Fleet Vehicle Study PALM DESERT, CA

November 7, 2024



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1. Executive Summary

Matrix Consulting Group was engaged to conduct a fleet and electrification study for the City of Palm Desert. This study reviews the existing fleet and makes recommendations regarding the future management of the fleet.

Key areas of focus include the composition of the fleet to efficiently meet the operational needs of the City, compliance with applicable regulations regarding zero-emissions vehicles, the respective value of leasing and purchasing, the adoption of cost-effective replacement cycles, and the maintenance and staffing resources needed to support the fleet.

1.1 Study Overview

The study entailed a series of analytical tasks, each of which contributed to answering the key questions and developing recommendations. These included:

- The project team collected data on the City's fleet and conducted interviews with staff to develop a deep understanding of the organization and its operations. Based on this, a descriptive profile was created summarizing the existing fleet composition, the City's fleet facilities, budget, organizational structure, staffing, policies, and technology resources.
- 2. The project team interviewed points of contact within each department and division of the City, learning about the daily use of their fleet assets, their fit for their assigned function, and the City's intended disposition of the asset. Odometer readings and GeoTab GIS data were collected. Based on this, recommendations for the future state composition of the fleet were developed. These recommendations included eliminating some underused vehicles and changing others to classifications that are more standardized or better suited to the specific needs of the City.
- 3. The project team reviewed the relevant regulatory requirements regarding zeroemission vehicle (ZEV) adoption and electrification. Based on the timeframes from these regulations and the appropriate replacement lifecycles for each unit, specific timelines and powertrains for the replacement of each fleet asset were recommended.
- 4. The project team analyzed the costs of leasing and purchasing. This included a comparison of the annualized total cost of ownership (TCO) for each option, as well as non-cost factors such as management responsibility and the impact of ZEV

adoption. Fleet replacement recommendations were developed to align with the optimal fleet leasing/ownership approach.

- 5. The project team created a detailed fleet replacement plan for each individual vehicle and each recommended classification. This plan aligns with the requirements of the City's operational needs, cost-efficient replacement lifecycles, regulatory requirements for ZEV adoption, and lease agreement timelines.
- 6. The project team recommended an approach to maintenance and staffing for supporting the fleet. This includes preventive maintenance tasks and schedules which can be tracked in the City's fleet management software, and job roles and responsibilities for a position overseeing the fleet.

The study's analysis and recommendations provide a roadmap for the City as it navigates the end of many of the current leases, the regulatory environment related to ZEV adoption and electrification, and the adoption of fleet management software and maintenance planning.

1.2 Summary of Key Findings and Recommendations

While each of the sections of this report discusses our findings in more detail, the following bullets summarize the answers to the key questions in the study in the form of findings and recommendations.

- Fleet Composition: The fleet can be right-sized by eliminating three units or scheduling them for non-replacement. The City's future fleet will also include fewer classifications in order to standardize assets, more zero-emissions vehicles, and more four-wheel drive units.
- **Regulatory Compliance:** The City's focus for compliance will primarily be on the Advanced Clean Fleets (ACF) rule, which applies to medium- and heavy-duty assets. The "milestone" approach will require the addition of two ZEV models in this category by 2026, two additional units by 2029, and more ZEV vehicles in subsequent years. The City is free to use light-duty vehicles in any powertrain, but manufacturers are likely to increasingly emphasize ZEV units in this category due to the Advanced Clean Cars (ACC) rule.
- Leasing and Ownership: The City should adopt an ownership strategy instead of leasing, saving about \$50,000 per year. The City should purchase most of its leased units from Enterprise this year, terminate leases where purchasing a replacement immediately is appropriate, and extend two leases to 2026 in preparation for their replacements.

- **Staffing:** The City should hire a Fleet Coordinator position to manage the fleet. This position would be responsible for vehicle acquisition and disposal, managing vendor contracts for maintenance and repairs, and managing the City's fleet management software.
- **Maintenance:** The City should enter into a contract for preventive maintenance on the fleet and additional contracts for repairs and specialized fleet work. These contracts may be with other government agencies such as a nearby city or the County of Riverside, or with a private vendor such as a fleet management company. The City should use the provided preventive maintenance schedules to plan and monitor contracted maintenance and repairs.
- Fleet Management: The City should adopt a number of fleet management policies and practices such as a utilization policy, a multi-year replacement plan, a department charge-back methodology, and a specifications development process. The use of Cartegraph and other data sources will be essential for maintenance management, generating reports, and strategic decision-making.

The background and rationale for each of these recommendations is provided in the following chapters.

1.3 Implementation Note

The analysis and recommendations in this report have been developed over the course of the study, which concluded at the end of October 2024. Likewise, the implementation guidance in this document is applicable to the conditions and circumstances of that time period. The City's approach to implementation will necessarily change, however, as conditions and circumstances fluctuate.

The replacement plan should be viewed flexibly. As additional staff are added to the City's roster, State regulations change, or vehicles become inoperable unexpectedly due to collisions or breakdowns, the vehicle replacement plan will change. When adjusting the replacement plan, the City should always consider the impact to cost of asset ownership and CARB regulations.

Early replacements of light-duty zero-emissions vehicles can be undertaken with minimal impact. Additions of medium- and heavy-duty (ACF) vehicles should be approached more cautiously to ensure ongoing compliance with the advanced clean fleets (ACF) rule.

2. Fleet Overview

This chapter provides a fleet overview that summarizes the current organization and operations of the City's fleet, as well as existing asset inventory, facilities, budget, technology use, and relevant policies. This overview section does not attempt to include every organizational and operational facet related to the fleet. Instead, it provides a summary profile that can be used as a starting point to show how specific recommendations will impact the organization's approach – whether in organizational structure, operational practices, or in the makeup and management of the fleet.

2.1 Fleet Overview

The fleet function in Palm Desert is part of the Public Works Department. The Streets and Fleet Supervisor oversees streets work and the City's fleet.

The fleet consists of 61 active vehicles and equipment pieces including 32 light-duty pickups, ten medium-duty trucks of various configurations, and nine sedans and SUVs. Half of the fleet, including the majority of light-duty vehicles, is leased.

The following table provides a total count and average age in years – as of June 2024 – for each vehicle classification.

Classification	Count	Avg. Age
City-owned	30	9.3
Cart/ATV	3	22
Sedan	1	8
Truck HD Dump	1	5
Truck HD Tank	1	5
Truck LD .5 Ton	12	9.3
Truck LD Compact	2	7
Truck MD 1 Ton	5	10
Truck MD 1 Ton Dump	1	8
Truck MD Class 4 Paint	1	2
Truck MD Class 5	1	23
Truck MD Class 5 Aerial	2	5.5

Current Fleet Inventory

Classification	Count	Avg. Age
Leased	31	5.9
Sedan	5	5.6
SUV Small	3	6
Truck LD .5 Ton	18	6
Truck MD 1 Ton	3	6
Truck MD 1 Ton Dump	1	6
Truck MD Class 5	1	-
Grand Total	61	8.5

The next graph demonstrates the number of assets in the active fleet by model year, separating city-owned from leased units. It shows that starting in 2018, the majority of the City's fleet acquisitions are leased units.



The fleet is used for a variety of functions, with Public Works being the largest user. The following table shows the count of each classification type along with average annual utilization in miles.

Classification	Count	Avg. Utilization
Cart/ATV	3	N/A
Sedan	6	2,834
SUV Small	3	2,732
Truck HD Dump	1	1,460
Truck HD Tank	1	1,834
Truck LD .5 Ton	30	4,849

Classification	Count	Avg. Utilization
Truck LD Compact	2	7,034
Truck MD 1 Ton	8	6,643
Truck MD 1 Ton Dump	2	4,043
Truck MD Class 4 Paint	1	N/A
Truck MD Class 5	2	N/A
Truck MD Class 5 Aerial	2	8,855
Total	61	4,854

Most of the fleet assets are fueled by unleaded gasoline, but a few units are electric or diesel-powered. The following table shows a count of the current fleet by fuel type, for those available.

Fuel Type	Count	Percentage
Diesel	3	4.84%
Electric	3	4.84%
Gas	55	88.71%
Multiple	1	1.61%

Current	Fleet	by	Fuel	Туре
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Most preventive maintenance and repair work is outsourced to private vendors; only very minor tasks such as wiper blade replacement are handled by maintenance workers.

2.2 Facilities

Palm Desert has a maintenance shop at the corporation yard at 74705 42nd Ave, a building which is about 25 years old. The facility has space for three heavy-duty work bays, but the facility has not been built out or equipped for work because the City outsources maintenance and repairs. It has no lifts or tools and is only used to store some fluids and oil. The building also has four offices and an exterior car wash bay, which was built after the original building.

The site has a dispenser for unleaded fuel with a 2,000-gallon tank, and a dispenser for diesel fuel with a 1,000-gallon tank.

The corporation yard operates on a 9-80 schedule. Staff work from 5 a.m. to 2:30 p.m. Monday through Thursday. Fridays are from 5:30 a.m. to 2 p.m. with every other Friday off.



Palm Desert Corporation Yard – Aerial View

2.3 Budget

The fleet budget is managed as part of the general fund with each department making annual requests for vehicle replacements. Annual lease payments have constituted the largest annual expenditure in recent years. The budget for the current fiscal year shows \$1.56 million in planned equipment purchases as well as an increase in expected maintenance costs.

	FY21-22 Actual	FY22-23 Actual	FY23-24 Budget
Operations	\$302,415	\$318,788	\$409,083
Fuel	\$135,102	\$133,134	\$137,500
Maintenance	\$167,314	\$185,654	\$240,000
Fuel Management System	-	\$0	\$31,583
Capital	\$249,280	\$232,777	\$1,775,052
Equipment Purchases 4403000	\$6,250	-	\$1,356,111
Equipment Purchases 4404500	-	-	\$200,000
Annual Lease Payments (Enterprise)	\$243,030	\$232,777	\$218,941
Total	\$551,695	\$551,565	\$2,184,135

2.4 Organization

The following organizational chart shows the current structure of the fleet organization in Palm Desert. The oversight of fleet operations falls to the Streets Maintenance Supervisor who reports to a Deputy Director of Public Works. The two Senior Maintenance Workers and nine maintenance workers primarily focus on streets work with periodic fleet-specific tasks. An Administrative Assistant provides administrative support for the fleet as part of their other duties, and some fleet management and oversight responsibilities fall to a Senior Project Manager who reports to the Deputy Director of Public Works. Each staff member has a role in fleet management as a small fraction of their overall workload, but none are assigned fully to manage the fleet.



2.5 Job Descriptions

The next table shows a summary of the key roles and responsibilities of each position. It is important to note that the maintenance workers are not mechanics and perform little work on vehicles.

Position Title	Key Roles and Responsibilities
Streets Maintenance Supervisor	 Plan, organize, and supervise the maintenance, repair, and construction of city streets, fleet vehicles, and other infrastructure; ensure compliance with safety standards and operational guidelines. Monitor and evaluate staff performance, provide training, and manage resources and equipment necessary for street maintenance activities. Oversee the preparation of reports, manage budgets, and participate in the bidding and procurement processes for maintenance projects and materials. Coordinate with other city departments, contractors, and external agencies to ensure effective execution of street maintenance operations and respond to public inquiries or emergencies as needed.
Senior Maintenance Worker	 All duties of Maintenance Worker. Oversee teams of Maintenance Workers, ensure work is done to satisfactory standards, report to the Supervisor and assist
Maintenance Worker	 Operate city vehicles safely and responsibly, and take vehicles to vendors and dealerships for preventive maintenance and repairs. Perform maintenance and repair tasks on city streets, sidewalks, and related infrastructure. Operate and maintain a variety of tools and heavy machinery such as paving equipment, paint stripers, and other maintenance equipment. Conduct regular inspections and ensure cleanliness and safety of public roads and pathways, removing debris and hazards.
Administrative Assistant	 Provide general administrative support to the Street Maintenance Supervisor, such as scheduling meetings, preparing correspondence, and managing calendars. Assist in the procurement of vehicles, parts, and equipment by obtaining quotes, preparing purchase orders, and tracking deliveries. Assist in contract administration, including coordinating contract renewal and ensuring timely execution of contract documents. Update vehicle information as requested, mileage, drivers assigned, vehicle specifications, and any other pertinent details.
Senior Project Manager	 Negotiate and manage leased vehicle contracts, ensuring compliance and accurate record-keeping. Support fleet policy development, coordinate with stakeholders, and contribute to strategic planning for optimized fleet operations. Conduct market research, prepare cost-benefit analyses, and assist in procurement documentation for purchasing fleet vehicles.

2.6 Policy Framework

The following table summarizes the City's key fleet operations and asset management policies.

Policy	Description
Fleet Services Policy and Procedure (2010)	Outlines the administrative guidelines for the use and maintenance of city fleet vehicles. Specifies the responsibilities for procuring and maintaining fleet vehicles, assigning them to employees, and providing pool vehicles. Includes rules for vehicle operation, emphasizing safety and seat belt use, a ban on smoking and handheld cell phone use, and restrictions against operating vehicles under the influence. Covers maintenance, fueling procedures, insurance, and registration requirements, as well as guidelines for the use of personal and rental vehicles for city business.
Capital and Inventoriable Assets Management	Sets thresholds for capitalization and details requirements for the accounting of purchased, donated, or developed assets. It mandates recording assets at historical cost and outlines specific procedures for depreciation using the straight-line method.
Disposal of Surplus Property and Equipment	Defines procedures for responsibly disposing of surplus property and equipment, including criteria for declaring items as surplus and the various methods of disposal like donation, sale, or recycling.

2.7 Technology

The following table provides a summary of the technology utilized in fleet operations. Each tool or application is accompanied by a description of its functionality and the primary ways it is used.

Technology	Description
Cartegraph	Asset management system used city-wide, functions as the fleet management system. Contains records of all vehicles and equipment.
Gasboy	Drivers use key fobs for fuel, and each fueling includes the driver and vehicle number which goes into a database.
Geotab	Automatic vehicle location and GIS-powered data collection system being implementation to generate data on vehicle usage, efficiency, and safety.
NetworkFleet	Real-time vehicle tracking, diagnostics, and reporting program offering insights into performance, fuel usage, maintenance needs, and driver behavior.

3. Regulatory Requirements and Standards

A crucial component of any city's fleet strategy is compliance with state and regional requirements for zero-emissions vehicles. The California Air Resources Board (CARB) has developed regulations and maintains a robust collection of resources intended to guide the widespread introduction of zero-emission cars, trucks, and equipment. This effort includes a wide variety of programs, resources, and zero-emission vehicle information available at CARB's Zero-Emission Transportation webpage¹.

Three primary regulations are most relevant to municipal fleet electrification because they impose mandatory requirements upon public and private fleet operators, and manufacturers who sell their vehicles in California. The Advanced Clean Cars and Advanced Clean Trucks regulations directly impact vehicle manufacturers who sell their vehicles in California. The Advanced Clean Fleets regulations directly impact fleets.

3.1 Advanced Clean Cars

The Advanced Clean Cars (ACC) program combines several regulations into one package. Advanced Clean Cars I was adopted in 2012 and created regulations aimed at scaling down emissions of light-duty passenger cars, pickup trucks and SUVs by requiring an increased number of zero-emission vehicles (ZEVs) to meet air quality and greenhouse gas emissions reduction goals. The Advanced Clean Cars II regulations were adopted in 2022, imposing the next level of low-emission and ZEV standards for model years 2026-2035 that contribute to meeting federal ambient air quality ozone standards and California's carbon neutrality targets. Current regulations require that, by 2035, all new passenger cars, trucks and SUVs sold in California will be zero emission vehicles.

The regulations are two-pronged. First, the Zero-emission Vehicle Regulation supports Governor Newsom's 2020 <u>Executive Order N-79-20</u> that requires all new passenger vehicles sold in California to be zero emissions by 2035². Second, the Low-emission Vehicle Regulations include increasingly stringent standards for gasoline cars and heavier passenger trucks to continue to reduce smog-forming emissions. The chart below illustrates the increasing percentage of zero-emission vehicle sales requirements that vehicle manufacturers are required to meet, including battery-electric and plug-in hybrid vehicles, by 2035.

¹ California Air Resources Board (CARB). Zero-Emission Transportation, <u>https://ww2.arb.ca.gov/our-work/topics/zero-emission-transportation</u>.

² State of California Executive Department. Executive Order N-79-20. 9/23/2020, <u>https://www.gov.ca.gov/wp-content/uploads/2020/09/9.23.20-E0-N-79-20-Climate.pdf</u>.



California Advanced Clean Cars (ACC) Requirements

Source: California Air Resources Board (CARB) - arb.ca.gov

3.2 Advanced Clean Trucks

Starting with the 2024 model year, the Advanced Clean Trucks (ACT) regulation requires manufacturers to sell zero-emission vehicles (ZEVs) as an increasing percentage of total medium- and heavy-duty sales in California. By the end of the 2024 model year, 5% to 9% of sales need to be ZEVs, depending on the truck category. Manufacturers were able to receive early credits for selling 2021 through 2023 model year ZEVs. They also have the flexibility to sell more ZEVs in one category while selling fewer in another, with the caveat that they must still sell a minimum number of ZEV tractors. Manufacturers were also allowed to trade or bank credits from excess ZEV sales and have one extra year to make up any shortfall.

In response to the ACT regulation, the sales of new ZEV medium- and heavy-duty trucks in California in 2023 doubled from the prior year, representing 1 out of every 6 new ACT-regulated vehicles. With more than 18,000 medium- and heavy-duty ZEVs sold in California in 2023, the state exceeded its ACT goal two years ahead of schedule and sold five times the number of ZEVs required by the regulation, according to a report released by CARB³.

³ California Air Resources Board (CARB). Advanced Clean Trucks Credit Summary Through the 2023 Model Year, https://ww2.arb.ca.gov/resources/fact-sheets/ACT-Credits-Summary%202023.

3.3 Advanced Clean Fleets

Approved on April 28, 2023, the Advanced Clean Fleets (ACF) regulation applies to vehicles with a gross vehicle weight rating (GVWR) greater than 8,500 lbs. and sets *"stringent emission standards for mobile sources that are needed to protect the public health and welfare of Californians by improving air quality and by mitigating the harms posed by greenhouse gases"*⁴. The ACF regulation complements the Advanced Clean Trucks regulation and is aimed at advancing the introduction of zero-emission technologies into California's truck and bus fleets, requiring fleets that are well suited for electrification to reduce emissions through requirements to both phase-in the use of ZEVs for targeted fleets and requirements that manufacturers only manufacture ZEV trucks starting in the 2036 model year. Achieving these and other milestones will contribute to meeting the goals in Governor Newsom's 2020 <u>Executive Order N-79-20</u>⁵.

There are two approaches that State and local government fleets can use to comply with ACF regulations. Option 1 (sometimes referred to as the 'Model Year Option') dictates that fleets must ensure, beginning January 1, 2024, that 50% of their annual vehicle purchases are ZEVs, and beginning January 1, 2027, that 100% of vehicle purchases are ZEVs. Near-zero-emissions vehicles, as defined in the regulation, with a vehicle model year of 2035 or earlier, count the same as ZEVs for this requirement. New internal combustion engine (ICE) vehicles, 2024 or newer, must have an engine certified to applicable California emissions standards and emissions-related requirements, and any used ICE vehicle added to the fleet must have a 2010–2023 model year engine. The required ZEV percentages by model year under this option are shown in the table below.

Required ZEV Purchases by Year (Model Year Option)	2024	2025	2026	2027	2028+
Percent of Vehicles	50%	50%	50%	100%	100%

Option 2 is the ZEV Milestones Option, which allows State and local governments the flexibility of phasing in ZEVs based on the suitability of different vehicles in their fleets. Under this option, vehicles are categorized according to three "milestone groups". Each milestone group carries with it an increasing percentage of annual vehicles purchases that must be ZEVs. The percentages by milestone group are shown in the table below. It should be noted that all 17 of the ACF-regulated vehicles in the Palm Desert fleet fit into Milestone Group 2.

⁴ California Air Resources Board (CARB). *Advanced Clean Fleets*, <u>https://ww2.arb.ca.gov/our-work/programs/advanced-clean-fleets/about</u>.

⁵ State of California Executive Department. Executive Order N-79-20. 9/23/2020, <u>https://www.gov.ca.gov/wp-content/uploads/2020/09/9.23.20-EO-N-79-20-Climate.pdf</u>.

Required ZEV Composition (Milestones Option)	10%	25%	50%	75%	100%
Milestone Group 1: Box trucks, vans, buses with two axles, yard tractors, light-duty package delivery vehicles	2025	2028	2031	2033	2035
Milestone Group 2: Work trucks, day cab tractors, pickup trucks, buses with three axles	2027	2030	2033	2036	2039
Milestone Group 3: Sleeper cab tractors and specialty vehicles	2030	2033	2036	2039	2042

Based on the fleet composition and vehicle utilization analysis, the ACF Milestones Option is recommended. When opting into the ZEV Milestones Option, the fleet owner must report this intention. After electing to use this option, fleet owners are no longer subject to, and may not switch back to, the State or Local Government Fleet Requirements.

3.4 Reporting

Regardless of the option selected, ACF requires fleets to report their vehicle information through the Truck Regulation Upload, Compliance and Reporting System (TRUCRS). TRUCRS reporting information, guidance and a link to the submission portal is available at CARB's <u>TRUCRS Reporting Information</u> webpage⁶.

Recommendations

The following recommendations pertaining to fleet regulation should be adopted by the City:

- 1. Adopt option 2 (Milestones Approach) for ZEV compliance.
- 2. Report the option selected and vehicle selection information through TRUCRS.

⁶ California Air Resources Board (CARB). *TRUCRS Reporting Information*, <u>https://ww2.arb.ca.gov/our-work/programs/truck-bus-regulation/trucrs-reporting-information</u>.

4. Fleet Composition Analysis

This chapter provides the project team's analysis of the City's fleet and recommendations for right-sizing and reallocation based on sound fleet utilization principles. It also includes and an assessment of EV replacement needs based on the market for these vehicles and the regulations governing fleet emissions. It provides a summary and a preliminary recommendation for each vehicle.

4.1 Analysis Framework and Principles

In addition to the regulatory requirements outlined in Section 3, the transition and replacement plan is shaped by factors including the efficiency of fleet composition, the cost-effectiveness of replacement lifecycles, the availability of ZEV vehicles in the market, and the timing of leasing and purchasing decisions.

1. Fleet Composition

Efficient fleet composition calls for organizations to have a mobility mindset. When a transportation requirement is identified, management and users should first ask whether that requirement can be met most efficiently by means such as leasing, renting, public transportation, employee reimbursement, or pooled vehicles. Vehicle leasing/ownership should be undertaken only when the business case is framed by the organization's needs and the cost to taxpayers justifies it. When leasing/ownership is the best option, care should be taken in matching the asset to the requirement in a way that promotes efficiency and sustainability.

2. Fleet Replacement Timelines

Vehicles and equipment should be replaced at the point that will minimize the Total Cost of Ownership (TCO) to the City⁷. This is usually just before the maintenance costs associated with an older vehicle start to spike. By establishing a standard set of replacement cycles as the basis for replacement decisions and replacement funding, the City can prevent the recurrence of an aged fleet, which is costly and inefficient. A set of replacement cycles can be used for each classification of motorized vehicles and equipment in the fleet. These are shown in the following table.

⁷ TCO methodologies are discussed further in Section 5.

Classification	Lifecycle (years)
Sedan	10
SUV Small / Crossover	10
Truck LD 1/2 Ton	10
Truck LD Compact	10
Truck MD 1 Ton	12
Truck MD Class 4/5	15
Truck HD Dump	15
Truck HD Tank	15
Cart/ATV	15

Suggested Fleet Replacement Lifecycles

These standard replacement lifecycles have been used to project estimated replacement timing for vehicles to minimize the total cost of ownership.

4.2 Methodology

This section describes the three-step methodology used to develop the EV transition and fleet composition plan.

1. Fleet Composition Review

The first step of the right-sizing and reallocation analysis was to interview stakeholders to discuss the vehicles and equipment in each division. These interviews provided information about the daily use of these assets, their fit for their assigned function, and the City's intended disposition of the asset.

Along with these interviews, mileage data was collected from each vehicle – both their odometer reading and a set of data from the GeoTab GIS vehicle location system which is installed on some of the vehicles. This data allowed for a comparison of interview findings with information about units' frequency of use, typical driving durations, and average annual mileage.

Based on this analysis, one of the following dispositions was assigned to each asset:

	Immediately	At Next Cycle
Replace in Kind	Replace the asset with the same type immediately, typically because it is aged past its lifecycle.	Replace the asset with the same type at the next replacement cycle.
Right-Type	Replace the asset with an asset more suited to the job function immediately, typically because it is aged past its lifecycle.	Replace the asset with an asset more suited to the job function at the next replacement cycle.
Eliminate	Dispose of the vehicle as soon as possible through an appropriate remarketing method.	Dispose of the vehicle when it is next due for replacement, and do not replace it.

These recommendations were adjusted later in the process after analyzing the impacts of leasing and purchasing.

2. Zero Emissions Conversion Review

In the second step, the suitability of various electric vehicle types (e.g., sedans, vans, trucks) to meet the City's operational needs was evaluated. This analysis was based on the current and expected commercially available EV options, as well as consideration of the City's operational needs and charging requirements. Additionally, this review considered the impact of the applicable regulations and the urgency of EV transition to comply with them.

- Light-Duty Vehicles: The light-duty fleet consists of 44 vehicles, of which 26 (60%) are Ford F-150 ½-ton pickup trucks, five are similar trucks from other manufacturers, and nine are sedans and small SUVs. There is also a single Neighborhood Electric Vehicle (NEV), two electric carts, and one historical vehicle in service. The light-duty EV market is well-developed and there are viable EV options for all the ICE powered light-duty vehicles in the fleet.
- **Medium- and Heavy-Duty Vehicles:** The medium- and heavy-duty fleet consists of 17 vehicles that are subject to ACF regulations, of which nine are Class 3, six are Class 5, and two are Class 6 trucks. While there are existing EV options available in each of these vehicle classes, individual vehicle utilization is highly variable and needs to be accounted for as electrification of this subset of the fleet to achieve regulatory compliance is accomplished.

3. Preliminary Replacement Recommendations

In the third step, a preliminary recommendation was developed for each unit. This incorporated the year-by- year replacement of each asset and the integration of electric vehicles into the City's fleet, considering operational demands and the market availability

of suitable EV options. The recommendations were designed to comply with the relevant state regulations and timelines as described in Section 3, focusing on the assets in the City's fleet which are best-suited for EV replacement. The plan did not include the leasing and purchasing analysis, which were completed later in the study. The full replacement plan, which includes updated timeline recommendations, is provided in Section 6.

4.3 Analysis of Fleet Data

The City provided access to the GeoTab GPS data for the fleet, which tracks the locating and timing every time a vehicle is turned on. It is only installed on a subset of vehicles, but it provides a data-rich view of their usage including the number of days a vehicle is driven, the average number of hours in use on days when it is driven, and the maximum single-day number of hours in use. The following table shows this data.

Asset #	Department	Description	Days Driven	Daily Avg	1-Day Max
1	DPW - Facilities	2018 F-150	175	1:00:40	2:51:16
2	Dev - Bldg & Safety	2018 F-150	185	2:33:24	5:04:42
4	DPW - Streets	2018 F-350	3	4:01:38	4:50:54
5	Pool Vehicle	2019 Ford Fusion	116	0:43:38	3:24:14
6	Dev - Code	2018 F-150	203	1:45:26	4:07:58
7	DPW - Director	2018 F-150	85	0:44:48	3:51:14
10	Capital Projects	2018 F-150	184	2:22:30	5:21:50
77	DPW - Traffic	2018 F-350	10	1:49:09	2:49:00
78	Capital Projects	2018 F-150	174	1:06:57	4:57:32
79	DPW - Streets	2018 F-150	210	1:44:58	6:43:47
80	COPS Program	2018 Ford Escape	62	2:19:07	3:58:02
81	COPS Program	2018 Ford Escape	55	2:01:09	5:21:10
82	DPW - Streets	2018 F-350	199	2:15:49	5:52:36
83	Pool Vehicle	2018 Ford Fusion	145	0:41:28	5:30:44
84	DPW - Facilities	2018 F-150	185	1:22:20	3:24:04
86	DPW - Streets	2018 F-550	75	1:45:02	5:36:18
87	DPW - Streets	2018 F-350 Dump	170	2:13:49	6:50:33
88	COPS Program	2018 Ford Flex	138	2:40:54	5:28:56
90	Pool Vehicle	2018 Ford Escape	142	0:46:07	4:56:33
91	DPW - Landscape	2018 F-150	196	2:10:50	5:42:08
92	Dev - Bldg & Safety	2018 F-150	138	2:13:16	3:57:38
94	Pool Vehicle	2019 Ford Flex	99	0:41:19	4:34:03
95	DPW - Landscape	2018 F-150	222	1:52:11	6:01:27
96	Dev - Bldg & Safety	2018 F-150	191	2:08:59	3:09:44
99	Capital Projects	2018 F-150	174	1:08:34	4:24:25
100	Dev - Bldg & Safety	2018 F-150	180	1:23:07	3:03:23

GeoTab Data for Available Units (12 months ending 3/31/24)

This data provides some important points regarding utilization and suitability for EV transition:

- Most vehicles are driven regularly. The average among this group was 145 days over the course of the year, and 70% of units were driven at least 125 days. The vehicles that show lower utilization levels had broken sensors or are shared or special-purpose units which can justify less frequent use.
- The average daily use is moderate. The average daily use for this group was an hour and 45 minutes, with 80% of units averaging less than 2 hours and 15 minutes. One vehicle averaged just over 4 hours, but no other unit averaged more than 2 hours and 40 minutes.
- Vehicles are rarely if ever pushed for long durations. The typical 1-day max during the year was 4 hours and 41 minutes, and no vehicle was driven on any day more than 6 hours and 50 minutes.

The GeoTab data shows that the utilization of most vehicles is strong. While it only included 26 units, it shows that the average daily use of the fleet – as well as the maximum duration of use – is moderate. Because of this, electric vehicles are good candidates as long as the City's charging infrastructure can support them.

4.4 Fleet Composition Analysis and Recommendations

The following section provides analysis and recommendations for each vehicle in the City's inventory. It includes vehicle right-typing and reallocation recommendations as well as a determination of each unit's suitability for EV conversion and a timeframe for the transition. Key findings from the analysis include:

- As stated above, the GeoTab data provided by the City covered 26 units (43%) of the 61 operational assets in the fleet inventory, preventing a full utilization determination for some vehicles beyond a simple calculation of average miles per year. Where available, the GeoTab data showed that no unit had average daily use above 4 hours, and no unit had a maximum daily use in any day greater than 6 hours and 50 minutes. This suggests that most vehicles' use is compatible with EV transition.
- In response to the recent storm and flooding in Palm Desert this spring, the City Manager's Office has asked that the number of 4WD vehicles be increased in order to provide capacity for sand/mud operations as needed in case of future

storm/flooding/mudslide events in the City. Additional units have been recommended for 4WD replacement to provide requested capacity within the fleet.

The findings and recommendations in the following sections do not include specific timeframes, because those depend on the impacts of leasing and purchasing decisions. The full replacement plan – including timeframes – can be found in Section 6, which includes considerations of leasing and purchasing decisions as well as the utilization and EV transition analysis.

1. Public Works – Streets

The Streets Division is responsible for maintaining the City's streets and sidewalks, conducting pavement repairs, resurfacing, and some traffic markings. The Division is supported by 15 vehicles, primarily a mix of light-duty and medium-duty trucks and their specialized configurations and attachments for road work.

Unit	Description	Right-Sizing and Reallocation	EV Transition Evaluation	Preliminary Recommendation
3	2004 F-350 Concrete Truck	Specialized vehicle for specialized use, good utilization. Heavier body appropriate for concrete work.	ACF Milestone Group 2. Compatible EV chassis available.	Class 5 Utility Body in 2024. ICE in first cycle; EV by 2038.
4	2018 F-350	Correctly sized and well utilized. 4WD needed for sand/mud use occasionally.	ACF Milestone Group 2. Compatible EV chassis available.	Replace with 1 Ton 4WD Flatbed EV by 2026.
9	2019 F-750 Dump Truck	Only HD Dump Truck unit for specialized function, appropriate type.	ACF Milestone Group 2. Compatible EV chassis available. Hydraulic power not yet widespread in EV market.	Replace with Class 7 Dump Body EV by 2035.
11	2019 F-750 Water Truck	Only HD Water Truck unit for specialized function, appropriate type.	ACF Milestone Group 2. No compatible EV options currently available.	Replace with Class 7 Tanker Truck EV by 2038.

Unit	Description	Right-Sizing and Reallocation	EV Transition Evaluation	Preliminary Recommendation
12	2022 F-450 Stencil Truck	Specialized vehicle for specialized use, good utilization.	ACF Milestone Group 2. No compatible EV options currently available.	Replace in kind with Class 4 Stencil Truck EV by 2038.
57	2016 GMC Sierra	Correctly sized and well utilized. 4WD needed for sand/mud use occasionally.	Compatible EV currently available.	Replace with ½ Ton 4WD Ext Cab EV at next cycle in 2026.
63	2016 F-350 Dump Truck	Correctly sized and well utilized.	ACF Milestone Group 2. Compatible EV chassis available. Hydraulic power not yet widespread in EV market.	Replace in kind with 1 Ton 2WD Dump Truck EV by 2035.
64	2016 F-350 Flat Bed	Correctly sized and well utilized. 4WD needed for sand/mud use occasionally. Duration of loan to PD/Code unclear.	ACF Milestone Group 2. Compatible EV chassis available.	Replace in kind with 1 Ton 4WD Flatbed EV by 2032.
67	2017 F-150 Truck	Correctly sized and well utilized. 4WD needed for sand/mud use occasionally.	Compatible EV currently available.	Replace with ½ Ton 4WD Ext Cab EV at next cycle in 2027.
70	2017 GMC 3500 Flatbed	Correctly sized and well utilized. 4WD needed for sand/mud use occasionally.	ACF Milestone Group 2. Compatible EV chassis available.	Replace with 1 Ton 4WD Flatbed EV by 2029.
71	2017 GMC 3500 Flatbed	Correctly sized and well utilized. 4WD needed for sand/mud use occasionally.	ACF Milestone Group 2. Compatible EV chassis available.	Replace with 1 Ton 4WD Flatbed EV by 2029.
79	2018 F-150	Correctly sized and well utilized. Ext cab sufficient for 1-2 passengers.	Compatible EV currently available.	Replace with ½ Ton 4WD Ext Cab EV at lease renewal or next cycle in 2028.
82	2018 F-350	Correctly sized and well utilized. 4WD needed for sand/mud use occasionally.	ACF Milestone Group 2. Compatible EV chassis available.	Replace with 1 Ton 4WD Flatbed EV by 2026.
86	2018 F-550/Ditch Witch	Specialized vehicle for specialized use. Department has planned for Vac truck as replacement.	ACF Milestone Group 2. No compatible EV options currently available.	Replace as planned with HD Vac Truck in 2024. ICE in first cycle; EV by 2038.

Unit	Description	Right-Sizing and Reallocation	EV Transition Evaluation	Preliminary Recommendation
87	2018 F-350 Dump	Correctly sized and well utilized.	ACF Milestone Group 2. Compatible EV chassis available. Hydraulic power not yet widespread in EV market.	Replace in kind with 1 Ton 2WD Dump Truck EV by 2035.

The division's vehicles are generally well-utilized and their configuration and assignment are matched to their function. Because many of their regularly used trucks are also afterhours responding in sand/mud to storms, some should be converted to 4WD units.

The vehicles in this division are the best candidates for the first ACF (medium- and heavyduty) transitions to EVs, beginning with the 1-ton flatbed trucks. They are relatively lightweight compared to utility body and dump trucks, and an initial transition of two trucks in this category will leave the City with three ICE versions while operators acclimate to operating the EV versions.

2. Public Works – Traffic

The Traffic Division is responsible for maintaining the City's lighted traffic signals, to include intersections, crosswalks, and other caution zones. It maintains a total of 97 intersections (of 102 total owned by the City) as well as roundabout lighting. The Division is supported by 5 vehicles, including two Class 5 aerial bucket trucks for signal work.

Unit	Description	Right-Sizing and Reallocation	EV Transition Evaluation	Preliminary Recommendation
47	2014 F-150	Correctly sized and well utilized. Ext cab useful for storage, and division should have a 4WD truck. Due for replacement.	Compatible EV currently available.	Replace with ½ Ton 4WD Ext Cab EV in 2025.
59	2001 F-550 (non-operable)	Unit is aged and has been non-operable for years.	ACF Milestone Group 2. Disposal will reduce the size of the ACF-regulated fleet.	Eliminate immediately.
72	2017 F-550 Bucket Truck	Specialized vehicle for specialized use.	ACF Milestone Group 2. Compatible	Replace in kind with Class 5

Unit	Description	Right-Sizing and Reallocation	EV Transition Evaluation	Preliminary Recommendation
		Appropriately sized and well utilized.	EV chassis available. Hydraulic power not yet widespread in EV market.	Aerial Truck EV by 2032.
77	2018 F-350	Appropriate unit for traffic support role, and consistent utilization.	ACF Milestone Group 2. Compatible EV chassis available.	Replace in kind with 1 Ton 2WD Utility Body EV by 2032.
556	2020 F-550 Bucket Truck	Specialized vehicle for specialized use. Appropriately sized and well utilized.	ACF Milestone Group 2. Compatible EV chassis available. Hydraulic power not yet widespread in EV market.	Replace in kind with Class 5 Aerial Truck EV by 2035.

The Division's specialized traffic light functions require specialized vehicles, and the current fleet reflects this. An aged, non-operable unit should be eliminated, and the Division should have at least one 4WD truck.

3. Public Works – Landscape

The Landscape Division is responsible for inspecting and maintaining city landscape areas and parks, as well as managing contractors. The Division is supported by 4 vehicles, all of which are half-ton trucks housed at City Hall.

Unit	Description	Right-Sizing and Reallocation	EV Transition Evaluation	Preliminary Recommendation
45	2014 F-150	Correctly sized and well utilized. 4WD needed for sand/mud use occasionally.	Compatible EV currently available.	Replace with ½ Ton 4WD Ext Cab in 2025; EV at next cycle in 2035.
48	2014 F-150	Assigned to landscape division, but not used currently.	N/A	Eliminate immediately.
91	2018 F-150	Correctly sized and well utilized. 4WD needed for sand/mud use occasionally.	Compatible EV currently available.	Replace with ½ Ton 4WD Ext Cab EV at lease renewal or next cycle in 2028.
95	2018 F-150	Appropriate size and well utilized. Division could use	Compact pickup EV not yet available except as hybrid. Larger pickup	Replace with compact pickup 4WD Ext Cab EV at

Unit	Description	Right-Sizing and Reallocation	EV Transition Evaluation	Preliminary Recommendation
		some compact trucks. Due for replacement.	EV and Compact SUV EV currently available.	lease renewal or next cycle in 2028.
97	2018 F-150	Appropriate size and well utilized. Division could use some compact trucks. Due for replacement.	Compact pickup EV not yet available except as hybrid. Larger pickup EV and Compact SUV EV currently available.	Replace with compact pickup 4WD Ext Cab EV at lease renewal or next cycle in 2028.

The division's use of light-duty pickups is appropriate and should continue. Not all of the Division's trucks need to be half-ton units; compact pickups are sufficient for much of the light-duty landscape work for which they are used. The Division should have 4WD trucks for occasional sand/mud use and response to emergencies.

4. Public Works – Facilities

The Facilities Division is responsible for inspecting and maintaining city facilities, as well as managing contractors. The Division is supported by 3 vehicles, all of which are half-ton trucks housed at City Hall.

The following table discusses the recommended type and disposition for each vehicle, as well as its candidacy for EV conversion based on its utilization, the EV market, and CARB regulations. A recommendation and timeframe are provided for each unit.

Unit	Description	Right-Sizing and Reallocation	EV Transition Evaluation	Preliminary Recommendation
1	2018 F-150	Correctly sized and well utilized. Lift gate needed for heavy hauling.	Compatible EV currently available.	Replace with ½ Ton 2WD Ext Cab EV w/Lift Gate at lease renewal or next cycle in 2028.
58	2016 GMC 1500	Assigned to project manager; no need for full- sized truck. Well utilized.	Compact pickup EV not yet available except as hybrid. Larger pickup EV and Compact SUV EV currently available.	Replace with compact pickup 4WD Ext Cab in 2026; EV at next cycle in 2036.
84	2018 F-150	Correctly sized and well utilized. Utility body needed for better storage.	Compatible EV currently available.	Replace with ½ Ton 2WD Utility Body EV at lease renewal or next cycle in 2028.

The Facilities Division is staffed by a project manager, a senior facilities technician, and a facilities technician. The Division needs at least one truck with a lift gate and at least one unit with the expanded storage of a utility body. The project manager does not need

a full-size pickup, but should have 4WD for occasional sand/mud use and response to emergencies.

5. Public Works – Other

There are a number of additional fleet assets in the Public Works Department that do not belong to any of the operational divisions. These include the vehicles assigned to the Director and Assistant Director, as well as the graffiti truck, a spare truck, and a handful of electric carts.

Unit	Description	Right-Sizing and Reallocation	EV Transition Evaluation	Preliminary Recommendation
7	2018 F-150	Assigned to Dept Director; no need for full-sized truck.	Compact pickup EV not yet available except as hybrid. Larger pickup EV and Compact SUV EV currently available.	Replace with compact pickup 4WD Ext Cab EV at lease renewal or next cycle in 2028.
46	2014 F-150	Assigned to Dept Director; no need for full-sized truck.	Compact pickup EV not yet available except as hybrid. Larger pickup EV and Compact SUV EV currently available.	Replace with compact pickup 4WD Ext Cab; EV at next cycle in 2035.
56	2016 Ford F-350	Specialized vehicle for specialized use. Appropriately sized and well utilized.	ACF Milestone Group 2. Compatible EV chassis available.	Replace in kind with 1 Ton 2WD Utility Body EV by 2032.
60	2016 GMC 1500	Essentially a pool vehicle. Sensible to have one pool truck at the city yard.	Compatible EV currently available.	Replace with ½ Ton 4WD Ext Cab EV in 2026.
Carts/	/ATVs			
224	2002 Ford NEV	Electric cart, not planned for replacement.	Existing EV.	Do not replace.
275	Humdinger	Electric cart, appropriate for city yard use.	Existing EV.	Replace in kind at next cycle.
287	Flat Bed Utility Cart	Electric cart, appropriate for city yard use.	Existing EV.	Replace in kind at next cycle.

These miscellaneous vehicles in the Public Works Department can be transitioned to EVs of the appropriate size when they are available. A compact pickup replacement this year will likely be an ICE due to the lack of EV options in the category, but suitable EV options are available for all others. The carts and ATVs are already EVs powered by Level 1 (traditional outlet) charging.

6. Development – Building and Safety

The Building and Safety division is assigned to inspecting construction and development sites, ensuring compliance with building and safety codes. The Division is supported by 6 half-ton pickups which are housed at City Hall and assigned to inspectors and the division supervisor and used for daily inspection work.

Unit	Description	Right-Sizing and Reallocation	EV Transition Evaluation	Preliminary Recommendation
2	2018 F-150	Well utilized for dedicated assignment. Truck not needed for this function.	Compatible EV currently available.	Replace with Compact SUV EV AWD at lease renewal or next cycle in 2028.
61	2016 GMC 1500	Well utilized for dedicated assignment. Truck not needed for this function.	Compatible EV currently available.	Replace with Compact SUV EV AWD at next cycle in 2026.
92	2018 F-150	Well utilized for dedicated assignment. Truck not needed for this function.	Compatible EV currently available.	Replace with Compact SUV EV AWD at lease renewal or next cycle in 2028.
96	2018 F-150	Well utilized for dedicated assignment. Truck not needed for this function.	Compatible EV currently available.	Replace with Compact SUV EV AWD at lease renewal or next cycle in 2028.
98	2018 F-150	Well utilized for dedicated assignment. Truck not needed for this function.	Compatible EV currently available.	Replace with Compact SUV EV AWD at lease renewal or next cycle in 2028.
100	2018 F-150	Well utilized for dedicated assignment. Truck not needed for this function.	Compatible EV currently available.	Replace with Compact SUV EV AWD at lease renewal or next cycle in 2028.

The Division has a Supervisor and five inspectors, and its trucks are used regularly and highly utilized. Their work does not involve any heavy tools or hauling materials/debris, but these vehicles may be called for assistance with as part of the City's emergency response plan. They should be right-sized to the minimum viable 4WD asset, either a compact pickup or Compact SUV EV.

7. Development – Code Compliance

The Code Compliance Division is responsible for inspecting and responding to property code violations in the City, as well as writing citations and cleaning up trash, debris, and abandoned material. The Division has 5 half-ton pickups to support its operations which are housed at city hall.

The following table discusses the recommended type and disposition for each vehicle, as well as its candidacy for EV conversion based on its utilization, the EV market, and CARB regulations. A recommendation and timeframe are provided for each unit.

Unit	Description	Right-Sizing and Reallocation	EV Transition Evaluation	Preliminary Recommendation
6	2018 F-150	Appropriate size and well utilized.	Compatible EV currently available.	Replace with ½ Ton 2WD Ext Cab EV at lease renewal or next cycle in 2028.
68	2017 F-150	Appropriate size and well utilized.	Compatible EV currently available.	Replace with ½ Ton 2WD Ext Cab in 2027; EV at next cycle in 2037.
85	2018 F-150	Appropriate size and well utilized. Some 4WD needed in division.	Compatible EV currently available.	Replace with ½ Ton 4WD Ext Cab EV at lease renewal or next cycle in 2028.
93	2018 F-150	Appropriate size and well utilized. Some 4WD needed in division.	Compatible EV currently available.	Replace with ½ Ton 4WD Ext Cab EV at lease renewal or next cycle in 2028.
253	2006 F-150 Crew Cab	Appropriate size and well utilized. Some 4WD needed in division. Crew cab for supervisor.	Compatible EV currently available.	Replace with ½ Ton 4WD Crew Cab in 2025; EV at next cycle in 2035.

The Division's work requires the use of a truck by each inspector. While typical work happens on city streets, some of the unit's trucks should be 4WD to allow periodic sand/mud operations as needed. The Supervisor's truck should have a crew cab to allow transporting more passengers.

Grant funding for abandoned vehicle enforcement may be available to support the cost of vehicles in this division.

8. Capital Projects

The Capital Projects division is responsible for overseeing work on capital projects in the City and inspecting connections to City traffic, water, and wastewater infrastructure. The Division is supported by 4 half-ton trucks which are housed at City Hall and primarily driven by inspectors.

The following table discusses the recommended type and disposition for each vehicle, as well as its candidacy for EV conversion based on its utilization, the EV market, and CARB regulations. A recommendation and timeframe are provided for each unit.

Unit	Description	Right-Sizing and Reallocation	EV Transition Evaluation	Preliminary Recommendation
10	2018 F-150	Appropriate size and well utilized.	Compatible EV currently available.	Replace in kind with ¹ / ₂ Ton 2WD Ext Cab EV at lease renewal or next cycle in 2028.
69	2017 F-150	Appropriate size and well utilized. Some 4WD needed in division.	Compatible EV currently available.	Replace with ½ Ton 4WD Ext Cab in 2027; EV at next cycle in 2037.
78	2018 F-150 4WD	Appropriate size and well utilized. Some 4WD needed in division.	Compatible EV currently available.	Replace in kind with ¹ / ₂ Ton 4WD Ext Cab EV at lease renewal or next cycle in 2028.
99	2018 F-150	Appropriate size and well utilized.	Compatible EV currently available.	Replace in kind with ¹ / ₂ Ton 2WD Ext Cab EV at lease renewal or next cycle in 2028.

The Division needs half-ton pickups for each inspector and another to be shared between the division manager and the project managers. At least two of the pickups should be 4WD for occasional sand/mud operations.

9. COPS Program

The Citizens on Patrol (COPS) program is a volunteer police assistance force, which is supported by City Manager's Office but is mostly self-run. It includes about 35-40 volunteers who attend monthly meetings and city events, conduct traffic control and visibility patrols, and complete some administrative work. The program has 7 vehicles

which are shared between COPS volunteers and housed at the corporation yard and the Portola Community Center.

The following table discusses the recommended type and disposition for each vehicle, as well as its candidacy for EV conversion based on its utilization, the EV market, and CARB regulations. A recommendation and timeframe are provided for each unit.

Unit	Description	Right-Sizing and Reallocation	EV Transition Evaluation	Preliminary Recommendation
62	2016 Ford Flex SE Sedan	Well utilized, should be standardized in this division.	Compatible EV currently available.	Replace with Compact SUV EV in 2026.
65	2017 Chevy Colorado	Well utilized, should be standardized in this division. A few 4WD useful for sand/ mud use occasionally.	Compact pickup EV not currently available. Larger pickup EV and Compact SUV EV currently available.	Replace with Compact Pickup 4WD Ext Cab in 2027; EV at next cycle in 2037.
66	2017 Chevy Colorado	Well utilized, should be standardized in this division. A few 4WD useful for sand/ mud use occasionally.	Compact pickup EV not currently available. Larger pickup EV and Compact SUV EV currently available.	Replace with Compact Pickup 4WD Ext Cab in 2027; EV at next cycle in 2037.
80	2018 Ford Escape	Well utilized, should be standardized in this division.	Compatible EV currently available.	Replace with Compact SUV EV at lease renewal or next cycle in 2028.
81	2018 Ford Escape	Well utilized, should be standardized in this division.	Compatible EV currently available.	Replace with Compact SUV EV at lease renewal or next cycle in 2028.
88	2018 Ford Flex	Well utilized, should be standardized in this division.	Compatible EV currently available.	Replace with Compact SUV EV at lease renewal or next cycle in 2028.
89	2018 Ford Fusion	Well utilized, should be standardized in this division.	Compatible EV currently available.	Replace with Compact SUV EV at lease renewal or next cycle in 2028.

The Division's units appear to be well utilized from the available data. They should be standardized to vehicles with sufficient space to carry traffic cones such as SUVs and Compact Pickups. Their work does not require off-road operations, but a few units should have 4WD capability for occasional sand/mud operations as needed.

10. Pool Vehicles

The City has four pool vehicles at City Hall which are not assigned to an individual; anyone in the City can reserve these, including council members. They are used mostly in town, and occasionally for out-of-town multiple-day trips.

The following table discusses the recommended type and disposition for each vehicle, as well as its candidacy for EV conversion based on its utilization, the EV market, and CARB regulations. A recommendation and timeframe are provided for each unit.

Unit	Description	Right-Sizing and Reallocation	EV Transition Evaluation	Preliminary Recommendation
5	2019 Ford Fusion	Good utilization, should be standardized with other admin vehicles.	Compatible EV currently available.	Replace with Compact SUV EV at lease renewal or next cycle in 2029.
83	2018 Ford Fusion	Good utilization, should be standardized with other admin vehicles.	Compatible EV currently available.	Replace with Compact SUV EV at lease renewal or next cycle in 2028.
90	2018 Ford Escape	Good utilization, should be standardized with other admin vehicles.	Compatible EV currently available.	Replace with Compact SUV EV at lease renewal or next cycle in 2028.
94	2019 Ford Flex	Good utilization, should be standardized with other admin vehicles.	Compatible EV currently available.	Replace with Compact SUV EV at lease renewal or next cycle in 2029.

The data on these pool vehicles suggests frequent use (an average of 125 days per unit) at short durations. The four vehicles appear to be an appropriate number and sufficiently utilized. They should be standardized with other vehicles in the fleet as roomy, versatile vehicles (such as Compact SUV EVs) which can be converted to EVs quickly.

4.5 Best Practices for Fleet Composition Management

The following table provides a list of best industry practices for managing fleet composition, utilization levels, right-sizing, and effective asset disposition. Together, these practices result in a data-informed, cost-effective fleet where vehicles are strategically selected to meet departments' operational and mobility needs as efficiently as possible. The principles of utilization thresholds, minimizing total cost of ownership, and ongoing cost allocation for replacement planning are central to this fleet approach.

Best Practice

- 1. Asset utilization policies and guidelines are clearly defined to ensure that vehicles and equipment are allocated properly based on job requirements.
- 2. Utilization thresholds are in place and the fleet is reviewed annually against these benchmarks.
- 3. Processes are in place to capture utilization data from available sources and to validate and analyze the data.
- 4. Motor Pool vehicles are available for occasional transportation needs. Motor Pools reduce the number of assigned vehicles in the fleet and reduce mileage reimbursements.
- 5. A cost charge-back system is in place that promotes transparency and incentivizes fleet users to reduce ownership and operating costs.
- 6. A replacement policy is in place and asset replacement cycle guidelines reasonably follow industry norms.
- 7. A multiple-year fleet equipment replacement plan has been developed to identify future peak year funding requirements so that this can be dealt with in a planned manner.
- 8. Focus is on matching vehicle design to meet specific customer job requirements and customers are given ample input into the specification process.
- 9. Non-technical requirements such as parts lists, repair manuals, diagnostic tools, and training are included in vehicle specifications.
- 10. Vehicles are remarketed at the optimum point in their lifecycle to minimize the Total Costs of Ownership (TCO).
- 11. Equipment standardization is ensured where possible in order to minimize the number of tools needed and maximize the efficiency of mechanics and driver training.
- 12. Vehicle decommissioning practices ensure that vehicles are disposed of in the most efficient and cost-effective manner possible. Vehicles determined to no longer be needed are physically removed from service so as to control fleet size.
- 13. A fleet system is in place that uses modern technology and provides up to date functionality for asset management, maintenance management, performance measurement, and cost reporting.
- 14. A telematics system is in place to improve routing and scheduling of services, identify driver training issues, and provide timely fleet data.
- 15. Information produced by systems are routinely used to make management decisions and reports are provided to customer departments.

Recommendations

The following recommendations pertaining to fleet composition should be adopted by the City:

- 3. Adopt the fleet right-sizing recommendations made in this chapter.
- 4. Establish a fleet utilization and right-sizing plan which includes utilization policies and thresholds, provisions for lightly-used assets, and a process for collecting and reviewing utilization data at least annually to make decisions about fleet composition and efficiently decommissioning assets.
- 5. Adopt a replacement policy based on asset replacement cycle guidelines similar to those recommended in this report. Create a multi-year replacement plan based on the anticipated lifecycles, TCO maximization, and industry norms.
- 6. Complete the entry of all fleet assets and data into Cartegraph, and supplement this with fueling, telematics, and GeoTab data to assess utilization trends and the efficiency of fleet usage.
- 7. Formalize the City's motor pool policies and reservation system.
- 8. Create a policy for developing fleet specifications. Specifications should be developed in collaboration with user groups early in the process, and they should be informed by their specific job requirements as well as the utilization review findings. Specifications should lead to standardized classifications as much as possible, and they should include non-technical requirements such as parts lists, repair manuals, diagnostic tools, and training
- 9. Establish a department cost charge-back system to promote transparency and incentivize fleet users to reduce ownership and operating costs.

5. Leasing Versus Purchasing Evaluation

The City currently leases 31 vehicles (53% of its active on-road vehicle fleet) from Enterprise. All the vehicles that are presently being leased are 2018 model year units. The table below shows the leased assets by vehicle classification.

Leased Fleet Assets: Palm Desert

Classification	Count
Sedan	5
SUV Small	3
Truck LD ½ Ton	18
Truck MD 1 Ton	3
Truck MD 1 Ton Dump	1
Truck MD Class 5	1
Total	31

The terms of these leases are ending this year. This chapter discusses whether leasing or purchasing vehicles for the City's fleet is more cost-effective, the implications of this decision for replacement planning, budgeting, staffing, and implementation steps for the coming years.

5.1 Leasing and Purchasing Philosophy

Government organizations may consider leasing vehicles instead of purchasing and owning them, for several reasons. Leasing allows a fleet to acquire necessary vehicles without a large upfront cost. Leasing companies or Fleet Management Companies (FMC) specialize in common fleet vehicles like sedans, SUVs, and standard pickup trucks. At the end of the lease terms, the vehicles can either be returned to the leasing company or purchased by the lessee.

This arrangement has disadvantages. The vehicles are acquired under a contract that may have high early termination fees. Mileage clauses may also restrict the number of miles that can be driven before a surcharge is assessed. In addition, certain specialty vehicles needed for municipal operations may not be available through a leasing company.

Advantages	Disadvantages
The lessee replaces their vehicles every few years according to the lease terms. This maintains a fleet of newer vehicles.	Certain specialty vehicles may not be available through a lease; the lessee may have to settle for a vehicle that does not fully meet needs.
Leasing may alleviate some of the administrative burden of managing their fleet.	Lease payments are ongoing even after the vehicle is fully depreciated; there is no break in monthly payments.
Leased vehicles require a smaller cash outlay at the time of purchase.	Leases may include excess fees for mileage and wear and tear, as well as interest on monthly payments.
New vehicles can be added quickly to scale up the size of the fleet.	The lessee cannot customize vehicles for their intended job.
Maintenance services can be included in the lease for an additional monthly payment.	Maintenance may have to be performed by a specific vendor which could be inconvenient.

Advantages and Disadvantages of Fleet Leasing

When considering leasing, the primary decision factors are usually financial benefit and convenience. Leasing allows organizations to sidestep the need for capital funds to acquire vehicles, but they must consider the total costs of the lease over the term.

Most government organizations acquire vehicles through outright purchase. They earmark funds during the annual budget process for capital additions and replacements, then purchase the asset once the budget is approved. Depending on the procurement policies of the organization and adopted purchasing limits, this process may involve a formal bidding or proposal process, or assets may also be purchased through Cooperative Purchasing Agreements (CPA) or cooperative purchasing from an existing contract with another governmental entity (when permitted).

Advantages	Disadvantages
No additional fees for wear and tear or mileage overages.	Purchased vehicles experience rapid depreciation in the first few years of use, and modifications may lower value when reselling.
The organization can modify or upfit the vehicle as necessary for the job.	May require a greater degree of administrative oversight to manage purchase, disposal, and maintenance of vehicles.
The organization keeps the proceeds when the vehicle is sold.	Maintenance costs typically increase the longer the vehicle stays in the fleet.
The vehicle can be repaired in-house or taken to any repair shop.	A large initial capital outlay is required.
There are no monthly payments.	

Advantages and Disadvantages of Fleet Purchasing
The purchasing decision may be based on fiscal criteria, such as an agency's funding and capital investment approach. An organization may choose to lease vehicles because they lack the capital funds to make initial purchases, or if the total cost of ownership (TCO) for a lease is lower than the TCO of a purchase over the same time period.

5.2 Comparison of Total Cost of Ownership

This section discusses the relative fiscal value of leasing versus purchasing in terms of the annualized total cost of ownership for each. It also addresses factors that may impact this cost analysis in future years, such as changing fleet composition.

1. Annualized TCO Definition

The "Total Cost of Ownership" (TCO) for a vehicle refers to the complete cost of owning and operating a vehicle over a period of time. It includes all expenses related to the vehicle beyond the initial purchase price. This includes:

- **Depreciation:** The reduction in the vehicle's value over time, resulting in a lower residual value than the original purchase price.
- **Financing Costs:** Interest and fees associated with vehicle loans or leases.
- **Fees:** For registration, licensing, after-market equipment, and other costs.
- **Insurance:** Costs of insuring the vehicle.
- **Fuel:** The cost of gasoline, diesel, or electricity to power the vehicle.
- **Maintenance and Repairs:** Regular servicing, oil changes, tire replacements, and unexpected repairs.

This comprehensive measure helps assess the true financial impact of vehicle leasing or ownership over its lifetime. Dividing the total cost of ownership by the length of ownership yields the *Annualized TCO*, or the average cost per year to own the vehicle over the course of its lifecycle/lease term.

2. TCO Factors for Leasing and Purchasing

The factors determining the total cost of ownership are similar for leased vehicles and purchased vehicles, with some key differences:

 Leasing costs include initial one-time fees, a monthly depreciation charge, monthly leasing fee, monthly sales tax, insurance, maintenance fees, and any out-of-pocket repairs required. The remaining residual value at the end of the lease is an asset available to the lessee. • Purchasing costs include the initial purchase price, as well as one-time charges, the cost to the City of self-insurance, and all maintenance and repairs.

Purchasing vehicles requires an up-front purchasing expense and bearing the full risk of maintenance and repairs, whereas leasing requires monthly depreciation, a leasing fee, sales tax, and expenses required to offset the cost of maintenance and repairs.

3. Sample Comparison of Annualized TCO

The following table provides a comparison of leasing versus purchasing for a 1/2 Ton 4WD Pickup. This is a common classification for Palm Desert. The fleet composition analysis completed earlier in this study recommends 12 such vehicles for the City's fleet. The table compares each of the TCO factors and calculates the TCO for three options: a five-year leasing cycle, a five-year lease with a five-year extension (for a total 10-year cycle), and a 10-year lifecycle for purchase and ownership of the asset. It also divides each of these figures by the length of ownership to determine the annualized TCO. The following values and assumptions are used in the comparison:

- The initial purchase price is estimated at \$52,565, or a monthly depreciation charge of \$876 for the leased vehicle. The initial fees are based on the State of CA registration fee and the cost of badging and delivery. The charges are assumed to be unchanged for purchasing, but twice the initial amount for the extended lease based on the City's lease documents.
- The term is anticipated to be 60 months for the lease (matching the initial term of the City's leases), and 120 months for purchased units.
- The monthly leasing fee is \$216 (equivalent to 9.3% APR), and the monthly taxes/fees are pulled from the leasing documents for vehicles of this classification. This is multiplied by the number of months in the lease term. After the initial lease term, the leasing fee drops to \$25/month for the extended lease.
- It is assumed that the cost of insurance and the cost to the City for self-insurance will be approximately equal, and fuel is not shown because it is assumed that the cost of fuel will not change depending on whether the vehicle is leased or purchased.
- The maintenance/repair cost is higher for the extended lease because the term is longer and because it is anticipated that the vehicle's mileage will exceed the terms of the maintenance agreement during the extension period, requiring out-of-pocket spending to maintain. The cost is higher still for the purchased unit because maintenance and repair costs are paid entirely out-of-pocket for the duration of the ownership period.

Due to the longer lifecycle for extended leases and purchased units, the residual value is lower than the residual value at the end of the initial lease term.

	Lease (5 years)	Lease + Extension (10 years)	Purchase (10 years)
Pickup 1/2 Ton 4WD Ext/Crew Cab			
Initial Purchase Price	\$0	\$0	\$52,565
Initial Fees (licensing, delivery, badging)	\$1,278	\$2,556	\$1,278
Monthly depreciation charge (initial term)	\$876	\$876	\$0
Monthly leasing fee (initial term)	\$216	\$216	\$0
Monthly leasing fee (in extension)	-	\$25	\$0
Monthly sales tax (initial term)	\$85	\$85	\$0
Monthly sales tax (in extension)		\$2	
Monthly Insurance / self-insurance	\$63	\$63	\$63
Monthly maintenance fee	\$48	\$48	\$0
Lifespan Maintenance/Repair (out of pocket)	\$2,000	\$4,500	\$10,990
Lifecycle/Lease Term (months)	60	120	120
Residual Value	\$25,000	\$18,500	\$18,500
Total Cost of Ownership (TCO)	\$55,510	\$68,848	\$53,893
Annualized TCO	\$11,102	\$6,885	\$5,389

The result of these calculations is an annualized TCO estimate of \$11,102 for leasing for five years, \$6,885 for a 5-year lease with a 5-year extension, and \$5,389 over ten years for purchase.

This analysis suggests that the annualized TCO for leasing plus the extension is significantly lower than leasing for just the initial term, but that the annualized TCO for purchased vehicles is lower than either leasing arrangement. This excludes the personnel costs of managing fleet acquisition.

4. Comparison of Annualized TCO for Fleet-Wide Classifications

The following table shows this calculation for nine separate vehicle classifications that are found in the City's fleet and recommended in the fleet composition analysis performed earlier in this study, including the 1/2 Ton 4WD Pickup shown above. The figures in this table are sourced from the City's lease documents, research on the vehicle market, estimates from industry sources like CarEdge.com, and our team's years of experience as fleet managers and consultants for agencies across the country.

Lease +

	Lease (5 years)	Extension (10 years)	Purchase (10 years)
Compact SUV 2WD/4WD			
Initial Purchase Price	\$0	\$0	\$41,130
Initial Fees (licensing, delivery, badging)	\$1,150	\$2,300	\$1,150
Monthly depreciation charge (initial term)	\$686	\$686	\$0
Monthly leasing fee (initial term)	\$169	\$169	\$0
Monthly leasing fee (in extension)	-	\$25	\$0
Monthly sales tax (initial term)	\$66	\$66	\$0
Monthly sales tax (in extension)	-	\$2	
Monthly Insurance / self-insurance	\$63	\$63	\$63
Monthly maintenance fee	\$48	\$48	\$0
Lifespan Maintenance/Repair (out of pocket)	\$500	\$1,500	\$4,000
Lifecycle/Lease Term (months)	60	120	120
Residual Value	\$15,000	\$10,000	\$10,000
Total Cost of Ownership (TCO)	\$48,530	\$58,740	\$43,840
Annualized TCO	\$9,706	\$5,874	\$4,384
Compact Pickup 4WD Ext Cab			
Initial Purchase Price	\$0	\$0	\$40,000
Initial Fees (licensing, delivery, badging)	\$1,000	\$2,000	\$1,000
Monthly depreciation charge (initial term)	\$667	\$667	\$0
Monthly leasing fee (initial term)	\$164	\$164	\$0
Monthly leasing fee (in extension)	-	\$25	\$0
Monthly sales tax (initial term)	\$64	\$64	\$0
Monthly sales tax (in extension)		\$2	_
Monthly Insurance / self-insurance	\$63	\$63	\$63
Monthly maintenance fee	\$48	\$48	\$0
Lifespan Maintenance/Repair (out of pocket)	Ş750	\$2,000	\$5,000
Lifecycle/Lease Term (months)	60	120	120
Residual Value	\$15,000	\$10,000	\$10,000
Total Cost of Ownership (TCO)	\$47,113	\$57,423	\$43,560
Annualized TCO	\$9,423	\$5,742	\$4,356
Pickup 1/2 Ton 2WD Ext Cab			·
Initial Purchase Price	\$0	\$0	\$44,250
Initial Fees (licensing, delivery, badging)	\$1,278	\$2,556	\$1,278
Monthly depreciation charge (initial term)	\$738	\$738	\$0
Monthly leasing fee (initial term)	\$181	\$181	\$0
Monthly leasing fee (in extension)	-	\$25	\$0
Monthly sales tax (initial term)	\$71	\$71	\$0
Monthly sales tax (in extension)	***	\$2	.
Monthly Insurance / self-insurance	Ş63	\$63	\$63

Leasing versus Purchasing: Comparison of Annualized TCO for Nine Fleet Classifications in Palm Desert

	Lease (5 years)	Lease + Extension (10 years)	Purchase (10 years)
Monthly maintenance fee	\$48	\$48	\$0
Lifespan Maintenance/Repair (out of pocket)	\$2,000	\$4,500	\$10,990
Lifecycle/Lease Term (months)	60	120	120
Residual Value	\$20,000	\$13,500	\$13,500
Total Cost of Ownership (TCO)	\$49,347	\$62,685	\$50,578
Annualized TCO	\$9,869	\$6,269	\$5,058
Pickup 1/2 Ton 4WD Ext/Crew Cab			
Initial Purchase Price	\$0	\$0	\$52,565
Initial Fees (licensing, delivery, badging)	\$1,278	\$2,556	\$1,278
Monthly depreciation charge (initial term)	\$876	\$876	\$0
Monthly leasing fee (initial term)	\$216	\$216	\$0
Monthly leasing fee (in extension)	-	\$25	\$0
Monthly sales tax (initial term)	\$85	\$85	\$0
Monthly sales tax (in extension)		\$2	
Monthly Insurance / self-insurance	\$63	\$63	\$63
Monthly maintenance fee	\$48	\$48	\$0
Lifespan Maintenance/Repair (out of pocket)	\$2,000	\$4,500	\$10,990
Lifecycle/Lease Term (months)	60	120	120
Residual Value	\$25,000	\$18,500	\$18,500
Total Cost of Ownership (TCO)	\$55,510	\$68,848	\$53,893
Annualized TCO	\$11,102	\$6,885	\$5,389
Truck 1 Ton 2WD Dump			
Initial Purchase Price	\$0	\$0	\$95,000
Initial Fees (licensing, delivery, badging)	\$1,846	\$3,692	\$1,846
Monthly depreciation charge (initial term)	\$1,583	\$1,583	\$0
Monthly leasing fee (initial term)	\$390	\$390	\$0
Monthly leasing fee (in extension)	-	\$25	\$0
Monthly sales tax (initial term)	\$153	\$153	\$0
Monthly sales tax (in extension)		\$2	
Monthly Insurance / self-insurance	\$63	\$63	\$63
Monthly maintenance fee	\$75	\$75	\$0
Lifespan Maintenance/Repair (out of pocket)	\$3,500	\$7,250	\$15,685
Lifecycle/Lease Term (months)	60	120	120
Residual Value	\$45,500	\$31,000	\$31,000
Total Cost of Ownership (TCO)	\$95,669	\$119,635	\$89,091
Annualized TCO	\$19,134	\$11,964	\$8,909
Truck 1 Ton 4WD Flatbed			
Initial Purchase Price	\$0	\$0	\$85,000
Initial Fees (licensing, delivery, badging)	\$1,781	\$3,562	\$1,781
Monthly depreciation charge (initial term)	\$1,417	\$1,417	\$0

	Lease (5 years)	Lease + Extension (10 years)	Purchase (10 years)
Monthly leasing fee (initial term)	349	\$349	\$0
Monthly leasing fee (in extension)	\$0	\$25	\$0
Monthly sales tax (initial term)	137	\$137	\$0
Monthly sales tax (in extension)		\$2	
Monthly Insurance / self-insurance	\$63	\$63	\$63
Monthly maintenance fee	\$75	\$75	\$0
Lifespan Maintenance/Repair (out of pocket)	\$3,000	\$6,750	\$15,685
Lifecycle/Lease Term (months)	60	120	120
Residual Value	\$30,000	\$20,000	\$20,000
Total Cost of Ownership (TCO)	\$97,221	\$116,622	\$90,026
Annualized TCO	\$19,444	\$11,662	\$9,003
Truck 1 Ton 2WD Utility Body			
Initial Purchase Price	\$0	\$0	\$95,000
Initial Fees (licensing, delivery, badging)	\$1,846	\$3,692	\$1,846
Monthly depreciation charge (initial term)	\$1,583	\$1,583	\$0
Monthly leasing fee (initial term)	\$390	\$390	\$0
Monthly leasing fee (in extension)	-	\$25	\$0
Monthly sales tax (initial term)	\$153	\$153	\$0
Monthly sales tax (in extension)		\$2	
Monthly Insurance / self-insurance	\$63	\$63	\$63
Monthly maintenance fee	\$75	\$75	\$0
Lifespan Maintenance/Repair (out of pocket)	\$3,000	\$6,750	\$15,685
Lifecycle/Lease Term (months)	60	120	120
Residual Value	\$34,000	\$18,900	\$18,900
Total Cost of Ownership (TCO)	\$106,669	\$131,235	\$101,191
Annualized TCO	\$21,334	\$13,124	\$10,119
Class 5 2WD Aerial			
Initial Purchase Price	\$0	\$0	\$209,990
Initial Fees (licensing, delivery, badging)	\$2,519	\$5,038	\$2,519
Monthly depreciation charge (initial term)	\$3,500	\$3,500	\$0
Monthly leasing fee (initial term)	\$861	\$861	\$0
Monthly leasing fee (in extension)	-	\$25	\$0
Monthly sales tax (initial term)	\$338	\$338	\$0
Monthly sales tax (in extension)		\$2	
Monthly Insurance / self-insurance	\$63	\$63	\$63
Monthly maintenance fee	\$84	\$84	\$0
Lifespan Maintenance/Repair (out of pocket)	\$4,000	\$7,750	\$15,685
Lifecycle/Lease Term (months)	60	120	120
Residual Value	\$99,500	\$62,995	\$62,995
Total Cost of Ownership (TCO)	\$197,764	\$244,678	\$172,75 <mark></mark> 9
Annualized TCO	\$39,553	\$24,468	\$17,276

	Lease (5 years)	Lease + Extension (10 years)	Purchase (10 years)
Class 5 2WD Utility Body			
Initial Purchase Price	\$0	\$0	\$240,000
Initial Fees (licensing, delivery, badging)	\$2,790	\$5,580	\$2,790
Monthly depreciation charge (initial term)	\$4,000	\$4,000	\$0
Monthly leasing fee (initial term)	\$984	\$984	\$0
Monthly leasing fee (in extension)	-	\$25	\$0
Monthly sales tax (initial term)	\$386	\$386	\$0
Monthly sales tax (in extension)		\$2	
Monthly Insurance / self-insurance	\$63	\$63	\$63
Monthly maintenance fee	\$84	\$84	\$0
Lifespan Maintenance/Repair (out of pocket)	\$4,000	\$7,750	\$15,685
Lifecycle/Lease Term (months)	60	120	120
Residual Value	\$99,500	\$62,995	\$62,995
Total Cost of Ownership (TCO)	\$238,326	\$285,511	\$203,040
Annualized TCO	\$47,665	\$28,551	\$20,304

The following table and chart summarize the annualized TCO for each of these vehicle classifications.

Leasing versus Purchasing: Comparison of Annualized TCO for Nine Fleet Classifications in Palm Desert

		Lease +	
Class	Lease	Extension	Purchase
Compact SUV 2WD/4WD	\$9,706	\$5,874	\$4,384
Compact Pickup 4WD Ext Cab	\$9,423	\$5,742	\$4,356
Pickup 1/2 Ton 2WD Ext Cab	\$9,869	\$6,269	\$5,058
Pickup 1/2 Ton 4WD Ext/Crew Cab	\$11,102	\$6,885	\$5,389
Truck 1 Ton 2WD Dump	\$19,134	\$11,964	\$8,909
Truck 1 Ton 4WD Flatbed	\$19,444	\$11,662	\$9,003
Truck 1 Ton 2WD Utility Body	\$21,334	\$13,124	\$10,119
Class 5 2WD Aerial	\$39,553	\$24,468	\$17,276
Class 5 2WD Utility Body	\$47,665	\$28,551	\$20,304



Leasing versus Purchasing: Comparison of Annualized TCO for Nine Fleet Classifications in Palm Desert

This analysis shows that regardless of classification, purchasing results in a lower annualized TCO than either leasing option. The savings for ownership is greater for more expensive vehicles, but the ratio of costs remains fairly equal throughout. The annualized TCO of extended leasing is lower than the cost of leasing by 37-40% regardless of classification, and the annualized TCO of purchasing is lower than the cost of leasing by 49-57% regardless of classification.

These calculations do not include the cost to the City of managing the purchase and disposal of their fleet internally. This is covered below.

5. Fleet-Wide Annualized TCO Comparison

The total fleet-wide savings of leasing versus purchasing can be estimated by calculating the per-vehicle annualized TCO for each classification and multiplying it by the number of vehicles in that classification. The count of vehicles in the table below equals 56 in total, based on the recommendations of the fleet composition analysis completed earlier in this study.

Classification	Leased Units	Purchase Savings Over Leasing	Purchase Savings Over Leasing + Extension
Compact SUV 2WD/4WD	13	\$69,185	\$19,370
Compact Pickup 4WD Ext Cab	3	\$15,200	\$4,159
Pickup 1/2 Ton 2WD Ext Cab	4	\$19,246	\$4,843
Pickup 1/2 Ton 4WD Ext/Crew Cab	5	\$28,564	\$7,478
Truck 1 Ton 2WD Dump	1	\$10,225	\$3,054
Truck 1 Ton 4WD Flatbed	2	\$20,883	\$5,319
Truck 1 Ton 2WD Utility Body	2	\$22,429	\$6,009
Class 5 2WD Aerial	-	-	-
Class 5 2WD Utility Body	-	-	-
HD Dump/Tank/Jet/Vac Truck	1	-	-
Total	31	\$185,733	\$50,231

Leasing versus Purchasing: Annual Fleet-Wide Savings Realization in Palm Desert

This analysis shows that converting all of the City's leased units to owned units would result in an annual savings of about \$185,000 if compared to 5-year leases, or \$50,000 if compared to a lease + extension model.

This analysis does *not* include the three heavy-duty trucks in the recommended fleet composition (a dump, a tanker, and a jet/vac truck) because no leasing cost data is available for them. It is assumed that all three – including the Class 5 unit which is currently leased and recommended for conversion to a HD Jet/Vac truck – will be purchased rather than leased.

Regardless of whether the City leases or owns its fleet, they should create a Fleet Coordinator position to oversee the acquisition, disposal, and maintenance/repair contracts that the fleet requires. This position is estimated at \$130,000 annually in salary and benefits, which is offset by the savings to be gained from owning the fleet. Based on this, fleet ownership is the most cost-effective approach for the City of Palm Desert.

5.3 Impact of Zero-Emission Vehicle Transition

As the composition of the fleet changes in the coming years, more of the fleet will be transitioned to zero-emission vehicles (ZEVs) in compliance with CARB regulations, as outlined in the analysis completed earlier in this study. As a result, the cost impact of leasing versus purchasing may shift. While the cost of future vehicles cannot be fully known, the following points summarize the key themes and trends within the annualized TCO dynamic as more of the fleet is replaced with zero-emissions units.

• **Vehicle Prices:** ZEVs will likely cost more than conventional units, at least in the immediate term. Because the City "purchases" vehicles in both a purchase or

leasing scenario (either through an up-front expense or a monthly depreciation charge, respectively), this part of the comparison will remain unchanged.

- **Depreciation and Residual Values:** While the market is still fluctuating, ZEVs tend to depreciate faster and have lower resale values than conventional fuels. This means that the residual value at the end of a 5-year lease would likely be lower, as would the resale value at the end of a 10-year lifecycle. Given the uncertainty around depreciation and resale value, the shorter leasing term offers some reduction in risk compared to the longer lifecycle of ownership
- **Technology Advances:** ZEV technology is advancing rapidly, creating a risk of technological obsolescence for owners. Leasing offers flexibility by allowing the city to regularly upgrade to the latest models, minimizing the risk of being stuck with outdated vehicles, whereas ownership carries the potential downside of outdated technology over time.
- **Charging Requirements:** Both leasing and purchasing will require the City to make arrangements for charging the electric vehicles added to the fleet. The cost would remain the same whether the vehicles are leased, or city owned.
- Maintenance and Repair Cost: ZEVs generally have lower maintenance and repair costs compared to conventional vehicles due to fewer mechanical components and no need for oil changes. This reduction in long-term maintenance expenses makes purchasing ZEVs more appealing because maintenance and repair costs are currently fairly significant factors in the cost of ownership for some classes. Maintenance and repair costs would be reduced under both the leasing and purchase options.
- **Fuel Cost:** While the cost of fuel for ZEVs is significantly lower than for traditional combustion engine vehicles, it will remain the same whether the vehicle is leased or purchased.

The cost impact for most of these factors is uncertain, and they are likely to continue to fluctuate. For other factors such as maintenance and fuel costs, the cost is largely unaffected by whether they vehicle is purchased or leased. Considering this, the findings of the cost comparison still favor ownership over leasing.

5.4 Non-Cost Factors

In addition to the total cost of ownership, the City should consider other, non-cost related factors in the decision to lease or purchase vehicles. These include:

- Complexity versus Convenience: Leasing simplifies fleet management by outsourcing maintenance, upgrades, and vehicle replacement, making it more convenient. Ownership requires more complex internal management, including maintenance scheduling, depreciation tracking, and replacement planning. These internal tasks can be handled by a Fleet Coordinator position to oversee the City's 55-60 vehicles.
- **Scalability**: Leasing allows for easier scalability as the fleet grows, providing the flexibility to quickly add vehicles as needed based on city needs. Leasing companies may be able to secure vehicles more quickly due to their purchasing power with manufacturers. Ownership requires larger initial capital outlays and more planning to scale up, especially for long-term fleet expansion. While ownership would require more capital resources initially to add vehicles, it would not prevent the City from complying with CARB regulations or making the transition to ZEVs.
- **Flexibility for Replacing/Right-Typing Vehicles**: Leasing provides more flexibility to replace or rotate vehicles as needs change, ensuring the fleet is right-sized and right-typed for different operational demands. Owning the fleet makes adjustments slower and less flexible, as replacement schedules depend on budget cycles and asset lifespans. Both leasing and ownership can accommodate the CARB regulations for ZEV adoption. But if the operational demands of the City's vehicles are expected to change notably in the coming years, leasing would allow more convenience but not necessarily any cost savings in accomplishing this.
- Fleet Downtime and Shop Capacity: Because the City of Palm Desert does not have its own maintenance shop, the maintenance and repair of vehicles cannot be performed by in-house staff. Contract arrangements are necessary. Under the leasing agreement, Enterprise provides a maintenance contract for a monthly pervehicle fee, and the City holds other vendor contracts for repairs and specialized work. The arrangement under a fleet ownership model would be similar. The City could either create a maintenance contract with a fleet management company or manage multiple contracts with local vendors. Alternatively, they could explore the option of an Interagency Agreement (IA) with another municipality such as the City of Indio or Riverside County. Regardless of the fleet acquisition model selected, maintenance and repairs will be outsourced, with minimal impact on fleet availability, downtime, or performance.

While there are minor differences in factors such as complexity, scalability, flexibility, and fleet downtime, ultimately neither leasing nor owning presents an advantage so significant that it would outweigh the cost considerations. Both models offer viable

solutions for managing a municipal fleet, and the City's decision should primarily focus on the total cost of ownership to ensure the most financially sound approach.

Recommendations

The following recommendations pertaining to fleet acquisition should be adopted by the city:

10. Buy out the leases for the vehicles identified in this chapter.

11. Track capital and operating costs to fully understand the TCO of EV as it evolves.

12. Establish a contract(s) for third party maintenance to replace the Enterprise arrangement.

6. Fleet Replacement Plan

The following section summarizes the fleet replacement and electrification plan for the City, including descriptions and timelines of fleet leasing and replacement for each classification and each individual vehicle.

6.1 Recommendations

The City of Palm Desert should plan to transition from leased to owned vehicles across all classifications, maintain compliance with CARB regulations, and employ a Fleet Coordinator to oversee the management of the fleet.

1. Fleet Replacement Recommendations

The recommendations for vehicles fall into four categories depending on their current leasing status and the applicability of Advanced Clean Fleet (ACF) regulations:

- **City-Owned ACF-Applicable Vehicles:** Purchase replacements at the end of lifecycle, as outlined in the replacement plan.
- **City-Owned Light-Duty Vehicles:** Purchase replacements at the end of lifecycle, as outlined in the replacement plan. The City may purchase ICE, HEV, or ZEV units as long as manufacturers and dealers permit.
- **Leased ACF-Applicable Vehicles:** End leases and replace with purchased vehicles, or purchase vehicles out of the leases, within the next two years.
- **Leased Light-Duty Vehicles:** Buy vehicles out of their lease, then replace at the end of lifecycle, as outlined in the replacement plan. The City may purchase ICE, HEV, or ZEV units as long as manufacturers and dealers permit.

The following table illustrates this updated replacement plan. EV replacements are shown in **blue**, while hybrid or EV-optional replacements are shown in **light green**. ICE replacements are shown in **orange**. Vehicles recommended to be purchased out of their leases in 2025 are shown in gray.

Classification		2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
City-owned																	
1 Ton 2WD Dump	ACF		1									1					
1 Ton 2WD Utility	ACF								1								
1 Ton 4WD Flatbed	ACF					2			1								
Class 4 Stencil Truck	ACF														1		
Class 5 2WD Aerial	ACF								1			1					
Class 5 2WD Utility	ACF	1													1		
Class 7 Dump Body	ACF											1					
Class 7 Tanker Truck	ACF														1		
1/2 Ton 2WD Ext Cab				1										1			
1/2 Ton 4WD Crew		1										1					
1/2 Ton 4WD Ext Cab		2	2	2								2	2	2			
Compact Pickup 4WD		1	1	2								1	1	2			
Compact SUV 2WD			1										1				
Compact SUV 4WD			1										1				
Electric Cart								2									
Leased																	
1 Ton 2WD Dump	ACF	1										1					
1 Ton 2WD Utility	ACF	1							1								
1 Ton 4WD Flatbed	ACF		2												2		
HD Jet/Vac Truck	ACF	1													1		
1/2 Ton 2WD Ext Cab		3					3										3
1/2 Ton 2WD Utility		1			1										1		
1/2 Ton 2WD w/Gate		1			1										1		
1/2 Ton 4WD Ext Cab		5				5										5	
Compact Pickup 4WD		3					3										3
Compact SUV 2WD		8			8										8		
Compact SUV 4WD		5		5										5			

Fleet Replacement Plan by Recommended Classification

2. Fleet Recommendations by Unit

The following table shows the recommendation and timeline for each individual vehicle in the fleet, including leasing and electrification considerations.

Fleet Replacement Recommendations and Plan: Individual Vehicle	S
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Unit	Status	Current Classification	ACF	Recommendation
1	Lease	2018 F-150	-	Buy the vehicle out of the lease in 2025. Replace with ICE, HEV, or ZEV in 2028.
2	Lease	2018 F-150	-	Buy the vehicle out of the lease in 2025. Replace with ICE, HEV, or ZEV in 2027.
3	Owned	2004 F-350 Concrete Truck	ACF	Replace with Class 5 2WD Utility Body ICE in 2025. Replace with ZEV by 2038.
4	Lease	2018 F-350	ACF	Extend lease to 2026. Purchase ZEV Replacement in 2026.
5	Lease	2019 Ford Fusion	-	Buy the vehicle out of the lease in 2025. Replace with ICE, HEV, or ZEV in 2028.
6	Lease	2018 F-150	-	Buy the vehicle out of the lease in 2025. Replace with ICE, HEV, or ZEV in 2030.
7	Lease	2018 F-150	-	Buy the vehicle out of the lease in 2025. Replace with ICE, HEV, or ZEV in 2030.
9	Owned	2019 F-750 Dump Truck	ACF	Replace with Class 7 Dump Body ZEV by 2035.
10	Lease	2018 F-150	-	Buy the vehicle out of the lease in 2025. Replace with ICE, HEV, or ZEV in 2030.
11	Owned	2019 F-750 Water Truck	ACF	Replace with Class 7 Tanker Truck ZEV by 2038.
12	Owned	2022 F-450 Stencil Truck	ACF	Replace with Class 4 Stencil Truck ZEV by 2038.
45	Owned	2014 F-150	-	Replace with ICE, HEV, or ZEV in 2025.
46	Owned	2014 F-150 Truck	-	Replace with ICE, HEV, or ZEV in 2025.
47	Owned	2014 F-150	-	Replace with ICE, HEV, or ZEV in 2025.
48	Owned	2014 F-150	-	Dispose of vehicle in 2025 and eliminate from inventory.
56	Owned	2016 Ford F-350	ACF	Replace with 1 Ton 2WD Utility Body ZEV by 2032.
57	Owned	2016 GMC Sierra	-	Replace with ICE, HEV, or ZEV in 2026.
58	Owned	2016 GMC Sierra 1500	-	Replace with ICE, HEV, or ZEV in 2026.
59	Owned	2001 F-550 - Non operable	-	Dispose of vehicle in 2025 and eliminate from inventory.
60	Owned	2016 GMC Sierra 1500 Truck	-	Replace with ICE, HEV, or ZEV in 2026.
61	Owned	2016 GMC Sierra 1500	-	Replace with ICE, HEV, or ZEV in 2026.
62	Owned	2016 Ford Flex SE Sedan	-	Replace with ICE, HEV, or ZEV in 2026.
63	Owned	2016 F-350 Dump Truck	ACF	Replace with 1 Ton 2WD Dump ICE in 2026. Replace with ZEV by 2035.
64	Owned	2016 F-350 Flat Bed	ACF	Replace with 1 Ton 4WD Flatbed ZEV by 2032.
65	Owned	2017 Chevy Colorado	-	Replace with ICE, HEV, or ZEV in 2027.
66	Owned	2017 Chevy Colorado	-	Replace with ICE, HEV, or ZEV in 2027.
67	Owned	2017 F-150 Truck	-	Replace with ICE, HEV, or ZEV in 2027.
68	Owned	2017 F-150 ext-cab	-	Replace with ICE, HEV, or ZEV in 2027.
69	Owned	2017 F-150 ext-cab	-	Replace with ICE, HEV, or ZEV in 2027.
70	Owned	2017 GMC 3500 Flatbed	ACF	Replace with 1 Ton 4WD Flatbed ZEV by 2029.
71	Owned	2017 GMC 3500 Flatbed	ACF	Replace with 1 Ton 4WD Flatbed ZEV by 2029.
72	Owned	2017 Ford-F550 Bucket Truck	ACF	Replace with Class 5 2WD Aerial ZEV by 2032.

Unit	Status	Current Classification	ACF	Recommendation
77	Lease	2018 F-350	ACF	Buy the vehicle out of the lease in 2025. Purchase ZEV replacement by 2032.
78	Lease	2018 F-150 4x4	-	Buy the vehicle out of the lease in 2025. Replace with ICE, HEV, or ZEV in 2029.
79	Lease	2018 F-150	-	Buy the vehicle out of the lease in 2025. Replace with ICE, HEV, or ZEV in 2029.
80	Lease	2018 Ford Escape	-	Buy the vehicle out of the lease in 2025. Replace with ICE, HEV, or ZEV in 2028.
81	Lease	2018 Ford Escape	-	Buy the vehicle out of the lease in 2025. Replace with ICE, HEV, or ZEV in 2028.
82	Lease	2018 F-350	ACF	Extend lease to 2026. Purchase ZEV Replacement in 2026.
83	Lease	2018 Ford Fusion	-	Buy the vehicle out of the lease in 2025. Replace with ICE, HEV, or ZEV in 2028.
84	Lease	2018 Ford F-150	-	Buy the vehicle out of the lease in 2025. Replace with ICE, HEV, or ZEV in 2028.
85	Lease	2018 F-150	-	Buy the vehicle out of the lease in 2025. Replace with ICE, HEV, or ZEV in 2029.
86	Lease	2018 F-550/Ditch Witch	ACF	End lease and purchase HD Vac Truck ICE in 2025. Replace with ZEV by 2038.
87	Lease	2018 F-350 DUMP	ACF	End lease and purchase 1 Ton 2WD Dump ICE in 2025. Replace with ZEV by 2035.
88	Lease	2018 Ford Flex	-	Buy the vehicle out of the lease in 2025. Replace with ICE, HEV, or ZEV in 2028.
89	Lease	2018 Ford Fusion	-	Buy the vehicle out of the lease in 2025. Replace with ICE, HEV, or ZEV in 2028.
90	Lease	2018 Ford Escape Eps	-	Buy the vehicle out of the lease in 2025. Replace with ICE, HEV, or ZEV in 2028.
91	Lease	2018 F-150	-	Buy the vehicle out of the lease in 2025. Replace with ICE, HEV, or ZEV in 2029.
92	Lease	2018 F-150 Truck	-	Buy the vehicle out of the lease in 2025. Replace with ICE, HEV, or ZEV in 2027.
93	Lease	2018 F-150	-	Buy the vehicle out of the lease in 2025. Replace with ICE, HEV, or ZEV in 2029.
94	Lease	2019 Ford Flex	-	Buy the vehicle out of the lease in 2025. Replace with ICE, HEV, or ZEV in 2028.
95	Lease	2018 F-150	-	Buy the vehicle out of the lease in 2025. Replace with ICE, HEV, or ZEV in 2030.
96	Lease	2018 F-150	-	Buy the vehicle out of the lease in 2025. Replace with ICE, HEV, or ZEV in 2027.
97	Lease	2018 F-150	-	Buy the vehicle out of the lease in 2025. Replace with ICE, HEV, or ZEV in 2030.
98	Lease	2018 F-150	-	Buy the vehicle out of the lease in 2025. Replace with ICE, HEV, or ZEV in 2027.
99	Lease	2018 F-150	-	Buy the vehicle out of the lease in 2025. Replace with ICE, HEV, or ZEV in 2030.

Unit	Status	Current Classification	ACF	Recommendation
100	Lease	2018 F-150	-	Buy the vehicle out of the lease in 2025. Replace with ICE, HEV, or ZEV in 2027.
224	Owned	2002 Ford NEV (Green)	-	Dispose of vehicle at end of lifecycle and do not replace.
253	Owned	2006 F-150 Super Crew	-	Replace with ICE, HEV, or ZEV in 2025.
275	Owned	Humdinger	-	Replace with Electric Cart in 2031.
287	Owned	Flat Bed Utility Cart	-	Replace with Electric Cart in 2031.
556	Owned	2020 F-550 Bucket Truck	ACF	Replace with Class 5 2WD Aerial ZEV by 2035.

3. Fleet Replacement Funding

The following table provides cost estimates for this plan over the coming years, presented in current year dollars. It assumes that city-owned vehicles can be sold for a residual value of 15% of the purchase price, and that leased vehicles can be bought out of their lease for only a service fee once the book value has been fully depreciated over the original lease term.



Annual Cost of Fleet Purchases

The increase in 2038 is due to a confluence of multiple replacements due that year; this can be addressed by replacing some of them early, using an annual fleet replacement allocation.

The cost of capital fleet replacement for the recommended fleet composition is estimated at \$300,000 per year. In the initial years however, a greater expenditure will be required to bring outdated fleet assets up to date and replace leased vehicles with purchased ones.

4. Staffing and Contracting

The City should enter into a contract for preventive maintenance on the fleet and additional contracts for repairs and specialized fleet work. When vehicles are under warranty, dealership services should be utilized. Otherwise, the Fleet Coordinator should manage maintenance and repair contracts. These may be with other government agencies such as a nearby city or the County of Riverside, or with a private vendor such as a fleet management company.

The City should hire a Fleet Coordinator position to manage the fleet. This position differs from a traditional fleet manager because they would not oversee a mechanic shop, but they would be responsible for acquisition, disposal, managing vendor contracts for maintenance and repairs, and managing the City's fleet management software. The following summarizes the key duties and costs for this position:

Fleet Coordinator • Reports to Streets Maintenance • Supervisor • Salary/Benefits Estimate: • \$130,000 per year • • •	Work with city departments to develop vehicle specifications based on operational needs. Manage the acquisition of fleet vehicles, ensuring timely procurement and delivery. Oversee contracts for vehicle upfitting, badging, and preparation for end-of-life, as well as routine maintenance, repairs, and specialized work. Handle vehicle disposal, ensuring compliance with city policies and procedures. Assist with capital planning to support fleet sustainability and growth. Act as the power user of fleet management software, including vehicle tracking and location systems.
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6.2 Fleet Replacement Steps

The following table outlines the key steps for the City to implement the recommendations above, including the year, responsibility, and estimated cost of each step.

Action	Year	Responsibility	Cost Estimate
Extend Leases for Units #4 and #82 until 2026	2024	Public Works / Purchasing	\$1,210 / month
Hire Fleet Coordinator	2025	City Manager's Office / Director of Public Works	\$130,000 / year
Contract for Fleet PMs & Repairs of Owned Vehicles	2025	Fleet Coordinator	Similar to current rates

Action	Year	Responsibility	Cost Estimate
Purchase 26 leased light-duty (non-ACF) vehicles out of their leases	2025	Fleet Coordinator	\$10,400 in service fees
Replace Unit #3 (2004 F-350 Concrete Truck) with Class 5 Utility Body ICE as planned	2025	Fleet Coordinator	\$212,900
Terminate lease for Unit #86 (2018 F-550) and replace with purchased HD Vac Truck ICE as planned	2025	Fleet Coordinator	\$248,400
Terminate lease for Unit #87 (2018 F-350 Dump) and replace with purchased 1 Ton 2WD Dump ICE as planned	2025	Fleet Coordinator	\$98,300
Follow replacement and disposal plan as presented.	2026 and onward	Fleet Coordinator	\$390,000 / year in total cost of ownership, including \$300,000 in capital replacement.

Recommendations

The following recommendations pertaining to fleet replacement should be adopted by the city:

- 13. Establish a fleet coordinator position to coordinate fleet activities.
- 14. Action the inventory changes outlined in Section 6.2.
- 15. Adopt a smoothed replacement plan with initial funding of \$300,000 annually.

7. Fleet Maintenance Plan

Fleet maintenance and repair processes significantly affect vehicle availability, reliability, safety, cost efficiency, and environmental impact. The main components of fleet maintenance include technician labor, facilities and equipment, parts, and outsourced (sublet) services. The goal for fleet managers is to integrate these components to optimize performance while minimizing costs.

7.1 Maintenance Overview

A fleet maintenance and repair plan outlines strategies and procedures to ensure a fleet remains safe, efficient, and operational. The benefits of having a preventative maintenance (PM) plan for the fleet include:

- **Lower operating costs:** Regular maintenance can help avoid major mechanical problems and breakdowns, which can be costly and unexpected.
- **Lower repair costs:** Scheduled check-ups can help identify and repair minor issues before they become more expensive.
- **Enhance safety:** Regular maintenance can help prevent accidents and ensure vehicles are safe to drive.
- **Resale value:** Well-maintained vehicles with a documented service history will be worth more at auction.
- **Reduce downtime:** Regular PM can help minimize downtime and the associated costs.
- **Fuel management:** Well-maintained vehicles have better fuel efficiency.

This section provides a summary of best practices regarding fleet maintenance, a recommended listing of PM tasks and intervals by vehicle classification for the City, a staffing recommendation for fleet maintenance, and an appendix containing a framework for the development of a more comprehensive fleet maintenance program and policy, should the City desire it.

7.2 Best Practices for Fleet Maintenance

Creating and adhering to a proactive PM program is essential to the safe and efficient operation of fleet vehicles and there are other maintenance best practices that fleet operations should adhere to. As Palm Desert does not have garage operations, the focus is on best practices for outsourced repair services.

• Have a formal, written PM program that delineates all services needed for maintenance on a vehicle. This written program sets out the expectations on what service is needed at the prescribed interval, following manufacturer

recommendations for each vehicle class or type. The program can be disseminated to all fleet vehicle users so that each department can plan for vehicle maintenance and amend work schedules as needed.

- Designate PM intervals in the program based on time and use, aligned with manufacturer recommendations. These intervals can be amended based on the usage of the vehicle or can be tailored to a department's needs. More frequent intervals can be used if the vehicle experiences higher mileage in extreme conditions or can be lengthened if a vehicle is not used as often as anticipated.
- Set benchmarks for user compliance with the program. Best practice in the fleet industry is that 90% of all PM inspections should be completed within 30 days of when the services are due. By tracking the timing of completion, a fleet operation can alert users of upcoming inspections and those that are past due.
- Include instructions for roadside breakdowns. Provide contacts for fleet personnel or towing contractors to get a vehicle into a shop quickly and minimize downtime.
- Ensure maintenance schedules for off-road vehicles and construction equipment are included in the plan.
- Re-examine outsourcing versus insourcing options for PM programs regularly. A change in fleet composition such as a large influx of vehicles may necessitate a change in the maintenance plan.
- Include warranty recovery in any maintenance program. When vehicles have issues that may be covered under warranty, pursuing the warranty claims can lessen the expense of repairs. Dealership involvement in the warranty recovery process is essential to maintain a vehicle in peak condition.
- Ensure that the shops selected to implement the PM program have an adequate number of technicians to complete work in a timely manner. They should also have shop hours that correspond to the working hours of Palm Desert employees. The shop should have a good reputation and communicate all information about repairs in a timely manner.
- Stipulate how customers will be contacted to advise them on the repair status of vehicles. This contact can be in the form of phone calls or emails. There should also be a mechanism for customers to contact the repair facility, or an internal fleet contact.
- Record work orders from all PM and repairs in a master database. This allows for the information to be easily analyzed for future benchmarking and reviews of the maintenance program.
- Monitor fleet downtime on a consistent basis. Fleet personnel should be in regular communication with repair shops and department personnel to facilitate timely repairs and work to have vehicles returned quickly.
- Include a formal performance measurement system as part of the PM and repair program. Benchmarks or key performance indicators (KPIs) should be developed to monitor the efficiency and effectiveness of the maintenance program.

- Enforce pre-trip and post-trip inspections of vehicles. The inspections can be used to flag items of concern so that they can be addressed as quickly as possible.
- Monitor the PM and repair program. There should be a full-time fleet position assigned to analyze fleet data and seek improvement in the program. This position can also work with all outsourced maintenance shops to facilitate repairs, communicate with all departments, and provide input into vehicle acquisitions and disposals.

7.3 **Preventive Maintenance Plan**

Maintenance plans can be customized vehicles by manufacturer, class or type. For Palm Desert, a maintenance plan was reviewed for the following types of vehicles:

- Compact SUV 2WD/4WD
- Compact Pickup, 4WD, Extended Cab
- ¹/₂ Ton Pickup, 2WD, Extended Cab
- ¹/₂ Ton Pickup, 4WD, Extended Cab
- 1 Ton Truck, 2WD, Dump Body
- 1 Ton Truck, 2WD, Utility Body
- 1 Ton Truck, 4WD, Flatbed
- Class 5 Truck, 2WD, Aerial Altec 24' Arm
- Class 5 2WD, Utility Body
- Class 7 Truck, Dump/Tank/Jet/Vac

The Federal Highway Administration (FHA) considers that vehicles fall into a certain class of vehicle according to its Gross Vehicle Weight Rating (GVWR). These classes are:

Gross Vehicle	Federal Highway Administration		
Weight Rating (lbs)	Vehicle Class	GVWR Category	
> 6,000	Class 1: < 6,000 lbs	Light Duty	
10,000	Class 2: 6,001 – 10,000 lbs	< 10,000 lbs	
14,000	Class 3: 10,001 - 14,000 lbs		
16,000	Class 4: 14,001 - 16,000 lbs	Medium Duty	
19,500	Class 5: 16,001 – 19,500 lbs	10,001 – 26,000 lbs	
26,000	Class 6: 19,501 – 26,000 lbs		
33,000	Class 7: 26,001 – 33,000 lbs	Heavy Duty	
> 33,000	Class 8: > 33,001 lbs	> 26,001 lbs	

Figure 1: Vehicle Weights and Categories. Source: US Dept of Energy - Alternative Fuels Data Center⁸

⁸ https://afdc.energy.gov/data/10380

As many different types of vehicles can fall into the same class because of the GVWR, it is better to have PM plans by vehicle class rather than customizing a plan per vehicle type. This eliminates the need for numerous plans that are overly cumbersome to implement and track while leaving room to customize for a specific piece of equipment that may require extra attention because of additional added equipment.

If the FHA standards for vehicles classes are used, vehicles will fall into the following classes:

Vehicle Type	Vehicle Class
Compact SUV, Compact Pickup	Class 1
½ Ton Pickup	Class 2
1 Ton Pickup	Class 3

The Class 5 and Class 7 units listed above are self-explanatory as to which classes they will fall into for a PM program.

The basic PM schedules for Classes 1 through 3 are below. These schedules can be modified, if necessary, when usage patterns indicate more or less mileage intervals than average.

Service	Interval	Components
CLASS 1: Compact SUV o	r Pickup	
PM A	6 months, or 5,000 miles if reached first	 Change Oil and Filter Rotate Tires Lube Chassis as Required Check and Fill all Fluid Levels Check Tire Pressure
PM B	12 months, or 10,000 miles if reached first.	 Change Oil and Filter Rotate Tires Lube Chassis as Required Check and Fill all Fluid Levels Check Tire Pressure Check Brake Linings

Service	Interval	Components
PM C	24 months, or 30,000 miles if reached first	 Change Oil and Filter Rotate Tires Lube Chassis as Required Check and Fill all Fluid Levels Check Tire Pressure Check Brake Linings Replace All Other Filters Repack Wheels Bearings if Needed Check Transfer Case and Service if Needed Check Differential and Service if Needed
Checklist Items for All Services		 Check All Lights Check all Wiring Inspect Undercarriage Check all Safety Equipment Inspect Body/Paint Check Battery/Electrical System Inspect Engine Area Check Wipers
CLASS 2: Pickup 1/2 Ton	2WD or 4WD	
ΡΜΑ	6 months, or 5,000 miles if reached first	 Change Oil and Filter Rotate Tires Lube Chassis as Required Check and Fill all Fluid Levels Check Tire Pressure
PM B	12 months, or 15,000 miles if reached first	 Change Oil and Filter Rotate Tires Lube Chassis as Required Check and Fill all Fluid Levels Check Tire Pressure Check Brake Linings

Service	Interval	Components
PM C	24 months, or 30,000 miles if reached first	 Change Oil and Filter Rotate Tires Lube Chassis as Required Check and Fill all Fluid Levels Check Tire Pressure Check Brake Linings Replace All Other Filters Repack Wheels Bearings if Needed Check Transfer Case and Service if Needed Check Automatic Transmission, All Lines and Hoses, Radiator, Condenser, Coolant, Exhaust System, Axles and Ball Joints.
Checklist Items for All Services		 Check All Lights Check all Wiring Inspect Undercarriage Check all Safety Equipment Inspect Body/Paint Check Battery/Electrical System Inspect Engine Area Check Wipers
CLASS 3: Pickup 1 Ton 2WD or 4WD		
ΡΜΑ	6 months, or 7,500 miles if reached first	 Change Oil and Filter Rotate Tires Lube Chassis as Required Check and Fill all Fluid Levels Check Tire Pressure
PM B	12 months, or 15,000 miles if reached first	 Change Oil and Filter Rotate Tires Lube Chassis as Required Check and Fill all Fluid Levels Check Tire Pressure Inspect Wheels Inspect Pads, Rotors, Shoes, Drums, Linings, Hoses and Parking Brake Inspect Exhaust System Inspect Axle and Joints Replace Cabin Air Filter

Service	Interval	Components
PM C	24 months, or 30,000 miles if reached first	 Change Oil and Filter Rotate Tires Lube Chassis as Required Check and Fill all Fluid Levels Check Tire Pressure Check Brake Linings Replace All Other Filters Repack Wheels Bearings if Needed Check Transfer Case and Service if Needed Check Differential and Service if Needed Check Automatic Transmission, All Lines and Hoses, Radiator, Condenser, Coolant, Exhaust System, Axle and Ball Joints.
Checklist Items for All Services		 Check All Lights Check all Wiring Inspect Undercarriage Check all Safety Equipment Inspect Body/Paint Check Battery/Electrical System Inspect Engine Area Check Wipers Check All Upfit Beds for Stability and Repair Items

When discussing the maintenance intervals for a Class 5 vehicle, each manufacturer has their own schedule for the vehicles they manufacture. As an example, the PM schedule for a diesel-fueled Ford F-550 follows.

Service	Interval	Components
CLASS 5: Ford F-550 Dies	el	
PM A	6 months or 7,500 miles if reached first	 Change Oil and Filter Rotate Tires Refill the DEF Tank Check Air Filter Inspect Brake System Inspect Engine and Cooling System Inspect Exhaust System and Heat Shields Inspect Axles and U-Joints Inspect Linkage, Joints, Suspension, Tie-Rods, and Driveshaft Lube Chassis as Required Check and Fill all Fluid Levels Check Tire Pressure
РМВ	12 months or 20,000 miles if reached first	 Complete All Services under PM A plus Replace Cabin Air Filter
PM C	24 months or 30,000 miles if reached first	 Complete All Services under PM B plus Replace Engine Air Filter
Additional Interval Maintenance	50,000 miles 60,000 miles 90,000 miles 150,000 miles	 Replace Engine Air Inlet Foam Filter Replace Front Wheel Bearing Grease and Grease Seals Inspect Accessory Drive Belt(s) Change Automatic Transmission Fluid and Filter Replace Accessory Drive Belt(s) Replace Front Wheel Bearings and Seals Change Axle Fluid
Checklist Items for All Services		 Check All Lights Check all Wiring Change Brake Fluid Every Three Years Inspect Undercarriage Check all Safety Equipment Inspect Body/Paint Check Battery/Electrical System Inspect Engine Area Check Wipers Check All Upfit Beds for Stability and Repair Items Conduct Annual Inspections and Testing on all Booms and Cranes

Class 7 vehicles have extensive maintenance and repair schedules due to the size of the vehicle and the number of intricate systems that need inspection. Because of this, it is hard to break down the maintenance schedule into a simple table. As an example, the maintenance schedule for a Class 7 Freightliner M2 106 is encompassed in a 197-page document. This maintenance schedule can be found at <u>Business Class M2 Maintenance</u> <u>Manual.pdf</u>

7.4 Staffing

As Palm Desert does not have a fleet garage and outsources all maintenance, there are no staffing recommendations to be made regarding technicians. As discussed in the leasing analysis however, Palm Desert should consider having a dedicated Fleet Coordinator to assume the fleet management responsibilities which will accompany a larger city-owned fleet. The Fleet Coordinator would review PM parameters for the fleet and track compliance. They would also establish contracts with preferred third-party service providers and review all invoices to ensure that services are provided according to contract.

Recommendations

The following recommendations pertaining to fleet maintenance should be adopted by the city:

- 16. Create a formal PM program along the parameters described in this chapter.
- 17. Track user compliance with the PM program. With the goal 90% of all PM inspections completed within 30 days of when the services are due.
- 18. Include warranty recovery in the maintenance program.
- 19. Record work orders from all PM and repairs in a master database.
- 20. Enforce pre-trip and post-trip inspections of vehicles.

8. Implementation Guidance

A full list of recommendations by priority and the level of effort required to address them is included below. Priorities are allocated as A, B, C, and D indicating in which order they should be completed. The level of effort is assigned as:

1: requires less than \$25,000 or six months to achieve.

2: requires between 6 and 12 months and \$25,000 to \$50,000 to achieve.

3: requires more than 12 months and \$50,0000 to achieve.

#	Recommendation	Priority	Effort
1.	Adopt the ACF Milestones approach offered by CARB for ZEV compliance.	A	1
2.	Report the option selected and vehicle selection information through TRUCRS.	С	1
3.	Adopt the fleet right-sizing recommendations made in Section 4 including eliminating Unit #48 and Unit #59.	В	1
4.	Establish a fleet utilization and right-sizing plan which includes utilization policies and thresholds, provisions for lightly-used assets, and a process for collecting and reviewing utilization data at least annually to make decisions about fleet composition and efficiently decommissioning assets.	С	2
5.	Adopt a replacement policy based on asset replacement cycle guidelines similar to those recommended in this report. Create a multi-year replacement plan based on the anticipated lifecycles, TCO maximization, and industry norms.	С	2
6.	Complete the entry of all fleet assets and data into Cartegraph along with the recommended preventive maintenance cycles. Supplement this tool with fueling, telematics, and GeoTab data to assess utilization trends and the efficiency of fleet usage.	В	1
7.	Formalize the City's motor pool policies and reservation system.	С	1
8.	Create a policy for developing fleet specifications. Specifications should be developed in collaboration with user groups early in the process, and they should be informed by their specific job requirements as well as the utilization review findings. Specifications should lead to standardized classifications as much as possible, and they should include non-technical requirements such as parts lists, repair manuals, diagnostic tools, and training.	С	2

#	Recommendation	Priority	Effort
9.	Establish a department cost charge-back system to promote transparency and incentivize fleet users to reduce ownership and operating costs.	D	3
10.	Purchase the 26 leased light-duty (non-ACF) vehicles out of their leases in 2025 and schedule them for replacement according to recommended lifecycle.	В	1
11.	Track capital and operating costs to fully understand the TCO of EV as it evolves.	D	1
12.	Enter into a contract for preventive maintenance on the fleet and additional contracts for repairs and specialized fleet work. These may be with a nearby city, the County of Riverside, or with a private vendor such as a fleet management company.	В	2
13.	Establish a Fleet Coordinator position to oversee acquisition, disposal, managing vendor contracts for maintenance and repairs, and managing the City's fleet management software.	А	2
14.	Action the fleet inventory changes outlined in Section 6.2: Extended the leases for Unit #4 and Unit #82 to 2026. Terminate the leases for Unit #86 and Unit #87 in 2025. Replace Unit #86 with a purchased HD Vac Truck ICE as planned. Replace Unit #87 with a purchased 1 Ton 2WD Dump ICE as planned. Replace Unit #3 with a Class 5 Utility Body ICE as planned in 2025.	В	3
15.	Adopt a smoothed replacement plan and allocate \$300,000 per year – increasing in future years to account for inflation – for capital fleet replacement.	D	3
16.	Create a formal preventive maintenance program along the parameters described in Section 7. Use Cartegraph to manage the program.	В	1
17.	Track user compliance with the PM program, with the goal 90% of all PM inspections completed within 30 days of when the services are due.	D	2
18.	Include warranty recovery in the maintenance program.	D	1
19.	Record work orders from all PM and repairs in a master database.	D	2
20.	Enforce pre-trip and post-trip inspections of vehicles.	D	1

Appendix A: List and Terms of Leased Vehicles

A detailed summary listing of the leased vehicles was completed to determine whether leasing is the best option for the City going forward. Some important lease terms are defined:

Lease Start: Start date of the lease with Enterprise.

Lease End: End date of the lease with Enterprise.

Initial Payment: First payment made to Enterprise that covers the partial time between the lease start to the first full month, plus the first full month.

Monthly Payment: Payment made each month to Enterprise. This payment includes insurance, maintenance program and sales tax.

Capital Price: The price of the new vehicle from Enterprise. This would have been the price if the vehicle had been purchased outright.

Book Value: Value of the vehicle that Enterprise has on its books at the end of the lease term.

The 1	foll	lowing	table	summari	zes the	e <u>initial</u>	leasing	terms of	all 31	leased	vehicl	es.

#	Vehicle Type	Lease Start	Lease End	Initial Payment	Monthly Payment	Capital Price	Book Value
90	SUV Small	04/16/2018	05/01/2023	\$1,301.94	\$522.19	\$23,391.58	\$4,444.18
80	SUV Small	04/10/2018	05/01/2023	\$1,500.86	\$630.35	\$26,474.00	\$2,647.40
81	SUV Small	04/20/2018	05/01/2023	\$1,556.55	\$609.19	\$26,421.00	\$2,641.80
78	Truck LD ½ Ton	04/16/2018	05/01/2023	\$4,135.33	\$787.96	\$33,972.25	\$3,397.45
79	Truck LD ½ Ton	04/06/2018	05/01/2023	\$1,418.20	\$758.29	\$33,049.20	\$3,304.80
84	Truck LD ½ Ton	04/06/2018	05/01/2023	\$1,422.67	\$681.20	\$30,827.20	\$5,857.00
85	Truck LD ½ Ton	04/10/2018	05/01/2023	\$1,853.17	\$673.22	\$30,855.20	\$5,862.20
91	Truck LD ½ Ton	04/06/2018	05/01/2023	\$1,942.94	\$673.22	\$30,855.20	\$5,862.20
92	Truck LD ½ Ton	04/06/2018	05/01/2023	\$1,942.94	\$673.22	\$30,855.20	\$5,862.20
93	Truck LD ½ Ton	04/12/2018	05/01/2023	\$1,673.51	\$685.23	\$31,038.52	\$5,897.32
95	Truck LD ½ Ton	01/09/2019	02/01/2024	\$1,801.87	\$709.50	\$29,983.15	\$2,998.15
96	Truck LD ½ Ton	01/09/2019	02/01/2024	\$1,942.88	\$706.61	\$29,840.47	\$2,983.87
97	Truck LD ½ Ton	01/30/2019	02/01/2024	\$1,357.26	\$743.29	\$31,654.37	\$3,165.17
98	Truck LD ½ Ton	01/30/2019	02/01/2024	\$1,357.26	\$743.29	\$31,654.37	\$3,165.17
99	Truck LD ½ Ton	01/18/2019	02/01/2024	\$1,644.98	\$743.29	\$31,654.37	\$3,165.17
100	Truck LD ½ Ton	01/18/2019	02/01/2024	\$1,790.98	\$743.29	\$31,654.37	\$3,165.17
1	Truck LD ½ Ton	01/15/2019	02/01/2024	\$1,862.90	\$743.29	\$31,654.37	\$3,165.17

Matrix Consulting Group

#	Vehicle Type	Lease Start	Lease End	Initial Payment	Monthly Payment	Capital Price	Book Value
7	Truck LD ½ Ton	01/30/2019	02/01/2024	\$1,348.62	\$743.29	\$31,654.37	\$3,165.17
2	Truck LD ½ Ton	01/09/2019	02/01/2024	\$2,125.54	\$750.42	\$31,936.38	\$3,193.38
10	Truck LD ½ Ton	01/18/2019	02/01/2024	\$1,790.98	\$743.29	\$31,654.37	\$3,165.17
6	Truck LD ½ Ton	02/07/2019	03/01/2024	\$1,440.99	\$729.76	\$30,933.83	\$3,093.23
77	Truck MD 1 Ton	04/30/2018	05/01/2022	\$16,697.86	\$1,106.03	\$41,303.77	\$5,617.21
82	Truck MD 1 Ton	05/08/2018	06/01/2023	\$17,465.35	\$1,047.94	\$42,671.82	\$1,066.02
4	Truck MD 1 Ton	07/12/2019	08/01/2024	\$18,085.68	\$1,046.49	\$43,892.00	\$2,857.80
86	Truck MD Class 5	05/07/2018	06/01/2023	\$15,561.23	\$1,128.55	\$48,647.50	\$4,864.90
87	Truck MD 1 Ton Dump	04/30/2018	05/01/2023	\$11,424.65	\$1,122.38	\$45,906.00	\$459.00
88	Sedan	04/12/2018	05/01/2023	\$1,716.92	\$687.00	\$29,056.00	\$2,905.60
94	Sedan	01/15/2019	02/01/2024	\$1,654.20	\$678.76	\$28,856.99	\$2,885.99
89	Sedan	05/07/2018	06/01/2023	\$2,864.82	\$566.20	\$23,200.00	\$2,320.00
83	Sedan	05/04/2018	06/01/2023	\$1,679.24	\$560.22	\$23,200.00	\$2,320.00
5	Sedan	01/15/2019	02/01/2024	\$1,238.02	\$475.41	\$18,876.99	\$1,887.99

The following table summarizes the leasing terms <u>after</u> initial lease termination (lease extension).

#	Vehicle Type	Lease Start	Lease End	Initial Payment	Monthly Payment	Capital Price	Book Value
90	SUV Small	05/01/2023	07/01/2025	\$901.36	\$121.61	\$23,391.58	\$1.00
80	SUV Small	05/01/2023	12/01/2024	\$1,805.42	\$134.91	\$26,474.00	\$1.00
81	SUV Small	05/01/2023	01/01/2025	\$1,868.97	\$121.61	\$26,421.00	\$1.00
78	Truck LD ½ Ton	05/01/2023	01/01/2025	\$1,136.67	\$136.90	\$40,173.60	\$1.00
79	Truck LD ½ Ton	05/01/2023	12/01/2024	\$796.81	\$136.90	\$33,049.20	\$1.00
84	Truck LD ½ Ton	05/01/2023	08/01/2024	\$886.54	\$145.07	\$30,827.20	\$1.00
85	Truck LD ½ Ton	05/01/2023	07/01/2025	\$1,831.80	\$138.77	\$30,855.20	\$1.00
91	Truck LD ½ Ton	05/01/2023	08/01/2024	\$1,141.82	\$145.10	\$30,855.20	\$1.00
92	Truck LD ½ Ton	05/01/2023	08/01/2024	\$1,365.30	\$136.27	\$30,855.20	\$1.00
93	Truck LD ½ Ton	05/01/2023	08/01/2024	\$1,053.82	\$96.47	\$31,038.52	\$1.00
95	Truck LD ½ Ton	02/01/2024	08/01/2024	\$1,709.80	\$653.33	\$29,987.15	\$1.05
96	Truck LD ½ Ton	02/01/2024	08/01/2024	\$2,189.01	\$644.97	\$29,840.47	\$1.02
97	Truck LD ½ Ton	02/01/2024	09/01/2024	\$1,269.31	\$655.34	\$31,654.37	\$1.03
98	Truck LD ½ Ton	02/01/2024	09/01/2024	\$1,613.81	\$655.34	\$31,654.37	\$1.03
99	Truck LD ½ Ton	02/01/2024	09/01/2024	\$1,534.51	\$632.82	\$31,654.37	\$1.00
100	Truck LD ½ Ton	02/01/2024	09/01/2024	\$1,680.51	\$632.82	\$31,654.37	\$1.00
1	Truck LD ½ Ton	02/01/2024	09/01/2024	\$1,743.20	\$623.59	\$31,654.37	\$1.00
7	Truck LD ½ Ton	02/01/2024	09/01/2024	\$1,287.59	\$682.26	\$32,318.51	\$1.06

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#	Vehicle Type	Lease Start	Lease End	Initial Payment	Monthly Payment	Capital Price	Book Value
2	Truck LD ½ Ton	02/01/2024	08/01/2024	\$2,022.02	\$683.13	\$31,936.38	\$1.00
10	Truck LD ½ Ton	02/01/2024	09/01/2024	\$1,667.71	\$642.07	\$31,654.37	\$1.00
6	Truck LD ½ Ton	03/01/2024	09/01/2024	\$1,374.06	\$662.83	\$30,933.86	\$1.00
77	Truck MD 1 Ton	05/01/2022	02/01/2025	\$12,431.72	\$129.94	\$41,303.77	\$1.00
82	Truck MD 1 Ton	06/01/2023	10/01/2024	\$11,532.17	\$163.87	\$42,671.82	\$1.00
4	Truck MD 1 Ton	07/12/2019	08/01/2024	\$18,085.68	\$1,046.49	\$43,892.00	\$2,857.80
86	Truck MD Class 5	06/01/2023	02/01/2025	\$3,803.39	\$174.09	\$48,742.50	\$1.00
87	Truck MD 1 Ton Dump	05/01/2023	06/01/2025	\$1,157.03	\$168.67	\$46,001.00	\$1.00
88	Sedan	05/01/2023	01/01/2025	\$1,968.69	\$138.77	\$29,056.00	\$1.00
94	Sedan	02/01/2024	09/01/2024	\$1,546.34	\$570.90	\$28,856.99	\$1.06
89	Sedan	06/01/2023	01/01/2025	\$2,433.53	\$134.91	\$23,200.00	\$1.00
83	Sedan	06/01/2023	01/01/2025	\$1,253.93	\$134.91	\$23,200.00	\$1.00
5	Sedan	02/01/2024	09/01/2024	\$1,174.21	\$411.60	\$18,876.99	\$1.06

Appendix B: Comprehensive Maintenance Plan Framework

Fleet maintenance extends beyond PM work. It includes decisions about outsourcing, contract management, parts inventories, and the relationship between repair costs and lifecycles. This appendix provides a framework and sample outline for a more comprehensive fleet maintenance plan.

B.1 Steps to Create a Maintenance Plan

For organizations who do not have a program, or who wish to revamp their program, the following actions are needed.

Create a Fleet inventory. Document each asset in the fleet that requires preventive maintenance. Include pertinent asset information such as make, model, odometer reading, last inspection, and maintenance history.

Track Service History. Maintaining thorough maintenance records can assist mechanics in understanding the health of a vehicle and its components. It will show vehicles that follow a formal PM schedule and allow maintenance planners to prioritize upcoming maintenance needs.

Create a Maintenance Tasks and Interval List. The Original Equipment Manufacturers (OEMs) Guidelines are a good starting place for establishing the maintenance tasks and intervals that should be used. Time and experience with specific vehicle types will be beneficial in adjusting as warranted.

Create a PM Calendar. Knowing the maintenance history of the fleet inventory and the OEM recommended task list allows maintenance planners to create an online M calendar for all fleet assets. The calendar will describe when inspections or work is required and what type of maintenance will be performed. The calendar is usually tied to odometer readings of specific assets.

Track Odometer Readings. The final element in establishing a program is to ensure there is a method in place to track odometer readings that trigger PMs.

Most PM schedules are based around mileage and hour intervals, so fleet managers rely heavily on odometer readings to manage maintenance. These readings may be captured through telematics or the fuel system. Automated mileage capture is best practice as it eliminates human error associated with entering mileage. Accurate odometer readings allow maintenance planners to adhere to PM schedules by setting up service schedules the fleet or maintenance management software and receiving reminders based on odometer updates. In general terms, the following list shows the basic components that should be part of any PM checklist. Detailed checklists by vehicle class are included in the Appendix to this report.

- Change engine oil and filter.
- Rotate tires and check PSI.
- Check air and cabin air filters (change if needed).
- Check brake system/replace worn components.
- Check exhaust system.
- Lubricate grease fittings.
- Check fluid levels (coolant, brake, power steering, transmission, differential, transfer case, master cylinder, etc.).
- Check belts and hoses.
- Check lighting systems.
- Check safety systems/equipment (if applicable).
- Check coupling devices (for trailers).

Note that this list should be amended significantly for electric vehicles as the mechanical components are significantly changed and reduced.

B.2 Condition Assessments

Vehicle condition assessments are detailed evaluations of a of a vehicle's condition. These assessments take several factors into consideration when deciding on whether to replace a vehicle. While the most frequent assessments are the age of the vehicle and the mileage, there are other factors that can indicate whether a vehicle should be replaced.

Assessments typically include the following:

- **Age:** The most common factor in assessing whether a vehicle should be replaced. While this is a strong indicator that a vehicle is past its useful life, there may be issues in using age as the only factor. For example, if two vehicles are the same age, then determining which vehicle should be replaced becomes difficult. However, one vehicle may be in better overall condition because of usage patterns and can be replaced later.
- **Mileage:** Mileage can be a more of a determining factor when assessing a vehicle's condition as it indicates how much a vehicle has been used over its lifespan. The more miles the vehicle has on its engine and drivetrain, the more

likely the vehicle has experienced repairs to its systems over the normal PM schedule.

- **Exterior:** The exterior of a vehicle can be an indication of how much a vehicle has been used. By parking a vehicle in a garage or building, the vehicle is kept out of the elements and has less issues with paint condition, dents, scratches, rust, mirrors and glass damage. Also, frequent cleanings of a vehicle can remove corrosive substances that affect the paint and metals. This leads to less breakdown of components like the frame, exhaust system, transmission and axles.
- Interior: The interior of a vehicle can show how much a vehicle has been cared for by the operator. Rips, stains, burns, and smells show whether the operator has been diligent in keeping the asset in top condition. The smell of tobacco products may be particularly problematic as it permeates porous surfaces and can be very difficult to remove.
- Mechanical: Engine, brakes, transmission, lights, battery, radio, and power accessories are all systems that should be included in an assessment of a vehicle. Frequent repairs in these systems that are expensive may indicate a need for replacement.
- Accident: The accident history of a vehicle should also be included in any assessment. Frequent and expensive accidents may indicate that a vehicle should be replaced sooner.
- Service/Repair History: Repair and maintenance histories on vehicles show how much a vehicle has been in a shop for repair, the systems that needed repair, and the cost associated with the repairs. Assessing whether a vehicle is reliable based on this history can influence whether a vehicle should be replaced.

Once the assessments have been defined, a simple points system can be developed to prioritize replacements. Each item can be scored on a system from one to five, with one being the best and five being the worst. An example is below.

Points Determination for Age Assessment

Points Remaining Service Life Percentage Definition

1	81% to 100%	Very Good Condition
2	61% to 80%	Good Condition: Light use
3	41% to 60%	Fair Condition: General signs of use
4	21% to 40%	Poor condition: Significant degradation
5	<20%	High Risk: Failure imminent
By completing a points table for all the factors in an assessment, each vehicle can be evaluated and given an overall total score. The higher the score, the more critical the vehicle for replacement priority.

B.3 Maintenance Plan Sample Outline

The following outline represents a framework which can be used for an adopted maintenance plan as a policy document.

1. Purpose

The purpose of the fleet maintenance plan is to keep all vehicles and related equipment in a safe, reliable and operational condition.

2. Responsibilities

<u>Fleet Managers</u>: Responsible for the entire fleet, including maintenance plans and service scheduling. Oversees the lifecycle of each vehicle, supervises the fleet maintenance staff, and is accountable for the procurement and disposition of vehicles and equipment. Creates and modifies the fleet maintenance plan and capital replacement plan according to strategic plans, funding, and market availability.

<u>Drivers</u>: Responsible for the overall operation and condition of vehicles and equipment. Performs daily inspections and notes issues with operation.

<u>Supervisors</u>: Monitor driver behavior. Conduct spot checks of vehicles and equipment. Review vehicles after repair to confirm repair status and completion.

3. Third-Party Service Providers

List third-party service providers here and what services they provide to the City of Palm Desert.

4. Types of Maintenance

Preventive Maintenance (PM): Regularly scheduled maintenance on vehicles and equipment to prevent unexpected breakdowns and costly repairs.

Predictive Maintenance: The use of historical data to predict future problems in advance and estimate when maintenance should be performed. Repairs: Repairs made to restore functionality when vehicles or equipment break, malfunctions or stops working. Repairs are reactive and are completed to minimize losses after downtime.

5. PM Program

- Intervals and activities (see Section 3 Preventive Maintenance Plan)
- Measurement of compliance
- Invoices
- PM Plan should contain the vehicle types, asset numbers, intervals and activities.

6. Abuse

Vehicle abuse is the improper use of a vehicle. Abuse can be:

- Neglecting maintenance;
- Purposely damaging the interior or exterior;
- Failing to report operational issues;
- Disregarding traffic laws; and
- Intentionally using the vehicle or equipment outside of designated proper use.

7. Breakdowns

If a vehicle breaks down while in operation, the following steps need to be taken:

- Pull over to the roadside safely;
- Turn on hazard lights;
- Set up flairs or safety triangles;
- Call a Supervisor, Fleet Manager or roadside assistance provider;
- Engage the emergency brake if on an incline; and
- Stay with the vehicle until help arrives.

8. Pre- and Post-trip Inspections

Pre-trip inspections shall be completed daily. All pre-trip inspections that indicate a condition needing repair should be immediately reported to a Supervisor or the Fleet Manager.

Post-trip inspections shall be completed after each daily use of a vehicle. All post-trip inspections that indicate a condition needing repair should be immediately reported to a Supervisor or the Fleet Manager.

9. DOT Regulations

All drivers and supervisors shall follow all DOT rules and regulations as outlined in the US Department of Transportation, Federal Motor Carrier Safety Administration (FMCSA) Regulations, Parts 40, 303, 325 and 350-399.

All drivers shall be given a copy of the regulations and sign an acknowledgement that they have received and read these regulations.

10. Condition Assessments

Each year, vehicles shall be replaced according to the replacement plan developed by Fleet. In addition, when funding is unable to replace vehicles according to the plan, a condition assessment shall be performed on each vehicle scheduled to be replaced in that year. This condition assessment shall rank all vehicles in order of replacement necessity and the replacement plan shall be amended accordingly.