



Innovative Procurement for Fleet Electrification

May 22, 2019

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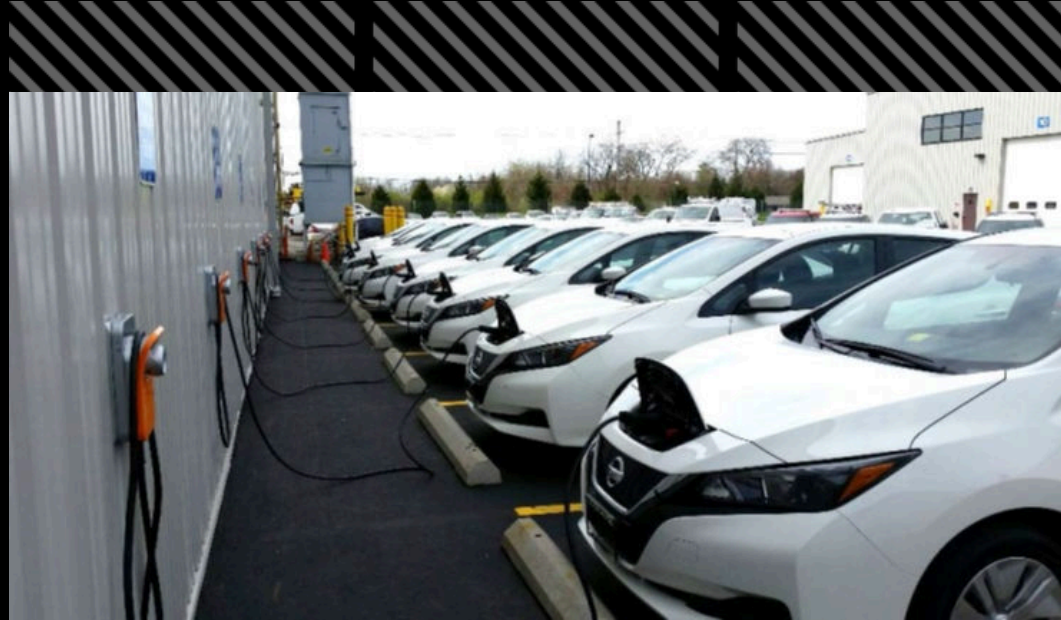


# Electrification Plan **PRIORITY 2:**

## **Vehicle Fleet Adoption**

Improve the Midwest's  
lagging position in electric  
vehicle (EV) deployment

- *265 Public EV's*
- *10 COTA Buses*
- *450 Private Fleets*
- *40 Transportation Service Providers*



# Building Partnerships

## Public Partners and Their EV Commitments

Agency	Quantity	Additional Expected
City of Columbus	93	107
Airport, MPO, 7 municipalities	11	11
Dublin, OH	5	5
Franklin County	13	0
The Ohio State University	5	15
<b>Total Committed</b>	<b>127</b>	<b>138</b>

# CITY OF COLUMBUS FLEET VEHICLES

Vehicles acquired to-date through one year lease to buy:



**Nissan Leaf**  
**73 vehicles**



**Ford Fusion Energi**  
**20 vehicles**



**Chevy Bolt**  
**1 vehicle**



# FLEET ELECTRIFICATION PRIORITY TIMELINE

## June 2016

U.S. Smart City Challenge grant awarded to the City of Columbus, with goal of adding 300 EVs to public fleets, 200 of them for the City of Columbus

## November 2017

Universal Term Contract passed by the Columbus City Council

## May 2017

Bid (addendum 1) released by the City of Columbus for EV procurement

## January 2018

Purchase order for 93 EVs completed by the City of Columbus

Triple Net Price Bid = Dealer Invoice - Dealer Holdback – Advertising - Fleet Discounts + Dealer Markup

Where:

- Dealer Invoice = Vehicle invoice from the automaker
- Dealer Holdback = Percentage of dealer invoice or suggested MSRP
- Advertising = Marketing funding from the automaker
- Fleet Discounts = Intra-transit credit, automaker bid assistance, or fleet-specific discount. Policies for government bid assistance may vary by automaker
- Dealer Markup = A bid above the cost to the dealer

# Addressing Challenges:

## 1. High Upfront Costs for EV Procurement

Example: 2018 Nissan Leaf S Hatchback – EV  
MSRP = \$30,680

Bid Price = \$21,706

12 Month Lease to Own Price = \$20,861

Less Grant Incentive = \$17861

Total discount = 40%

# Vehicle Fleet Adoption

## ROUND 2, City Universal Term Contract Bid Prices

2019 Vehicle Models	Mike Albert	Ricart Ford	Byers	Savings	Type
Nissan Leaf	\$22,304	\$23,310		\$1,005	Lease
Chevy Bolt	\$30,749		\$33,878	\$3,128	Lease
Ford Fusion Energi	\$31,455	\$28,552		\$2,902	Purchase

# Other Challenges:

## 2. Overcoming Range Anxiety and Deploying Charging Infrastructure

### CHARGING LEVELS

The figure below shows the three levels of charging for electric vehicles. The charging capabilities (miles per hour rates) increase moving from left to right, along with the cost of equipment and installation. Level 1 charging is the least costly option but provides an EV with less than 50 miles of range in 10 hours. Level 2 charging can require electrical system upgrades in some cases. DC fast charging requires the most extensive electrical system upgrades, but also provides the quickest charge.



#### LOW – AC 120 V AC LEVEL 1

- Primarily residential (all EVs)
- Uses standard outlet
- Power requirements similar to a toaster
- Up to 1.4 kilowatts
- Can use existing power outlets resulting in no-cost installation
- Charging rate: 3-5 miles per hour



#### MEDIUM – AC 240 V AC LEVEL 2

- Residential, workplace and commercial (all EVs)
- Requires high-voltage circuit
- Power requirements similar to an electric clothes dryer
- Up to 19.2 kilowatts
- Equipment and installation costs vary widely (~\$6,500 in public and ~\$2,000 at home)
- Charging rate: 12-75 miles per hour



#### HIGH – DC FAST CHARGE

- Community/metro and highway Corridors (BEVs)
- Power requirements are up to max power for 15 homes
- Max power varies by system (CHAdeMO: 62.5 kW, SAE Combo: 100 kW, Tesla: 120kW)
- Can have very high equipment and installation costs (up to \$90,000 per station)
- Charging rate: 100-300 miles per hour



# Partial List of available EV's to Columbus in 2017 (within price range)

Make	Model	Type	E Range
Chevy	Bolt	BEV	238 mi
	Volt	PHEV	53 mi
Chrysler	Pacifica	PHEV	33 mi
Ford	Fusion	PHEV	22 mi
	Focus	BEV	115 mi
Honda	Clarity	BEV	89 mi
Hyundai	Sonata	PHEV	27 mi
	Ioniq		24 mi
Nissan	Leaf	BEV	107 mi

## Other Challenges:

### 3. Improving Vehicle Selection

For 2019:  
Kia Niro, Toyota Prius Prime...

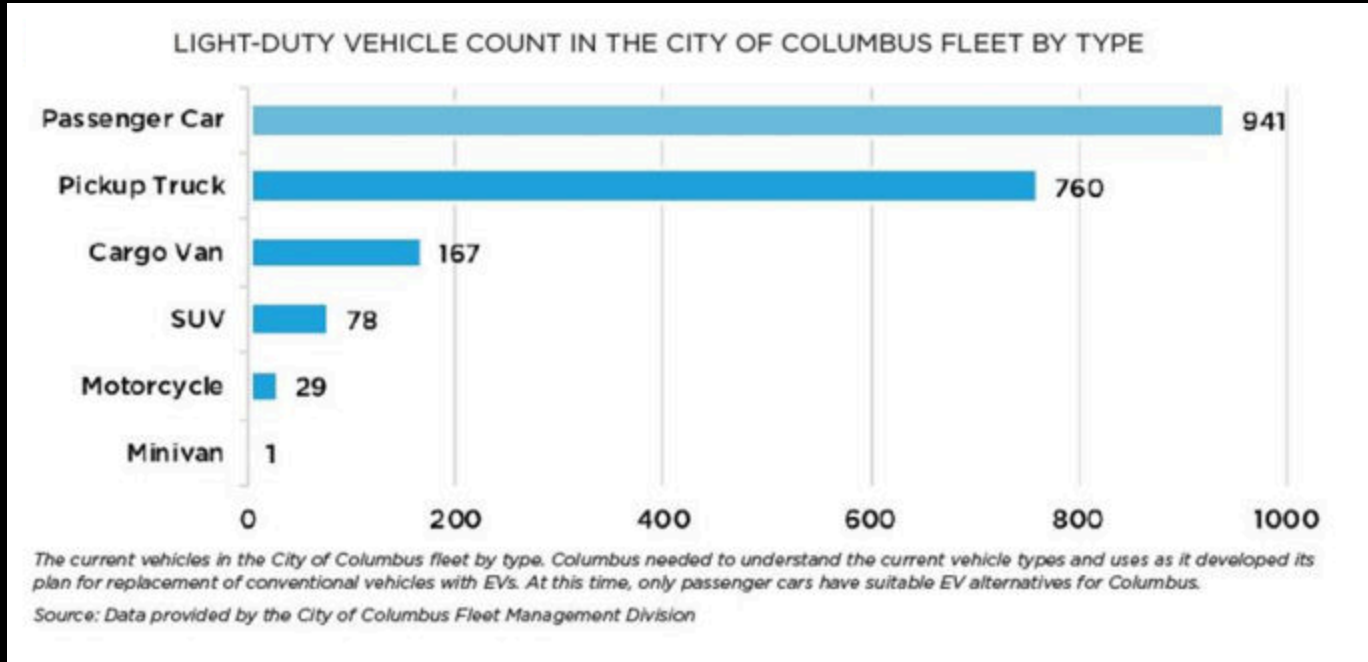
# City of Columbus Vehicle Procurement Process

## MAJOR PROCESS STEPS FOR THE CITY OF COLUMBUS FLEET ELECTRIFICATION

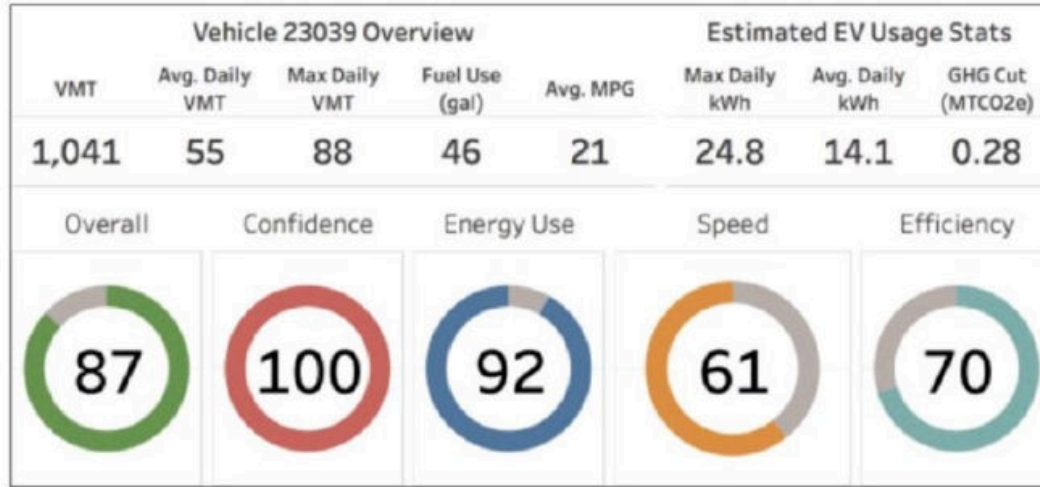


*Major process steps for the City of Columbus EV procurement program. Some steps happened concurrently, for example the assessing the city's need for charging infrastructure was critical to identifying candidate vehicles and making vehicle purchases.*

# Existing Fleet Assessment



## EV SUITABILITY SCORE FOR AN EXAMPLE VEHICLE



*Suitability analysis results for an example City of Columbus vehicle provided by the Electrification Coalition. The results show that the vehicle is a good candidate for EV replacement based on daily usage.*

*Source: [9]*

# Identifying Vehicles for Replacement by Evaluating Vehicle Data

# Evaluating the Bids for a Universal Term Contract

**TABLE 3:** EVS OFFERED BY BIDDERS TO THE CITY OF COLUMBUS

MAKE	MODEL	TYPE	BATTERY SIZE	ELECTRIC RANGE (MI)	MSRP	TAX CREDIT (BUY/LEASE)
Chevrolet	Volt**	PHEV	18.4	53	\$33,220	\$0/\$3,750
	Bolt EV**	BEV	60	238	\$36,620	\$0/\$3,750
Ford	Fusion Energi Plug-in Hybrid**	PHEV	7.612	22	\$33,120	\$800/\$2,000
	C-MAX Energi Plug-in Hybrid**	PHEV	7.612	20	\$27,120	\$800/\$2,000
	Focus Electric**	BEV	33.5	115	\$29,120	\$1,500/\$3,750
Nissan	LEAF**	BEV	30	107	\$30,680	\$1,500/\$3,750

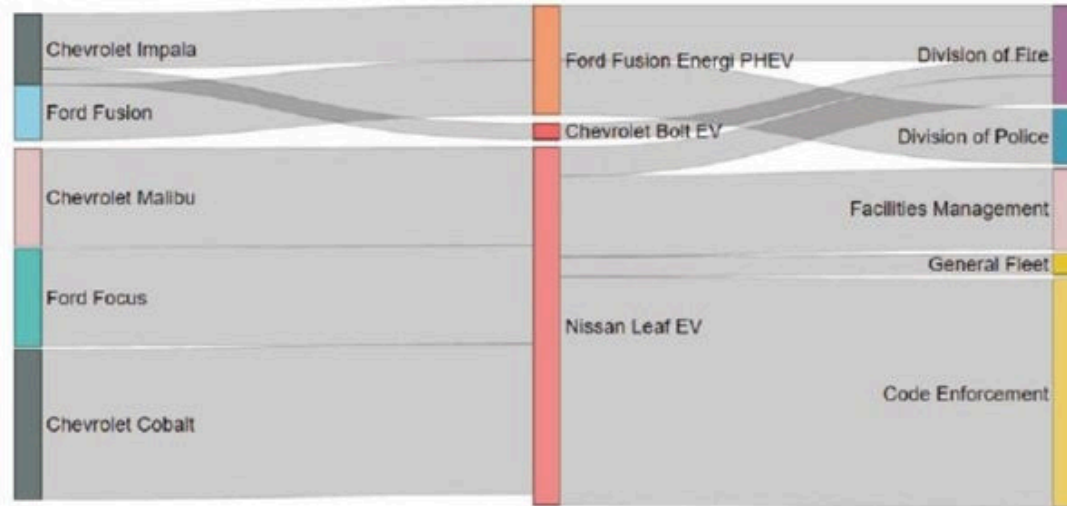
2017 model EVs offered to the City of Columbus by bidders with battery size, electric range in miles, MSRP in U.S. dollars, and tax credit savings. Note the bidder with a purchase option offered to pass along much less of the federal EV tax credit than the bidder that proposed a lease.

Source: [6]



# Vehicle Replacements

CONVENTIONAL FLEET VEHICLES, THEIR EV REPLACEMENTS, AND THE CITY DIVISION WHERE THE EV WILL BE USED



*A mix of gasoline-powered passenger cars are being replaced with EVs for several divisions within the City of Columbus.*

*Source: City of Columbus*

# Infrastructure Deployment





- Persistence
- Flexibility
- Non Profit Expertise
- EV advantages

## Lessons Learned and Guidance for Other Cities

# Workforce Training: EV Course offerings at Columbus State Community College







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# THANK YOU

