

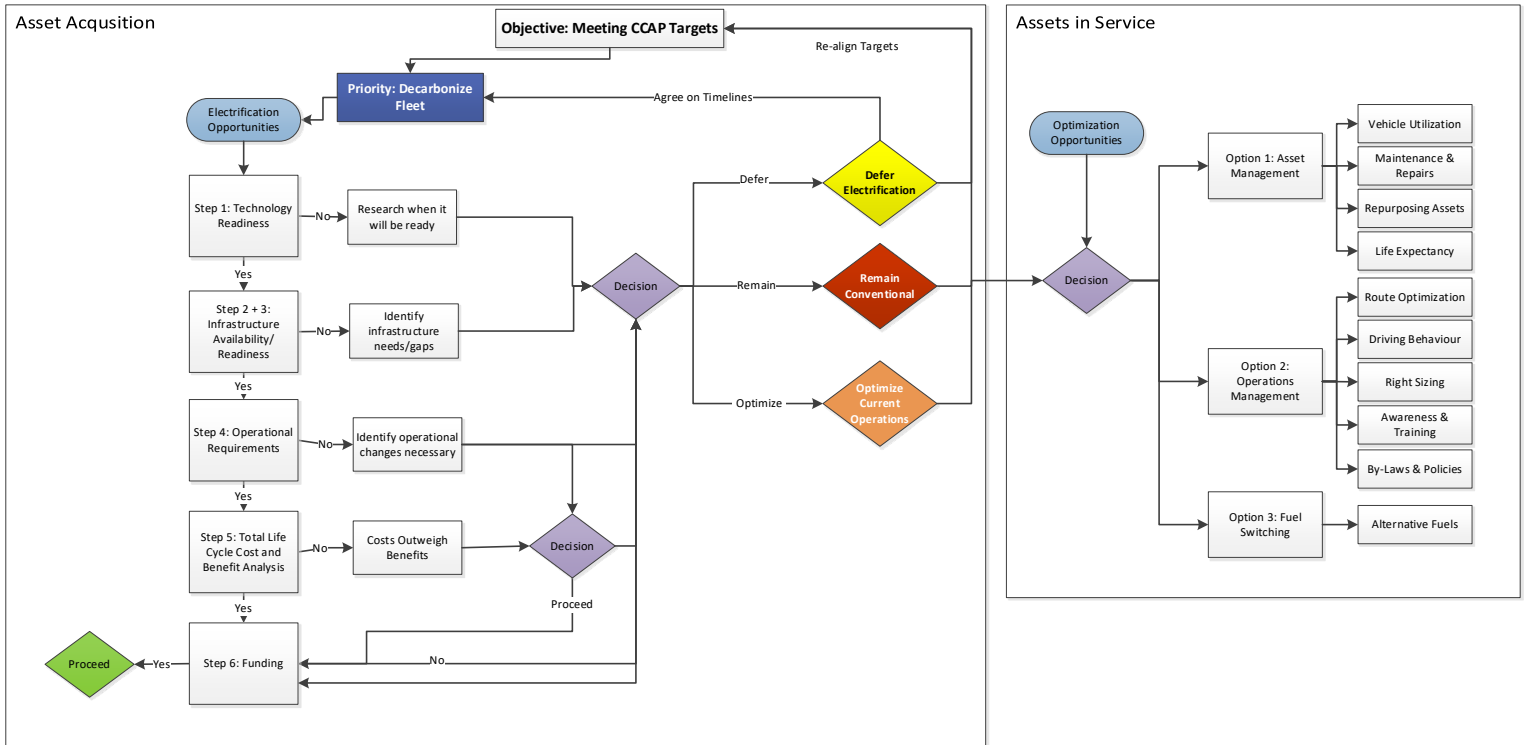
Green Fleet and Equipment Policy - Decision Making Framework

Prepared by the Green Fleet and Equipment Working Group

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Decision Making Framework

To support the Green Fleet and Equipment Policy, a decision making framework has been developed to guide decision making through both asset acquisition and optimizing the sustainability of assets already in service. This framework is summarized in the following graphic:



Asset Acquisition

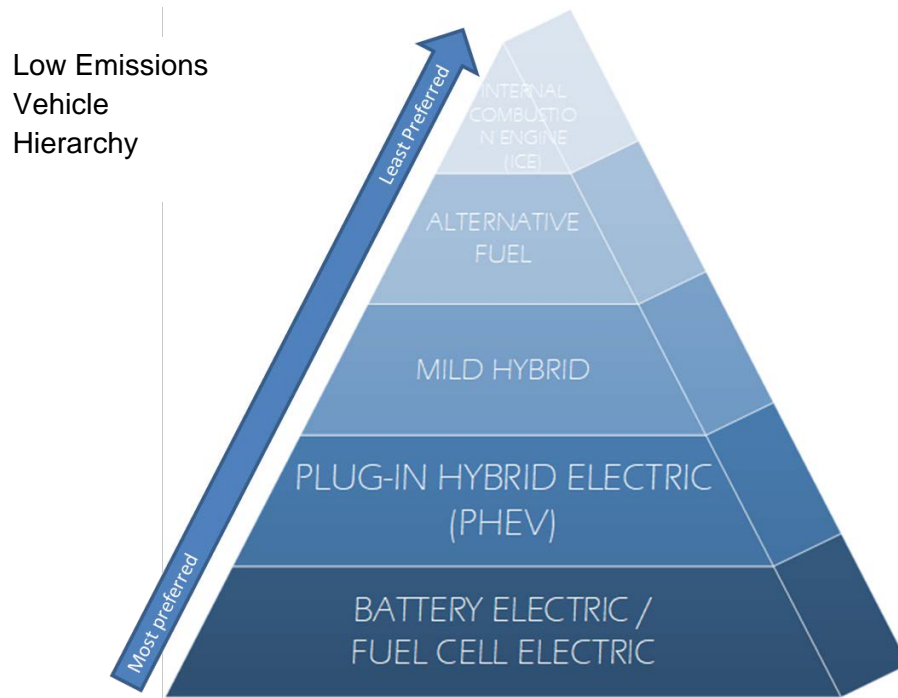
The following will be considered for all procurement of Fleet and Equipment and to optimize current operations of assets in service. These guidelines are supported by a series of Worksheets which will help staff to document decision making, especially in cases where a ZEV or LEV is not being acquired, and track the progress on electrification. This information will be compiled and shared annually with the Leadership Team to highlight opportunities (e.g. grants), barriers (e.g. lack of Infrastructure), and implications to the City’s Climate Change goals and targets.

Note: When considering the questions in the guidelines below, please be sure to consider only the risks, opportunities, cost increases, cost savings and other adjustments related to the core differences between the technology being assessed (e.g. ZEV) and the conventional technology (e.g. internal combustion engine). Please disregard aspects that will impact both options. For instance, if certain costs are related to increased service levels (e.g. the electric vehicle includes GPS locators linked to a cloud-based app), they should not be considered in the comparative analysis, as they do not relate to the difference in the core technology – even if the other option does not offer them.

Acquisition Considerations	Guidelines
<p>Trigger</p>	<p>A need to purchase new or replacement Fleet or Equipment has been identified</p> <p>A funding opportunity (for Fleet, Equipment, or Infrastructure) has arisen</p> <p>Examples:</p> <ul style="list-style-type: none"> • Fleet and/or Equipment have met the criteria for life cycle replacement • New Fleet and/or Equipment needs to be purchased to meet service needs
<p>Step 1: Technology Readiness</p> <p>Who: Fleet Managers, User Groups, IT</p>	<p>Q1: Is the zero or low emissions technology currently available on the market (e.g. local vendor)? (See Low Emissions Technology Hierarchy on page 8 below)</p> <p>Q2: Is the technology proven reliable and/or tested for its intended use and meets applicable Canadian standards (e.g. Canadian Standards Association, Underwriters Laboratories Canada) and the City of Mississauga’s EVCS Standard?</p> <p>Q2A: If not, what is the level of risk that the technology will not be able to achieve the standards for reliability and operability? If the risk is within a tolerable level, management and the leadership can still adopt pre-maturity technologies. If the level of risk is considered high at present, can the replacement be deferred to extend the life of the Fleet or Equipment (e.g. defer until low or zero emissions technology becomes available)?</p> <p><i>Example:</i></p> <ul style="list-style-type: none"> - <i>Technology is not yet available but market trends indicate that it will likely become available within the next 1-2 years.</i> <p>Q2B: If not, is there an opportunity for a demonstration or pilot project to test technology readiness?</p> <p><i>Example:</i></p> <ul style="list-style-type: none"> - <i>Technology is available and meets Canadian Motor Vehicle Safety Standards but has yet to be tested by users and/or municipalities and there may be an opportunity for a small scale pilot.</i> <p>Q3: Is there vendor support for this new technology?</p> <p>Q4: Are there parts available in the local market or easily acquirable from other markets?</p>
<p>Step 2: Infrastructure</p>	<p>Q1: Is Infrastructure available to support the low or zero emissions</p>

<p>Availability</p> <p>Who: Fleet Managers, User Groups, IT, and Facilities and Property Management</p>	<p>technology?</p> <p>Q1A: If not, what are the timing considerations of installing the appropriate Infrastructure?</p> <p>Q1B: If not, can the procurement/replacement be deferred until infrastructure becomes available?</p> <p>Q1C: Is the available Infrastructure owned/operated by the City (e.g. Level 3 Fast Charging networks)? If not, what are the risk considerations of relying on charging or refuelling Infrastructure that is owned by a third party against the City's ability to install the necessary infrastructure?"</p>
<p>Step 3: Infrastructure Readiness</p> <p>Who: Green Fleet and Equipment Working Group</p>	<p>Q1: What impact will the new Fleet and/or Equipment have on energy load and electrical infrastructure at the site? Are there options to distribute the new load requirements to other locations and to favourable time-of-day?</p> <p>Q2: Does the charging technology have the ability to monitor usage/consumption? See EVCS Standard for reference. (For Fleet Only)</p> <p>Q3: What IT infrastructure (e.g. cellular/network connection, software systems, integrations, data sharing) is needed/available at the site?</p>
<p>Step 4: Operational Requirements</p> <p>Who: Fleet Managers, User Groups, IT</p>	<p>Q1: What are the Fleet or Equipment specifications and do the low or zero emissions technologies meet operational requirements when compared to conventional technology (e.g. internal combustion engines)?</p> <p>Q2: What changes would be needed to operate and maintain the low or zero emissions technology, and associated infrastructure?</p> <p>Q3: Is a skills and/or training upgrade required to operate and/or maintain the Fleet or Equipment?</p>
<p>Step 5: Total Life Cycle Cost/Benefit Analysis</p> <p>Who: Fleet Managers, User Groups, Finance, Facilities, Environment, IT</p>	<p>Q1: What are the capital cost impacts (including all soft costs) of the zero or low emissions technology and its associated Infrastructure when compared to conventional technology (e.g. internal combustion engines)?</p> <p>Q2: What are the annual operating cost impacts – both in terms of increases and savings (including resourcing, utility, maintenance, and licensing) of the low or zero emissions technology, and its associated Infrastructure (e.g. annual subscription fees) when compared to conventional technology (e.g. internal combustion engines)?</p> <p>Q3: What are the training and/or operational adjustment costs (if applicable) or staff resources implications when compared to the conventional technology (e.g. internal combustion engines)?</p>

	<p>Q4: Will there be a decrease in greenhouse gas emissions as a result of the new technology (e.g. fuel saved/avoided, \$/eC02 tonnes)?</p> <p>Q5: Are there any other associated benefits of the new technology (e.g. improved air quality, reduced noise)?</p> <p>Q6: What is the total life cycle cost (e.g. total cost of ownership) of the low or zero Fleet or Equipment when compared to the conventional technology (e.g. internal combustion engine)?</p>
<p>Step 6: Funding</p> <p>Who: Business Planning, Fleet Managers, Facilities, IT</p>	<p>Q1: Has budget been secured for the purchase of the new low or zero emissions Fleet or Equipment?</p> <p>Q2: If infrastructure if not currently available, is there budget secured for the required Infrastructure?</p> <p><i>Example: Budget has been requested and approved by the appropriate department for the procurement of the new ZEV or LEV and associated infrastructure is currently available at site.</i></p> <p><i>Example: Budget has been requested and approved by the appropriate department for the procurement of the new ZEV or LEV, however associated infrastructure is not currently available. Additional budget requests are required to install charging infrastructure prior to procurement of Fleet and/or Equipment.</i></p> <p>Q1/2B: If not, are there alternative funding streams available (e.g. grants, rebates, sponsorship opportunities)?</p> <p>Q1B: If not, have additional operating expenses (e.g. keeping an asset in use beyond its useful life) been taken into account?</p>



It is important to note that while the desired technology from a Climate Change perspective is a Zero Emissions Vehicle, there are other options available on the market which also help to reduce fuel consumption and, by extension, greenhouse gas (GHG) Emissions (e.g. mild hybrid).

Optimizing Current Operations

Optimizing operations of in-service Fleet and Equipment will also contribute to a reduction in GHGs. These guidelines can be applied to existing Fleet and Equipment at any time.

Optimizing Current Operations	Guidelines
<p>Option 1: Asset Management</p> <p>Who: Fleet Managers, Fleet/Equipment Operators</p>	<ol style="list-style-type: none"> 1) Vehicle Utilization (allocation, rentals, pooling/sharing) <ul style="list-style-type: none"> ○ Ensure proper utilization levels ○ Are there opportunities to update/revise vehicle allocation (e.g. rentals, pooling/sharing)? 2) Maintenance and Repairs <ul style="list-style-type: none"> ○ Optimize workshop activities <ul style="list-style-type: none"> ▪ Are parts being replaced prematurely? ▪ Are service intervals too short/long? ▪ Is the technology operating efficiently? ○ Optimize preventative maintenance schedules 3) Repurposing Assets (Equipment) <ul style="list-style-type: none"> ○ Is there an opportunity to repurpose the asset in a different capacity (e.g. chainsaws from Forestry to Park Operations)? 4) Repurposing Assets (Fleet) <ul style="list-style-type: none"> ○ Is there an opportunity to repurpose the asset (within the life expectancy) in a different capacity (e.g. change off vehicles

	<ul style="list-style-type: none"> moving locations)? ○ Is there an opportunity to repurpose the asset (beyond the life expectancy) in a different capacity (e.g. buses as barriers/blockades) <p>5) Life Expectancy</p> <ul style="list-style-type: none"> ○ What is the expected useful life of the Fleet (or Equipment)? Can or should this be extended? ○ If not, refer to Disposal of Surplus City Assets Policy.
<p>Option 2: Operations Management</p> <p>Who: Fleet Managers, Fleet/Equipment Operators, Driver Training Staff, Enforcement, Environment</p>	<ol style="list-style-type: none"> 1) Route Optimization <ol style="list-style-type: none"> 1. Are drivers taking the most efficient route to their destination? 2) Driving Behaviour <ol style="list-style-type: none"> 1. Are drivers operating the vehicles responsibly (non-aggressive acceleration/braking, adhering to speed limits)? 2. Is the Idling Control By-law being adhered to? 3. Is there sufficient onboarding and safety training? If not, consider whether additional training programs may be required. 3) Right-Sizing <ol style="list-style-type: none"> 1. Is the right size/type of vehicle being used for the task? 2. Is there an opportunity to replace, repurpose, or convert vehicles to more fuel efficient alternatives (e.g. hybrids)? 4) Awareness and Training <ol style="list-style-type: none"> 1. Is there a need for additional awareness and/or training programs generally or for specific issues (e.g. to address aggressive driving/idling/route issues)? 5) By Laws and Policies <ol style="list-style-type: none"> 1. Does the Idling Control By-Law need to be updated and/or enhance? 2. Are additional enforcement procedures/practices required?
<p>Option 3: Fuel Switching</p> <p>Who: Fleet Managers</p>	<ol style="list-style-type: none"> 1) Alternative Fuels <ul style="list-style-type: none"> • Is there an opportunity to switch to alternative fuels (e.g. biodiesel)?