Spokane Green Fleet Playbook

2022

Introduction

Like most cities, transportation is the leading source of greenhouse gas emissions (GHGs) in Spokane. When engines burn fuel, they produce carbon dioxide (CO2) and release it into the local atmosphere along with other harmful emissions that include volatile organic compounds (VOC), carbon monoxide (CO), oxides of sulfur (SOx), oxides of nitrogen (NOx), and particulate matter (PM), all of which have devastating effects on health and the environment.

Spokane's Sustainability Action Plan addressed strategies to reduce GHGs from transportation and included a goal to "implement conversion of City fleet vehicles to carbon-negative, carbon neutral, and low carbon alternatives; by at least 50% by 2030; 75% by 2040 to reduce fleet well-to-wheel emissions to zero by 2050."

Conversion is a process, not a light switch, and it's important to have a plan for replacing existing fleet vehicles with ZEVs to ensure that the City continues to deliver high levels of services to residents and businesses, and to be fiscally prudent with the needed investment in vehicles and fueling infrastructure. The transition plan and this playbook will guide the City in its investments in vehicles and charging stations, and will regularly be revised to incorporate new light-, medium- and heavy-duty ZEVs, incentives and grants as costs become more comparable with conventional vehicles.

Four strategies to reduce emissions from transportation

1. **Drive fewer miles.** For Spokane residents, this might mean walking or rolling to a destination, taking public transportation, and sharing rides. For the City fleet, it can be challenging. No one wants fewer police patrols or less refuse collection.
2. **Shift to zero-emission vehicles** with battery electric vehicles, plug-in hybrids, and other ZEVs like hydrogen fuel cell vehicles and trucks and buses that use renewable natural gas.
3. **Reduce idling.** According to the Alternative Fuel Data Center, personal-vehicle idling wastes about 3 billion gallons of fuel and generates around 30 million metric tons of CO2 annually in the U.S. Driving "warms up" an engine faster than idling, and idling for 10 seconds uses more fuel and emits more CO2 than stopping and starting the engine.
4. **Employ sustainable design** that includes streets and intersections that encourage biking and minimize traffic signals and signs, and land use that facilitates mixed use development so that people can walk to work, school, shopping, and recreational activities.

Planning Checklist

Understand the Goals

- ☑ Articulate the motivations to transition the fleet
- ☑ List the benefits to City residents
- ☑ Set a timeline for implementation

Assess Fleet Vehicles

- ☑ Identify vehicles' duty cycles and operating requirements
- ☑ Associate each vehicle with a "home base" facility
- ☑ Look for opportunities to rightsize vehicles
- ☑ Identify suitable EV replacements

Assess Charging Station Needs

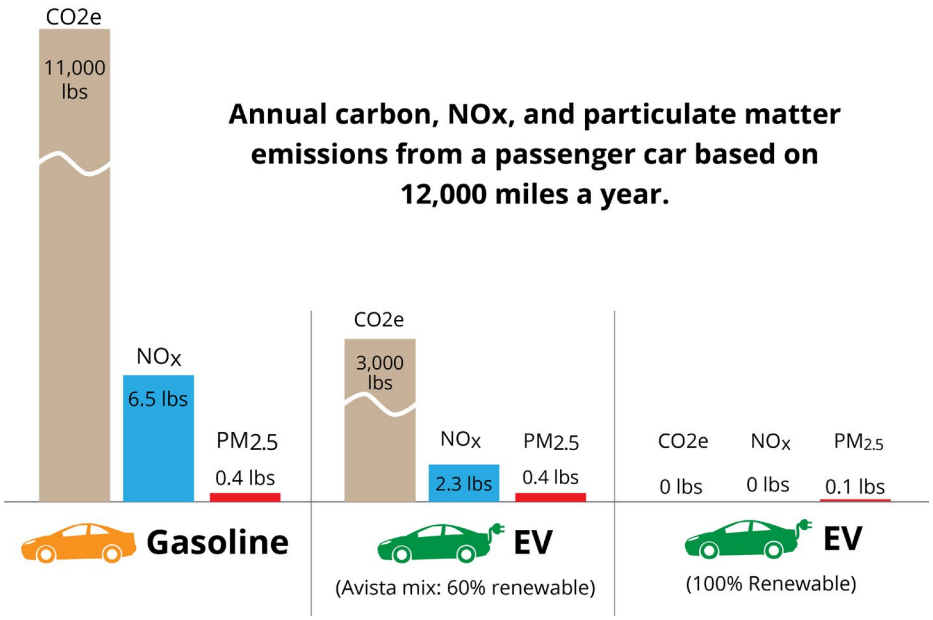
- ☑ Determine the charging strategy
- ☑ Identify the ideal ratio of chargers to EVs
- ☑ Estimate energy needed to charge EVs
- ☑ Evaluate each facility's electrical capacity
- ☑ Engage with Avista

Spokane's Goals

As a community, Spokane ensures the well-being of all our people and the ecosystems of which we are a part. We do this by investing in our neighborhoods and caring for our natural habitats while building an equitable, regenerative, carbon-free economy that is resilient and sustainable.

Spokane's Sustainability Action Plan answers the City's call to address environmental- and climate-related requirements at the local and state levels. It is a guide to meet State of Washington requirements to make meaningful changes to transition to 100% renewable energy and reduce greenhouse gas emissions.

The Action Plan calls for the complete conversion of City fleet vehicles to carbon-negative, carbon neutral, and low-carbon alternatives by 2050, which will greatly reduce greenhouse gas emissions and the threats of climate change. EVs also reduce noise pollution, cost less to operate, and cost less to maintain. All of which benefit Spokane residents.



Based on calculations from fueleconomy.gov

Assessing Spokane

A “fleet” is the collective group of motor vehicles that a business or agency owns to conduct work-related tasks. Like most cities, Spokane’s fleet includes a range of vehicles from passenger cars to heavy trucks. Most vehicles are vocational vehicles used to maintain streets and parks, ensure that water and sewer systems are functioning, and for public safety.

The city’s vehicles have many different home bases. Some, like the library and Riverfront Park, are a home base or "domicile" for one or two vehicles. Other facilities are the domicile for 10 or 20 vehicles, and the police department is the domicile for 300 cars, motorcycles, SUVs, and trucks.

Of the motorized vehicles in Spokane’s fleet, 981 could be transitioned to zero emission vehicles (ZEVs) before 2030 and 299 after 2030. Of the 299, some are newer and will not need to be replaced before 2030. For others, like snowplows and fire apparatus, a cost-effective and suitable EV or ZEV replacement is not expected to be available by 2030.

Between now and ZEV replacement, the fleet could transition to renewable natural gas or renewable diesel, both of which reduce GHGs and NOx from combustion.

It may be possible to rightsize vehicles by replacing a conventional vehicle with an EV in a different class or body style. For example, 15-passenger vans are available as EVs; eight-passenger minivans are not. A minivan might be replaced with an electric 15-passenger van or electric five-passenger SUV.

e's Fleet

1,679

Cars, trucks, boats, and equipment in Spokane's fleet

981

Could be electric vehicles by 2030

299

Could run on renewable, zero-carbon fuel

Buses

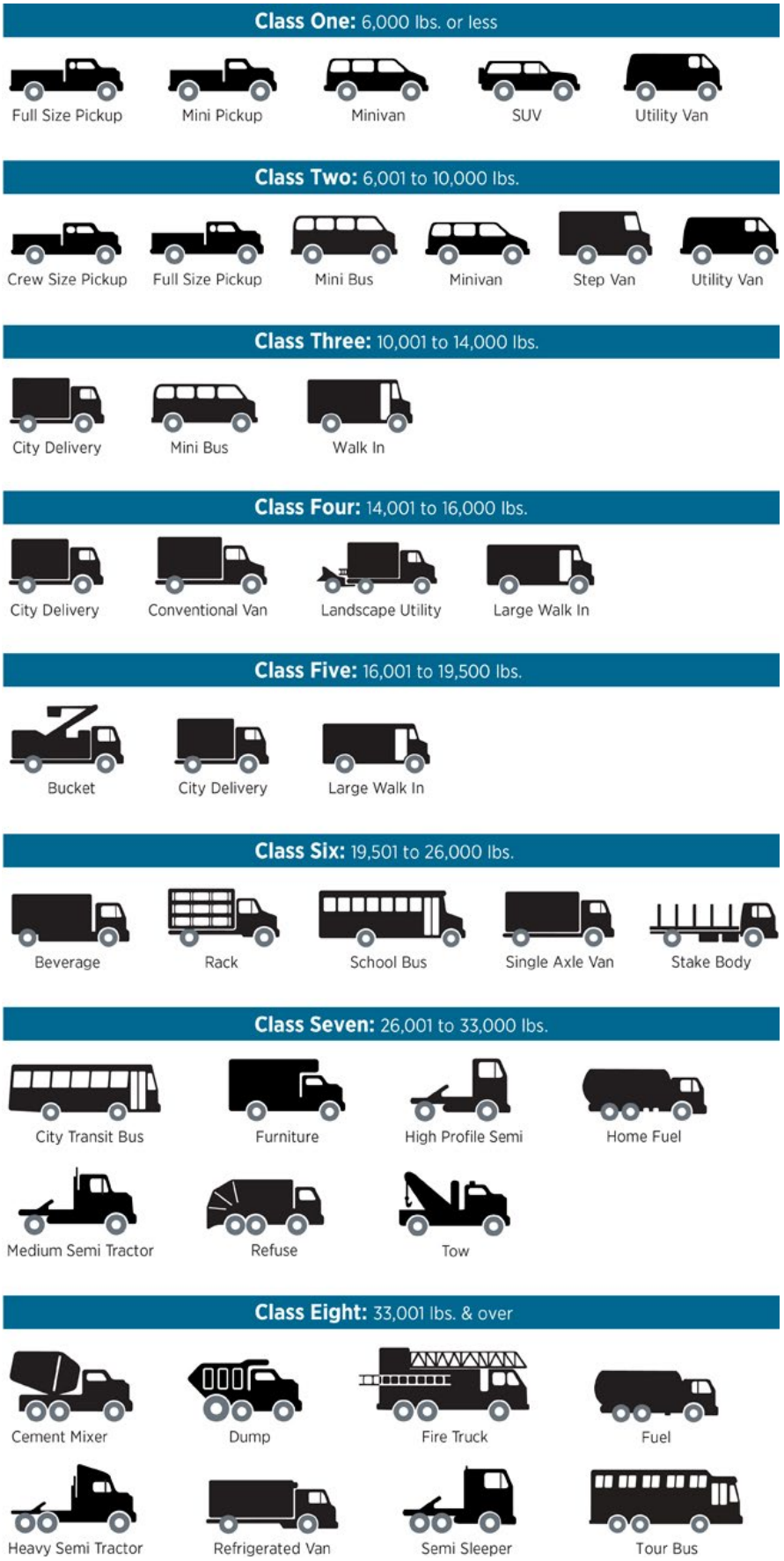
Spokane's transit buses are newer CNG buses that will not need to be replaced before 2030. The buses have clean, low-NOx engines and will use renewable natural gas when its available in Washington.

Vehicle Classes

This figure from the U.S. Department of Transportation shows body styles of medium- and heavy-duty vehicles (MHD). The weight rating includes the vehicle itself and the weight of the passengers and cargo the vehicle can carry or tow on an attached trailer.

Medium-duty vehicles are Class 2, 3, and 4—bigger pickup trucks, cargo vans, delivery vans, and transit vans that hold 12-15 passengers. Heavy-duty vehicles in Class 5, 6, 7, and 8 and are a variety of body styles that fall into the broad categories of "truck" and "bus."

Some MHD vehicles, like transit buses and drayage trucks, are on rapid adoption curves. Others, like fire trucks and tow trucks, are on a slower curve.



Electric

Zero Emissions

Electric vehicles charge when and where they are parked. When using renewable electricity, EVs have no CO2 emissions.

Hydrogen

Zero Emissions

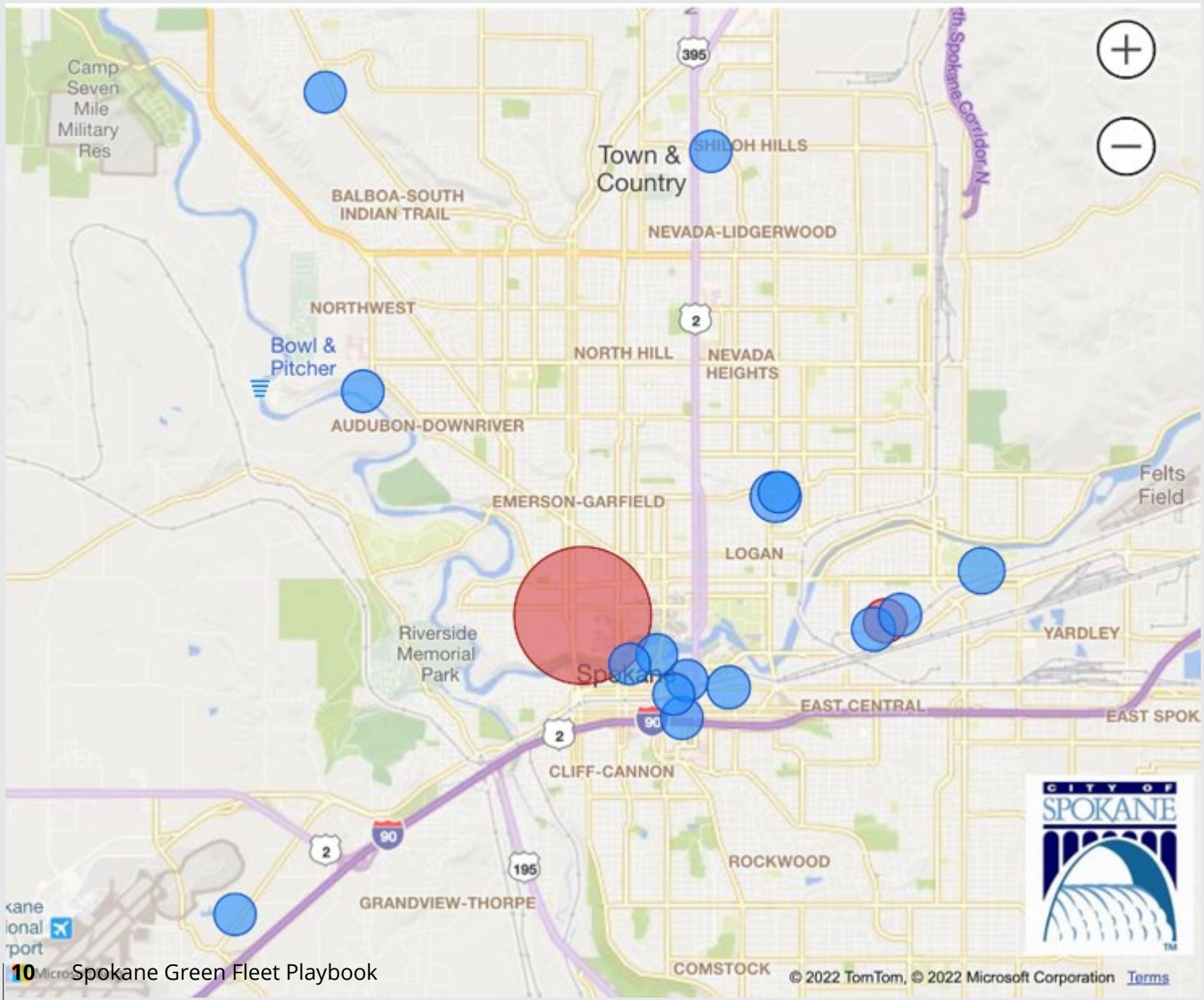
Fuel cell electric vehicles refill at a hydrogen station. When hydrogen is made from renewable sources, FCEVs have no CO2 emissions.

Renewables

Near Zero Emissions

Renewable diesel and renewable natural gas are near-term bridges to zero emission vehicles. Renewable diesel decreases GHG emissions by at least 50% and renewable natural gas can be carbon negative.

Assess Charging Needs



Spokane's fleet vehicles routinely park at 25 facilities, plus a handful of vehicles are taken home overnight, and they have different "dwell times."

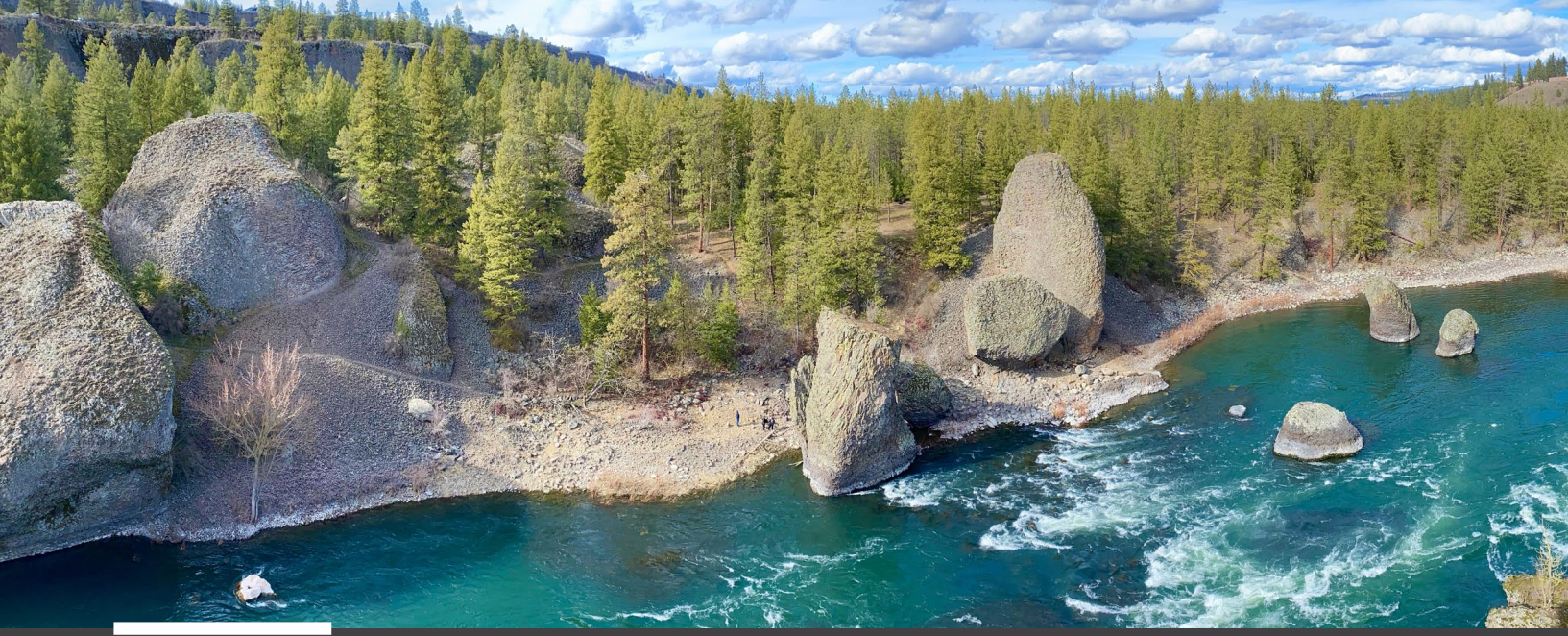
To minimize the cost of charging station installation and operation, the fleet vehicles will initially share charging stations, and occasionally staff may need to swap cars in and out of EV parking spaces. Most EVs will not need daily charging. As more EVs enter the fleet, charging stations can be added.

Avista is engaged with the City of Spokane to assess the electrical capacity on the utility side of the meter. Spokane facility staff are responsible for the customer side of the meter and will need to assess each facility to identify needed upgrades to the electrical panels, wires, and conduits.

Initial charging station build-out

- **Build two charging hubs with state-of-the-art DC fast chargers with multiple charging connectors**
- **Install at least one Level 2 charger at each of the facilities that need minor electrical work. For example, wiring could be run through the celiing to wall-mounted charging stations.**
- **At the facilities that require more-extensive electrical work, like trenching to run conduit, install one Level 2 charging station and "stub outs" for future charging stations, which will save costs.**

The circles on the map represent expected energy demand in kilowatt hours (kWh) to charge fleet EVs in 2030. Red circles represent DC Fast Chargers and blue circles represent Level 2 charging stations.



The Plan

Fuel

- [ ] CNG
- [ ] Diesel
- [x] Gasoline
- [x] Propane

Extended Lifespan

0 — 37

Annual Opex Savings

($10,775) — $46,524

Annual OpEx Savings (All vehicles)

$1.3M

EV DEPLOYMENTS

2022-2024

$14M
Vehicle Capex

340
Vehicles Deployed

Vehicle Type	Avg. Green Premium	Avg. Extended Lifespan
Van Fuel	0.85	7.57
Utility Fuel	0.66	2.32
Police Motorcycle	0.86	5.00
Pickup	0.79	7.21
Passenger Truck	0.80	4.75
Passenger SUV	0.62	6.33
Passenger Car	0.87	4.00
Forklift	1.04	9.00
City Delivery Van	0.88	20.00
Auto Hybrid Elec/Gas	0.97	9.00
Auto Fuel	0.83	8.28
Total	**0.77**	**6.05**

2025-2029

$5M
Vehicle Capex

154
Vehicles Deployed

Vehicle Type	Avg. Green Premium	Avg. Extended Lifespan
Van Fuel	0.81	9.23
Utility Hybrid Elec/Gas	0.64	1.00
Utility Fuel	0.64	1.52
Small Tractor	1.02	14.50
Police Motorcycle	0.86	1.80
Pickup	0.87	6.56
Passenger Van	0.64	13.33
Passenger Truck	0.76	1.50
Passenger SUV	0.65	0.50
Meter Patrol Scooter	1.12	10.00
Forklift	1.01	9.67
Total	**0.78**	**4.82**

2030

$15M
Vehicle Capex

245
Vehicles Deployed

Vehicle Type	Avg. Green Premium	Avg. Extended Lifespan
15+ Passenger Van	2.18	12.33
All Terrain Vehicle	1.14	3.00
Auto Fuel	0.73	12.63
Auto Hybrid Elec/Gas	1.03	18.00
Boat	1.07	30.00
City Delivery Van	0.40	12.00
Dump Truck	3.13	9.50
Heavy Truck	2.27	8.72
Passenger SUV	0.56	1.50
Passenger Truck	0.87	8.29
Pickup	0.93	9.20
Total	**1.15**	**8.85**

Transitioning to EVs

The green fleet plan has an interactive Transition Planner that department heads can use to select vehicles to replace with EVs based on:

- Service life of existing fleet vehicles
- EVs that would yield the greatest operational cost savings
- Greatest reduction in greenhouse gas emissions
- Availability of an EV or ZEV that can match the performance of the existing vehicle

Spokane has many vehicles that passed their expected replacement date, usually 10 years or 100,000 miles from the date they entered the fleet. The default view of the transition planner shows many new EV purchases in just two years. A procurement strategy will align replacements with sustainability goals, state regulation compliance, and a balanced city budget.

Implementation Checklist

Develop a Procurement Strategy

- ☐ Create a phased plan for vehicles and charging stations
- ☐ Select an owner/operator model for charging stations
- ☐ Identify potential incentives and rebates
- ☐ Determine a budget and financial strategy

Purchase and Install the First Charging Stations and EVs

- ☐ Create specifications for first EVs and charging stations
- ☐ Issue RFPs or purchase through a group buy contract
- ☐ Install hardware and software
- ☐ Apply for incentives and rebates

Create Policies and Train Staff

- ☐ Create policies
- ☐ Train drivers and maintenance staff
- ☐ Train staff on data and reporting tools

Evaluate EV Performance and Use

- ☐ Establish metrics and measure
- ☐ Reevaluate the EV transition plan as needed

Create a phased plan that aligns with a balanced budget and GHG reduction goals. Consider these case studies:

TEXAS

To normalize EVs across the fleet, the City of Austin replaced pool cars with EVs and put a Level 2 charging station at each pool domicile, and a DC Fast Charger at a hub As staff became comfortable with the EV range and charging time, department heads became more confident about requesting EVs.

FLORIDA

The City of Winter Park started with one department and replaces all bulding inspectors' vehicles with EVs with one charging station for each vehicle. The City saved $6,000 in fuel costs in one year and the inspectors became vocal champions of EVs.

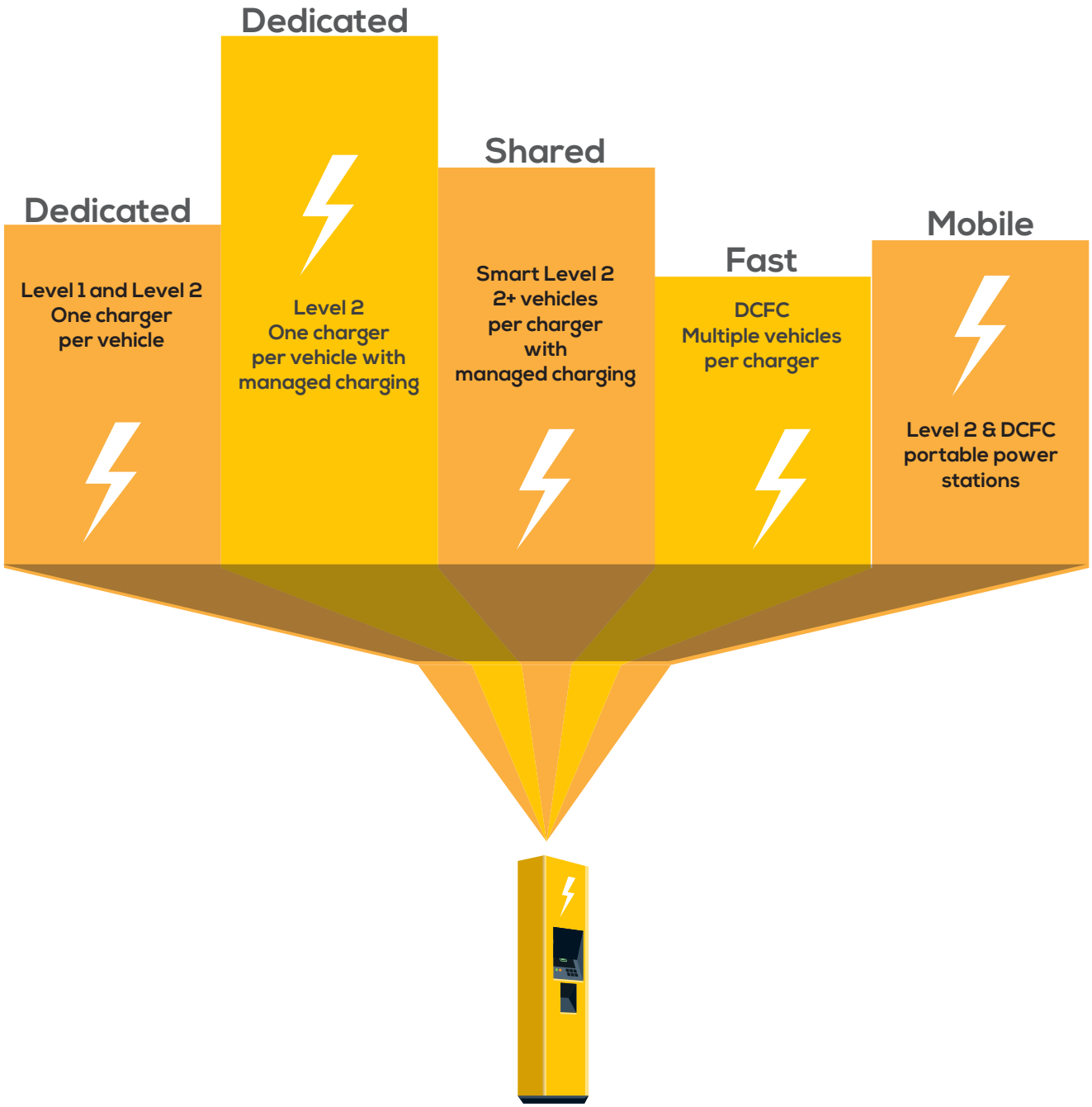
NEW YORK

A city in upstate New York took advantage of a parking lot lighting grant to install charging stations. During construction, the city replaced two cars with EVs. Soon, every facility had one or two charging stations and departments are choosing EVs.

IOWA

The City of Des Moines' new facility will house fleet maintenance, radio controls for the police department, and public works. The new facility will support charging for 160 electric fleet vehicles, and departments must justify why they don’t buy an EV.

Owner/Operator Models



EV charging is in the nascent stage of business development, and profit models are just developing. Typically, EV charging stations aren't profitable, and most EV charging networks rely on grants, rebates and other incentives, coupled with other revenue sources such as the sale of Clean Fuel Standard or other carbon credits or advertising to break even.

Several cities share the charging stations with employees and/or the public, which can help generate operating revenue and encourage local EV adoption while leveraging their infrastructure investments.

Many cities own the charging stations and contract technical support and maintenance with charging vendors. However, two other models can provide flexibility, especially when sharing the fleet charging stations with private customers.

Model	100% City Owned and Operated	Shared with Vendor	100% Vendor Owned and Operated
Brief Description	Spokane purchases and installs the charging stations and keeps 100% of the charging and clean fuel credit revenue	Spokane purchases equipment, vendor installs and operates stations; Spokane and vendor share ownership	Vendor purchases equipment and operates, Spokane or vendor pay for construction
Charger Maintenance	Via a maintenance contract; equipment provider provides driver support	Vendor provides technical support, maintenance, and operation	Vendor provides technical support, maintenance, and operation
City Staff Role	Potentially to issue work orders and financial reporting	Pay (or collect) monthly fees to/ from vendor, and for charging station fees	Pay annual fee to vendor
Revenue Option 1	100% Spokane; Spokane sets price at charging station	Split: Spokane keeps station revenue; vendor keeps CFS credits	Split: Spokane and vendor each have a percentage of revenue
Revenue Option 2		Vendor pays Spokane a monthly fee and keeps all revenue	100% vendor

If Spokane chooses shared or vendor-owned models, vendor contracts may require that Spokane install only that vendor's charging stations during the term of the contract. If Spokane chooses to own and operate the charging stations, each charging station vendor offers an optional maintenance contract that includes repairs from vandalism or accidents, and software/ hardware updates. City staff will maintain wiring, breakers, panels, and meters and work with Avista for other repairs and maintenance for the make-ready infrastructure.

Additionally, Spokane may want to contract with a company to aggregate and sell the Clean Fuel Standard (CFS) credits instead of using staff time for data collection, validation, and reporting.

Identify Rebates, Incentives, and Credits

Avista Commercial Electric Vehicle Charging Equipment Incentive Program

Pays for the charging station, installation costs, and 50% of the premise wiring costs, up to $2,000 per charging connector. The City would be responsible for the remainder of the premise wiring costs.

Avista Electric Forklift Incentive Program

Offers an instant rebate at the dealership of $2,000 rebate on forklifts with lead acid electric batteries, and a $3,000 rebate on forklifts with lithium-ion batteries.

Regulations often drive availability of credits and incentives. Participating in committees and workshops can shape development of incentives and grants that can benefit the transition plan

Washington's Clean Fuel Standard requires fuel suppliers to gradually reduce the carbon intensity of transportation fuels. Fuel suppliers can purchase credits generated by low-carbon fuel providers, including electric vehicle charging providers, to comply with the standard. This will create a revenue stream for charging station vendors, and producers of renewable natural gas and renewable diesel. The proposed rule will be adopted by early 2023.

In 2021 and 2022, the Washington state legislature passed several bills that will encourage adoption of zero emission vehicles.

SB 5974

The Washington State Department of Commerce and the Washington State Department of Transportation must establish an interagency EV coordinating council to advance transportation electrification.

SB 5693

Requires that WSDOT establish a grant program for by local governments, federally recognized tribal governments, or utilities to deploy EVSE in rural areas, office buildings, multi-unit dwellings, ports, schools and school districts, and state and local government offices. Preference will be given to direct current fast (DC Fast) EVSE projects.

SB 5689

Electric Vehicle (EV) Deployment Goal: All light-duty vehicles sold, purchased, or registered in Washington state must be EVs by model year 2030. The Interagency EV Coordinating Council that will develop plans by December 31, 2022.

A Joint Transportation Committee must study opportunities for high-consumption fuel users to adopt and make recommendations to the Committees and governor by July 1, 2023.

WSDOT must install co-located DC Fast EVSE and hydrogen fueling stations in the Wenatchee or East Wenatchee area near a state route or publicly owned facility. WSDOT must contract with a public utility that produces hydrogen or provides technical assistance for hydrogen fueling stations.

SB 5910

Requires the Washington Department of Commerce to establish the Office of Renewable Energy to leverage, support, and collaborate with other state agencies to:

- Accelerate market development by providing assistance along the life cycle of renewable fuel projects;
- Support research on the development and deployment of renewable fuel and use of renewable and green electrolytic hydrogen;
- Drive job creation, improve economic vitality, and support the transition to clean energy;
- Enhance resiliency by using renewable fuels and green hydrogen to support climate change mitigation and adaptations; and,
- Partner with underserved communities to ensure equitable benefit from clean fuel efforts.
- Compile data about the use of renewable fuels and green hydrogen in state operations.

Budget and Financial Strategy

EVs cost more than conventional vehicles and require a capital investment in charging stations and electric infrastructure. Because EVs and charging stations have lower operating costs, most fleets will see a return on investment within five years.

The Transition Plan has an overall budget for procurement and operation, and the strategy for deployment forms the basis for an annual procurement budget. Financial strategies to increase the budget for ZEVs and infrastructure may include:

- Establishing a fuel surcharge for fleet vehicles' gasoline and diesel use. A per-gallon surcharge of a few pennies charged to each department can create a funding mechanism to finance EVs and charging stations, or a pool of matching funds for potential grants.
- Alternative financing through infrastructure as a service. This approach is similar to a bond that provides all the up-front capital for vehicles, charging stations, and construction. The city pays a flat monthly fee over 10-40 years to pay off the bond. Some providers will upgrade the vehicles and charging stations during the life of the financing, which provides future proofing.
- A shared ownership model in which the fuel vendor—electricity, hydrogen, or renewable fuel—builds and operates shared infrastructure on City-owned property. The fuel is available to City vehicles at a pre-negotiated price (the baseload) and the operator can sell fuel to other drivers at market rate.

Purchasing

Many fleets standardize on makes and models of vehicles and on one charging station vendor. It may be prudent to standardize on a few EV models in each class, and two or more charging station vendors that can report data to a single management platform.

PROS

of standardizing vendors, makes, and models

Improved maintenance efficiency in labor, number of specialty tools, and parts in inventory

Drivers are more confident driving the same vehicle, which leads to increased safety

Closer relations with the vendors, which may result in better service

Fewer specifications and faster bid cycle

Fewer contracts and invoices to process

CONS

and missed opportunities when standardizing

Loss of competition, which can lead to increased prices and costs

Missed innovation

Supply chain issues can result in vehicles waiting for parts, charging stations out of commission, or a vehicle shortage

“Lemon” risk of all vehicles being recalled or suffering from the same flaw in design

Appearance of collusion with one dealer or manufacturer

Procurement

Local governments purchase vehicles and charging stations through an RFP process with bids from local vendors and national companies, or through Sourcewell. As a public agency, Sourcewell establishes and provides competitively solicited purchasing contracts on behalf of 50,000 government agencies. The Climate Mayors Electric Vehicle Purchasing Collaborative is one of the cooperative agreements and includes light-, medium-, and heavy-duty vehicles and charging stations, including installation and maintenance.

Currently, fulfillment for EVs takes several months. For some makes and models, like EV pickup trucks, manufacturers take orders through local dealers for delivery in 12-18 months. It's important that Spokane place purchase orders now for vehicles to be delivered in 2023.

Cooperative Purchasing

Sourcewell

EV charging infrastructure contracts

	Full Catalogue	Hardware Discount	Network	Hardware: Level 2	Hardware: DCFC	Installation	Maintenance
blink	✓	10%	✓	✓	✓	✓	✓
chargepoint	✓	0-20%	✓	✓	✓	✓	✓
evconnect	✓	10%	✓	✓	✓	✓	✓
flo	✓	11-20%	✓	✓	✓	✓	✓
FREEWIRE	✓	3%	✓	✓	✓	✓	✓
LIVINGSTON ENERGY GROUP	✓	30-100%	✓	✓	✓	✓	✓
NUVVE	✓	15-20%	✓	✓	✓		✓
SemaConnect	✓	0-25%	✓	✓	✓	✓	✓
SIEMENS	✓	30-80%	✓	✓	✓	✓	✓
WAVE	✓	15%	✓		✓	✓	✓

Training and Policies

Charging station vendors and EV manufacturers have training programs for maintenance staff and technicians, and for staff that will use the reporting and tracking software. Data can become overwhelming, and it may be beneficial to have multiple people from fleet, facilities, and IT learn the management apps.

Most charging station vendors offer an on-boarding program to help staff become familiar with the vehicles and to set up a personal code on the charging station app. Use all the resources from the vendors, and create a checklist that employees complete and file with fleet (or HR) to show that they read the policies, have charging station access, and agree to the City's safe driving policies.

Recommended EV Policies

Trip Length

You may encourage EVs for long trips to reduce GHG emissions and cost or discourage EVs due to public charging station availability.

Problems

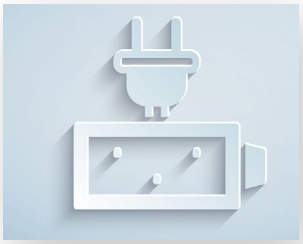
Describes the process to report technical problems with EVs and charging stations; and how to report issues to service providers.

Cost Allocation

Documents how departments will account for the energy used to charge EVs and any fees to cover charging station operating costs.

Complaints

Describes the process to report behavior-related complaints like an uncharged EV or a non-EV parked in an EV charging spot.



Reimbursement

Describes reimbursing employees for home charging of take-home EVs and use of public charging stations for fleet vehicles.

Shared Use

For charging stations that are shared with fleet vehicles, employees, and/or the public, the policy may address times of day/days of the week that employees can use fleet charging stations, a time limit for parking in an EV space, towing or ticketing unauthorized vehicles, a charging station surcharge for non-fleet vehicles, and use of an "OK to Unplug" placard.

When to Plug In

Clarifies when the driver is responsible for charging the car, which could be remaining range (e.g., 100 miles), state of charge (e.g., 50% battery capacity) or frequency (e.g., after every third use).

Evaluate the Implementation Plan

Use the data from EVs, charging stations, and other software to compare EV data to use of existing vehicles. The goal should be that the EVs are used in place of the conventional vehicle, not in addition to it. For example, if you see that the average EV trip is five miles and the average non-EV trip is 30 miles, it would be prudent to understand if the barrier to use is physical (the charging station is down) or behavioral (range anxiety.)

Evaluation should measure and analyze:

- Are people driving the EVs as they did the conventional vehicle?
- Do people charge every time they stop? Once a day? Once a week?
- What is the time of day that the stations are used? What does that cost?
- Are the EVs and stations working as expected?
- What are common causes of downtime? How long is an EV or charging station out of service?

In 2025, reevaluate the transition plan based on data and feedback, and the pace of technology roll out to decide to speed up, slow down, or incorporate different ZEV vehicles. Points that might influence the transition include:

- Evaluating the feasibility of building hydrogen production and a fueling station at the waste-to-energy plant. This facility could produce zero carbon hydrogen (green hydrogen) for medium- and heavy-duty fuel cell vehicles and generate additional Clean Fuel Standard carbon credits.
- Assess the availability of additional vehicle classes and body styles. The transition plan calls for some vehicles to run on renewable diesel and natural gas because comparable ZEV models have not yet been announced. By 2025, multiple models of medium- and heavy-duty vehicles may be available or on the horizon.
- Extending the transition plan to suppliers, vendors, and local businesses.

Suggested data points, frequency of collection, and metrics for comparison. Choose the data points that are helpful and manageable, and may include other points.

	Daily	Monthly	Quarterly
EVs	Number of EVs in operation Per vehicle: • Mileage • Operating hours • Number of charging stops • Energy consumed at charging session • Length of charging session	Preventative maintenance types Service reports by type and duration Number of drivers per vehicle	Maintenance and safety inspection results Total downtime per vehicle Operation costs
Charging Stations	Number of stations in operation Number and types of faults Per station: • Usage • Downtime • Number of connections • Energy dispensed	Charging station health Session data	Operation costs, including fees Revenue
Energy	Peak and off-peak energy consumption Demand response events	Total energy consumption	GHG reduction
Driver Satisfaction		Service calls Complaints	Feedback via survey

Glossary

Battery Electric Vehicle (EV or BEV) – a vehicle that operates only on electricity stored in a battery, and the battery is recharged by plugging into a wall outlet or charging station.

Class – the standardized system for categorizing vehicles by weight. The weight of larger vehicles includes the vehicle (curb weight) and payload.

Clean Fuel Standard – Washington state law requiring fuel suppliers to gradually reduce the carbon intensity of transportation fuels. Fuel suppliers can purchase credits generated by low-carbon fuel providers, including electric vehicle charging providers to comply with the standard, creating a revenue stream for charging station vendors, and producers of renewable natural gas and renewable diesel.

Domicile – Home base where vehicle is typically parked overnight.

Duty cycle – the vehicle's average daily operation that includes number of hours it's used, miles driven, hours of idling, payload carried or towed, and amount of time it is parked with the engine off.

Dwell Time – Duration that a vehicle is parked between uses, potentially providing opportunity for EV charging.

Fleet and Fleet Vehicles – the collective group of motor vehicles that a business or agency owns to conduct work-related tasks.

Fuel Cell Electric Vehicle (FCEV) – a vehicle that produces electricity from oxygen and hydrogen and refills with hydrogen at a hydrogen station.

Zero Emission Vehicles (ZEV) – any vehicle with a drivetrain that produces zero exhaust emissions of any criteria pollutant or greenhouse gas under any possible operational modes or conditions. Battery electric and fuel cell electric vehicles are ZEVs.

State of the EV Ma

Class 1

Cars, CUVs, and SUVs

Many automakers have non-luxury zero-emission vehicles available and more are coming. EVs have a range of up to 300 miles and FCEVs have a range of up to 500 miles.

Class 2

Light Pickups and Vans

Light pickups with up to 300-mile range are coming from several automakers. Dual motors provide similar traction to four-wheel drive.

Only Volkswagen has announced an EV van, which is a three-row vehicle based on the VW microbus.

Class 2/3

Medium Pickups and Vans

Several manufacturers have cargo and passenger vans in this category, but the pickups available and coming are designed as light-duty vehicles, not vocational trucks.

rket Summer 2022

Class 4/5

Heavy Pickups and Vans

In a municipal fleet, these are the workhorse vocational trucks. No manufacturer has announced zero-emission vocational pickups in these classes. EV vans in this class are usually delivery vehicles.

Class 6

Heavy Trucks

Usually sold as an incomplete chassis that the upfitter finishes. Range is around 170 miles but will vary with the weight of the finished vehicle.

Class 7/8

Heavy Trucks

Trucks in this class are used for freight and goods movement. Many manufacturers are building EV and FCEV trucks for short-haul drayage.

“To deliver efficient and effective services that facilitate economic opportunity and enhance quality of life.”

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