Clean Cities & Community Coalitions Sustainability/Resiliency

Lake Tahoe Electric Transportation Forum

August 20, 2025

Richard Battersby, Director

EAST BAY CLEAN CITIES COALITION

Clean Cities and Communities

About East Bay Clean Cities

- Serving Alameda, Contra Costa and Solano Counties
- First Designated in 1995
- 5 Member Board of Directors

- All volunteer 501(c)
- 60+ Active Stakeholders, 650 + e-contacts
- Additional Activities in North Bay (Napa, Marin & Sonoma Counties)
- Predominantly NGV's for first 25 years
- Now overwhelmingly EV and Renewable Diesel, but E85 rapidly accelerating

Coalition Functions

What we do for Stakeholders

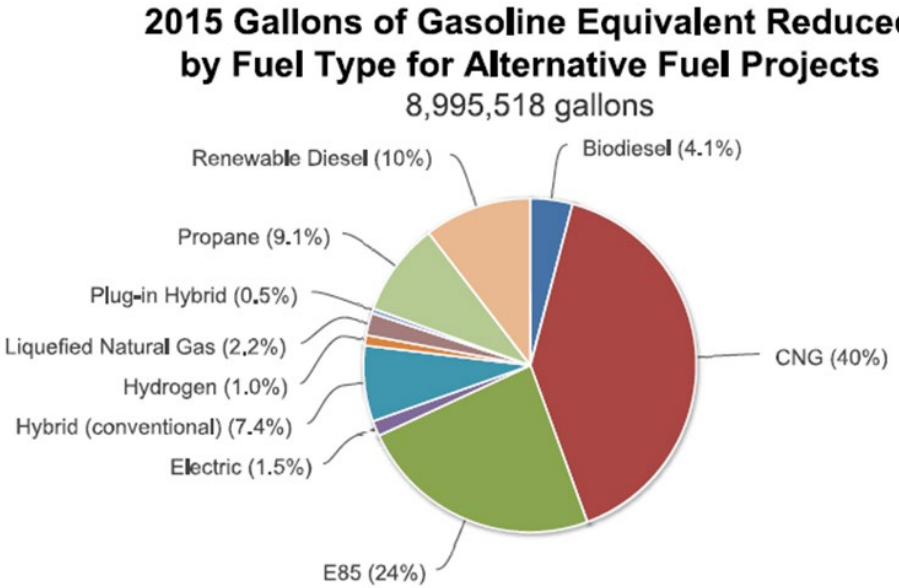
- Education and Outreach
- Listening Sessions
- Fleet and Manufacturer Site Tours
- Event, Publicity, Promotion, and Grand Openings
- Product/Technology Demonstrations and Ride ‘n Drives
- Support Local Professional and Trade Organizations
- Equipment Specification Development and Contract Sharing
- Strategic Planning and Networking with Peers
- Notification of Funding Opportunities
- Training, Training, Training

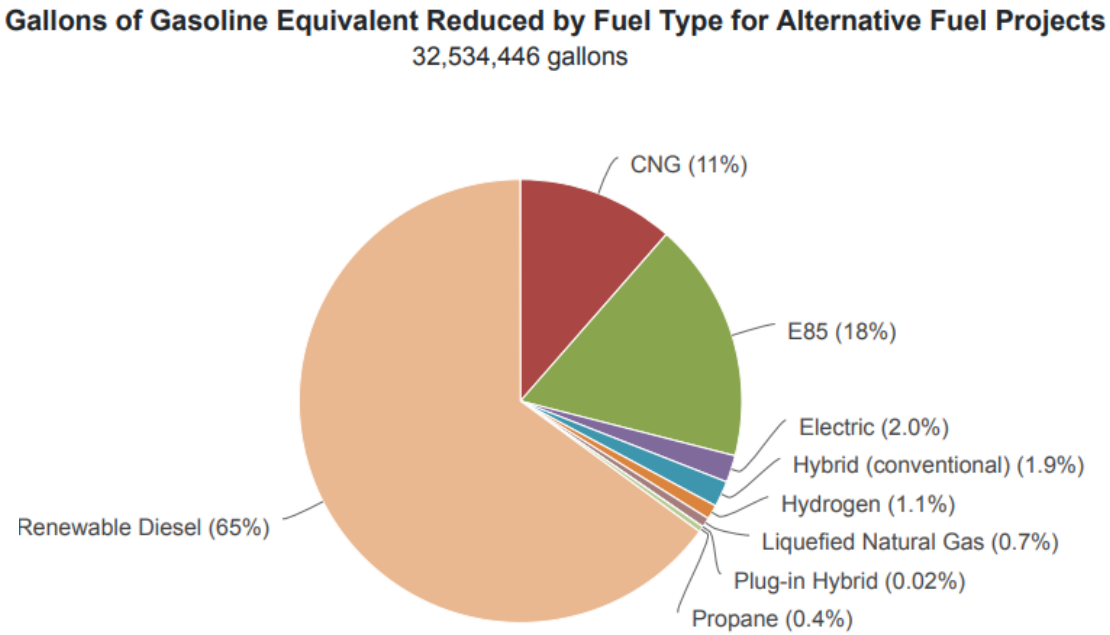
What we need from Stakeholders

- Participation at Events
- Quarterly Fuel Pricing Inputs
- Alternative Fuel Vehicle and Station Costs and Spec’s
- Annual Survey ($25 gift card)

East Bay Coalition Fuels Background

- Shift from CNG to Renewable Diesel as predominant alternative fuel
- Total petroleum displacement almost quadrupled since 2015
- Historically municipal fleets, but private fleets increasing
- Widespread retail RD may make reporting redundant (and E85……..)



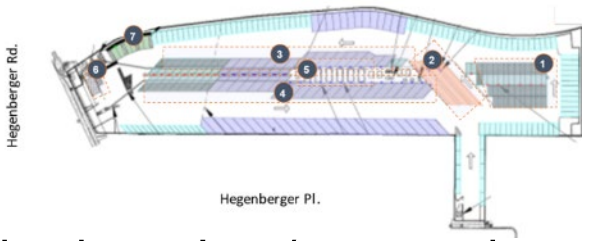


Moving Forward

EAST BAY
CLEAN CITIES COALITION

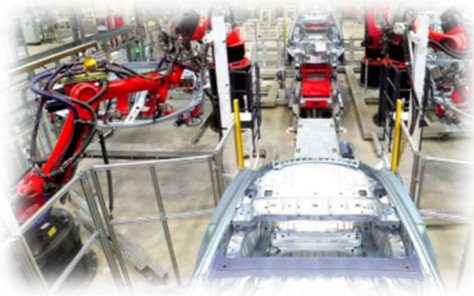
- **Recent Activities**
  - Renewable Diesel retail acceleration!
  - E85 retail acceleration!
  - Western State Renewable Diesel Cardlock
  - Port of Oakland Hydrogen Fuel Depot
  - EV Charging hubs throughout the region
  - BEV offroad and construction equipment
  - Grid independent BEV charging options
  - Formally expand into North Bay
  - Added numerous private industry fleets to existing mostly municipal roster
  - Expanded into other transportation sustainability and resiliency areas
  - Highlighted local manufacturers with onsite tours and hosted events
  - Extending outreach activities to general-public in addition to fleets
  - Increased participation in larger grants as partner and sub

Accomplishments/Successes



- Circular Economy projects
- Petroleum displacement
- BEV technician training series
- Renewable Diesel workshops
- Renewable Diesel deployment
- Renewable Diesel support out of state
- EV Charging Hub activities
- Advanced Clean Fleet Rule focus groups and education/outreach to fleets
- Calculation of CI of electricity used for transportation fuel (location and time of use)
- Renewable Diesel domestic production spreadsheet and incentive value documentation
- Partnering with other coalitions- (Sacramento, San Francisco, Silicon Valley, Columbia-Willamette, Western Washington, Long Beach)
- Partnering with Fleet professional organizations- (FleetPros, NAFA, MEMA, PFSA, APWA)

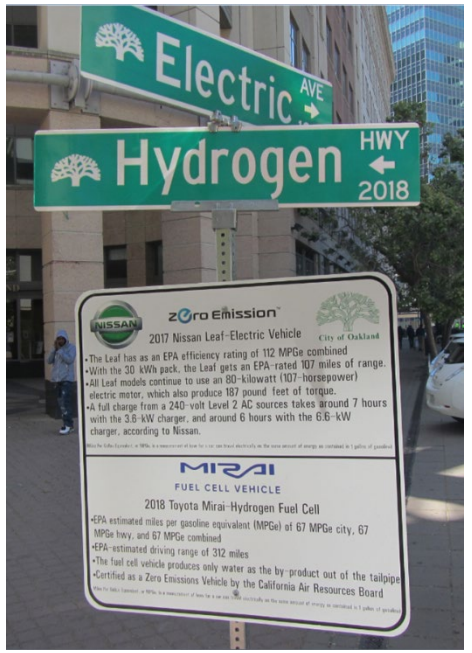
Signature Activities

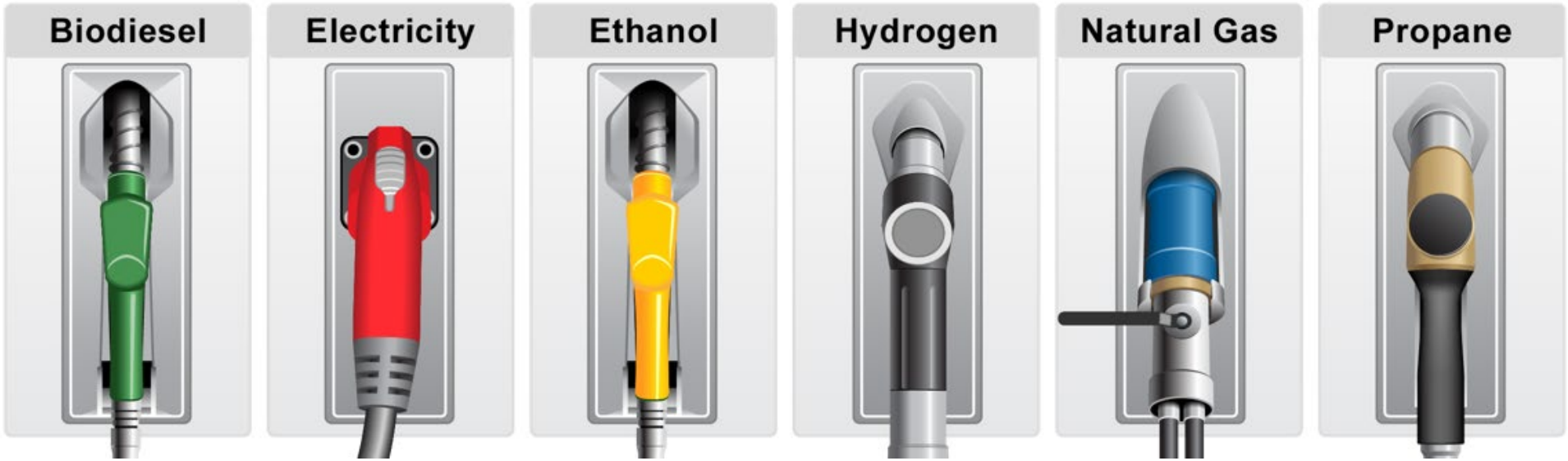


- EV Showcase and Alt Car North events
- Sonoma Raceway partnerships/events
- Clean Air Champion Awards
- Napa Valley Wine Train partnership/events (CNG locomotive)
- Tesla vehicle and Gigafactory battery tours (Fremont and Reno, NV)
- Other local manufacturer tours and onsite events:
  - Motiv Power Systems
  - Freewire Technologies
  - REVO (Wrightspeed)
  - Chargepoint
  - BEAM
- Annual survey and fuel price report gift cards and raffles
- Technology demonstrations (BEAM EV Arc, ZEVx, Zeus, Nikola, Mullen)

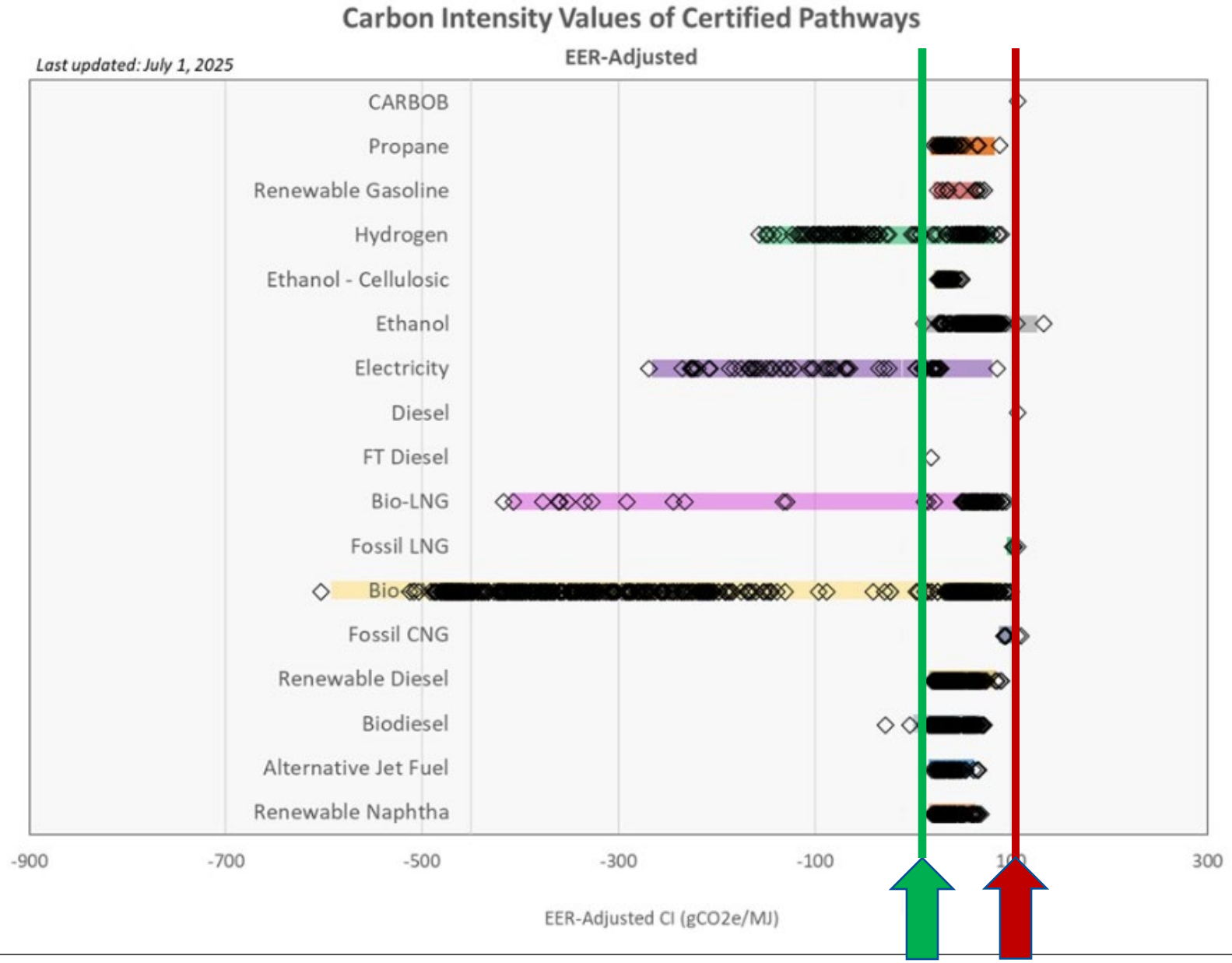
Emerging Alt Fuel Trends

- Fuel Diversity (resiliency)
- Renewable Fuels (RD, RNG, RLPG, RG, SAF, RH2, etc.)
- Battery Electric
- Hydrogen
- Solar & Grid Independent
- V2G & Battery Storage

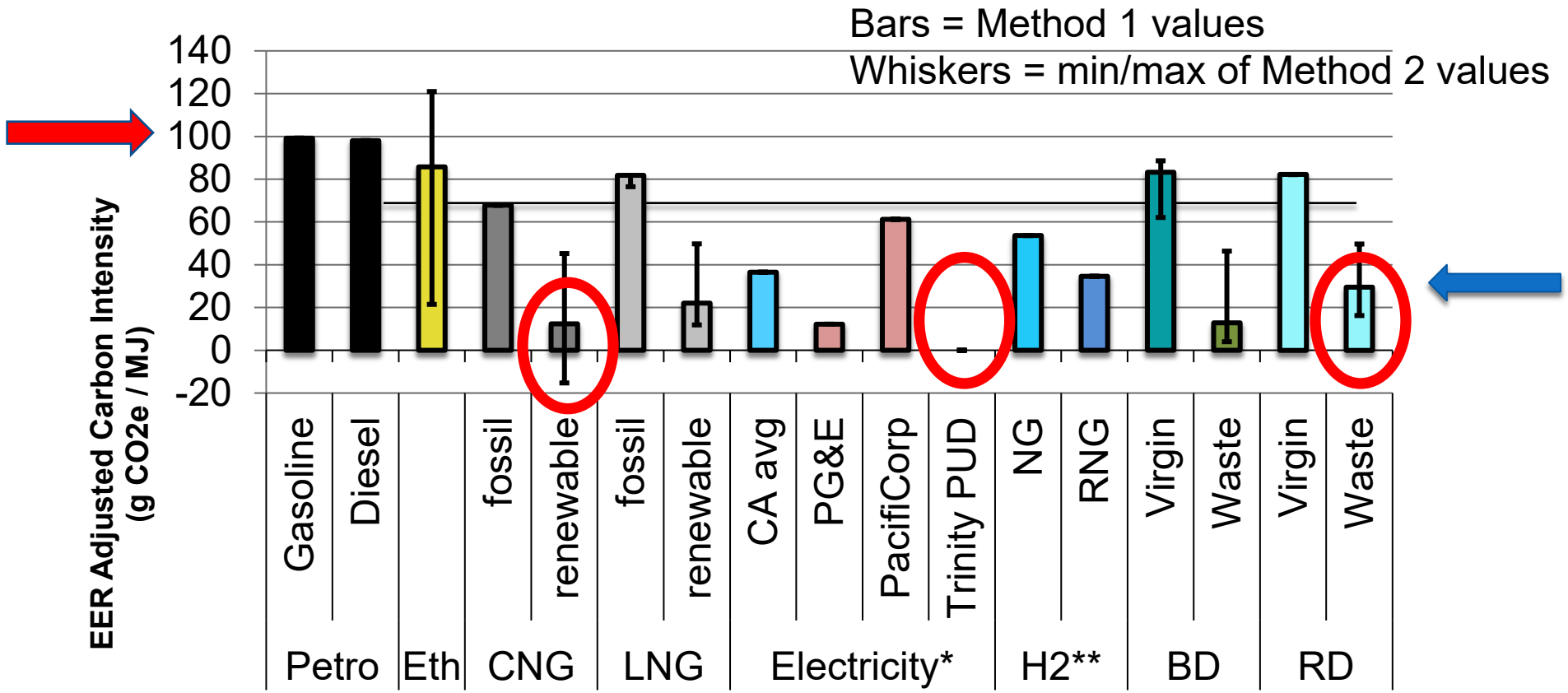




LCFS Carbon Intensities of Fuels



LCFS Carbon Intensities of Fuels, 2016 Graph



* Scaled by EER of 3.4. Utility values use utility specific reported carbon intensities.
** Scaled by EER of 2.2.

Source: SERC, 2016

Data Source: http://www.arb.ca.gov/fuels/lcfs/lcfs.htm (accessed 4/23/16)

UNCOVERING THE POTENTIAL OF FLEET ELECTRIFICATION TODAY

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EV SUITABILITY FOR A CHANGING WORLD

14,500+
EFM CUSTOMERS

Private Equity, Commercial, Non-Profits and Government Clients

Enterprise Fleet Management recognized the importance of basing their long-term business strategy on reliable data — not assumptions.

Nearly
1 MILLION Managed Vehicles

Sourcewell

"We are absolutely committed to fulfilling our mission to provide our customers with the best possible information to make the best decisions for their businesses."

— Dain Giesie,
Assistant Vice President,
Enterprise Fleet Management

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FLEET PROFILE & CONSIDERATION

Industry:
Leasing/Rental

Based in:
North America

Types of vehicles:
Mixed fleet

Fleet size:
649,000+ with a majority of medium duty work vehicles and trucks

Acquisitions /AME
Maintenance
Fuel savings
Resell

Total Cost of Ownership

Compliance &
CO2 Offset

The Challenge: From our existing fleet, at what pace could we sustainably transition to EV, while considering the TCO and suitability conditions?

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The Solution: Conduct a massive Electric Vehicle Suitability Assessment

Not only did the study help understand the market opportunity today, but it also provided valuable insights to further support our customers into the future

In all, 91,252 Enterprise Fleet Management leased vehicles were included in the study. The results surprised both teams:

13% (approximately 12,000) of the analyzed vehicles could be economically replaced by EVs today.

Near-term electrification could achieve a total potential savings of $33 million and 194,000 tons of CO2 emissions over four years.

Up to 45% (approximately 42,000) of the analyzed vehicles could be electrified as EV pickups enter the market.

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AUTOMOTIVE INDUSTRY: Electric Vehicles

EVs In The Marketplace

Adoption of EV technology is in the early phases, but **growing** due to:

- **Wider range of available models**
- **Falling battery prices**
- **Infrastructure investments**
- **Growing public policy support**

83% INCREASE IN GLOBAL EV SALES IN 2021

IN NORTH AMERICA, EVs REPRESENTED 4% OF SALES IN 2021

Source: Wards Intelligence, LMC Automotive

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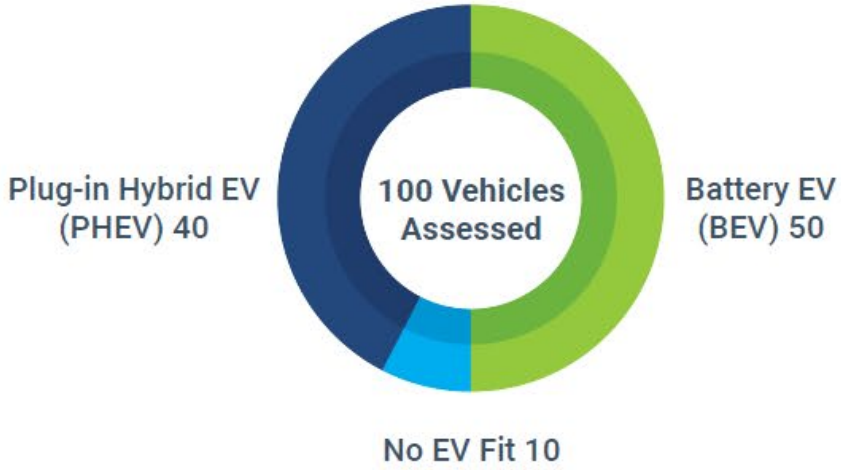
What is the EVSA?

Electric Vehicle Suitability Assessment

An EV procurement recommendation tool for *any* fleet seeking to go electric



Data-driven recommendations using Geotab telematics driving profiles

Best fit electric vehicles to replace current vehicles in your fleet

Recommended electric vehicles are guaranteed to meet your fleet vehicles' daily range requirements

Lifetime cost savings based on our recommendations

We only recommend electric vehicles that save you more when compared with procuring non-electric vehicles for your fleet

Estimated reduction in fuel consumption and carbon emission

We compute reasonable estimates for your reduced carbon footprint should you decide to go electric

GEOTAB

Advanced Clean Fleets

Any private entity with $50 million or more in annual revenue as reported to the IRS

Any private entity that owns or controls* 50 or more vehicles over 8,500 lbs. GVWR with at least one vehicle in California

Any federal, state, or local agency

Compliance Pathways *Objective: Transition to a 100% Zero Emissions Vehicle Fleet*

Vehicle Group Turnover Requirements	10%	25%	50%	75%	100%
Vans, box trucks, two-axle buses, yard tractors	2025	2028	2031	2033	**2035**
Work trucks, day cab tractors, three-axle buses	2027	2030	2033	2036	**2039**
Sleeper cabs tractors and specialty vehicles	2030	2033	2036	2039	**2042**

Pathway #1: Model Year Schedule

- Starting January 1, 2024, any vehicle over 8,500 lbs. GVWR added to a fleet must be a ZEV.
- All vehicles beyond their useful life must be removed from the fleet.

Pathway #2: ZEV Milestone Option

- Fleets achieve compliance by meeting or exceeding ZEV milestone targets
- Fleets will use body type categories to calculate ZEV targets.
- Can continue to purchase ICE as long as ZEV Milestones are met

FEASIBILITY ASSESSMENT What → **SOLUTION DESIGN** How → **ELECTRIC VEHICLE IMPLEMENTATION** Execute → **MANAGEMENT & OPTIMIZATION** Operate & Optimize

enterprise FLEET MANAGEMENT

Assumptions				
Fleet Analyzed	82	Fleet Growth	-0.28%
Current Cycle	9.53	Annual Miles	3,900
Current Maintenance	$87.75	Current MPG	12
Maint. Cents Per Mile	$0.27	Price/Gallon	$4.00

Proposals	
Proposed Fleet	81
Proposed Cycle	4.95
Proposed Maintenance	$44.21

	Fleet Mix				Fleet Cost						Annual	
Fiscal Year	Fleet Size	Annual Needs	Owned	Leased	Purchase	Lease*	Equity (Owned)	Equity (Leased)	Maintenance	Fuel	Fleet Budget	Net Cash
Average	82	8.6	82	0	304,717	0	-28,754		86,346	106,600	468,909	0
Year 1 ('25)	81	25	56	25	0	184,821	-99,154		72,232	99,007	256,906	212,003
Year 2 ('26)	81	17	39	42	0	307,071	-138,361		63,350	93,844	325,904	143,005
Year 3 ('27)	81	17	22	59	0	435,848	-150,037	-12,443	54,468	88,681	416,517	52,392
Year 4 ('28)	81	18	5	76	0	556,118	-184,692		45,586	83,519	500,531	-31,622
Year 5 ('29)	81	5	0	81	0	592,746	-48,116	-278,830	42,974	82,000	390,773	78,136
Year 6 ('30)	81	25	0	81	0	592,746		-197,099	42,974	82,000	520,621	-51,712
Year 7 ('31)	81	18	0	81	0	592,746		-196,551	42,974	82,000	521,168	-52,260
Year 8 ('32)	81	16	0	81	0	592,746		-199,767	42,974	82,000	517,952	-49,044
Year 9 ('33)	81	18	0	81	0	592,746		-72,831	42,974	82,000	644,888	-175,979
Year 10 ('34)	81	6	0	81	0	592,746		-266,387	42,974	82,000	451,333	17,576

SAVINGS

10 Year Savings*	$507,600
Net Sustainable Impact*	$13,951

*includes total unrealized equity of $365,105

Current Fleet Equity Analysis

YEAR	2025	2026	2027	2028	2029	Under-Utilized
QTY	25	17	17	17	5	1
Est $	$3,962	$8,139	$8,826	$10,864	$9,623	$100
TOTAL	$99,054	$138,361	$150,037	$184,692	$48,116	$100

$620,361

Estimated Current Fleet Equity**

Key Objectives

Lower average age of the fleet

43% of the current light and medium duty fleet is over 10 years old

Resale of the aging fleet is significantly reduced

Reduce operating costs

Newer vehicles have a significantly lower maintenance expense

Newer vehicles have increased fuel efficiency with new technology implementations

Maintain a manageable vehicle budget

Challenged by inconsistent yearly budgets

Currently vehicle budget is underfunded

* Lease Rates are conservative estimates

**Estimated Current Fleet Equity is based on the current fleet "sight unseen"
and can be adjusted after physical inspection and may change based on market factors, these are not guaranteed values

Lease Maintenace costs are exclusive of tires unless noted on the lease rate quote.

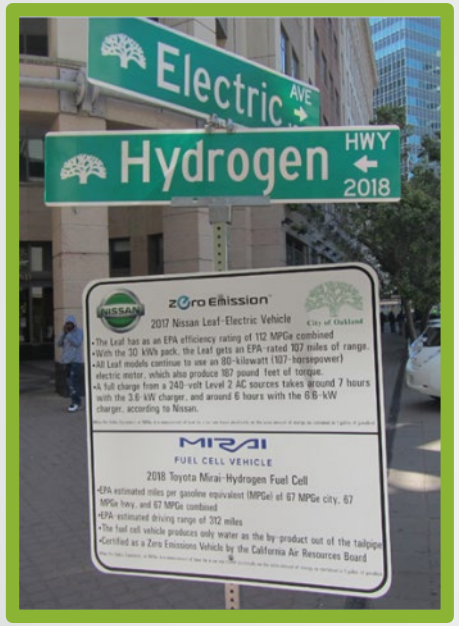
THE RESULTS MOVING FORWARD

Now armed with the data from this large-scale study, we can stay in front of industry EV trends and understand the landscape. Leveraging this data will help us adopt sustainably, with industry-leading expertise now and into the future

enterprise FLEET MANAGEMENT

City of Oakland Electrification

Richard Battersby, OAKLAND PUBLIC WORKS



8th largest City in CA
1800 vehicles

Electrification Journey Began 2014

2014- 4 Nissan Leafs and 6 L2 Chargepoint Ports

2025- Over 120 Plug-in vehicles, 87 L2 EVSE charge ports, 2 DCFC, 4 BEAM solar EV Arcs

CITY OF OAKLAND
PUBLIC WORKS

City of Oakland

Located in the East Bay of San Francisco Bay region
Population of approx. 435,000 citizens
54 square miles

Equipment Services part of Oakland Public Works
- Full service municipal fleet 1800 +/- vehicle/s equipment
- Supports all City department functions (no curbside refuse or transit)

60 FTE, 45 of these Mechanic and Service Worker
6 Functional shop areas (2 primary locations):
- Light Duty
- Heavy Duty (day and swing shifts)
- Emergency vehicle
- Motorcycle Shop
- Body Shop
- Machine Shop

2025 Fleet Composition

- **1,917** total assets, including on and off-road equipment
- **1,609** on-road vehicles and equipment
  - **(1,192)** Light Duty Class 1 & 2 (up to 10,000 lbs)
  - **(291)** Medium Duty Classes 3, 4 & 5 (10,000 lbs. - 19,500 lbs)
  - **(126)** Heavy Duty Classes 6, 7 & 8 (above 19,500 lbs)

Alternatively Fueled On-Road Fleet

Fuel Type	Quantity
Battery Electric:	74
Hybrid:	150
Plug-In Hybrid:	45
Renewable CNG:	113
Propane:	12
Renewable Diesel:	532
Hydrogen:	4
Total:	**930**
Total % of fleet:	**58%**

(over 75% for non-emergency fleet vehicles)

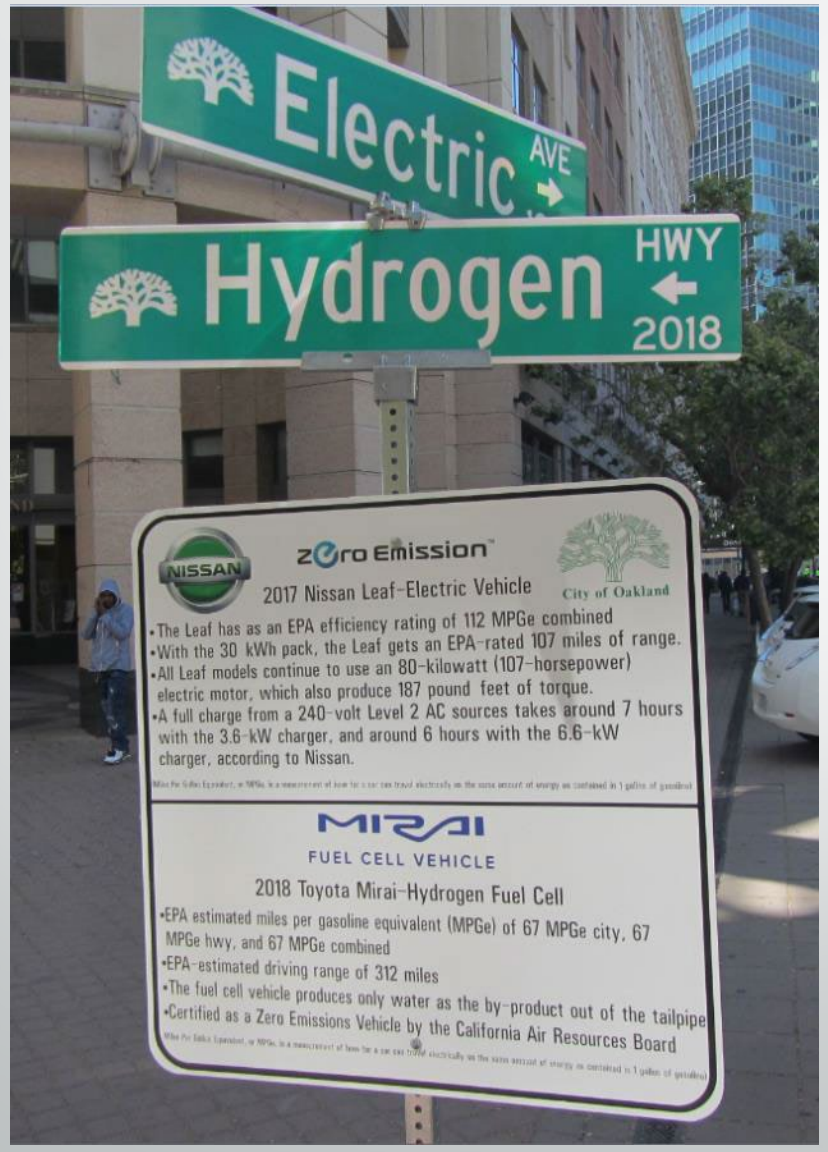
HYBRID

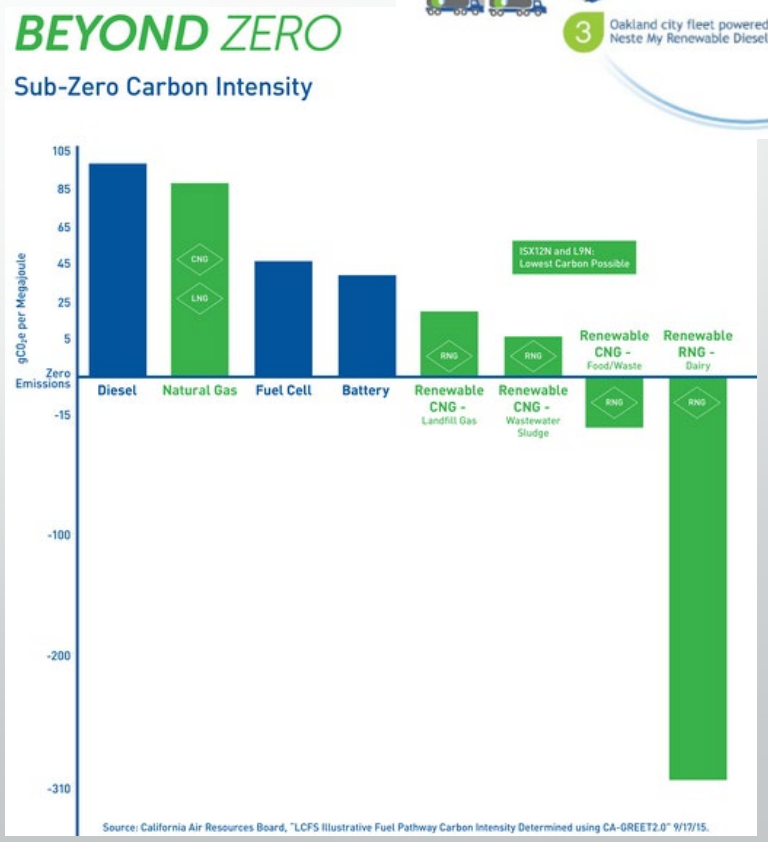
Renewable Diesel

RNG

CITY OF OAKLAND

Zero Emission (or better?)





Oakland Annual Fuel Consumption

750,000 Gallons Total

Gasoline

400,000 gallons

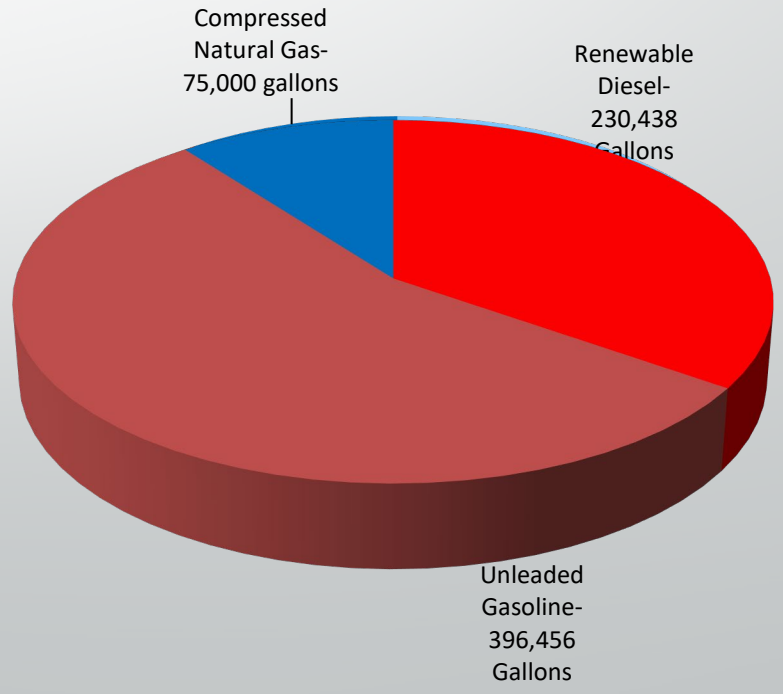
Renewable Diesel

275,000 gallons

Renewable Natural Gas (CNG)

75,000 gasoline gallon equivalents

Renewable Hydrogen and Electricity



Successes and Challenges

SUCCESSES

Light duty fleet electrification well underway
Fleet, workplace, and public EV charging installed
BEV and PHEV technician training program
Light duty fleet electrification assessment complete, MED/HD soon (EBCE and Frontier Energy)
Engineering consultant to be hired to formulate an overall plan
Fleet Electrification Plan and Informational Report presented to City Council
No significant dedicated funding utilized in early phases
Some grant funding utilized for early acquisitions- CVRP, BAAQMD Charge!, NGVIP, MTC EV Fleet
Grants- PG&E EV Fleet, CEC CIGF, EPA Med/HD, BetterFleet/REDWDS, (HVIP, BAAQMD Charge!)

CHALLENGES

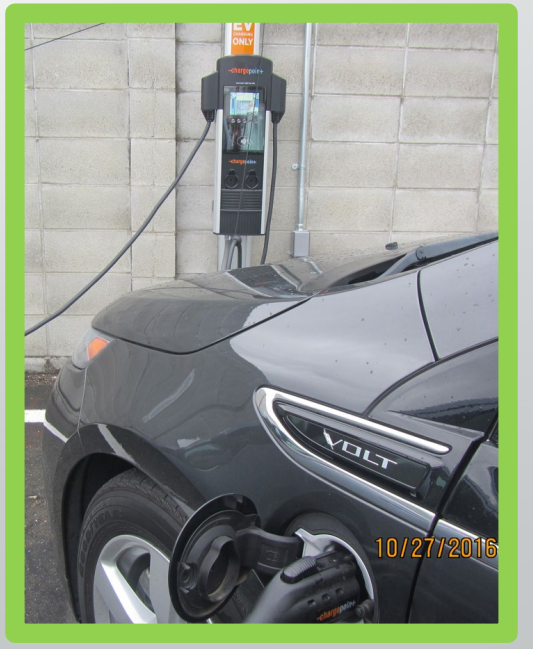
Medium and Heavy-Duty vehicle availability remains limited
No dedicated internal funding, replacement funding eliminated
Part time staff to project manage or pursue grant funding
Internal competition for electrification, resiliency, and sustainability funding
Existing fleet depot sites mostly at maximum electrical capacity
Anticipated lengthy lead times for major power upgrades
Offsite charging limited, and typically cannot accommodate MED/HD
Hydrogen fuel price at $37/kg is not financially viable

Upcoming Regulations – Advanced Clean Fleet

CALIFORNIA AIR RESOURCES BOARD

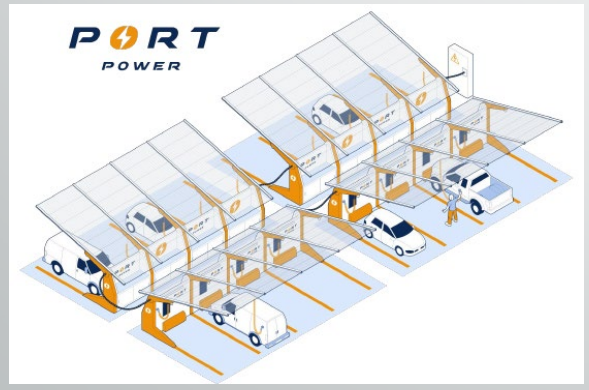
Fleets outside designated low-population counties: 50 percent of the total number of vehicle additions over 8500 GVW must be ZEVs beginning January 1, 2024, increasing to 100 percent beginning January 1, 2027.

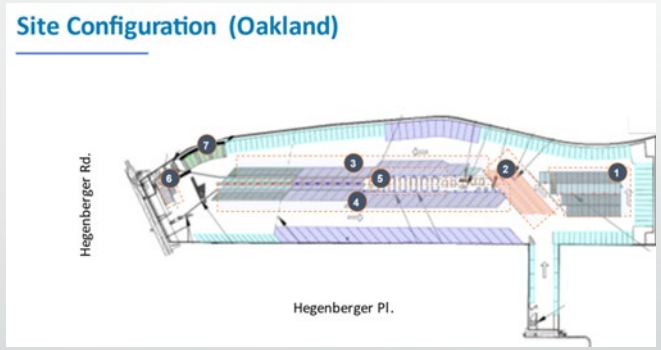
Additional Electricity Needed to Charge All These Electric Vehicles?



Potential Solutions

Onsite turn-key financed or bundled charging as a service options
External EV charging hubs
Onsite transportable/mobile EV charging
Mobile EV charging
Micro-grids
Integrated solutions (solar, onsite energy storage, wind)
Grid independent solutions
Bi-directional charging





EXTRA CREDIT PROJECTS

Evenergi charging efficiency study
ViaScience BEV electricity CI study
Clean Cities DAC EVSE projects
BEV technician training
EVSE service and repair training
Over-spec'ing truck/bus battery packs

Questions?

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CITY OF OAKLAND
PUBLIC WORKS

ACCREDITED AGENCY
A•P•W•A

EAST BAY
CLEAN CITIES COALITION

RTA THE FLEET
SUCCESS COMPANY

Don’t EV Your Way Into a Corner: Right-Size and Right-Type Your EV Transformation

August 20, 2025

Scott Conlon, CAFM

Fleet Consultant at RTA: The Fleet Success Company

25 years in the fleet industry

- 5 years at USDA Forest Service
- 6 years as fleet management consultant
- 8 years at Montgomery County, MD
- 6 years at Shuttle-UM
- Certificates in Public Management, Program/Project Management, and Executive Leadership

About RTA
The Fleet Success Company

- FMIS, Consulting & Analytics services for Fleets in North America
- Started in 1979, by former Fleet Manager of UPS
- BHAG: Save Fleets $1 B (saved fleets ~$195 M since 7/15/17)
- +1200 clients in every industry and sector
- +600 states, cities, counties and other government entities
- Software is designed and built by fleet professionals for fleet professionals
- Consulting included for FMIS customers and available to all
- Based in Glendale, AZ (Phoenix region)

About RTA

Fleet Management Information Software

- Designed and built by fleet professionals for fleet professionals
- Embedded Benchmarking
- Advanced Analytics & Dashboarding
- Asset & Life Cycle Management
- Multi-facility in-house M&R
- Multi-facility Parts Inventory Management
- Motor Pool Management
- Consulting included

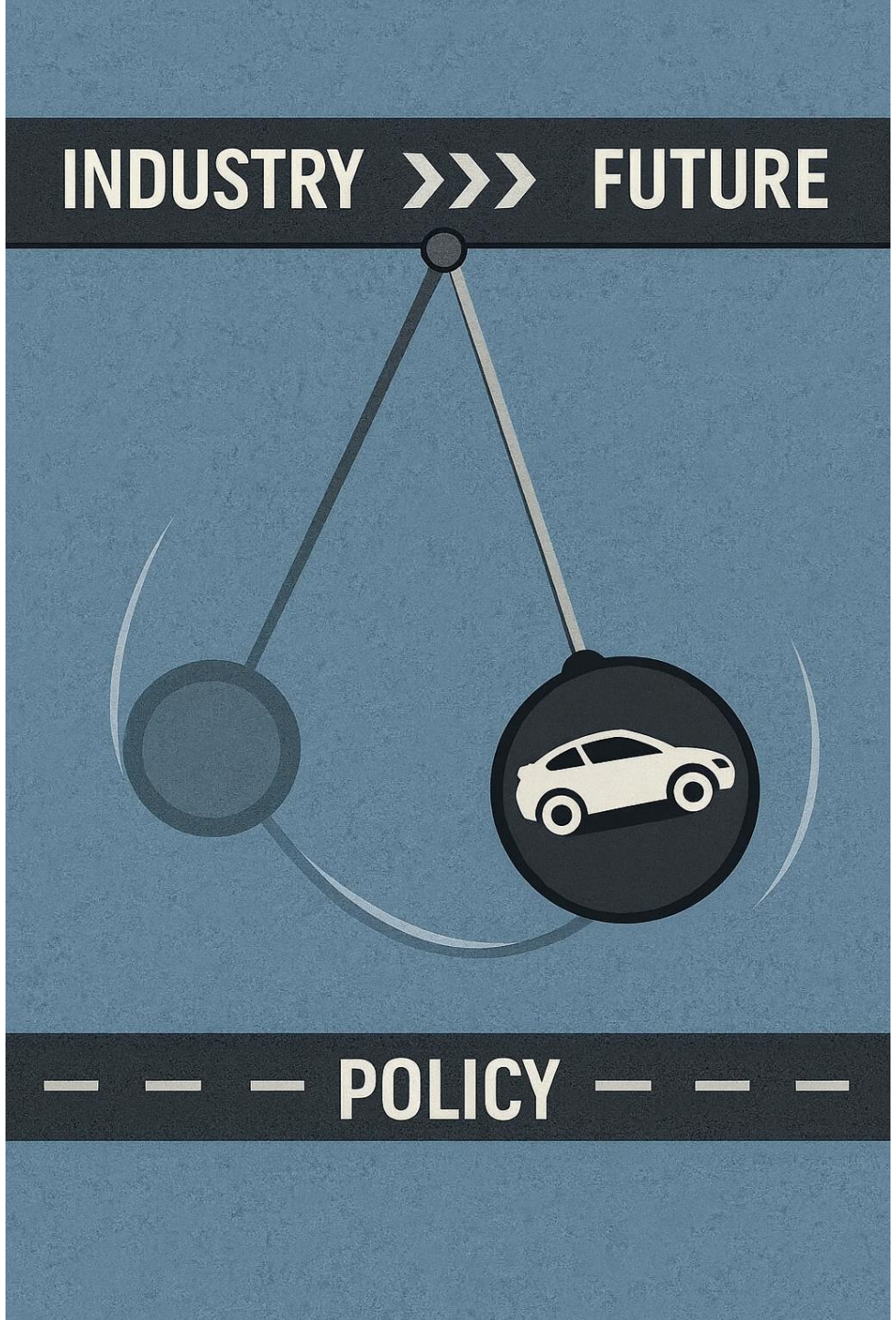
Fleet Management Consulting & Analytics

- EV Transition Planning & Milestone Management
- Alternative Emissions Reduction Planning
- Replacement Planning & Life Cycle Optimization
- PM optimization & Predictive M&R
- Right-sizing, Right-typing & Utilization Management
- Performance Assessments & Benchmarking
- Cost Allocation & Chargeback Development
- Policies and procedures

The Big Picture: Industry, Mandates, and Uncertainty.

The Pendulum Analogy

- Auto industry is electrifying for the long-term.
- Sustainability is a political football in the short-term.
- Regardless of short-term policy changes, fleet managers should implement best practices to build the capacity need to implement durable electrification strategies.



Take Steps to Optimize Your Fleet; Position Your Fleet for Electrification Success!

Top-tier fleet management organizations are those that optimize their fleets by…

- …implementing a class code structure that supports analysis,
- …utilize technology to automate and maximize data collection,
- …controlling fleet size and composition,
- …applying the principles of lifecycle costing, and
- …proactively planning for fleet replacement.

Example of Policy Uncertainty in Federal Fleets

Executive Order mandates:

- **2015** – reduce greenhouse gas emissions (gCO_2/mi.) by certain percentages from a 2014 baseline, buy 20 percent light duty zero emission vehicles by 2020 and 50 percent by 2025.
- **2018** – reversed: be more efficient.
- **2021** – reversed: buy 100 percent ZEV for light-duty by 2027 and for medium and heavy duty by 2035, put telematics in vehicles to assist in planning for transition.
- **2025** – cancelled without updated guidance.

Ongoing Uncertainty Around Electrification

- **Regulatory Ambiguity** – unclear whether CA or federal rules will prevail
- **Investment Risk** – EV infrastructure/purchases may lose value
- **Patchwork Rules** – different standards across states complicate operations
- **Procurement Challenges** – long vehicle cycles hinder planning amid uncertainty
- **Market Disruption** – unclear automaker commitments to EV production
- **Legal Instability** – ongoing litigation keeps future rules unsettled

The Goal of This Presentation

- Last year's presentation covered some of the higher level analyses that directly support EV adoption, which included:
  - EV Goal Setting and Calculating GHG Emissions Reductions
  - EVSE Requirements Analysis
  - The Effects of EVs on Maintenance and Repair Programs
  - Evaluating the Bottom-Line Costs and Benefits of EV Adoption
- This presentation will focus on often-overlooked fleet fundamentals that indirectly support EV adoption through resource efficiency.
  - Fleets with solid fundamentals will have better success in EV adoption.
  - I will share from two perspectives: as a consultant helping fleets succeed, and as a recent national fleet manager of a Federal agency.

Updating Fleet Class Code Structure

Why classify vehicles?

- Fleets can be made up of dozens (if not hundreds) of vehicle types.
- Vehicles should be in the same class when characteristically, vocationally, and financially similar.
- Vehicle classification is used to group vehicles by:
  - Weight range
  - Body configuration
  - Drive type
  - Fuel type
  - Vocation/specification
- A good classification system has character-level significance.

Weight and Body Types

Weight Code

Weight Code	Weight Description	GVWR
0	Non Self Propelled	Not Applicable
A	Class 1A	Class 1A: 3,000 lb or less (1,360 kg or less)
B	Class 1B	Class 1B: 3,001 - 4,000 lb (1,360 - 1,814 kg)
C	Class 1C	Class 1C: 4,001 - 5,000 lb (1,814 - 2,268 kg)
D	Class 1D	Class 1: 6,000 lb or less (2,722 kg or less)
E	Class 2E	Class 2E: 6,001 - 7,000 lb (2,722 - 3,175 kg)
F	Class 2F	Class 2F: 7,001 - 8,000 lb (3,175 - 3,629 kg)
G	Class 2G	Class 2G: 8,001 - 9,000 lb (3,629 - 4,082 kg)
H	Class 2H	Class 2H: 9,001 - 10,000 lb (4,082 - 4,536 kg)
3	Class 3	Class 3: 10,001 - 14,000 lb (4,536 - 6,350 kg)
4	Class 4	Class 4: 14,001 - 16,000 lb (6,350 - 7,258 kg)
5	Class 5	Class 5: 16,001 - 19,500 lb (7,258 - 8,845 kg)
6	Class 6	Class 6: 19,501 - 26,000 lb (8,845 - 11,794 kg)
7	Class 7	Class 7: 26,001 - 33,000 lb (11,794 - 14,969 kg)
8	Class 8	Class 8: 33,001 lb and above (14,969 kg and above)
9	Off Road and Construction	Not Applicable
X	Undefined Weight	Undefined

Body Code

Body Code	Body Description
0	Trailer
1	Cycles
2	Light Vehicles
3	Automobile
4	Passenger Van/Bus
5	Cargo Van
6	Sport Utility Vehicle
7	Truck - Regular Cab
8	Truck - Extended Cab
9	Truck - Crew Cab
X	Undefined Body

Drive and Fuel Types

Drive Code

Drive Code	Drive Description
4	4WD/AWD
2	2WD/FWD/RWD
N	No Driven Axles
X	Undefined Drive
B	Bumper Pull Trailer
G	Gooseneck Trailer
K	Kingpin Trailer
P	Pintle Hitch Trailer
S	Semi Trailer
W	Fifth Wheel Trailer
T	Tracked

Fuel Code

Fuel Code	Fuel Description
B	Gasoline Compressed Natural Gas Bi-Fuel
C	Compressed Natural Gas Dedicated
D	Diesel Dedicated
E	Electric Dedicated
F	Flex Fuel - Gasoline/E-85
G	Gasoline Dedicated
H	Hybrid - Gasoline
N	Non Fueled
P	Plug-in Hybrid
X	Undefined Fuel

Vocation Coding

Specification Code	Specification Description
AP	Type 6 - Platform
A7	Type 7 - Prevention
GE	General Use - Enclosed Utility Body
GP	General Use - Platform/Stake Body
GS	General Use - Standard Body
GU	General Use - Utility Body
HC	Hotshot Crew Carrier
HK	Helitack
HS	Hotshot Superintendent
HT	Helitender
LK	Law Enforcement K-9
LM	Law Enforcement Marked
LU	Law Enforcement Unmarked
RR	RLS and Striping - Regular Body
RS	RLS and Striping - Service Body
SR	Striping Only - Regular Body
SS	Striping Only - Service Body
VD	Vocational - Dump
VS	Vocational - Service Body

Example:

Specification Description:	Law Enforcement Rock Crawler

Attribute	Code	Description
Weight:	D	Class 1D
Body:	6	Sport Utility Vehicle
Drive:	4	4WD/AWD
Fuel:	G	Gasoline Dedicated
Specification:	LJ	Law Enforcement Rock Crawler

Resulting Class Code:	D64GLJ
Resulting Class Descripton:	Class 1D; Sport Utility Vehicle; 4WD/AWD; Gasoline Dedicated; Law Enforcement Rock Crawler

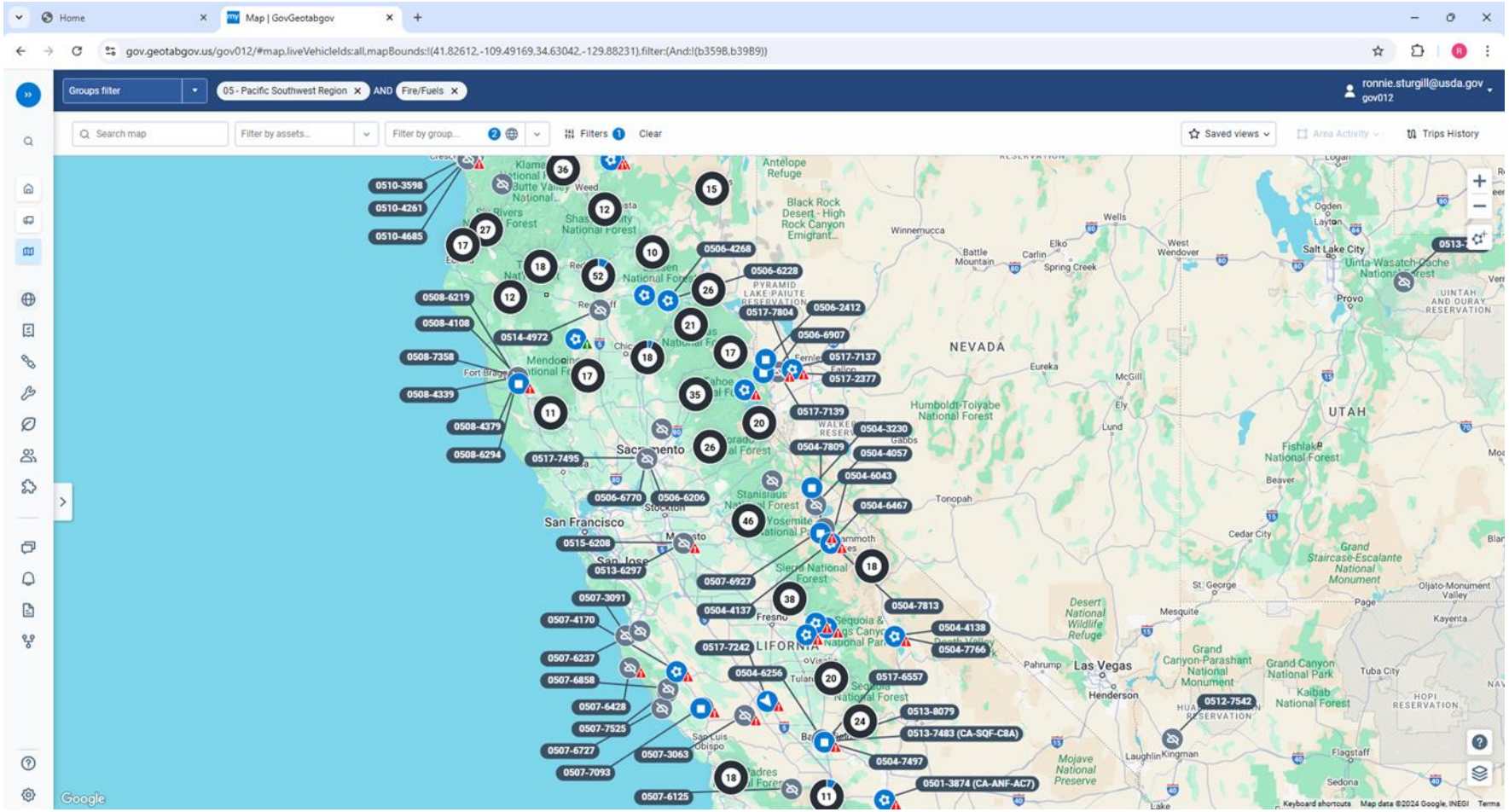
- Each character has an underlying meaning.
- If a plug-in hybrid Jeep were purchased, how would this class code change?
- Most of the characters in this class code can be derived from VIN decode data, which provides clearer definition around which vehicles belong together.
- NAFA provides a comprehensive four-digit class code system
  - Strengths: benchmarking with peers
  - Weaknesses: doesn't maintain character-level significance and doesn't address fuel type.
- Look for outlier vehicles, question why they were selected, then standardize.

Utilizing Technology to Automate and Maximize Data Collection

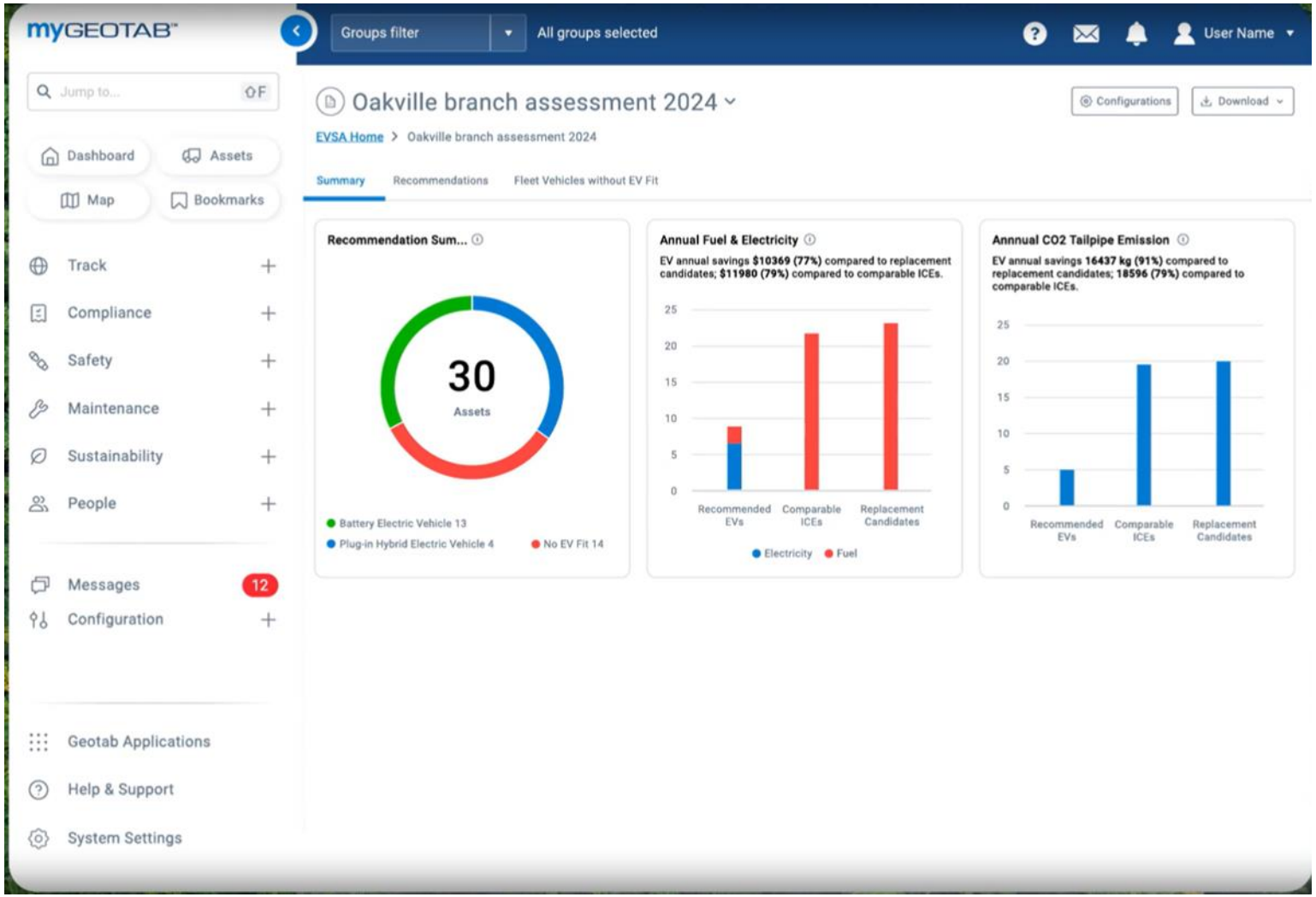
Asset Management Objectives Supported by Telematics

1. **Support Fleet Allocation Decisions.** To identify and reallocate underutilized vehicles, which will reduce the overall fleet costs.
2. **Reduce Downtime.** To reduce downtime and turnaround time for vehicle repairs by enabling proactive management and reporting of out-of-service vehicle repairs.
3. **Improve Fleet Credit Card Fraud Detection.** To reduce the likelihood of on-going fleet credit card fraud by integrating location data from fleet credit card transactions with location data from telematics.

Location: Overnight Parking



Metric: Days per Month Exceeding Range



Controlling Fleet Size and Composition

Why Right-size and Right-type your fleet?

- Most fleets suffer from “fleet creep”
- If you can reduce your fleet size.....
  - The capital cost needs for assets are reduced
  - The EVSE requirements are reduced
  - The M&R load is reduced
- If you can right-type your fleet.....
  - There will likely be more opportunities for assets to become EVs
    - E.g., medium duty truck turned into light duty truck, utilization increasing ROI, pooling instead of single assignment
- Several types of right-sizing/right-typing approaches:
  - Vehicle Allocation Method (VAM)
  - Zero-Based Asset Requirement Definition (ZARD)
  - Motor Pool – also helps in providing CFVs for odd days when EVs lack range
  - Route Based
  - Shift Based

Conducting a VAM

Fleet Inventory

Export and analyze fleet inventory and use data

Utilization Criteria

Develop survey questions, configure survey, & test

Survey & Analysis

Distribute survey, report progress, & apply criteria

Optimize Inventory

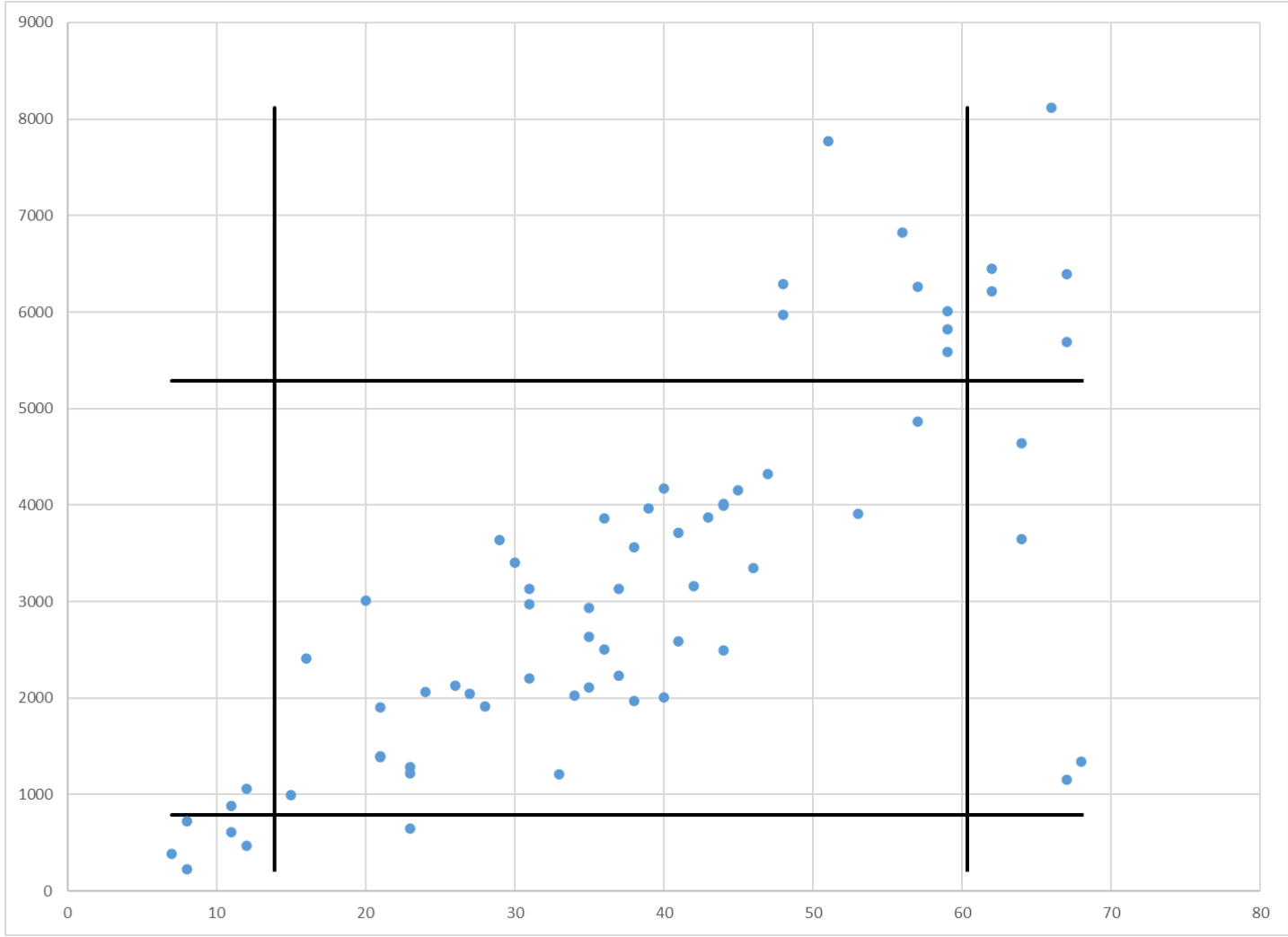
Validate results

Analysis of preliminary data call results

- Consolidate initial inventory and data call data
- Assign point values to utilization and criticality answers
- Weight and total point scores
- Compare vehicles within each vehicle type at the unit
  - For example, only compare SUVs to SUVs at Location X
- Identify mismatches between current vehicle type and reported use to develop right-typing recommendations

Preliminary Sample Results for a Class

- In this example, each LD Pickup 4x2 is represented by a point. Each point that appears low and left will need further justification (the same information will display in the VAM results tab).
- The VAM tool arrived at these conclusions by taking into account information gathered from the data call, according to the answers provided by vehicle POCs, combined with telematics vehicle data.



Preliminary Results by Region

	01	02	03	04	05	06	07	08	09	10	12	16	22	24	26	27	33	Grand Total
Eliminate	61	97	78	91	203	254	9	176	70	13	2	3	12	3	6	16	17	1111
High Utilization, High Mission Need					1	1		1					1					4
High Utilization, Low Mission Need	4		8	16	18	1		5	3	1		4				4		64
High Utilization, Normal Mission Need	48	38	40	71	82	46	2	59	45	11		17	3	1	5	3	3	474
Low Utilization, High Mission Need			1															1
Low Utilization, Low Mission Need	58	33	50	82	89	54		54	45	10	1	9	6	4	3	4	6	508
Low Utilization, Normal Mission Need	200	154	171	237	284	256	7	178	171	28	3	51	17	15	18	10	8	1808
Normal Utilization, High Mission Need			1	1	3				1			5	7			1		19
Normal Utilization, Low Mission Need	202	148	169	243	304	131	6	177	127	17		47	20	14	6	5	14	1630
Normal Utilization, Normal Mission Need	1056	958	951	1165	1626	1390	24	1057	895	129	5	249	82	70	59	34	89	9839
Grand Total	**1629**	**1428**	**1469**	**1906**	**2610**	**2133**	**48**	**1707**	**1357**	**209**	**11**	**385**	**148**	**107**	**97**	**77**	**137**	**15458**

Optimal Fleet Profile

		FUEL TYPES / CONFIGURATIONS					
	VEHICLE TYPE	Petroleum Dedicated Vehicles	Petroleum Dedicated LGHG Vehicles	Hybrid & Petrol/Alt Multi-Fuel Vehicles	Alt Fuel Dedicated Vehicles	Zero Emission Vehicles	GRAND TOTAL
PASSENGER	Low-speed Vehicle	-	-	-	-	1	1
	Sedan/St Wgn Subcompact	10	-	156	-	-	166
	Sedan/St Wgn Compact	20	-	332	-	3	355
	Sedan/St Wgn Midsize	5	-	57	-	1	63
	Sedan/St Wgn Large	-	-	-	-	-	-
	MD Sedan/St Wgn Large	-	-	-	-	-	-
	Sedan Limousine	-	-	-	-	-	-
	MD Sedan Limousine	-	-	-	-	-	-
	Subtotal	35	-	545	-	5	585
OTHER PASS	LD SUV 4x2	27	-	130	1	-	158
	LD SUV 4x4	225	-	1,576	5	16	1,822
	MD SUV	-	-	3	-	-	3
	LD Minivan 4x2 (Passenger)	-	-	108	-	-	108
	LD Minivan 4x4 (Passenger)	1	-	-	-	-	1
	LD Van 4x2 (Passenger)	1	-	12	-	1	14
	LD Van 4x4 (Passenger)	-	-	2	-	-	2
	MD Van (Passenger)	-	-	2	-	1	3
	Subtotal	254	-	1,833	6	18	2,111

Optimal Fleet Profile

		FUEL TYPES / CONFIGURATIONS					
	VEHICLE TYPE	Petroleum Dedicated Vehicles	Petroleum Dedicated LGHG Vehicles	Hybrid & Petrol/Alt Multi-Fuel Vehicles	Alt Fuel Dedicated Vehicles	Zero Emission Vehicles	GRAND TOTAL
TRUCK	LD Minivan 4x2 (Cargo)	-	-	7	-	-	7
	LD Minivan 4x4 (Cargo)	-	-	2	-	-	2
	LD Van 4x2 (Cargo)	-	-	-	-	-	-
	LD Van 4x4 (Cargo)	-	-	1	-	-	1
	MD Van (Cargo)	10	-	40	-	-	50
	LD Pickup 4x2	78	-	1,039	-	2	1,119
	LD Pickup 4x4	282	-	3,621	11	6	3,920
	MD Pickup	124	-	225	-	5	354
	LD Other 4x2	-	-	-	-	-	-
	MD Other	4	-	1	-	-	5
	HD	8	-	4	-	-	12
	Subtotal	506	-	4,940	11	13	5,470
OTHER	LD Ambulance	-	-	-	-	-	-
	Ambulance	-	-	-	-	-	-
	HD Ambulance	-	-	-	-	-	-
	MD Bus	-	-	-	-	-	-
	HD Bus	-	-	-	-	-	-
	Subtotal	-	-	-	-	-	-
	TOTAL ALL TYPES	795	-	7,318	17	36	8,166

Monitor Fleet Size and Composition

How do you transition from fleet right-sizing as a *project* (VAM) to fleet right-sizing as a *program*?

- Use the OFP to:
  - Develop OFPs by each organizational unit; and
  - Benchmark the *active*, on-hand fleet inventory periodically and during the acquisition cycle

Establish Controls

- Update policies and procedures for requesting approval for additional vehicles or retention of “replaced” vehicles
- Require the same level of scrutiny on new vehicle requests as you would apply during the VAM process
  - Evaluate alternatives to acquiring the vehicle
  - Forecast utilization
  - Articulate the mission need

Standardization/Employee-to-Vehicle Ratios

- Data gathered during the VAM process can be used to evaluate the ratios between personnel and vehicles.
- The military service branches refer to this type of approach as a “table of allowance” or “table of organization and equipment”. It is mostly used for deployable operating forces.
- Factors limiting comparability:
  - Lack of organizational uniformity across installations
  - Base type (air station, ground, logistics, or training base)
  - Tenant activities supported
  - Geographic factors (density, proximity to other installations, etc.)

Applying the Principles of Lifecycle Costing

Managing Lifecycles

- Fleet managers should determine how frequently vehicles should be replaced
- Most fleet management organizations keep vehicles too long
  - it is always less expensive to repair a vehicle than to replace it, but the repairs end up costing more in the long run
- Effective fleet management includes the identification of life cycles that minimize total cost of ownership

Lifecycle Cost Analysis

Approach

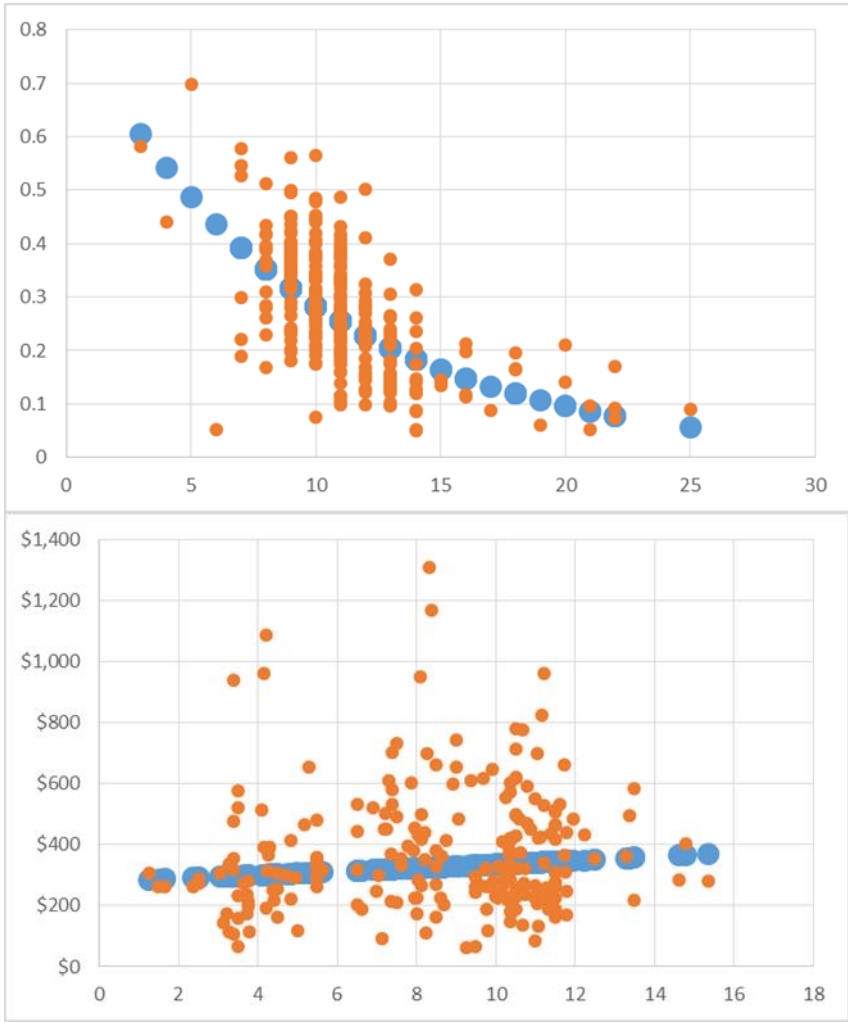
Quantify the key direct (and possibly indirect) costs of acquiring, using, maintaining and repairing, and disposing of a vehicle over a range of possible replacement cycles

Cost Factors

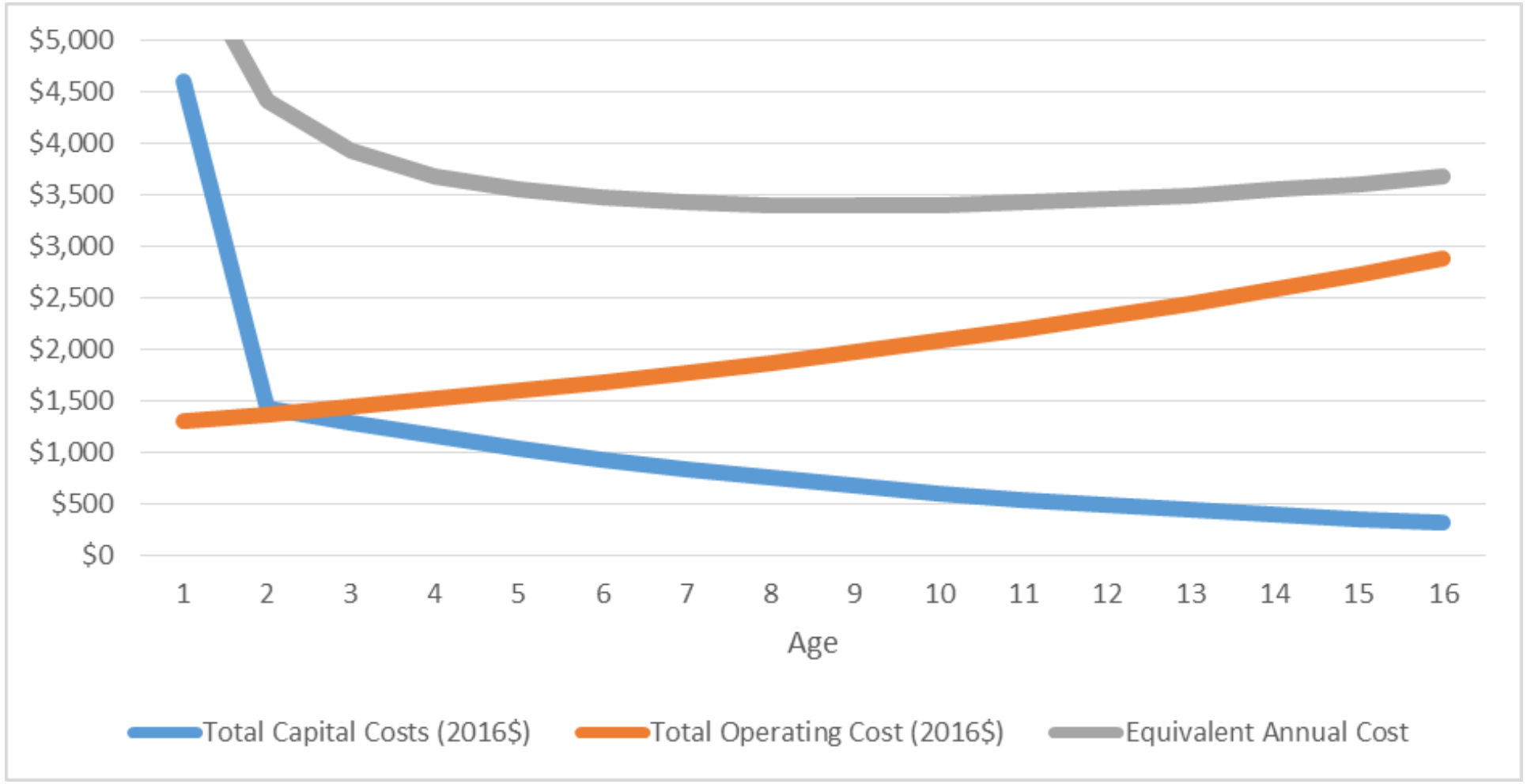
- Capital
  - Purchase price
  - Upfitting cost
  - Residual value
- Operating
  - Maintenance and repair
  - Fuel
- Other
  - Acquisition and disposal
  - Registration fees and taxes
  - Exclude accident costs

Where does the cost data come from?

- Financial and property management systems
- POs/Contracts/Schedules
  - Vehicle and fuel purchase prices
- Fuel/Fleet Card Systems
  - Maintenance and repair charges
  - Fuel consumption and cost
- Fleet Management Information Systems
  - In-house maintenance and repair labor and parts costs



Lifecycle Costs of a Vehicle



Lifecycle Cost Analysis Considerations

- Internal cost data accessibility and accuracy
  - Maintenance technician labor costs
  - Parts management costs
  - Sublet repair management costs
  - Asset management and administration costs
  - Activity-based costing for indirect costs
- Assumptions
  - Inflation rates
  - Downtime penalty for retaining older vehicles
  - Fuel efficiency penalty for older vehicles
- Sensitivity analysis of key assumptions

Applying Lifecycle Parameters through Replacement Prioritization

- A point-based system can be applied to the fleet to help advance, validate, or defer assets.
- Life-to-date maintenance / capital cost * 10 points
- Actual age / planned age * 5 points (10 for non-metered assets)
- Actual mileage / planned mileage *5 points
- The fleet should be sorted in descending order with low-point, eligible assets deferred to manage costs.
- A point-based system for determining replacement helps mitigate the effects of having high- and low-utilization vehicles in the same class (as this disparity can make them financially dissimilar).

Planning for Replacement: Benchmark, Status Quo, Modified, and EV Transition Plans

Replacement Planning

- We recommend transitioning assets to EV once they are due for replacement
- The capital cost to transition an entire fleet at once is exorbitant
- EVs have historically gotten cheaper over time as technology and manufacturing improves
- More options will be available over time

Replacement Planning Data Requirements

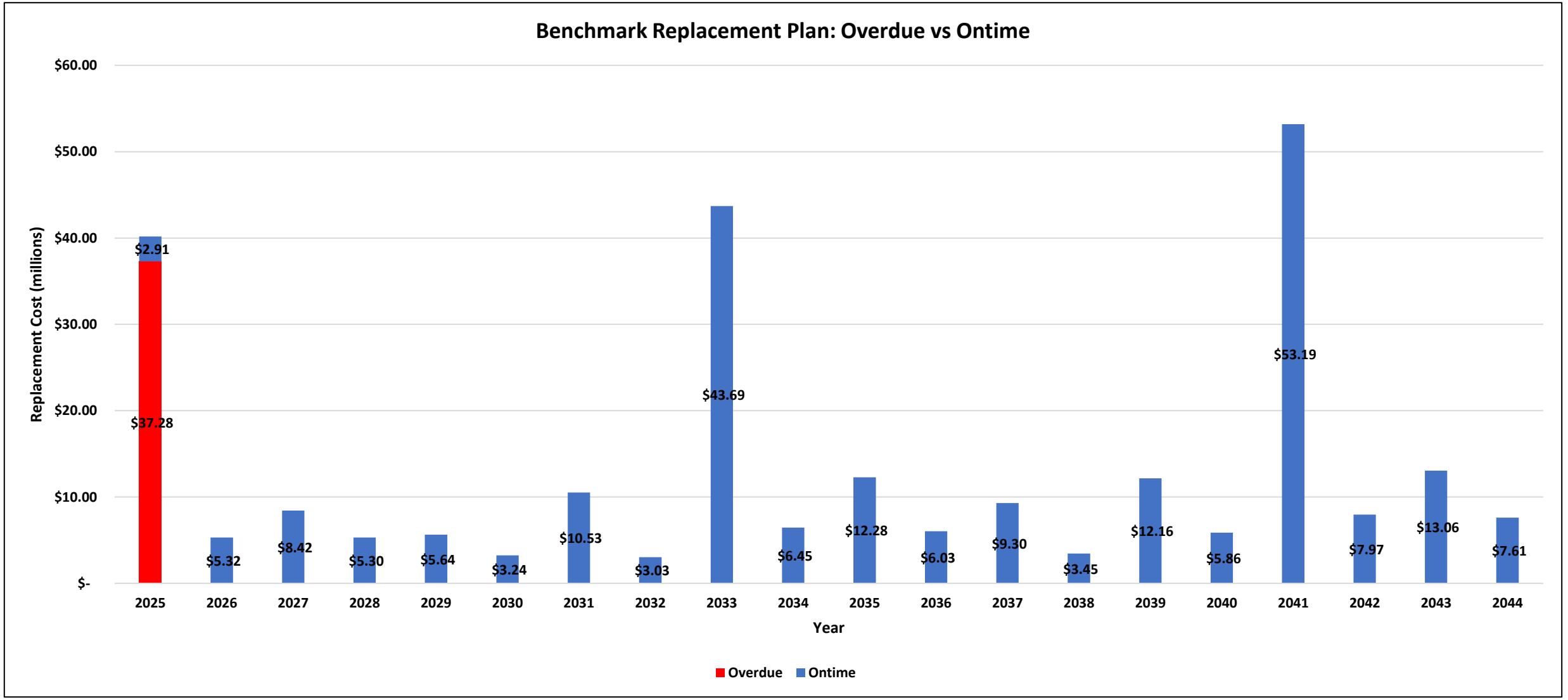
- Inventory of fleet
  - Assets
  - Classes
  - Age
  - Current Mileage/Hours
  - Annual Mileage/Hours
  - Annual Fuel Used
- Replacement Parameters for each class
  - Age
  - Mileage/Hours
  - Purchase Price
  - Expected inflation rate
  - EV alternative

Replacement Planning

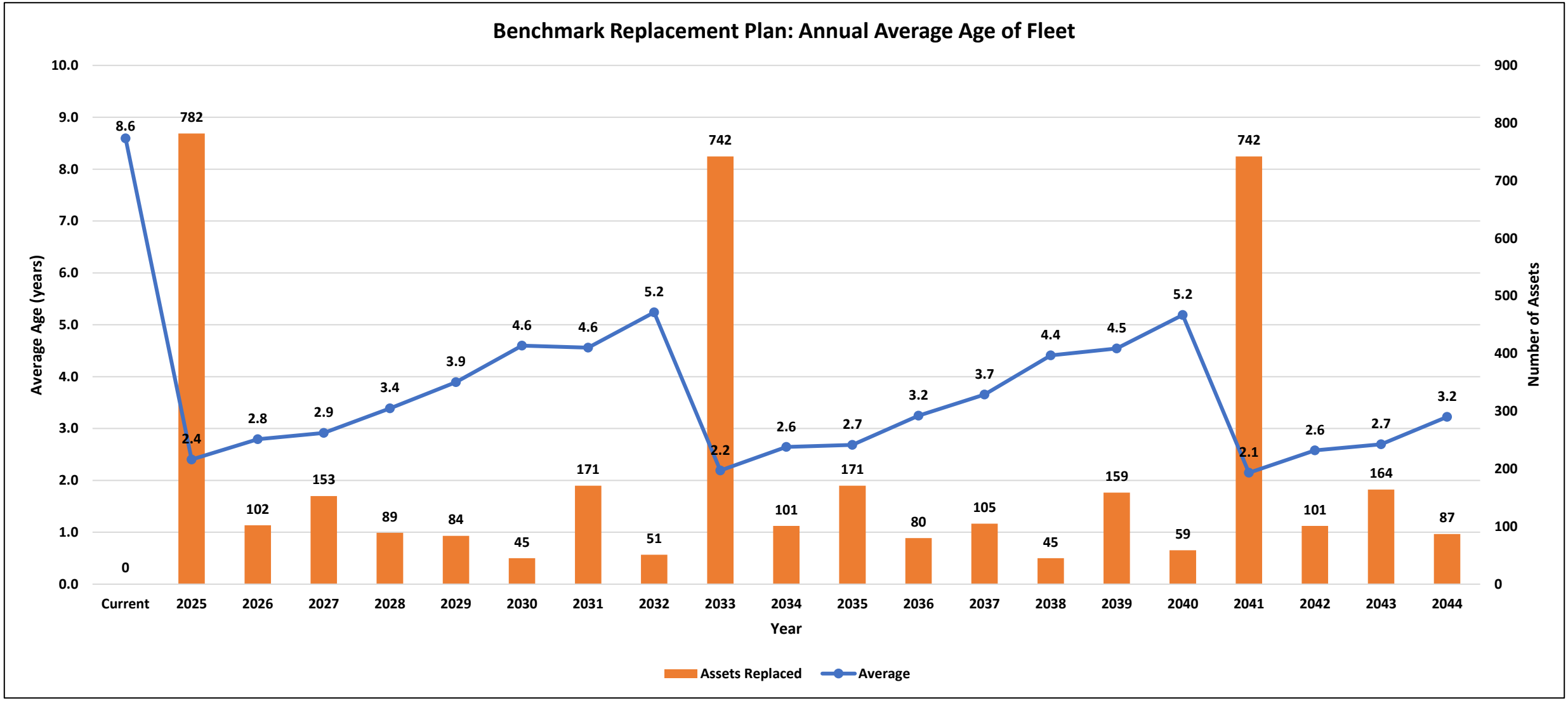
- In order to develop a reasonable transition plan for the fleet to move to EVs, understanding the current replacement benchmark is necessary
- Depending on the state of the replacement benchmark, a modified plan may be necessary to make it financially and operationally feasible
- A modified replacement plan would be the basis of an EV transition plan

Benchmark Replacement Plan

1,512 assets, county fleet near Washington D.C.



Benchmark Replacement Plan

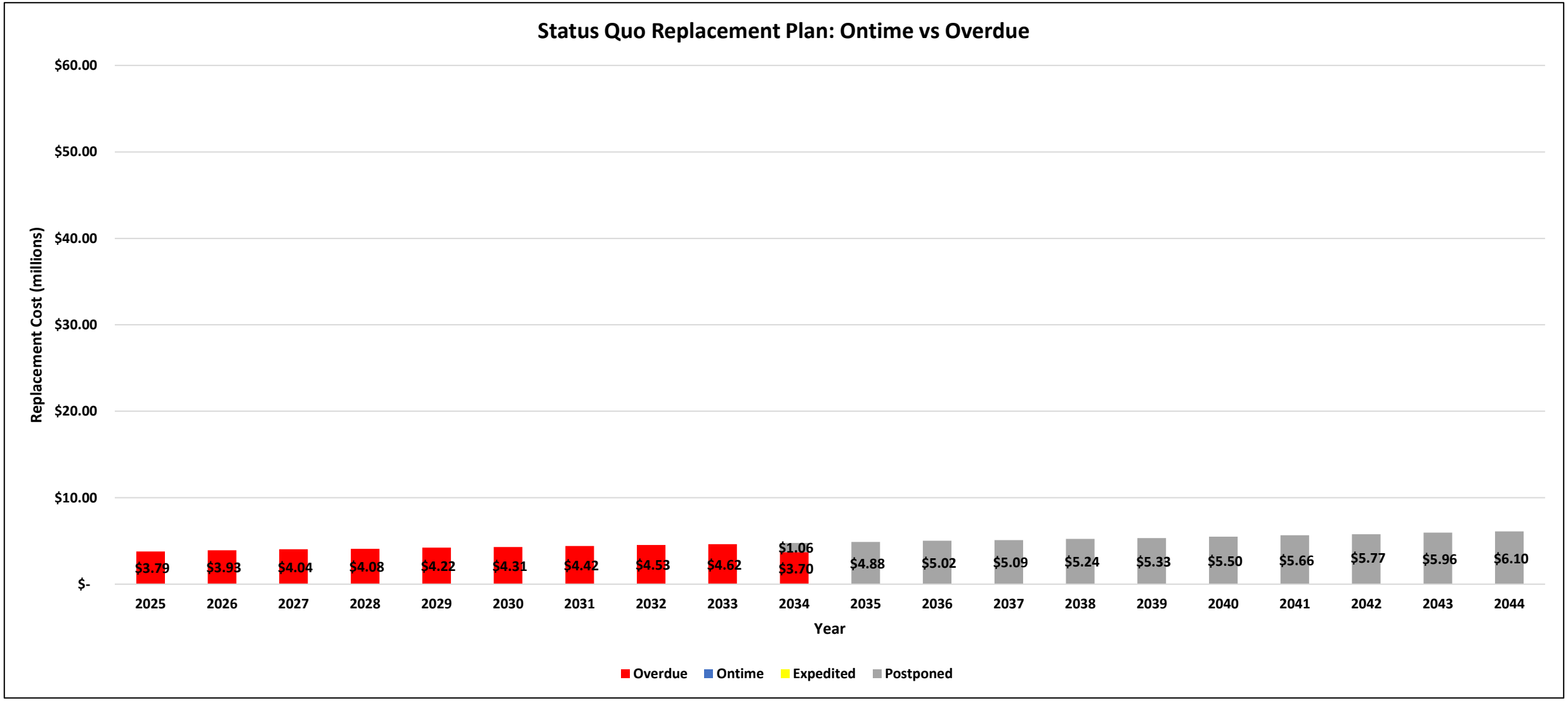


Benchmark Replacement Statistics

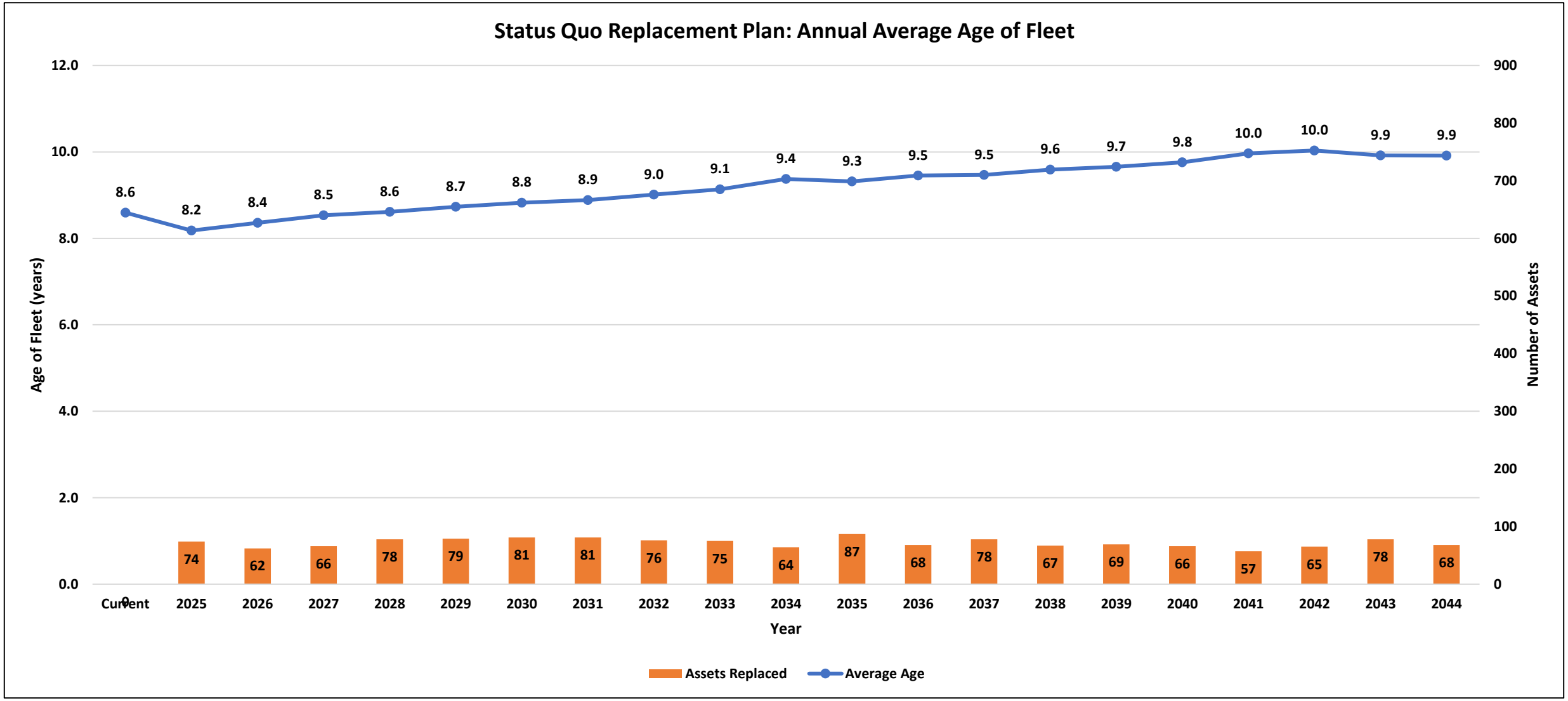
Statistic	Benchmark Plan
Number of Assets in Plan	1469
Number of Class Codes in Plan	74
Number of EVs: Beginning of Plan	13
Number of EVs: End of Plan	13
Number of New EVs	0
Number of Assets Overdue for Replacement in First Year	721 (49%)
Mean Age of Assets (years)	8.6
Median Age of Assets (years)	7.9
Weighted Overall Average Replacement Cycle	8.1
Average Class Replacement Age Cycle	9.2
Mean Miles of Assets	61,071
Median Miles of Assets	51,589
New Fleet Value Today	$ 78,030,897
Average Replacement Cost	$ 53,118
Cost of Replacing Overdue Assets	$ 37,277,953
Cumulative Cost of 20 Year Plan	$ 262,722,912
Cumulative Cost of EV Assets	$ 1,541,586
Average Annual Spend over 20 Year Plan	$ 13,136,146
Historical Average Annual Spend for Last 5 Years	$ 3,786,789
Historical Spend Previous Year	$ 3,800,000
Average Annual Spend based on Weighted Replacement Cycles	$ 9,601,088

Status Quo Replacement Plan

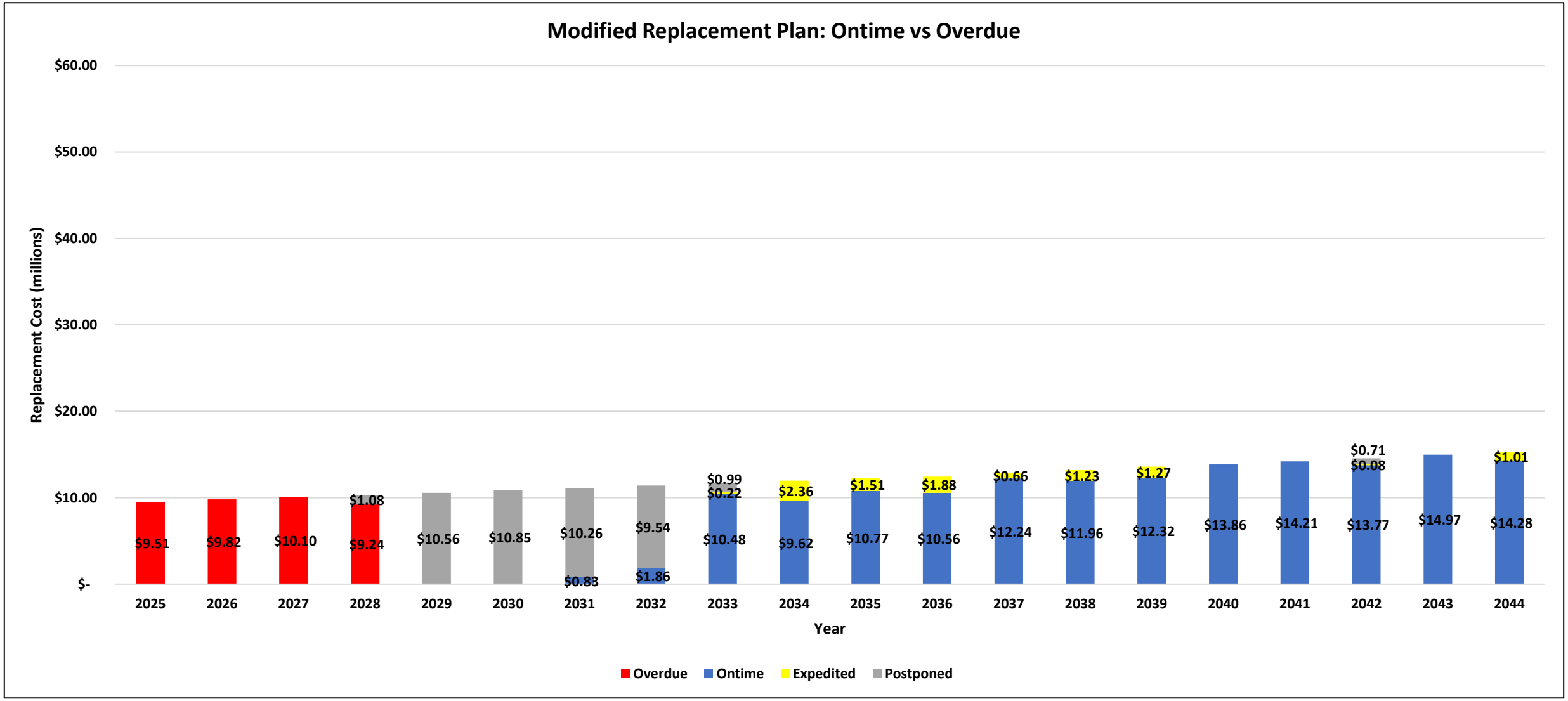
Assumes historical spend



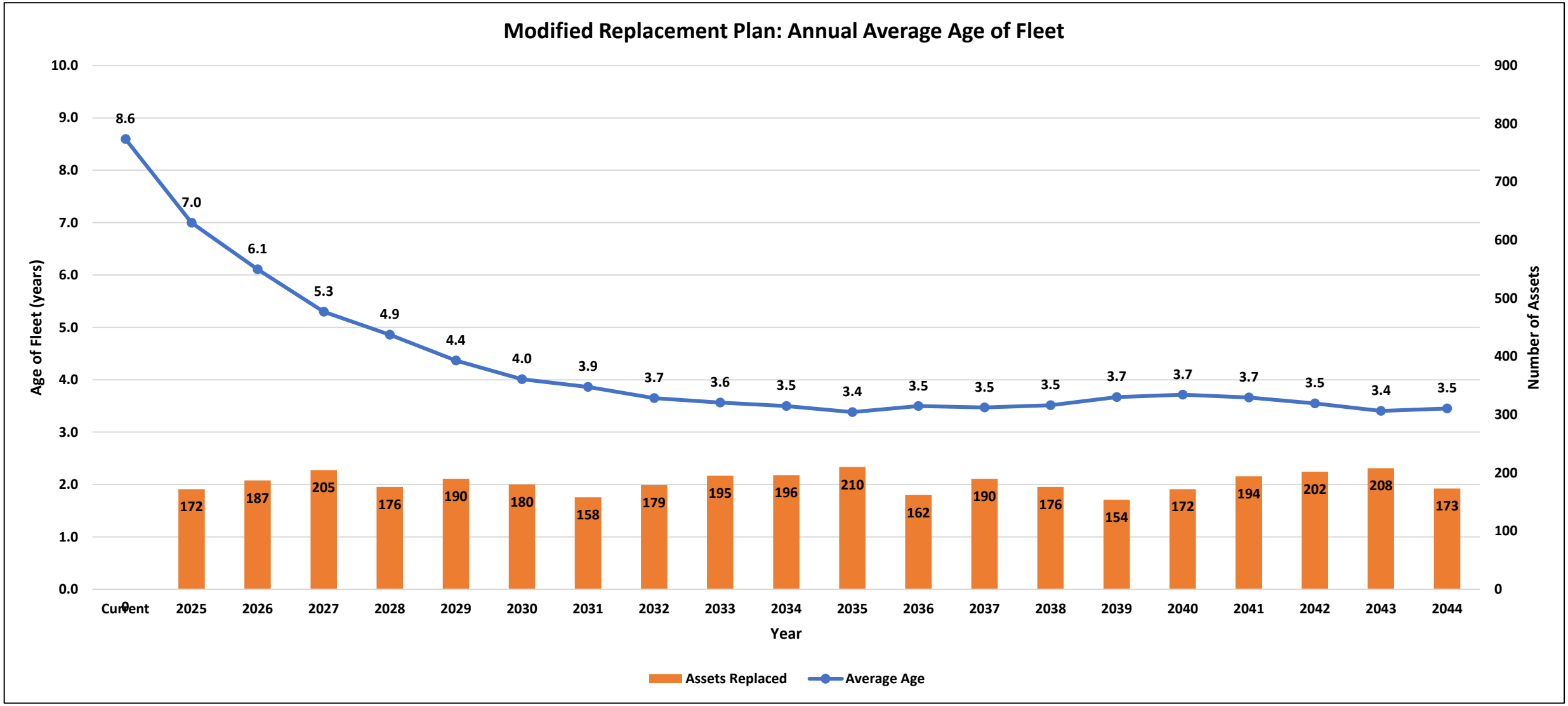
Status Quo Replacement Plan



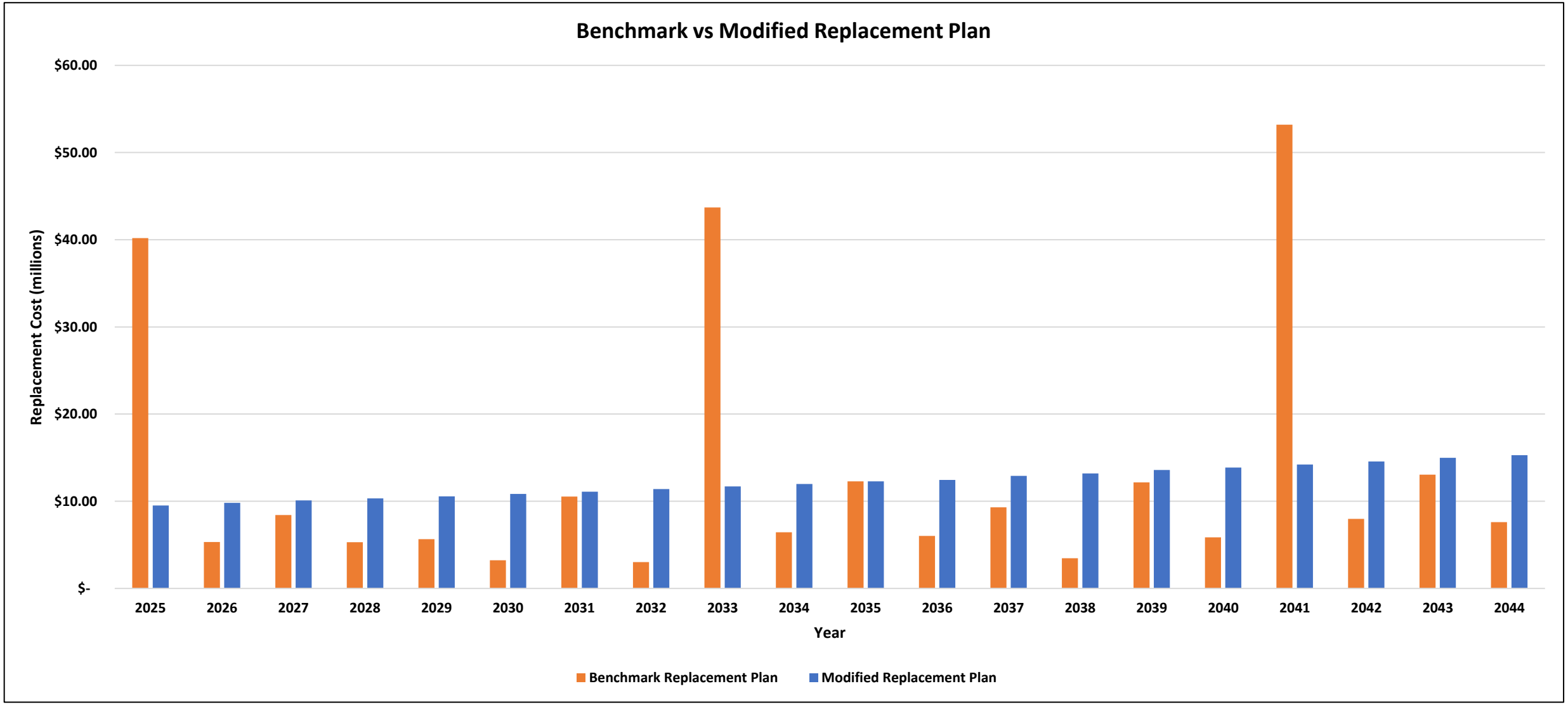
Modified Replacement Plan



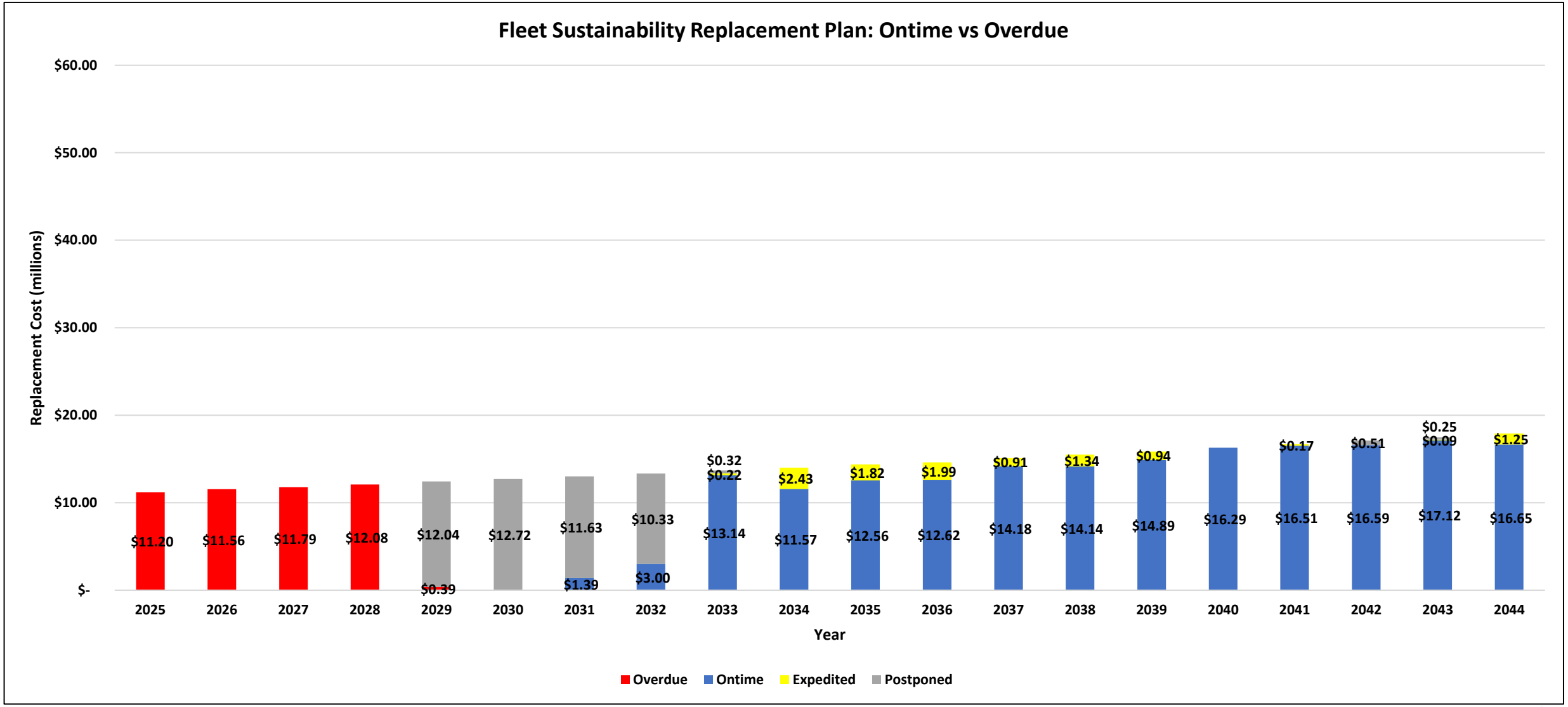
Modified Replacement Plan



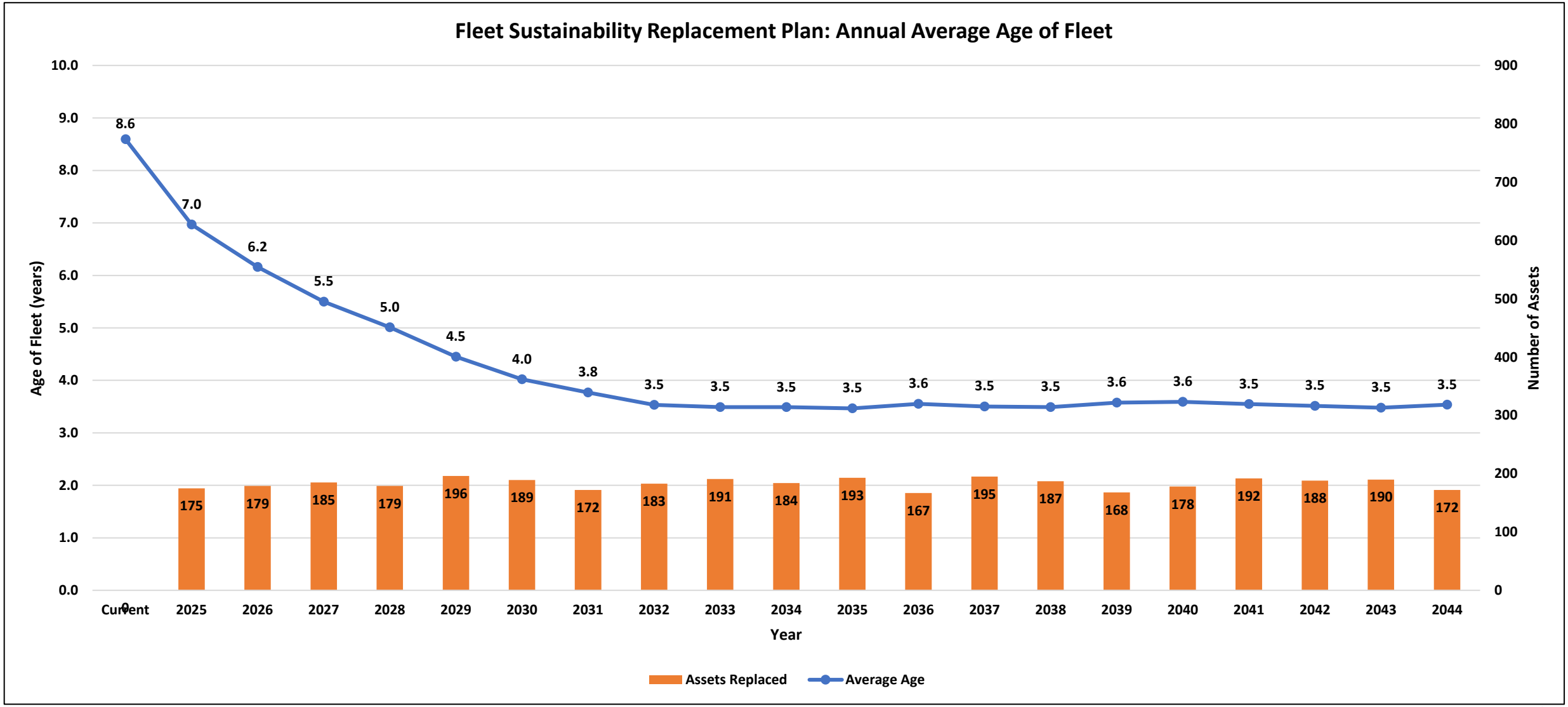
Benchmark vs Modified Replacement Plan



EV Replacement Plan



EV Replacement Plan



Other Considerations

- Grant and incentive opportunities (rebates)
  - Federal EV tax credits in 2024 top out at $7,500 for new cars and $4,000 if buying used
  - File Form 8936 with the IRS for BEVs and PHEVs, HEVs are not eligible
- Battery replacement vs buying new EVs
  - Batteries range from $7,000 to $30,000

Time Check

Q&A

RTA Fleet Consulting Group

Let RTA's Fleet Consulting Group Help You Solve Your Biggest Challenges

Operations Assessments

Evaluate operational performance through the lens of your current challenges and identify opportunities for improvement.

Fleet Data Analysis

Review your fleet's data to understand the organization's performance and find ways to optimize.

Staffing Plans

Calculate technician and support staff requirements so you can justify the staff resources you need.

Technology Analysis

Establish roadmaps to implement and use innovative fleet technologies like advanced telematics and artificial intelligence.

Contact Tony Yankovich at tyankovich@rtafleet.com

Renewal Planning

Develop a long-term replacement forecast that identifies spending requirements for each fiscal year.

Chargeback Rate Development

Calculate charge-back rates and determine department budgets that will lead to improved performance and a competitive advantage.

Optimization Studies

Determine the optimal fleet size and composition to ensure users have the most suitable vehicle for the jobs they need to perform.

Sustainability Planning

Develop EV and alternative fuel vehicle transition plans that are realistic and manageable, both financially and operationally.

Facility Needs Analysis

Assess and optimize the size and layout of maintenance facilities based on current and future fleet composition.

Fleet Policy Development

Document comprehensive fleet policies and procedures to guide internal operations.

RTA THE FLEET SUCCESS COMPANY

FleetPros

Ronald Wirth

Fleet Advance Planning and Sustainability Manager
County of Sacramento, Fleet Services Division

FLEET SERVICES STATISTICS

- Over 2,800 fleet units, 73% Light, 22% Medium and Heavy, 5% Off Road
- Approximately 460 Department Owned vehicles maintained by Fleet Services
- Annual Fuel Usage – over 3.4M Gallons (all fuels)
- Over 22 million miles traveled (VMT) in 2024
- 7 Maintenance Facilities
- 97 Total Fleet Employees
- 73 Technicians
- Fleet Services Division Chief
- Light Equipment Fleet Manager
- Heavy Equipment Fleet Manager
- Fleet Advance Planning and Sustainability Manager
- Specifications and Procurement Supervisor
- ASE Blue Seal Certified
- ASE Incentive Differential Pay for Certified Technicians

RENEWABLE FUELS AND ADVANCED TECHNOLOGY

- Entire Refuse Fleet, 153 Trucks, running on Renewable Natural Gas (RNG).
- Department of Transportation, 13 Trucks, running on Renewable Natural Gas (RNG).
- Nearly 1.4 M Gasoline Gallon Equivalent (GGE) of RNG consumption in 2024.
- Remaining Diesels (On and Off Road) running on Renewable Diesel (R99).
- Over 675K Gallons of R99 consumption in 2024.
- 736 Light Duty Hybrids – Including in Law Enforcement Service.
- 4 Hydrogen Fuel Cell
- 64% of 2024 Fuel Consumption was Renewable Fuels or Hybrid/Plug In/Fuel Cell

  (59.7% Renewable if Hybrid Fuel Consumption is not included.)
- 49+% Greenhouse Gas (GHG) reduction by using Renewable, Alternative and Electric VS. equivalent consumption of petroleum fuels.

SUSTAINABILITY MEASURES

- 1999 – Heavy Duty Low Emission Vehicle Acquisition Policy
- 2001 – Refuse converted first group of refuse trucks to LNG. County constructed LNG station.
- 2012 – First EV Chargers at Branch Center and Downtown. Nearly 100 L2 and 4 DCFC by year end 2025.
- 2015 - The County opened the first combination time/fast fill CNG station in the region
- 2015 – GPS Pilot in 200 vehicles resulted in 12.9% reduction in fuel usage in the test group and eliminating 3 underutilized units.
- 2016 – First Renewable Diesel Pilot
- 2017 – Conversion from CNG to RNG.
- 2021 – SMUD Efuel Advisor Study and Report
- 2025 – Broke Ground on charging identified in SMUD Efuel Advisor Report

COUNTY INITIATIVES AND REGULATORY COMPLIANCE

- 2011 - Board of Supervisors adopted the Sacramento County Climate Action Plan (CAP) Strategy and Framework Document (Phase 1) to meet GHG reductions required by California's Global Warming Solutions Act of 2006
- 2020 – County Board of Supervisors Climate Emergency Declaration
- 2020 – Executive Order N-79-20 signed by Governor Newsom
- 2022 – County Climate Action Plan Phase 2B
- 2024 – California Air Resources Board – Advanced Clean Fleets Regulation


RESOLUTION NO. ______
RESOLUTION OF THE BOARD OF SUPERVISORS OF THE COUNTY OF SACRAMENTO, STATE OF CALIFORNIA, DECLARING A CLIMATE EMERGENCY


EXECUTIVE DEPARTMENT
STATE OF CALIFORNIA
EXECUTIVE ORDER N-79-20

EMISSIONS REGULATION SUMMARY

- CARB – Advanced Clean Fleets – Vehicles over 8,500 GVWR + LD delivery.
- CARB – Clean Truck Check – Vehicles over 14,000 GVWR - all fuels other than gasoline.

  (2) times per year. In 4/2027 increases to (4) times per year.
- Smog Check Program – All Gasoline units. Proposed change from 8 years to 7 years old.
- LSI – **Proposed** zero emission. Example: Forklifts, Scrubbers, Yard Tugs.
- Off Road – 25HP+. New emission testing and new Tier 5 standards for 2031.
- PERP – 50HP+. Tier 3 Phase out. No proposed changes currently.

2018 #1 GREEN FLEET!

BY 100 BEST FLEETS - GREEN FLEET AWARDS


SACRAMENTO COUNTY


165 397
SACRAMENTO COUNTY
CA 55755


CA 55755


SACRAMENTO


SACRAMENTO COUNTY
ON CALL VEHICLE


CYBU96


702 016
SACRAMENTO COUNTY
CA 55755
CNG

EVERY FLEET IS UNIQUE !

- There is no "One Size Fits All" solution.
- Assess Your Fleet - Size, Make Up, Geography, Climate, Parking Locations, Operational Challenges and Unique Operations
- Talk to your vehicle / equipment operators. Review equipment needs with them. Visit job sites.

PREPARE TO MAKE THE MOST OF NEW TECHNOLOGY

- The Basics – PM Currency, PM Quality, Utilization, Unit Availability, Breakdown Rate, Technician Productivity and Efficiency, Accurate Data and Reporting.
- Fleet Assessment – Identify your Fleet's strengths and weaknesses. Be Honest. Identify Top 3 Needed Improvements. Re-Assess Regularly.
- Transportation Policy and Collective Bargaining.

  Are your policies and agreements up to date?
- KPI and Benchmarking – You cannot improve what you cannot measure!
- Customer Communication and Surveys – Your perception may not be reality.
- Asset Management – Vehicle / Equipment Replacement Forecasting

  Don't wait for the perfect solution while operating inefficient / costly vehicles.
- Collaboration and Communication – City Council, Board of Supervisors, Facilities Management, Real Estate Management, Budget / Accounting, Purchasing, Power Utility
- Understand your organization's Environmental / Sustainability Policies and Goals

GPS / TELEMATICS BENEFITS

- GPS / Telematics is the most efficient method to achieve a wide range of reporting.
- In 2024, nearly all smog checks were satisfied without removing vehicles from service.
- Clean Truck Check Program – Currently in first stages of implementation.
- Advanced Clean Fleet exemptions will require very detailed daily operating data which is best collected using telematics.
- Off Road emission testing requirements are expected from CARB soon.
- Additional Benefits:

  Safety – Speed monitoring, seat belt notification, driver behavior.

  Vehicle Data in Real time – Utilization Data, Odometer Readings, Engine Hour Readings, Emission Fault Notifications, Diagnostics Trouble Codes.

  Efficiency – Smog Checks, Automatic Work Requests, avoids breakdowns and reduces down time.

  Asset Management – Lifecycle Forecasting

GPS / TELEMATICS IN MUNICIPAL FLEETS

- Conduct Pilots to identify the system and supplier that works best for your application.
- Identify Approval Levels - City Council, Board of Supervisors, Director
- Transportation Policy
- Bargaining Unit Notification / Meetings
- Consult Purchasing – Identify Means to Purchase. State Contract, Co-Op Contract, Internal RFP. **Include installation and extended subscription period.**
- Verify IT Systems Compatibility.
- Identify a portion of the fleet with reliable historical data.
- Set benchmarks for the parameters that are most valuable to your fleet. Safety, Fuel Consumption, Unauthorized Use, Routing, etc.

INTERNAL REPORTS USING POWER BI

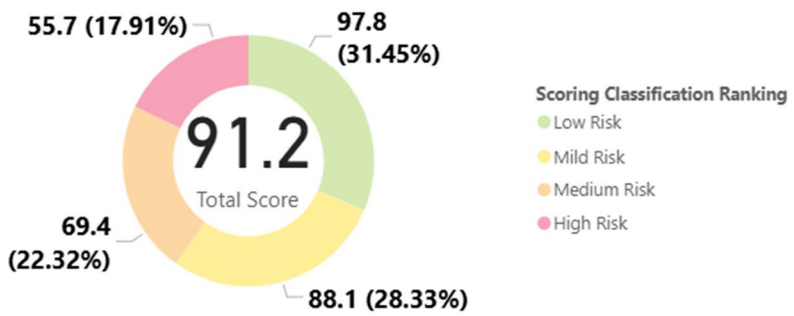
- Data Sources:
  - Fleet Management Information System (FMIS)
  - GPS / Telematics
  - Fuel Transactions
  - Microsoft Applications: Access, SharePoint, Excel
- Leverage data from multiple sources to produce custom reports:
  - Safety Scorecard
  - Unit Data
  - Utilization
  - Vehicle Miles Traveled (VMT)
  - Vehicle Replacement Forecasting
  - Accident / Vandalism Reports
  - Parking Location
  - Product / Fuel Reports
  - Parts inventory
- All above reporting is highly customizable by: Department, Vehicle Type, Fuel Type, Weight Class, etc.
- Indispensable data when planning for electric vehicle charging infrastructure.

GEOTAB TELEMATICS / POWER BI DASHBOARD

DEPARTMENT DRIVER SAFETY SCORECARD

Reset Filters

Total Score by Scoring Classification Ranking



FLEET VEHICLE COUNT

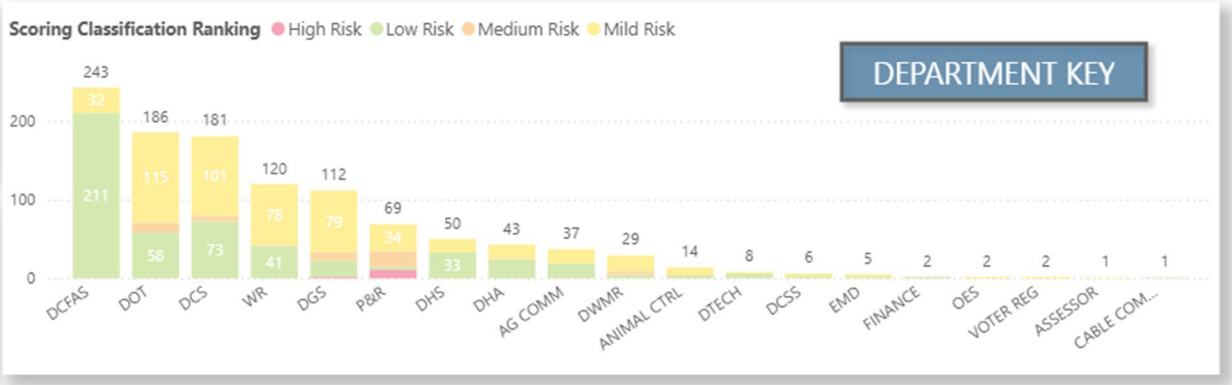
2632

Count of UNIT NO

GPS INSTALLED

1219

Count of UNIT NO



Department Safety Scorecard | Vehicle Safety Scorecard | Safety Benchmark

Incidents

DEPT NAME	FLEET#	GEOTAB#	Distance (mi)	Total Score	Scoring Classification	Harsh Acceleration	Harsh Braking	Harsh Cornering	No Seat Belt 6+ mph	Speeding	Total Trips	Speeding 10+ mph over posted speed limt.	Excessive Speed over 90 MPH Count	No Seat Belt 6+ mph	Harsh Acceleration	Harsh Braking	Harsh Cornering
AG COMM	40	19	47335	97.4	Low Risk	93.7	99.5	91.2	96.0	98.7	1665	209	0	750	17	17	367
AG COMM	40	18	43550	89.2	Mild Risk	79.5	96.8	77.3	70.0	99.2	8400	146	0	6033	72	123	801
ANIMAL CTRL	17	4	33885	96.4	Low Risk	95.9	99.8	96.6	89.2	96.5	1426	136	0	995	40	4	132
ANIMAL CTRL	17	10	73212	87.6	Mild Risk	77.7	99.3	89.6	59.1	95.5	20843	656	0	17455	197	44	714
ASSESSOR	1	1	2172	92.7	Mild Risk	77.0	99.1	83.9	84.4	99.0	200	8	0	105	50	2	35
CABLE COMMISSION	1	1	1381	96.6	Low Risk	84.8	100.0	84.8	98.5	99.9	50	1	0	7	21	0	21
DCFAS	247	211	923647	97.8	Low Risk	94.8	98.6	92.2	97.9	98.2	21760	5286	0	4324	20	1133	6701
DCFAS	247	32	81845	93.2	Mild Risk	78.7	98.3	75.3	92.1	97.5	6562	638	0	1971	57	132	2004
DCS	200	73	346895	97.7	Low Risk	93.8	99.4	90.9	97.8	98.7	9711	1170	0	3111	30	161	3091
DCS	200	7	52324	71.2	Medium Risk	45.0	98.8	38.4	21.1	93.7	26662	584	0	19465	456	57	3362
DCS	200	101	518976	88.0	Mild Risk	76.8	99.1	78.6	67.2	95.6	102869	5162	0	75653	124	322	9236
DCSS	6	2	7931	96.4	Low Risk	95.8	98.2	89.7	90.9	99.3	364	22	0	213	17	14	82
DCSS	6	4	17040	92.7	Mild Risk	89.3	97.1	65.3	88.9	98.5	1482	63	0	543	37	33	697
DGS	128	2	3204	56.9	High Risk	0.0	99.6	0.0	0.0	84.7	3867	102	0	2621	286	2	571
DGS	128	21	58019	97.4	Low Risk	93.0	99.1	92.4	95.8	99.2	1708	96	0	727	20	36	424
DGS	128	10	18383	69.9	Medium Risk	53.1	96.0	45.8	5.5	96.6	14484	101	0	12130	128	32	946
DGS	128	79	212642	88.2	Mild Risk	84.1	99.2	83.5	62.4	95.3	48078	930	3	40816	38	126	3085
DHA	74	24	59594	98.0	Low Risk	96.1	98.9	93.9	98.7	96.9	1408	421	0	171	14	66	419
DHA	74	1	2554	67.1	Medium Risk	20.5	98.8	68.7	67.2	24.2	710	133	0	291	203	3	80
DHA	74	18	51241	91.6	Mild Risk	79.8	96.9	92.6	80.1	93.1	5962	377	0	4525	35	38	386

UNIT DATA

UNIT DATA
ADMIN UNIT DATA
MAINTENACE - UNIT D...
REPLACEMENT LIST
REPLACEMENT LIST W/...
BY MAKE / MODAL
TECH SPEC
INSERVICE BY YEAR
GPS
UNIT DOWNTIME
FLEET DEPT SUMMARY
UNIT DATA FLAGS
UNIT SUMMARY
MPG
GVWR Check
Lic Check
Avg Miles
MCC

SUMMARY | FILTERS | TECH SPEC / MCC | Engine Family | Stats

FLEET UNIT REPORT

UNIT COUNT BY DEPARTMENT

DEPT NAME	UNIT COUNT
AG COMM	40
ANIMAL CTRL	17
ASSESSOR	1
CABLE COMMISSION	1
CORONER	8
DA	81
DCFAS	247
DCS	200
DCSS	6
DGS	147
DHA	74
DHS	60
DOT	285
DTECH	13
DWMR	334
EMD	10
FINANCE	4
FLEET	1
OES	16
P&R	102
PD	22
PROB	148
SSD	774
VOTER REG	6
WR	245
Total	**2842**

UNIT COUNT by CLASS

CLASS	COUNT
Automobile	792
Buses, Highway and Metro Transport	16
Buses, School Transportation	2
Engines, Pumps and Compressors	15
Excavating, Grading, Compacting, Paving and Loading Equip.	58
Farm Tractor, Implements, Industrial Tractor and Lifts	37
Hand Tools	1
Motorcycles, Scooters and ATV	16
Non-Self Propelled Equipment	10
Physical Plant	16
Pick Up Trucks	1027
Self Propelled Equipment Miscellaneous	21
Trailers	205
Trucks, Excavation	21
Trucks, General Purpose	114
Trucks, Pavement Maintenance	20
Trucks, Refuse Compacting	124
Trucks, Special Mobile Services	27
Trucks, Street Sanitation/Sewer Cleaning	27
Turf Grass Maintenance, Landscaping, Self-propelled & Non-S	11
Vans	270
Total	**2842**

UNIT COUNT by SUB CLASS

SUB CLASS	COUNT
All Terrain Cycle	1
All Terrain Vehicle, Dump Bed	1
All Terrain Vehicle, Pass	1
All Terrain Vehicle, Std Bed	3
Asphalt Crusher	1
Asphalt Grinder	1
Asphalt Spreader	1
Auto, Compact, 4 Door	364
Auto, Full Size, 4 Door	98
Auto, Intermed., 2 Door	4
Auto, Intermed., 4 Door	264
Auto, Sub Compact, 4 Door	62
Backhoe, w loader	10
Bus, Work Crew 15-19 Passenger	2
Bus,Metro,20-39 Pass	12
Bus,Metro,40-59 Pass	4
Chipper, Pull Behind	9
Cmpctr, Stationary	1
Compressor, Stationary	1
Compressor, Trailer Mtd	10
Compressor, Truck Mtd	1
Container Refuse, 45-49 yard	8
Crash Attenuator, Trk Mtd	6
Dozer, Strght Blade, Pwr Tilt	1
Excavator	3
Farm Compact Tractor W	1
Total	**2842**

UNIT COUNT by FUEL TYPE

FUEL TYPE	COUNT
Compressed Natural Gas (CNG)	156
Diesel	290
Dual Fuel, Gasoline and Electric	736
E85	627
Electric	61
Gasoline, EVR	716
Gasoline, non EVR	32
Hydrogen	4
Liquified Natural Gas (LNG)	11
Not Applicable	201
Total	**2842**

UNIT COUNT by FUEL TYPE

Fuel_Class	COUNT	%GT UNIT COUNT
ALT	1603	56.40%
DIESEL	290	10.20%
GAS	748	26.32%
NONE	201	7.07%
Total	**2842**	**100.00%**

UNIT_NO

Search

UNIT COUNT by GVWR

CLASS2_DESC	UNIT COUNT	CLASS2
GVWR > 33,001 LBS: HEAVY DUTY	302	CLS8
GVWR 10,001 - 14,000 LBS: MEDIUM DUTY	136	CLS3
GVWR 14,001 - 16,000 LBS: MEDIUM DUTY	7	CLS4
GVWR 16,001 - 19,500 LBS: MEDIUM DUTY	49	CLS5
GVWR 19,501 - 26,000 LBS: MEDIUM DUTY	38	CLS6
GVWR 26,001 - 33,000 LBS: HEAVY DUTY	46	CLS7
GVWR 6,000 LB & LESS: LIGHT DUTY	1115	CLS1
GVWR 6,001 - 10,000 LBS: LIGHT DUTY	999	CLS2
N/A	34	
Off Highway, GVW 10,000 lb and less	64	CLSK
Off Highway, GVW 10,000 to 19,500 lb	25	CLSL
Off Highway, GVW 19,501 to 29,500 lb	15	CLSM
Off Highway, GVW 29,501 to 39,500 lb	3	CLSN
Off Highway, GVW 39,501 to 59,500 lb	4	CLSP
Off Highway, GVW 59,501 to 79,500 lb	2	CLSQ
Trk-Trlr Combo, GVW 19,501 to 29,500 lb	1	CLSC
Trk-Trlr Combo, GVW 79,501 to 99,500 lb	2	CLSG
Total	**2842**	

GPS STATUS

GPS STATUS	UNIT COUNT
	66
DEPT DID NOT APPROVE	7
DEPT INSTALLED GPS	184
DO NOT INSTALL GPS	1015
INSTALL NEW GPS	1
INSTALLED	1243
Total	**2842**

UNIT COUNT by UNIT CLASS

CLASS	UNIT COUNT
101	9
102	53
107	67
110	399
118	2
122	227
124	326
126	16
131	264
132	44
134	49
135	31
137	48
140	86
141	11
142	37
143	18
150	143
151	18
152	62
153	32
154	126
156	1
157	4
158	11
Total	**2842**

STATUS

STATUS DESCRIPTION	UNIT COUNT
Active unit	2544
Flagged for disposal	298
Total	**2842**

OWNING TYPE

FLEET TYPE	UNIT COUNT
DEPT. OWNED	464
FLEET RENTAL	2378
Total	**2842**

TECH SPEC CHECK

SPEC_CHECK	UNIT COUNT
NEW	2651
OLD	191
Total	**2842**

FLEET TYPE

LIGHT/HEAVY/DEPARTMENT	UNIT COUNT
HEAVY	750
LIGHT	2092
Total	**2842**

FLEET UNIT DETAIL

MAINT_LOC	NAME	DEPT NAME	STATUS DESC	UNIT NO	YEAR	MAKE	MODEL	SERIAL_NO	CATEGORY	P1 CATEGORY	FUEL TYPE	CLASS	GPS STATUS	GVWR	MAINTENANCE COST	N
BU2754	BRADSHAW HEAVY SHOP	OES	Active unit	660435	2014	LARK UNITED	TRAILER	571BE121XFM007837	FQ0ZAAZPZ	Trailers	Not Applicable	CLS2	NO GPS NEEDED	3500	$2,116.07	
BU2754	BRADSHAW HEAVY SHOP	OES	Active unit	660437	2008	CHARMAC	STANDARD DUTY CARGO	4RYG162058T111132	FQ0Z2AZQZ	Trailers	Not Applicable	CLS2	NO GPS NEEDED	7000	$880.54	
BU2756	NORTH TRANSFER SHOP	DWMR	Active unit	704234	2023	AUTOCAR	XPEDITOR	5VCACRCE5PC243032	144C8AME5	Trucks, Refuse Compacting	Compressed Natural Gas (CNG)	CLS8	DEPT INSTALLED GPS	62000	$5,129.59	
BU2754	BRADSHAW HEAVY SHOP	OES	Active unit	660436	2008	CHARMAC	STANDARD DUTY CARGO	4RYG162038T111131	FQ0Z2AZQZ	Trailers	Not Applicable	CLS2	NO GPS NEEDED	7000	$1,156.60	
BU2754	BRADSHAW HEAVY SHOP	OES	Active unit	660434	2024	AMERICAN CARGO	TSV612T2	7V0H11220RU409467	FQ0Z2AZQZ	Trailers	Not Applicable	CLS2	NO GPS NEEDED	7000	$284.90	
BU2754	BRADSHAW HEAVY SHOP	DOT	Active unit	171453	2024	FREIGHTLIN	M2106	1FVACXFC1RHVJ9552	622D7AK35	Trucks, General Purpose	Diesel	CLS7	INSTALLED	33000	$2,133.78	
BU2754	BRADSHAW HEAVY SHOP	DWMR	Active unit	704247	2023	AUTOCAR	XPEDITOR	5VCACRCE3PC243045	144C8AME5	Trucks, Refuse Compacting	Compressed Natural Gas (CNG)	CLS8	DEPT INSTALLED GPS	62000	$4,471.90	
BU2754	BRADSHAW HEAVY SHOP	WR	Active unit	164125	2023	INTERNATIONAL	CV515	1HTKSSWK7PH120657	580D5AK35	Trucks, Special Mobile Services	Diesel	CLS5	INSTALLED	19500	$2,681.29	
BU2756	NORTH TRANSFER SHOP	DWMR	Active unit	787366	2025	KENWORTH	T880	1NKZD89X1SJ179717	670C8AQB5	Trucks, General Purpose	Compressed Natural Gas (CNG)	CLS8	DEPT INSTALLED GPS	53200	$8,397.07	
BU2754	BRADSHAW HEAVY SHOP	DWMR	Active unit	704243	2023	AUTOCAR	XPEDITOR	5VCACRCE6PC243041	144C8AME5	Trucks, Refuse Compacting	Compressed Natural Gas (CNG)	CLS8	DEPT INSTALLED GPS	62000	$3,244.70	
BU2756	NORTH TRANSFER SHOP	DWMR	Active unit	787364	2025	KENWORTH	T880	1NKZD89X8SJ179715	670C8AQB5	Trucks, General Purpose	Compressed Natural Gas (CNG)	CLS8	DEPT INSTALLED GPS	53200	$5,419.14	
BU2755	BRADSHAW SHOPLIGHT EQUIP.	EMD	Active unit	107511	2024	FORD	MAVERICK	3FTTW8A34RRB65338	B13Q1AF38	Pick Up Trucks	Dual Fuel, Gasoline and Electric	CLS1	INSTALLED	5180	$1.19	
BU2755	BRADSHAW SHOPLIGHT EQUIP.	AG COMM	Active unit	107509	2025	TOYOTA	TACOMA	3TYJDAHN6ST021910	B12G1AF36	Pick Up Trucks	Gasoline, EVR	CLS1	INSTALLED	5605	$0.00	
63	DOWNTOWN GARAGE	DCS	Active unit	131510	2025	TOYOTA	TACOMA	3TYKD5HN6ST017836	B13G2AF46	Pick Up Trucks	Gasoline, EVR	CLS1	INSTALLED	5775	$0.00	
BU2755	BRADSHAW SHOPLIGHT EQUIP.	DCS	Active unit	131502	2025	TOYOTA	TACOMA	3TYKD5HN6ST018145	B13G2AF46	Pick Up Trucks	Gasoline, EVR	CLS1	INSTALLED	5775	$0.00	
BU2755	BRADSHAW SHOPLIGHT EQUIP.	DCS	Active unit	131501	2025	TOYOTA	TACOMA	3TYKD5HN7ST018252	B13G2AF46	Pick Up Trucks	Gasoline, EVR	CLS1	INSTALLED	5775	$0.00	
BU2756	NORTH TRANSFER SHOP	DWMR	Active unit	704232	2023	AUTOCAR	XPEDITOR	5VCACRCE1PC243030	144C8AME5	Trucks, Refuse Compacting	Compressed Natural Gas (CNG)	CLS8	DEPT INSTALLED GPS	62000	$10,636.32	
BU2756	NORTH TRANSFER SHOP	DWMR	Active unit	704239	2023	AUTOCAR	XPEDITOR	5VCACRCE4PC243037	144C8AME5	Trucks, Refuse Compacting	Compressed Natural Gas (CNG)	CLS8		62000	$8,243.14	
BU2756	NORTH TRANSFER SHOP	DWMR	Active unit	704242	2023	AUTOCAR	XPEDITOR	5VCACRCE4PC243040	144C8AME5	Trucks, Refuse Compacting	Compressed Natural Gas (CNG)	CLS8	DEPT INSTALLED GPS	62000	$10,924.56	
Total															**$108,352,635.13**	

PARKING LOCATIONS

SUMMARY | FILTERS | MAP | Data Pull

PARKING LOCATION RESPONSES

PARKING LOCATION RESPONSES BY DEPARTMENT

DEPT NAME	NO	YES	Total
AG COMM	8	32	40
ANIMAL CTRL	5	12	17
ASSESSOR		1	1
CABLE COMMISSION		1	1
CORONER	4	4	8
DA	19	63	82
DCFAS	70	186	256
DCS	38	151	189
DCSS		6	6
DGS	44	105	149
DHA	12	63	75
DHS	24	36	60
DOT	92	202	294
DTECH	3	11	14
DWMR	122	201	323
EMD		8	8
FINANCE	2	2	4
OES	9	2	11
P&R	33	58	91
PD	6	14	20
PROB	46	103	149
SSD	260	545	805
VOTER REG		6	6
WR	74	169	243
Total	**871**	**1981**	**2852**

USING DEPARTMENT

FUEL TYPE	UNIT COUNT
Compressed Natural Gas (CNG)	134
Diesel	282
Dual Fuel, Gasoline and Electric	717
E85	664
Electric	54
Gasoline, EVR	740
Gasoline, non EVR	16
Hydrogen	4
Liquified Natural Gas (LNG)	32
[illegible]	[illegible]
Total	**2852**

PRIORITY

PRIORITY HOURS	UNIT COUNT
24 HOURS	1432
48 HOURS	315
72 HOURS	80
NA	1025
Total	**2852**

UNIT CLASS DESC

CLASS	UNIT COUNT	Sum of 2023 VMT.USAGE
Automobile	817	5,854,877.00
Buses, Highway and Metro Transport	17	125,218.00
Buses, School Transportation	2	18,298.00
Engines, Pumps and Compressors	16	45.00
Excavating, Grading, Compacting, Paving and Loading Equip.	55	17,703.00
Farm Tractor, Implements, Industrial Tractor and Lifts	38	2,000.00
Hand Tools	1	0.00
Motorcycles, Scooters and ATV	15	32,760.00
Non-Self Propelled Equipment	9	144.00
Physical Plant	15	3.00
Pick Up Trucks	998	9,967,960.00
Self Propelled Equipment Miscellaneous	22	844.00
Trailers	205	321,728.00
Trucks, Excavation	20	145,270.00
Total	**2852**	**21,267,108.00**

PARKING LOCATION

PARKING ADDRESS	LEASED BUILDING	UNIT COUNT	Sum of 2023 VMT.USAGE
		862	4,630,986.00
		9	24,301.00
10051 Florin Road	NO	44	157,614.00
10151 Florin Road	NO	48	433,141.00
10157 Missile Way	NO	2	0.00
12500 Bruceville Road	NO	26	259,468.00
12701 Kiefer Blvd	NO	40	18,581.00
2150 Stockton Blvd.	NO	5	14,964.00
2701 5th St.	NO	8	95,888.00
2897 Kilgore Road	NO	55	633,625.00
3636 AMERICAN RIVER DRIVE SUITE 200	NO	1	1,827.00
3700 Branch Center Road	NO	14	66,588.00
3701 Branch Center Road	NO	63	444,700.00
3711 Branch Center Road	NO	2	2,723.00
3720 DUDLEY BLVD STE 122	NO	2	8,759.00
3800 Branch Center Road	NO	1	2,419.00
3839 Bradshaw Road	NO	12	173,366.00
3843 Branch Center Road	NO	73	299,103.00
3860 Branch Center Rd.	NO	1	0.00
4000 Bradshaw Road	NO	47	217,555.00
4000 Branch Center Road	NO	15	83,894.00
4001 Branch Center Road	NO	132	533,856.00
4040 Bradshaw Rd	NO	38	211,657.00
4100 Branch Center Road	NO	12	83,202.00
4100 Traffic Way	NO	24	210,288.00
4111 Branch Center Road	NO	10	39,615.00
4135 Traffic Way	NO	51	409,762.00
Total		**2852**	**21,267,108.00**

STATUS_DESC
- (Blank)
- Active unit
- Flagged for disposal
- Ready unit for service

FLEET TYPE
- (Blank)
- DEPT. OWNED
- FLEET RENTAL

LIGHT/HEAVY
- (Blank)
- HEAVY
- LIGHT

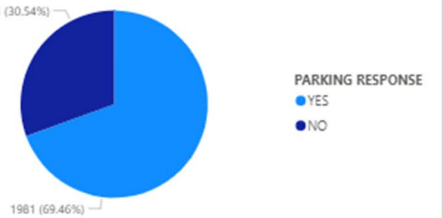
STATUS

STATUS_DESC	UNIT COUNT
Active unit	254
Flagged for disposal	24
Total	**285**

FLEET TYPE	UNIT COUNT
DEPT. OWNED	446
FLEET RENTAL	2406
Total	**2852**

LIGHT/HEAVY	UNIT COUNT
HEAVY	767
LIGHT	2085
Total	**2852**

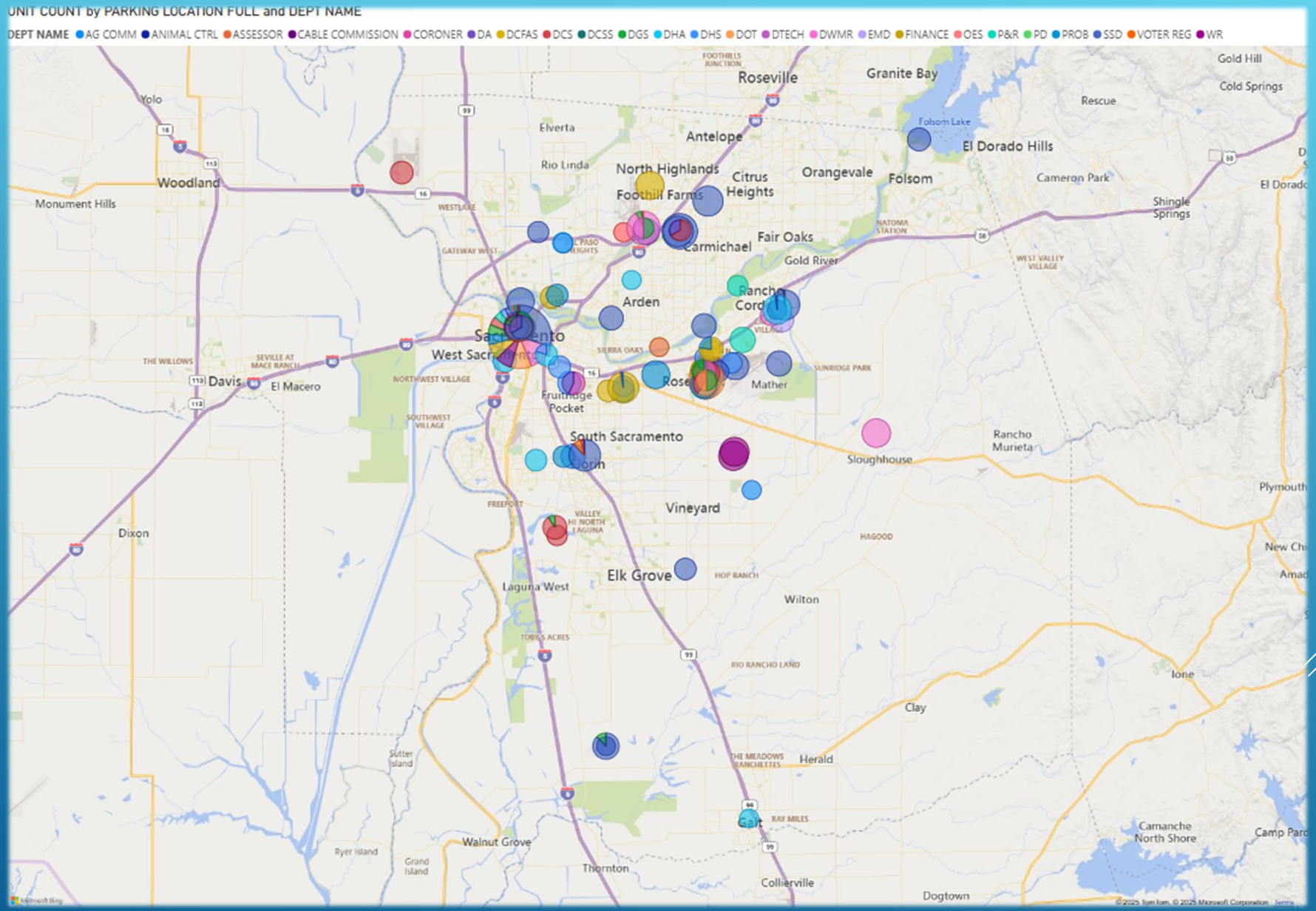
UNIT COUNT by PARKING RESPONSE



ACTIVE UNIT DETAIL

STATUS	UNIT NUMBER	YEAR	MAKE	MODEL	DEPT NAME	FUEL TYPE	BUILDING NAME	PARKING ADDRESS	LEASED BUILDING	PRIORITY 1-2-3	PRIORITY HOURS	Replacement Fiscal Year	FACILITY CODE	FACILITY COUNT	FLEET TYPE	GVWR	2023 VMT.USAGE
Active unit	101001	2019	BMW	R1250RT-P	SSD	Motorcycles, Scooters and ATV		2897 Kilgore Road	NO	1	24 HOURS		9721		FLEET RENTAL	1113	9,588.00
Active unit	101002	2019	BMW	R1250RT-P	SSD	Motorcycles, Scooters and ATV		2897 Kilgore Road	NO	1	24 HOURS		9721		FLEET RENTAL	1091	2,675.00
Active unit	101003	2019	BMW	R1250RT-P	SSD	Motorcycles, Scooters and ATV		2897 Kilgore Road	NO	1	24 HOURS		9721		FLEET RENTAL	1113	8,009.00
Active unit	101004	2019	BMW	R1250RT-P	SSD	Motorcycles, Scooters and ATV		2897 Kilgore Road	NO	1	24 HOURS		9721		FLEET RENTAL	1113	7,622.00
Active unit	101304	2023	BMW	R1250RT	SSD	Motorcycles, Scooters and ATV					NA				FLEET RENTAL	1113	0.00
Active unit	101305	2023	BMW	R1250RT	SSD	Motorcycles, Scooters and ATV					NA				FLEET RENTAL	1113	0.00
Active unit	101306	2023	BMW	R1250RT	SSD	Motorcycles, Scooters and ATV					NA				FLEET RENTAL	1113	798.00
Active unit	101307	2023	BMW	R1250RT	SSD	Motorcycles, Scooters and ATV					NA				FLEET RENTAL	1113	961.00
Flagged for disposal	101503	2015	BMW	R1200RT-P	SSD	Motorcycles, Scooters and ATV		2897 Kilgore Road	NO	1	24 HOURS		9721		FLEET RENTAL	1091	3,107.00
Active unit	102001	2021	TOYOTA	COROLLA	DCFAS	Automobile		9750 Business Park Drive	YES	1	24 HOURS		689		FLEET RENTAL	3915	9,246.00
Active unit	102002	2021	TOYOTA	COROLLA	DHS	Automobile		4600 Broadway	NO	2	48 HOURS		270		FLEET RENTAL	3915	7,878.00
Active unit	102003	2021	TOYOTA	COROLLA	DHS	Automobile		4600 Broadway	NO	2	48 HOURS		270		FLEET RENTAL	3915	4,399.00
Active unit	102004	2021	TOYOTA	COROLLA	DCFAS	Automobile		3331 Power Inn Road	YES	1	24 HOURS		635		FLEET RENTAL	3915	4,864.00
Active unit	102005	2021	TOYOTA	COROLLA	DCFAS	Automobile		3331 Power Inn Road	YES	1	24 HOURS		635		FLEET RENTAL	3915	9,425.00
Active unit	102006	2021	TOYOTA	COROLLA	DCFAS	Automobile		3701 Branch Center Road	NO	1	24 HOURS		221		FLEET RENTAL	3915	16,454.00
Active unit	102007	2021	TOYOTA	COROLLA	DCFAS	Automobile		3701 Branch Center Road	NO	1	24 HOURS		221		FLEET RENTAL	3915	15,370.00
Active unit	102008	2021	TOYOTA	COROLLA	DCFAS	Automobile		9750 Business Park Drive	YES	1	24 HOURS		689		FLEET RENTAL	3915	7,383.00
Active unit	102009	2021	TOYOTA	COROLLA	DCFAS	Automobile		3701 Branch Center Road	NO	1	24 HOURS		221		FLEET RENTAL	3915	5,952.00
Active unit	102101	2021	TOYOTA	COROLLA	DCFAS	Automobile		3331 Power Inn Road	YES	1	24 HOURS		635		FLEET RENTAL	3915	4,989.00
Active unit	102102	2021	TOYOTA	COROLLA	DCFAS	Automobile		3331 Power Inn Road	YES	1	24 HOURS		635		FLEET RENTAL	3915	1,744.00
Total																	

PARKING LOCATION MAP



FLEET VEHICLE REPLACEMENT FORECASTING

- Facilitates Regular and Scheduled Replacement of Fleet Vehicles on a pre-determined life cycle.
- Long Term Budget Planning.
- Maintains Average Fleet Age – Current Avg. Age – 5.5 years.
- Minimizes Maintenance and Operating Costs.
- Customizable for Specific Vehicle Classes.
- Use of these management tools has been beneficial in largely eliminating overdue replacement vehicles which will allow a strategic transition to Zero Emission and EV to meet sustainability goals and regulations.

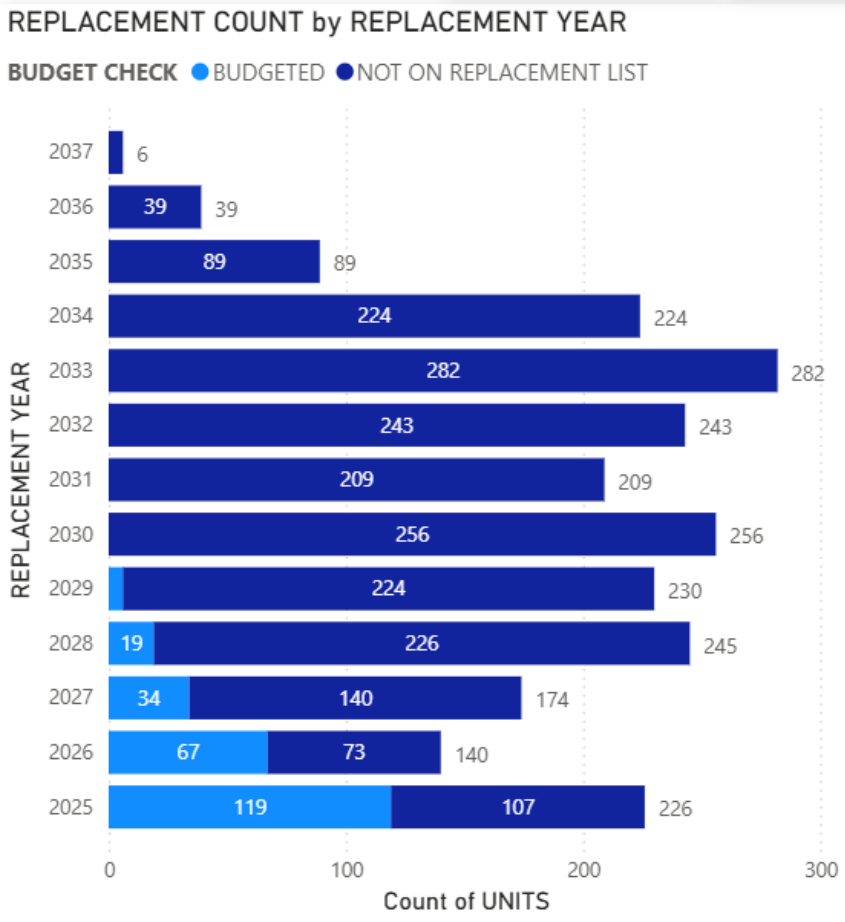
LONG TERM REPLACEMENT FORECAST

REPLACEMENT MODEL PLANNING

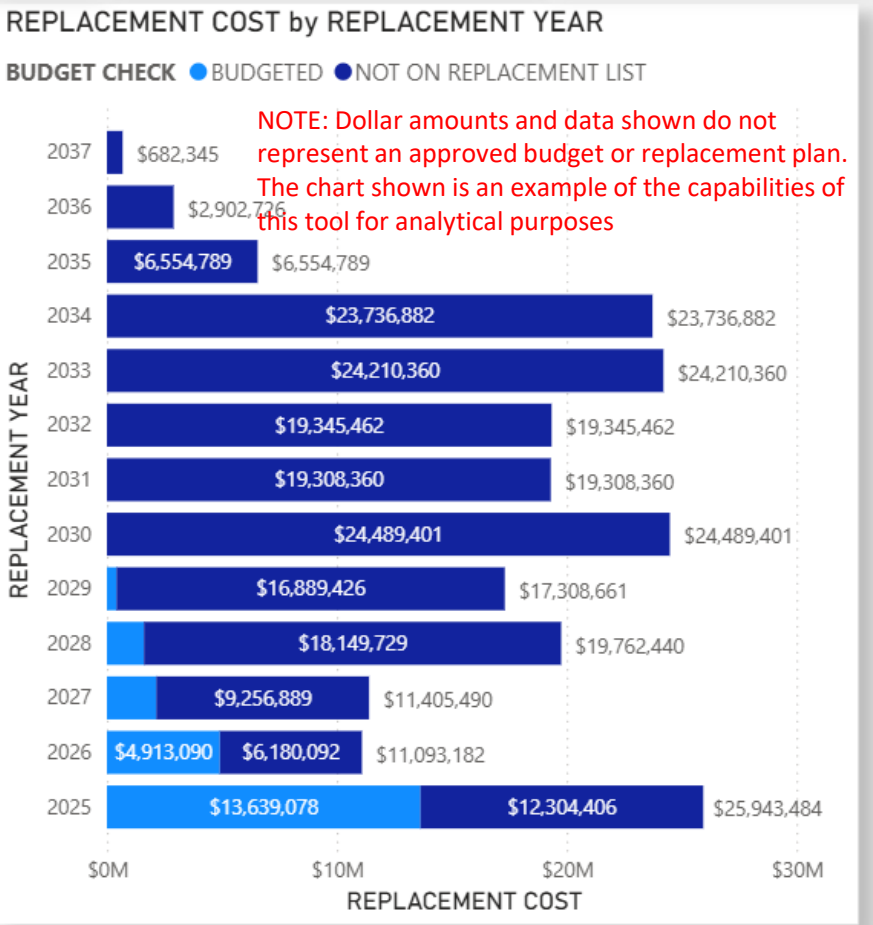
SACRAMENTO COUNTY FLEET SERVICES

2363	5.48	60	7.92%
UNIT COUNT	Average of AGE	Average of MONTHS IN SERVICE	INFLATION FACT

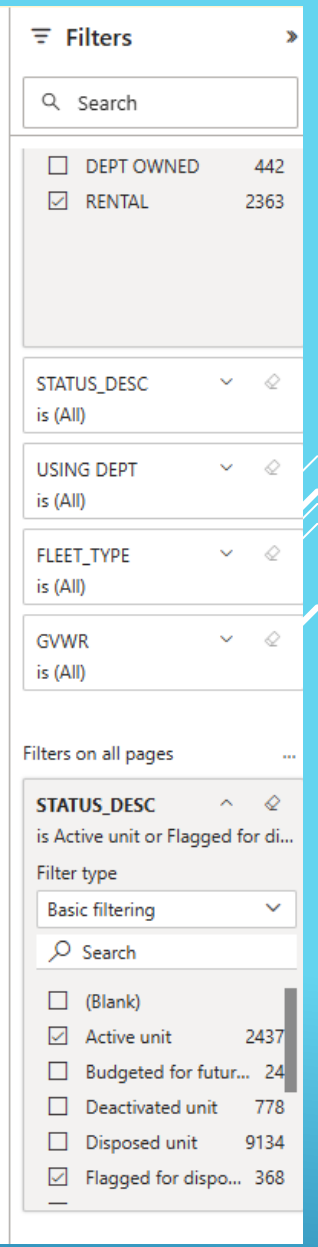
REPLACEMENT COUNT by REPLACEMENT YEAR



REPLACEMENT COST by REPLACEMENT YEAR



UNIT CLASS	Average of AGE
101	4.67
102	5.04
107	4.33
110	6.29
118	12.00
122	4.28
124	5.06
126	6.38
131	4.90
132	6.61
134	7.09
135	5.55
137	4.84
140	5.07
141	4.18
142	4.41
150	4.23
151	4.11
152	4.85
153	5.56
154	5.28
156	14.00
157	7.50
158	7.82
159	7.00
160	7.83
161	7.33
162	12.50
163	8.00
164	8.14
Total	**5.48**



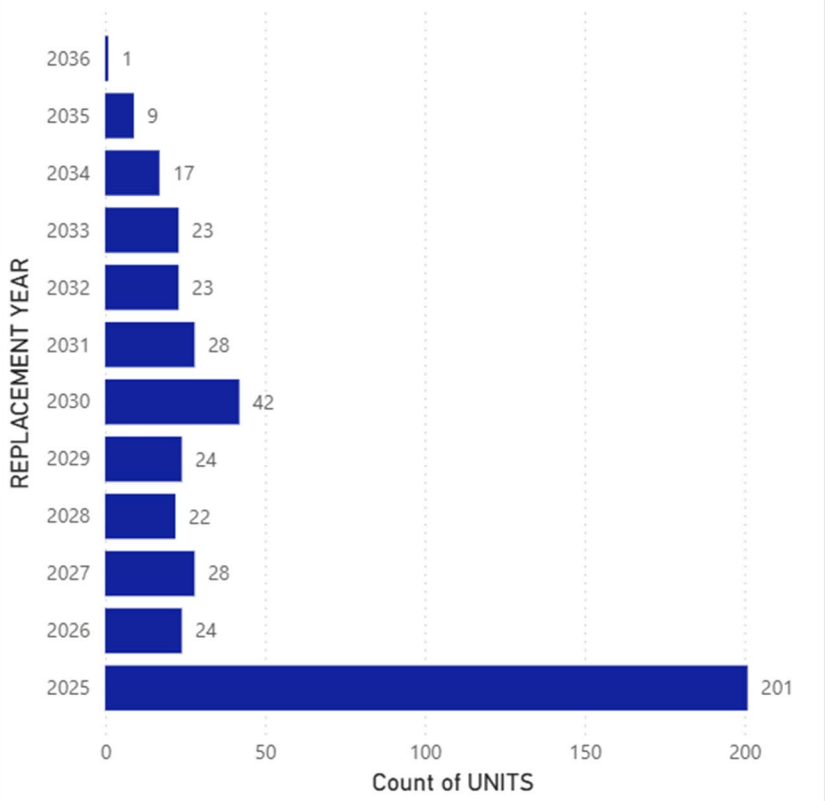
DEPARTMENT OWNED REPLACEMENT FORECAST

REPLACEMENT MODEL PLANNING

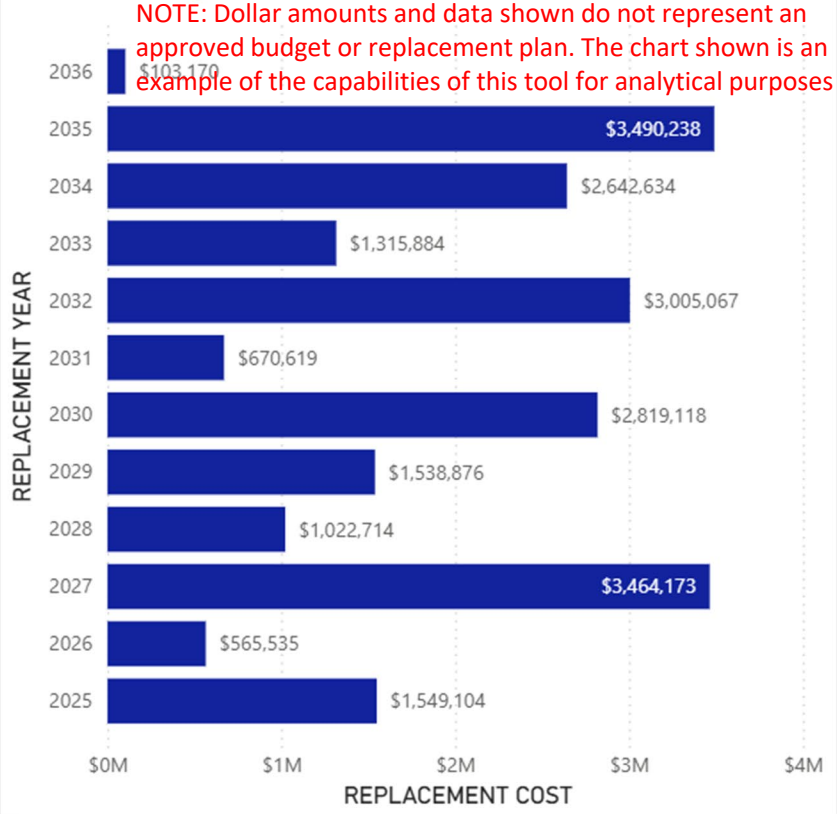
SACRAMENTO COUNTY FLEET SERVICES

442	10.50	111	7.82%
UNIT COUNT	Average of AGE	Average of MONTHS IN SERVICE	INFLATION FACT

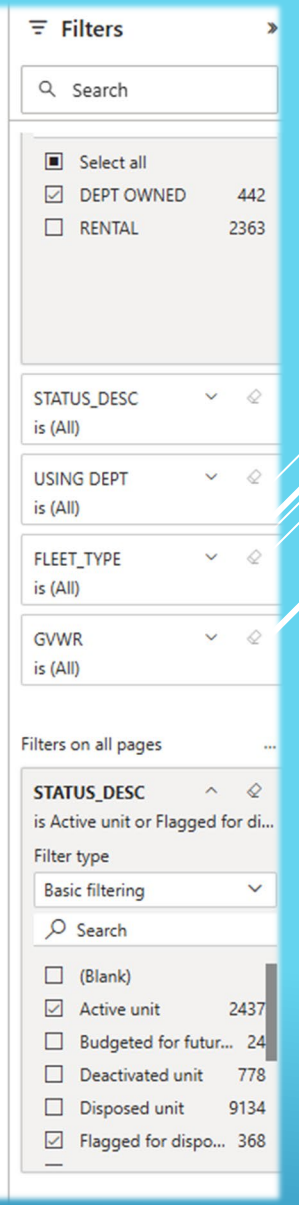
REPLACEMENT COUNT by REPLACEMENT YEAR



REPLACEMENT COST by REPLACEMENT YEAR



UNIT CLASS	Average of AGE
143	5.33
169	16.00
187	7.40
193	7.00
201	3.83
20T	7.67
236	20.00
237	18.50
239	7.22
364	19.00
384	9.00
393	8.00
400	10.25
660	15.48
661	6.30
663	25.00
701	10.57
702	6.27
704	7.09
706	11.33
707	4.00
768	4.00
769	9.00
787	6.68
888	9.25
891	3.00
893	7.00
SSI	8.00
Total	**10.50**



FORECASTING ELECTRIC VEHICLE COST

BY VEHICLE TYPE

Passenger Cars and Light Pickups

- Passenger cars and trucks are being manufactured currently. Availability has been limited for fleet type vehicles.
- Retail, Wholesale, CoOp Contracts, State Contract pricing is known.
- Estimates and Assumptions can be made based on current models, manufacturer pricing, and accounting for inflation.
- Manufacturer's are discontinuing many fleet trim levels for more profitable higher trim levels.

FORECASTING ELECTRIC VEHICLE COST

BY VEHICLE TYPE

Heavy Duty Trucks

- Currently suitable EV truck chassis are not available to build most County medium and heavy municipal service trucks. Available configurations do not allow for service body installations.
- Weight of electric chassis are much heavier. Batteries / Components occupy frame space.
- Most heavy manufacturers are not at scaled production.
- Many aftermarket and startups – one or more may fill the void but cost is currently unknown.
- Fleet cost assumptions are based on models for which manufacturers have retail pricing.
- County heavy municipal trucks require major upfit. Cost increase is not a straight percentage increase.

ELECTRIC VOCATIONAL TRUCK COST ESTIMATING

Example:

County of Sacramento heavy service truck. Total cost typically is 40% chassis and 60% body and upfit.

Total cost of truck shown in 2018 - $222,735

Estimate for diesel replacement in 2028 – $400,923

Estimate to Convert to EV:

Chassis Cost 40% = $160,370 **X 300%** (**Convert to EV**) = $481,108
Body and Upfit 60% = $240,554 Equivalent Body and Upfit = $240,554
= **$721,662**

Net Increase in this example is 80.0%

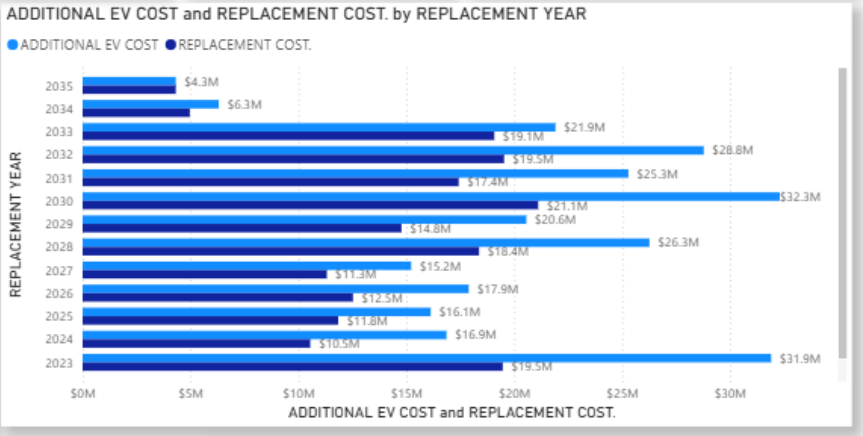
EV TRANSITION FORECAST

SACRAMENTO COUNTY FLEET SERVICES **EV TRANSITION FORECAST**

CHART

2376	7.98%	38%	$185M	$78M	$264M
Unit Count	Avg INFLATION RATE	Average of VAR_EV_MARKUP	REPLACEMENT COST	Sum of ADDITIONAL EV COST	Sum of EV ESTIMATED COST + INFLATION COST

REPLACEMENT YEAR	Count of UNIT NO	Sum of EV ESTIMATED COST + INFLATION COST	Sum of REPLACEMENT COST
2035	63	$4,314,332	$4,314,332
2034	91	$6,309,276	$4,964,916
2033	243	$21,906,448	$19,071,022
2032	218	$28,774,753	$19,524,740
2031	195	$25,284,478	$17,420,731
2030	222	$32,296,990	$21,105,292
2029	207	$20,555,375	$14,770,750
2028	221	$26,258,922	$18,365,940
2027	181	$15,221,264	$11,313,185
2026	183	$17,885,777	$12,523,425
2025	236	$16,126,047	$11,839,483
2024	115	$16,855,758	$10,543,735
2023	197	$31,897,886	$19,464,382
	4	$247,072	$247,072
Total	**2376**	**$263,934,379**	**$185,469,005**



CLASS TYPE	Count of UNIT NO	EV EST MARKUP	Sum of REPLACEMENT COST	Sum of EV ESTIMATED COST + INFLATION COST
Trucks, Refuse Compacting	13		$0	$0
Pick Up Trucks	4	80%	$104,907	$188,833
Buses, Highway and Metro Transport	1	30%	$151,921	$197,498
Trucks, Pavement Maintenance	1		$387,848	$387,848
Trucks, Street Sanitation/Sewer Cleaning	2	30%	$432,573	$562,345
Automobile	9	80%	$350,614	$631,105
Trucks, Refuse Compacting	110	80%	$575,900	$1,036,620
Buses, Highway and Metro Transport	2		$1,228,554	$1,228,554
Buses, School Transportation	2	80%	$802,864	$1,445,155
Trucks, Street Sanitation/Sewer Cleaning	3		$1,798,985	$1,798,985
Vans	39		$2,540,635	$2,540,635
Trucks, General Purpose	10		$2,736,622	$2,736,622
Turf Grass Maintenance, Landscaping, Self-propelled & Non-S	9	80%	$1,769,475	$3,185,054
Vans	10	80%	$2,151,444	$3,872,600
Automobile	83		$4,670,034	$4,670,034
Total	**2376**		**$185,469,005**	**$263,934,379**

DEPT NAME	Count of UNIT NO	Sum of EV ESTIMATED COST + INFLATION COST	Sum of REPLACEMENT COST
AG COMM	38	$3,326,627	$2,478,445
ANIMAL CTRL	14	$2,672,804	$2,071,046
ASSESSOR	1	$55,595	$42,765
CABLE COMMISSION	1	$72,126	$55,482
CORONER	6	$318,971	$271,924
DA	78	$4,727,947	$3,744,104
DCFAS	244	$14,549,922	$11,505,363
DCS	188	$12,093,355	$9,478,839
DCSS	6	$384,518	$252,685
DGS	113	$15,133,543	$10,694,974
DHA	74	$4,499,902	$3,504,264
DHS	52	$3,096,765	$2,451,609
DOT	193	$62,736,620	$38,919,770
DTECH	11	$713,527	$548,867
DWMR	201	$11,562,971	$6,983,343
Total	**2376**	**$263,934,379**	**$185,469,005**

ASSIGNED HEAVY EQUIP
362
Count of UNIT NO

ASSIGNED LIGHT EQUIP
2014
Count of UNIT NO

2289	72000
Min of GVWR	Max of GVWR

OWNED TYPE	Count of UNIT NO
DEPT OWNED	210
RENTAL	2166
Total	**2376**

NOTES:

NOTE: Dollar amounts and data shown do not represent an approved budget or replacement plan. The chart shown is an example of the capabilities of this tool for analytical purposes

ZERO EMISSION FLEET TRANISTION
WHICH VEHICLES DO YOU ELECTRIFY?

ZERO EMISSION FLEET TRANISTION
MEDIUM DUTY ELECTRIC TRUCKS

GPS / TELEMATICS TRIP DATA

TRIP SUMMARY DATA					
Unit No	Days	Greater than 110	Max Daily Dist.	Avg Daily Dist.	% Under 110 miles
134408	69	3	127.31	51.63	96%
134409	91	8	150.30	54.47	91%
134410	106	5	135.08	60.00	95%
134411	86	4	137.17	46.90	95%
134412	105	3	122.72	41.32	97%
134413	58	2	143.07	55.25	97%
134414	143	6	151.62	49.41	96%
134415	102	7	143.48	47.80	93%
134416	164	9	184.15	54.75	95%
134417	152	19	208.92	58.94	88%

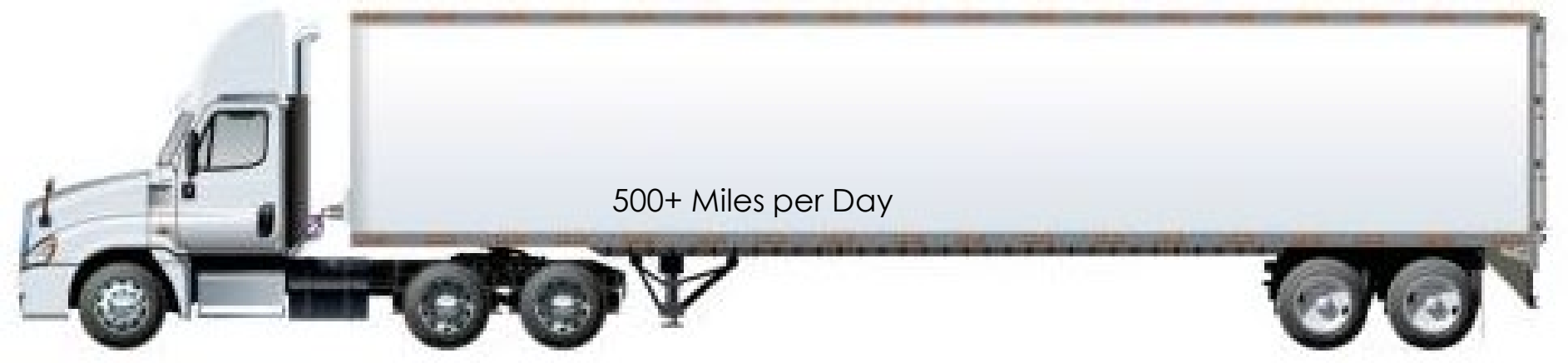
- Telematics Data with simple export to Excel
- Average Daily Distance for one year
- Maximum Daily Distance in one year
- 110 Mile Threshold – Achievable by most medium truck EV models
- Identifies frequent parking locations and dwell times – with additional sorting

TOYOTA MIRAI – HYDROGEN FUEL CELL

Vehicle Weight – 4,080 pounds
Gross Vehicle Weight Rating (GVWR) – 4,810
Payload of 730 pounds represents 18% of the Vehicle Weight
Advertised Range – 312 Miles
Hydrogen Fuel Capacity – 5 kg @ $29.99 / kg = $149.95
Fuel Cost Per Mile = $0.48

AVERAGE DIESEL TRACTOR TRAILER

$150,000



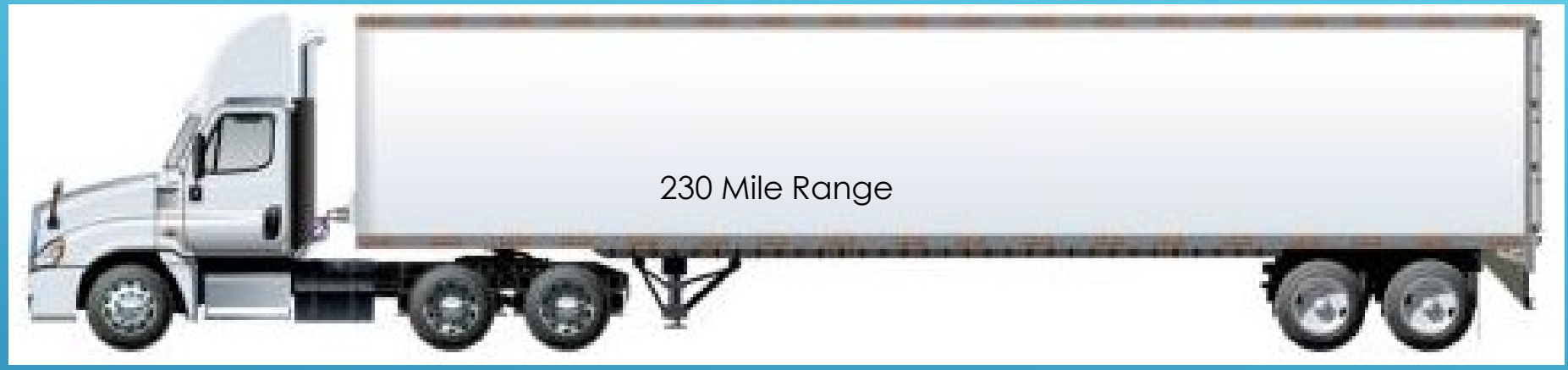
Tractor / Trailer Combination Empty Weight – 30,000 pounds
(Tractor Weight Vehicle – Avg 16,500 Trailer Weight – 13,500 pounds)

Gross Combined Weight Rating (GCWR) – 80,000 pounds
Payload of 50,000 pounds represents 167% of the vehicle weight
Diesel Range (based on 200 gallons @ 6.0 mpg) – 1,200 Miles
Fuel Capacity – 200 gallons @ $6.00 per gallon = $1,200
Fuel Cost Per Mile = $1.00

Refueling Time – 15 minutes

ELECTRIC TRACTOR TRAILER

$450,000



Tractor / Trailer Combination Empty Weight – 35,500 pounds

(Tractor Weight Vehicle – Avg 22,000 Trailer Weight – 13,500 pounds)

Gross Combined Weight Rating (GCWR) – 80,000 pounds

(Exemption of 2,000 pounds for ZEV does not increase axle weight ratings or change bridge weight laws – tractor and trailer must be properly spec'd for exemption to apply)

Payload Decreases 11% from 50,000 to 44,500 pounds

Electric Range – 230 miles

Battery Capacity – 438 kwh @ $0.45 kw = $197

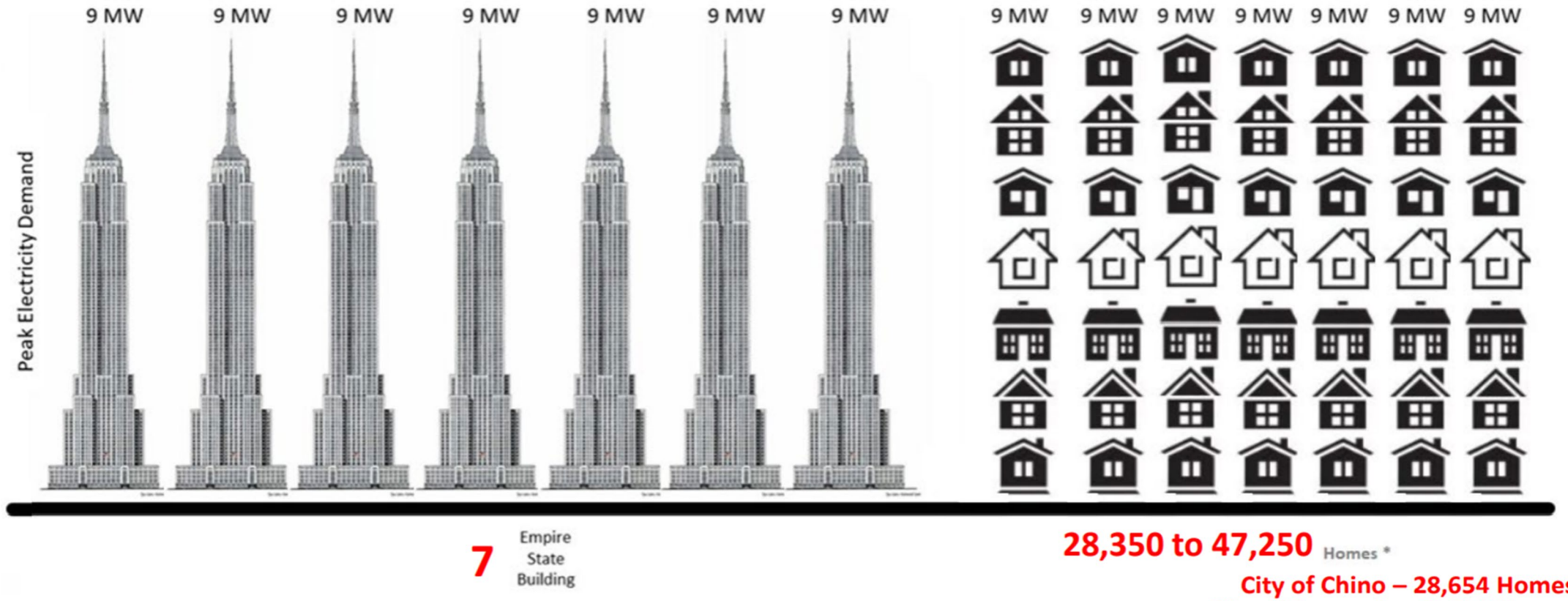
Fuel Cost Per Mile = $0.86

Refueling Time – 1.5 hrs. to 8.0 hrs.

THE HEAVY EQUIPMENT PORTION OF THE FLEET WILL REQUIRE MUCH MORE INFRASTRUCTURE AND VAST POWER DEMAND.

*

Electric Charging Infrastructure Example – 454 Trucks
Daily Electricity Consumption



7 Empire State Building

28,350 to 47,250 Homes *

City of Chino – 28,654 Homes
City of Concord – 47,816 Homes

- Varies Between 350 – 750 Homes per MW Depending on Location in U.S. and Size of Home

USE OF GRANTS AND INCENTIVES

- Assess Grant / Incentive Requirements

  Does it meet your use case?

  Are there restrictions? Fleet vs Public use? Regulatory Restrictions?

  Can you meet the timelines?

  Long Term Obligations – Data Collection and Reporting?

  Do you have the resources (hardware, software, personnel) to meet requirements?

  Does the benefit outweigh the costs of complying with grant requirements?

  Who will draft the grant application?

  Can you make a competitive business case compared to other applicants?

- Pre-Planned and /or Permitted Projects sometimes are required

  A "Shovel Ready" project is a huge advantage in meeting grant / incentive application deadlines.

HOW DO YOU MAKE SENSE OF IT ALL?

- Data, Data, Data
- Process improvement
- Internal Reporting
- Fleet Performance Measures and KPIs
- Understand your Fleet and Your Customers
- Identify "Low Hanging Fruit"
  - Where is the most fuel consumed?
  - What alternatives are available?
  - The cleanest gallon of fuel is the gallon that is never consumed!
- Third Party Consulting
  - Fleet Analysis and EV Transition Implementation Plan
  - Facility Assessment, Energy Modeling, Retrofit, Charging Infrastructure Plan
  - Grant Writer

Ronald Wirth

Fleet Advance Planning and Sustainability Manager
County of Sacramento, Fleet Services Division

WirthR@SacCounty.Gov

QUESTIONS ?

NorCal
Clean Cities and Communities

Clean Cities
Sacramento Clean Cities Coalition

EAST BAY
CLEAN CITIES COALITION

Sustainable Zero -Emission Technologies

AVINA

e-Boost®
A
Pioneer Power Solutions Company

GreenGo
Ventures

Meet the Speakers:

Panel Moderator

Richard Battersby
Deputy Director, City of Oakland Public Works &
Director, East Bay Clean Cities Coalition

Panelist

Vishal Shah
CEO, AvinaH2

vshah@avinah2.com

Panelist

Geo Murickan
CEO, Pioneer eBoost

geo@pioneer -emobility.com

Panelist

David Greenfader
CEO, GreenGo Ventures

david@greengoventures.com

Solar Fleet Charging

Solar Microgrid Solutions:

Integrates on-site solar panels with battery storage and EV chargers in a microgrid separate from the main grid

Why Fleets Use It:

- Reduces peak demand charges by using stored solar at high-cost times
- Enables overnight charging from stored solar energy and resilience during grid outages

Ideal For:

- Fleets in regions with unreliable grids or high energy costs
- Municipal and utility fleets needing additional resilience

Solar Fleet Charging

Off-Grid Solar Solutions:

Standalone solar installations connected to EV chargers not connected to the grid

Key Benefits:

- Ideal for small fleets in remote areas with unreliable or no access to the grid
- Can be rapidly deployed in remote or temporary locations
- Solar-generated power has a carbon intensity of 0

Dragon Wings Solar Generator:

Sesame Solar Mobile Solar Generator:

Hydrogen Fleet Refuelling

Hydrogen Hub Networks

- Regional hubs where hydrogen is produced, stored, and distributed through a network of centralized facilities
- Carbon intensity of Hydrogen production can range from -190 to 200

Key Benefits

- Avoids infrastructure costs associated with constructing on-site H2 fueling depots
- By producing hydrogen on-site, hubs avoid delays or limits from trucked-in liquid or gaseous hydrogen deliveries.

Hydrogen Fleet Refuelling

Avina H2's Vernon Clean Hydrogen Facility

- **Capacity:** 4,000 kg/day of green hydrogen via PEM electrolysis powered by renewables
- Includes **full -chain integration** : production, compression, storage, and dispensing (350 bar and 700 bar) for heavy-duty fleet refueling

- Throughput supports ~ **100 truck refuels/day**
- Expected commercial operation by **Q3 2025**

Hydrogen Fleet Refuelling

On Site-Hydrogen Refueling:

Key Benefits:

- Dedicated hydrogen station can installed at fleet depots
- Designed for high-throughput fleets (transit, refuse trucks)
- On-demand hydrogen availability enables rapid refueling with minimal downtime.
- All fueling happens at the depot where vehicles already park overnight

Mobile Fleet Charging

What it is:

- Portable charging solutions (trailer mounted, pod-based, truck mounted)
- Can take the form of temporary or permanent fixtures
- Offered in the form of generators and batteries with chargers attached
- Carbon Intensity of genset chargers can range from 20 to 60

Why Fleets Use It:

- Low Upfront Costs: No infrastructure or construction costs associated with charging
- Capable of functioning off grid or on remote work sites
- Ability to deploy multiple mobile units allows for scalability
- Able to move around as fleet operations change
- High energy output per square foot

Mobile Fleet Charging

Mobile Battery Trailers:

What it is:

Trailer-mounted battery packs equipped with EV chargers

Ideal for:

- Quickly deploying to fleet depots or remote worksites
- Enabling overnight or peak-time charging without grid upgrades
- Seasonal fleet surges

Pioneer e-Boost Mobile:

Mobile Battery Trailer equipped with DCFC or Level 2 Charging with 30kW to 300kW of charging power

Mobile Fleet Charging

Portable Battery Pod

What it is:

Self-contained pods equipped with batteries and chargers

Ideal for:

- Fleets operating in leased facilities or shared depots
- Transition periods while permanent infrastructure is built
- Fleets with changing capacity demand

Pioneer e-Boost Pod:

Permanent or temporary portable battery pod providing 180k - 600kW of charging power with DFCF or Level 2 Charging

Thank You