

Village of Ardsley

Plan to Lower Municipal Emissions

Paulina Dawidowska, Pieter Fildes, Lia Hansen, Manya Johnston-Ramirez



NYU

WAGNER

OVERVIEW OF PRESENTATION

01 GOALS

- Identify Vehicle Emission Reductions
- Craft a Fiscally-responsible transition plan

02 METHODOLOGY

- Literature Review
- Internal Interviews
- External Interviews
- Inventory & Additional Research

OVERVIEW OF PRESENTATION

03 KEY FINDINGS

- Interviews
 - External
 - Internal
- Vehicle Inventory
- Literature Review
- Low-Cost, Emissions-Reduction Technologies and Policies

04 RECOMMENDATIONS

- Vehicle Purchase Checklist
- Inventory Updating Suggestions
 - Capital Plan Replacements
 - Additional Replacements
 - Retrofittings
- Fuel Efficiency Tracking
- Infrastructure Plans
- Policy Recommendations

01 PROJECT GOALS



ARDSLEY'S GOAL

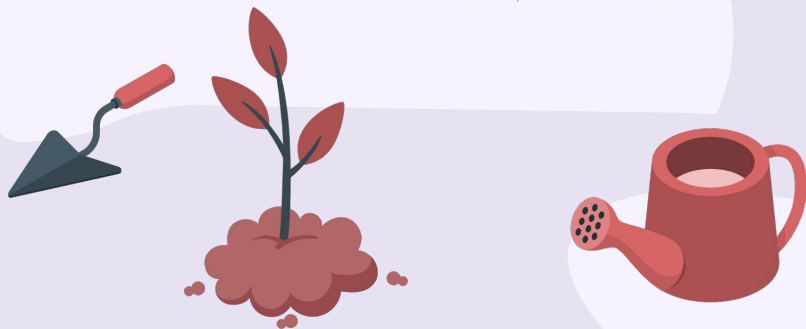
TAKE ACTION TO REDUCE GREENHOUSE GAS EMISSIONS.

Identify low-emission vehicles that can fit municipal needs.

Craft a fiscally responsible transition plan that accounts for infrastructure needs.

02

METHODOLOGY



LITERATURE REVIEW

- Reviewed 97 articles and sources

INTERNAL & EXTERNAL INTERVIEWS

- Ardsley's municipal government and department heads
- Representatives from three neighboring municipalities

VEHICLE INVENTORY

- Organized Ardsley's municipal vehicle specifications and combined it with department fuel data

ADDITIONAL RESEARCH

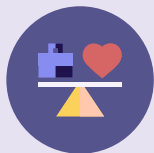
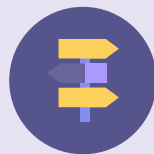
- Vehicle retrofitting and emission reduction policy research

03 KEY FINDINGS



INTERNAL INTERVIEWS

Management was very hopeful
about the future of EVs.



Management and Department
heads expressed concerns
about potential transition
challenges.

INTERNAL INTERVIEWS



PRIMARY CONCERNS

- Lack of EV Infrastructure
- High Cost of EVs
- EV Operability
- Power Outages
- Reliability in Cold Weather
- Mechanic Training



PROGRESS MADE

- Member of NY State's Climate Smart Communities Program
- Electric Bike in the PD
- Unofficial Vehicle Shut-Off Policy
- Street Light Upgrades to LED
- LED Upgrades in Village Hall

EXTERNAL INTERVIEWS

HASTINGS ON HUDSON

All new administration and police vehicles must be electric.

IRVINGTON

EV alternatives are considered but need to meet criteria before purchased.

WHITE PLAINS

New vehicles must be electric unless proven unfeasible. All Sedans must be electric.

EXTERNAL INTERVIEWS

**EV ORDER
BACKLOG**

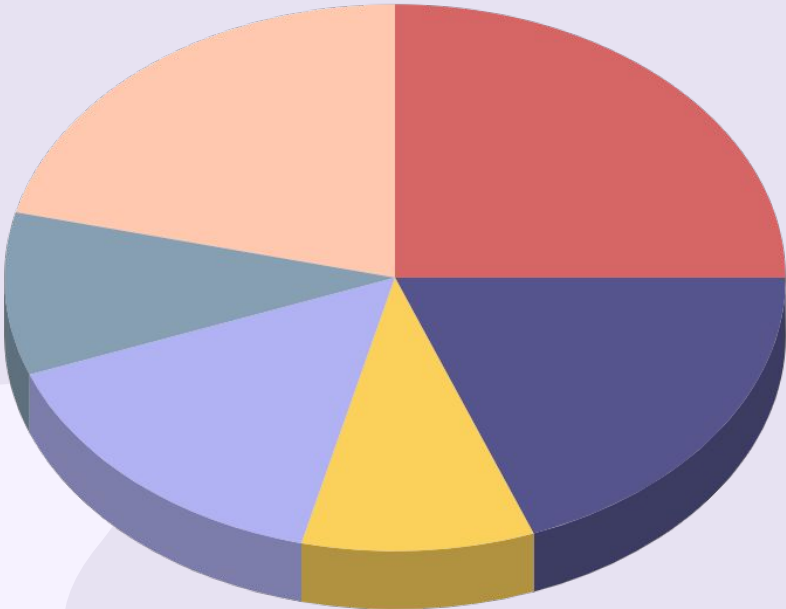
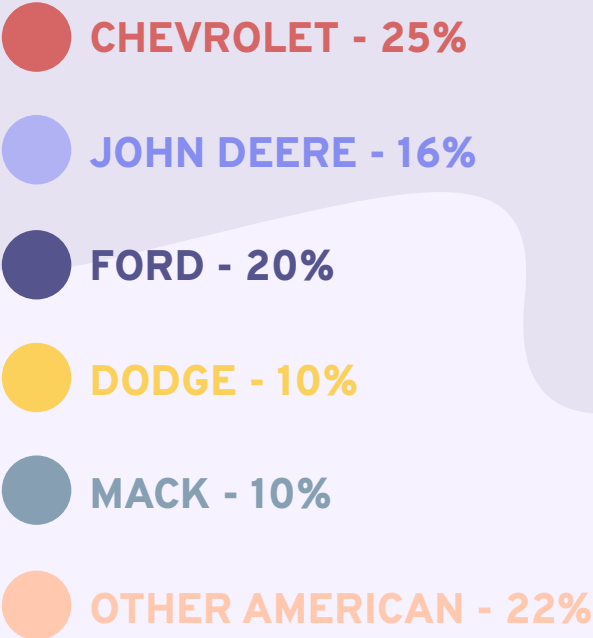
**LESS EV
MAINTENANCE**

**DEPARTMENT
HEAD BUY-IN**

**NO ELECTRICAL
GRID IMPACT**

**TAX CREDITS &
GRANTS**

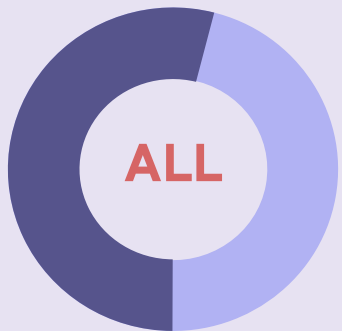
MANUFACTURERS MUNICIPAL FLEET



FUEL TYPES MUNICIPAL FLEET



83% 17%
DIESEL REGULAR

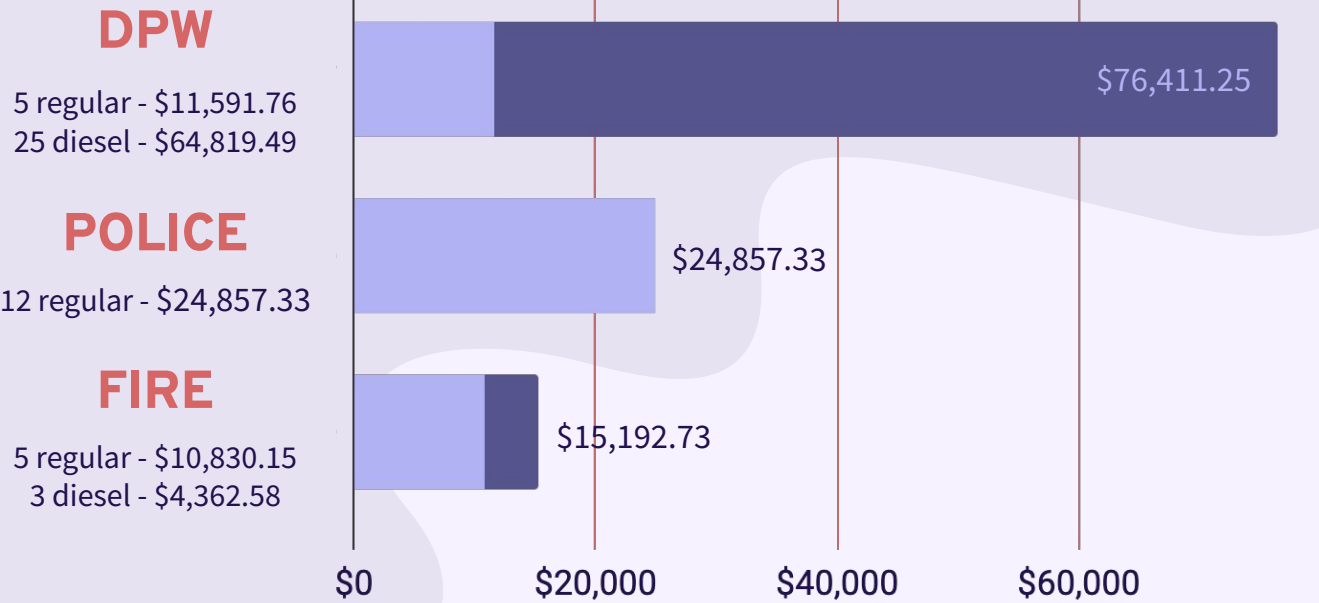
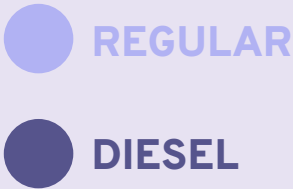


55% 45%
DIESEL REGULAR

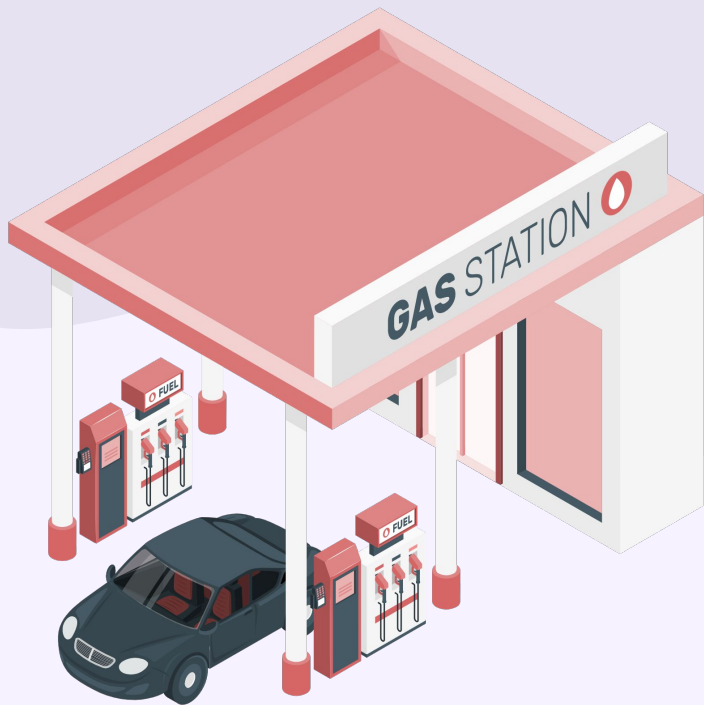


38% 62%
DIESEL REGULAR

FUEL COSTS MUNICIPAL FLEET



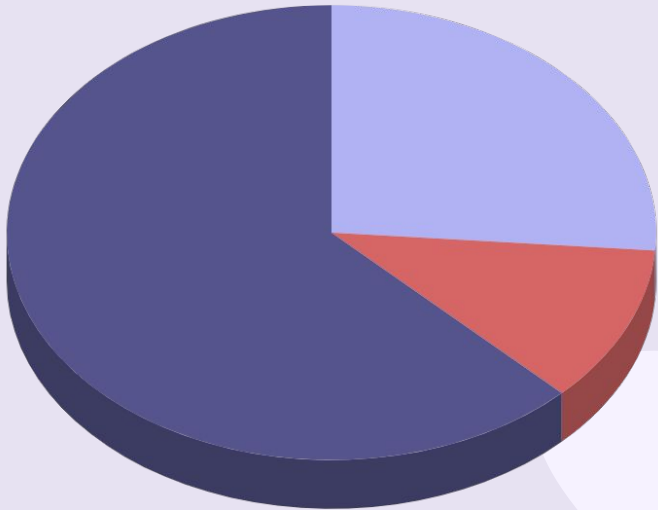
FY 21-22 FUEL COSTS MUNICIPAL FLEET



**\$3.42/gallon
REGULAR**

**\$4.06/gallon
DIESEL**

2019 EMISSIONS MUNICIPAL FLEET



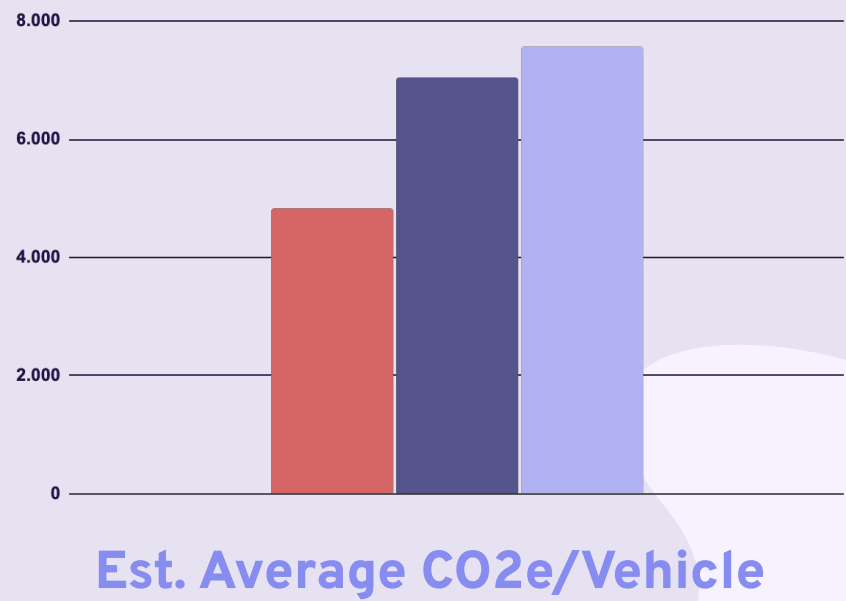
Municipal Fleet CO2e

FIRE
29 CO2e **11.2%**

DPW
162 CO2e **62.5%**

POLICE
68 CO2e **26.3%**

2019 EMISSIONS DEPARTMENT VEHICLES



FIRE
6 vehicles
4.833

DPW
23 vehicles
7.043

POLICE
9 vehicles
7.556

LITERATURE REVIEW



LOWER EMISSIONS

decreases air pollution-related health issues and death.



REDUCED MOTORIZATION

is the most effective way to reduce emissions.



DRIVING RANGES

are expected to increase in the next few years.

LITERATURE REVIEW



LOW TEMPERATURES

affect electric vehicle battery life.



COST OF OWNERSHIP

of electric vehicles are lower than conventional vehicles – can save \$6,000-\$10,000 annually.



ELECTRIC VEHICLE MARKET

is predicted to be fully mature by 2025. Vehicle market rapidly shifting towards EVs.

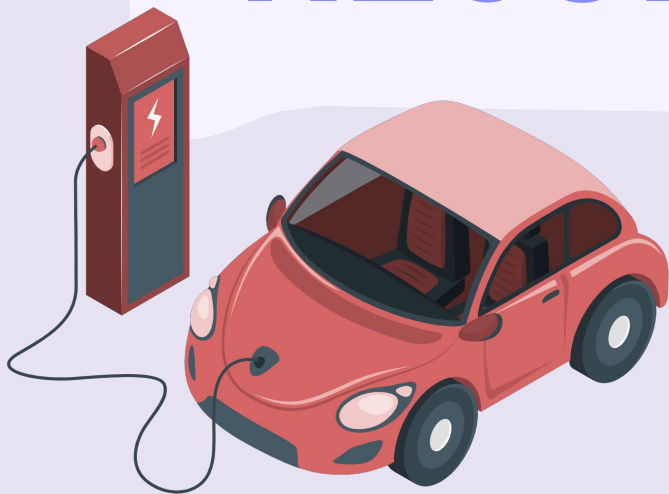
KEY CONSIDERATIONS

- Availability of data on fuel consumption & vehicle mileage impacted analyses.
- Encountered limitations on comparing total lifecycle carbon footprints for EVs, hybrids, and ICE vehicles.
- The EV industry is experiencing rapid growth and changes to the technology.

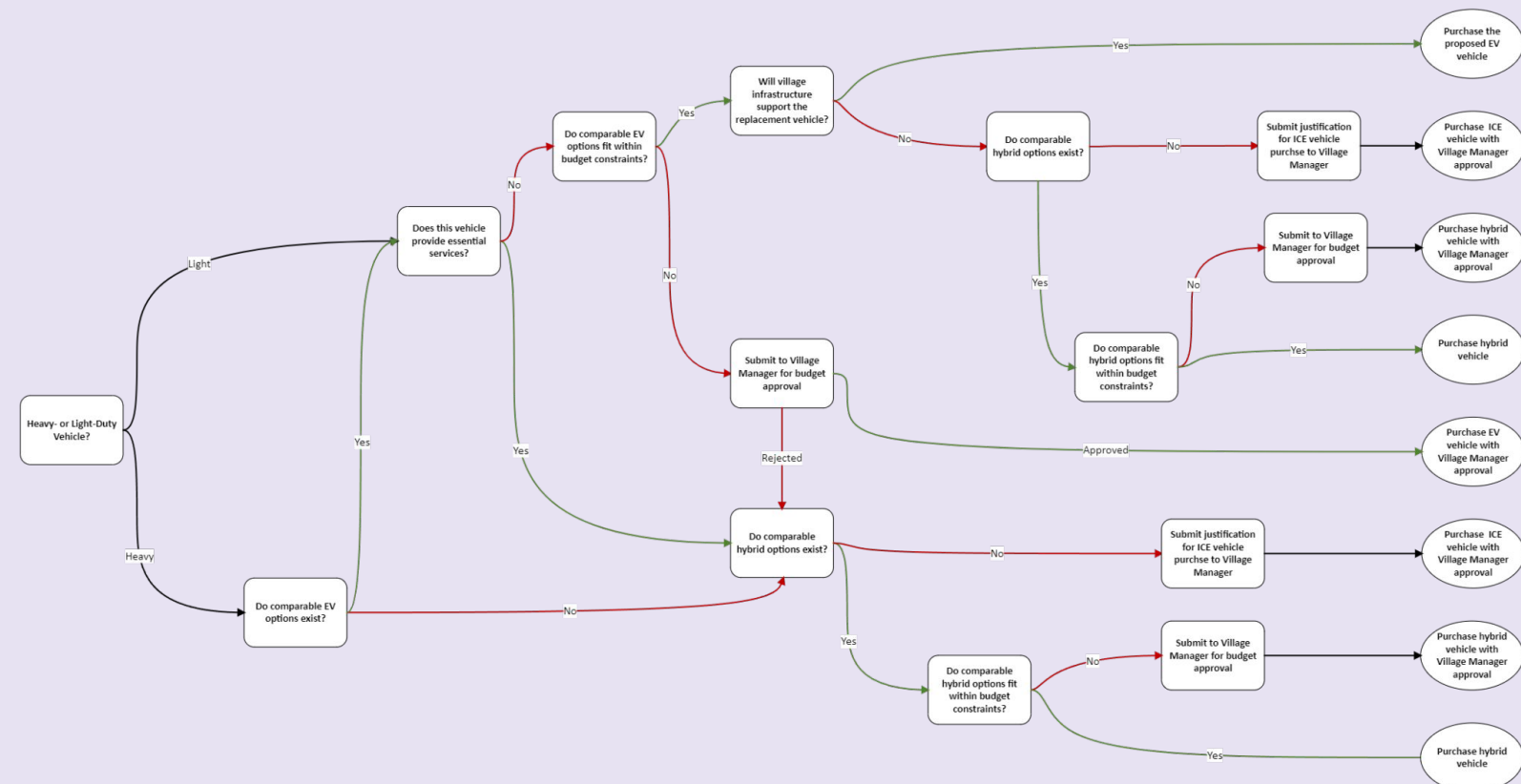


04

RECOMMENDATIONS



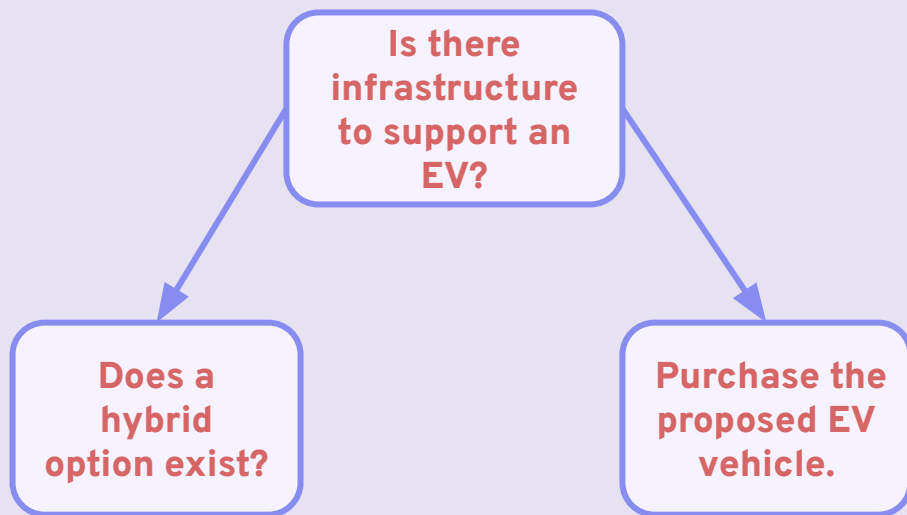
VEHICLE PURCHASE CHECKLIST



VEHICLE PURCHASE DECISION TREE

PURCHASE CONSIDERATIONS

- Vehicle weight classification
- Fuel type
- Availability of EVs and hybrid options
- Price options
- Availability of infrastructure
- Vehicle use



CAPITAL PLAN VEHICLE REPLACEMENTS

CHEVY Tahoe (DPW)	JOHN DEERE Loader 624J	CHEVY Tahoe (Fire)	JOHN DEERE Tractor 4720	CHEVY Tahoe (Fire)	CHEVY Tahoe (DPW)
2023-24 \$65,000	2023-24 \$325,000	2025-26 \$80,400	2026-27 \$135,000	2028-29 \$93,073	2030-31 \$80,000
CHEVY Silverado (Hybrid) \$53,000 est.	VOLVO L25 Electric \$151,575 est.	CHEVY Silverado (Hybrid) \$53,000 est.	KUBOTA LXe-261 \$29,339 min.	CHEVY Silverado (Hybrid) \$53,000 est.	CHEVY Blazer, Equinox, or Bolt EUV \$28,795 - \$35,100 min.

COST BENEFIT ANALYSIS:

REPLACEMENT OF CHEVY TAHOES

BENEFITS - \$455,473

- Avoid investment in conventional diesel vehicles.
- Save fuel diesel expenses resulting from operating all-electric vehicles.
- Avoid maintenance costs.
- Health benefits resulting from reduction in emissions of PM2.5.

COSTS - \$318,291

- Cost of purchasing four recommended electric vehicles.
- Cost of construction of charging stations.
- Costs of annual maintenance.
- Costs of charging electric vehicles.

INFRASTRUCTURE PLAN

PHASE 1

Purchase portable, level 2 chargers

Cooperate with Con Edison on needed upgrades and SmartCharge Program

Consider leasing roof space to earn money and promote clean energy

PHASE 2

Install of two Level 2 chargers at the DPW parking

Expand of the capacity and installation of Level 3 Direct Current Fast Charger

POLICY RECOMMENDATIONS



**PROMOTE
WALKING &
CYCLING**



**IMPROVE
BUILDING
EFFICIENCY**

THANK YOU!

We're happy to answer
any of your questions.

