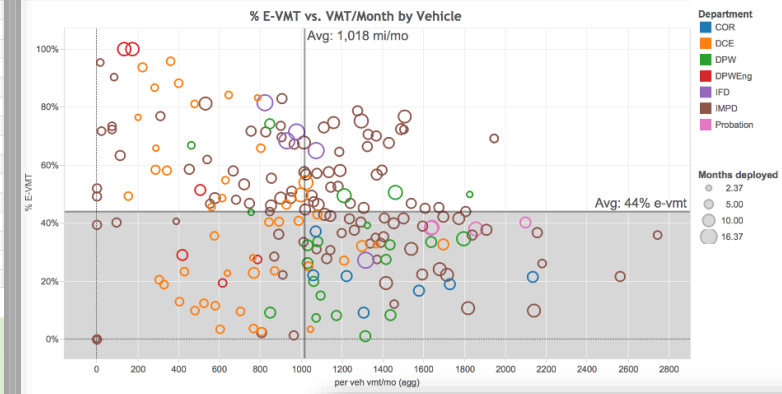
Null	150918	IMPD	0
	150928	IMPD	0
	150936	IMPD	0
	150937	IMPD	0
	150953	IMPD	0
	150964	IMPD	0
	150984	IMPD	0
	150987	IMPD	0
	150988	IMPD	0
7/7	150860	IMPD	8,018
7/9	140807	DCE	12,666
7/10	150917	IMPD	0
	150916	IMPD	0
7/16	150915	IMPD	0
7/17	150900	IMPD	0
	150908	IMPD	0
7/22	150926	IMPD	0
7/24	150925	IMPD	0
8/24	150935	IMPD	0
8/27	150957	DCE	2,531
8/31	150807	IMPD	18,929
	150965	IMPD	32

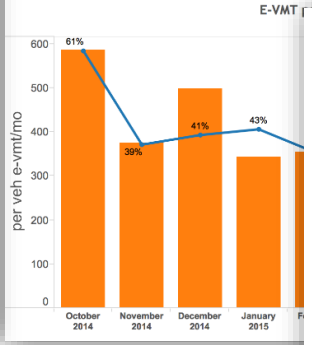


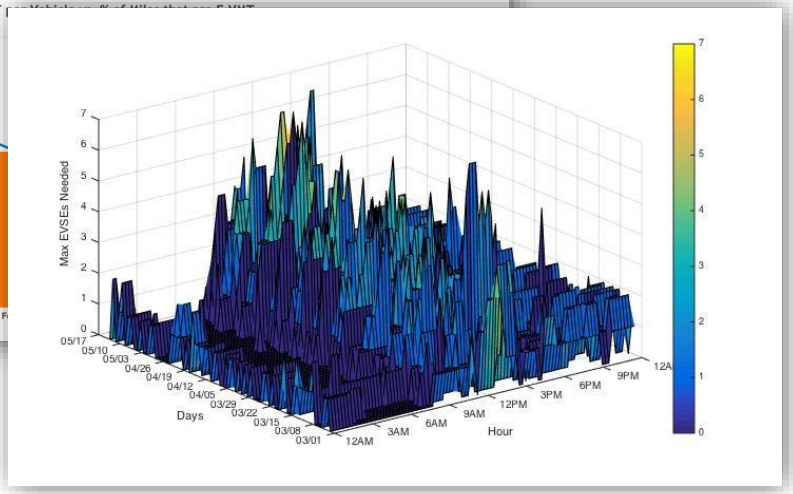
Weekly Operations Report (E-VMT) - September 8, 2015

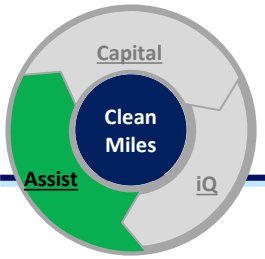
VMT vs E-VMT last 3 weeks

	Prior	Two weeks ago	Last week	This week
Vmt	1,309,392	49,786	49,781	20,504
Vmt Ev	565,045	13,978	14,456	5,890
% e miles	43%	28%	29%	29%
Charging events	40,184	615	688	332

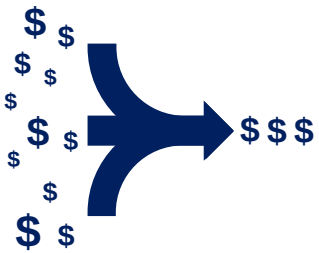
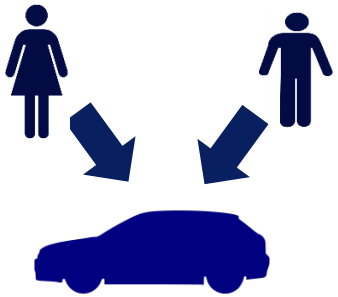
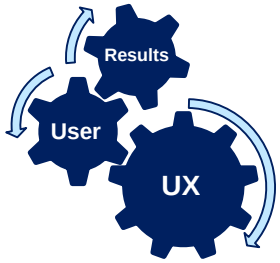




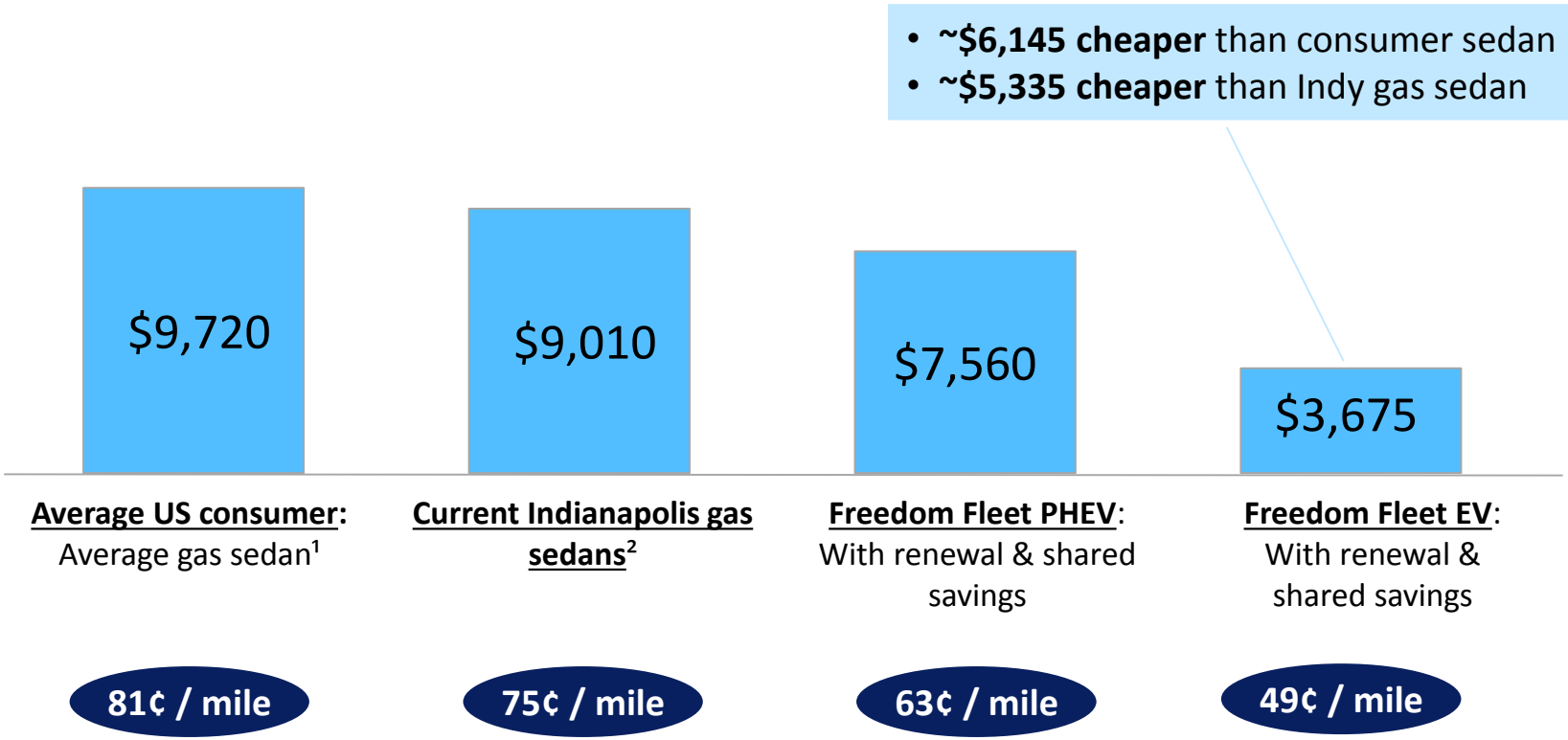




Snapshots of select Vision Fleet Assist™ innovations

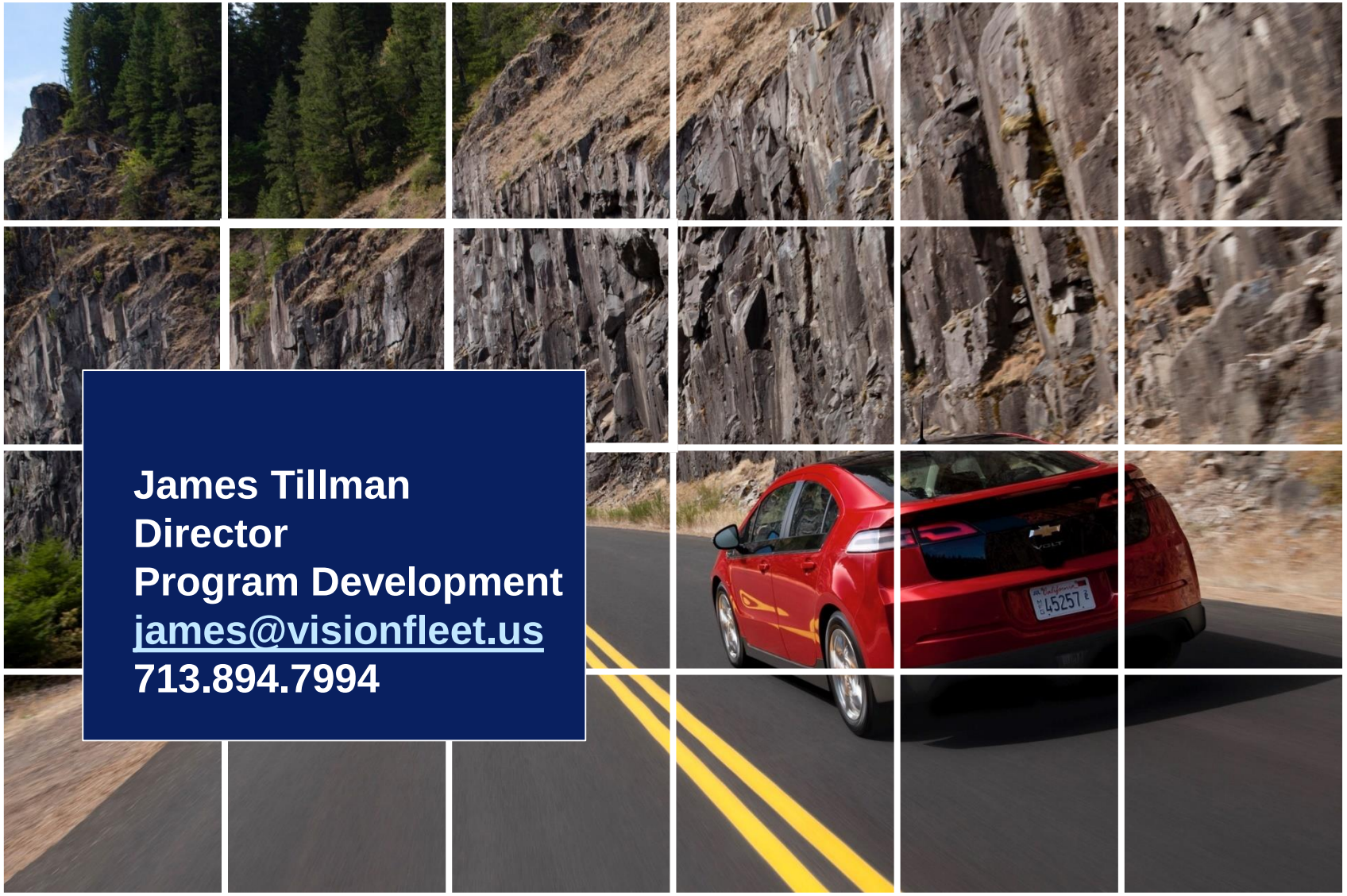
Rigorous TCO diagnostics	Enhanced utilization	Reimbursement for at-home charging	End-user engagement
			
Comprehensive TCO and ECO analysis and benchmarking	EV-focused telematics and carsharing platform + hands-on support	Drivers plugging in their EVs at home are reimbursed for the electricity	Fostering competition and rewards (gift cards) for optimal plug-in behavior

Comparison of total operating costs: Indianapolis is achieving substantial savings with the Freedom Fleet



1. Based on AAA's 2014 "Your Driving Cost" study, which estimated cost per mile at $0.783 for 10,000 annual miles and $0.608 for 15,000 miles for an average sedan; Using this data and other data AAA provides, the rate for 12,000 miles is estimated at $0.703 which is projected to grow at 3.5% per year for an average rate of $0.83 / mile over 10 years
2. The cost to operate Indianapolis existing fleet was $0.64 per mile in 2013 – this is projected to grow at 3.5% based on historical data, yielding an $0.75/mile average over 10 years
3. Calculations based on a blended average cost of the 85% of vehicles that are plug-in hybrid electric vehicles and the 15% that are battery electric vehicles; Average total cost is estimated at $0.665 / mile over 10 years if utilization is not improved and at $0.61 / mile if higher utilization is achieved

Note: Estimates shown in bar chart are rounded to nearest increment of $10



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Questions?