Specifications for Purchasing New Vehicles, Equipment and Vessels for the Port of Los Angeles (August 2019)

Introduction

In April 2019, Mayor Eric Garcetti released L.A.'s Green New Deal, which set aggressive goals for the City's sustainable future. Mayor Eric Garcetti's Green New Deal establishes L.A.'s position as a national leader for municipal fleet procurement, thus the City of Los Angeles, Harbor Department (Port) staff reviewed the Port's existing strategies to determine the current level of compliance with this goal. With minimal changes to these specifications, the Port is on track to adopt zero emission fleet technologies as they become feasible for Port operations. Attached to this document are the Port's procurement flowcharts for purchasing off-road diesel equipment, on-road heavy-duty vehicles, and off-road large spark-ignited equipment with their respective alternatives.

The following are specifications for purchasing new vehicles, equipment and harbor vessels for Port. It should be noted that the final selection in purchasing a new vehicle, equipment, or vessel should take into consideration the specific operational requirements for the Port's Divisions. In some cases, operational necessity may require purchasing vehicles of the same make (manufacturer) that already exists in the fleet in order to benefit from improved maintenance, training costs, and compatible charging infrastructure. The Port's Environmental Management Division (EMD) should be consulted for any deviations from the specifications below.

Passenger Cars (PCs), Light-Duty Vehicles (LDV), and Medium-Duty Vehicles (MDV)

New PCs/LDVs/MDVs must be electric vehicles if available and feasible. All new vehicles must meet the operational requirements of the Port's Divisions. If an electric vehicle is not available or feasible, then select a hybrid and/or CNG vehicle. For each vehicle class/type, the cleanest of Hybrid or CNG must be selected based on the vehicle's Environmental Performance (highest combined Smog and Greenhouse Gas Ratings) when an electric vehicle is not feasible. If neither hybrid nor CNG vehicles are available for a vehicle class/type, gasoline or diesel SULEVs[1] must be considered (if available) then followed by gasoline or diesel ULEVs[2], if SULEVs are not available. Select the vehicle with the highest combined Smog and Greenhouse Gas Ratings. The Smog and Greenhouse Gas Ratings for new vehicles are available at California Air Resources Board's (CARB) "Drive Clean" website at http://www.driveclean.ca.gov/.

See "General Guideline for Purchasing New Vehicles" for specific step by step instructions on how to purchase new PCs/LDVs/MDVs.

[1] Super Ultra Low Emission Vehicles
[2] Ultra Low Emission Vehicles

Harbor Craft

New diesel-powered harbor vessels must be equipped with propulsion and auxiliary engines that meet the cleanest applicable marine engine emission standards) in effect at the time of vessel acquisition. However, if electric, hybrid, alternatively-fueled (e.g. CNG, LNG), or gasoline engines meeting and/or exceeding the current cleanest marine engine emission standards are available and meet the Port's operational requirements, they should be given priority consideration over diesel engines in that specific order. All new engines must meet the operational requirements of the Port.

Whenever purchasing a new diesel-powered harbor vessel, please contact EMD to have the Port's Harbor Craft Fleet information updated as part of the CARB Harbor Craft regulation. EMD should also be contacted when a diesel-powered harbor vessel is taken out of service permanently, so the Port's Harbor Craft Fleet information can be updated. See "General Guidelines for Purchasing Other On-Road and Off-Road Equipment" for more details.

Off-Road Diesel Equipment and Alternatives

New off-road diesel equipment must be equipped with off-road engines that meet or exceed the cleanest applicable off-road diesel engine emission standards (e.g. Tier 4, Tier 4 Final) in effect at the time of equipment acquisition. However, if electric, hybrid, alternatively fueled (e.g., CNG, LNG), or gasoline equipment meeting the cleanest applicable off-road diesel equipment emission standards are available and meet the Port's operational requirements, they should be given priority consideration over diesel equipment in that specific order.

Whenever purchasing off-road equipment, please contact EMD to update the Port's Off-Road Diesel Vehicle fleet information (DOORS) as part of CARB's Off-Road Diesel regulation. See "General Guidelines for Purchasing Other On-Road and Off-Road Equipment" for more details.

Large Spark-Ignited (LSI) Off-Road Equipment and Alternatives

LSI equipment is defined as self-propelled, off-road equipment fueled by CNG, LNG, or gasoline powered engine with gross horsepower of 25 horsepower or greater, or is designed to produce 25 horsepower or greater. Examples of LSI equipment are forklifts, industrial tow tractors, single engine sweeper/scrubbers, and pieces of airport ground support equipment. LSI equipment definition does not include manlifts or boom hoists. New small off-road equipment must be electric-powered equipment (e.g., electric forklifts) if available and meet the specific operational requirements of the Port. If no electric equipment is available, hybrid equipment must be purchased. If no electric or hybrid equipment is available, then the new LSI equipment must meet or exceed the cleanest applicable LSI engine emission standard. The latest LSI engine emission standard applies to all 2010 and subsequent model engines.

Whenever purchasing any LSI equipment, please contact EMD to update the Port's LSI Off-Road Equipment fleet information as part of CARB's LSI regulation. See "General Guidelines for Purchasing Other On-Road and Off-Road Equipment" for more details.

On-Road Heavy-Duty Vehicles

New on-road heavy-duty vehicles must be either alternative-fuel heavy-duty vehicles (e.g., electric, CNG, LNG) or dual-fuel[3] heavy-duty vehicles which meet or exceed CARB low NOx on-road heavy-duty diesel engine emission standards (0.01 g/hp-hr PM, 0.02 g/hp-hr NOx) when available. However if electric or hybrid vehicles are available, and meet the Port's operational requirements, they should be given priority consideration over other equipment in that specific order. Additionally, if alternative-fuel or dual-fuel vehicles are not commercially available or would not meet the Port's operational requirements for the specified engine and chassis/body configurations, then the cleanest available heavy-duty gasoline or diesel vehicles must be considered. EMD must be contacted if diesel vehicle is chosen due to unavailability of electric, hybrid, or alternatively fueled vehicle.

See "General Guidelines for Purchasing Other On-Road and Off-Road Equipment" for more details.
NOTE: For all categories above, if the cost of the equipment is determined to be prohibitive by the Port, then choose the next feasible and cleanest equipment.

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[3] Dual-fuel heavy-duty vehicle refers to a heavy-duty vehicle with a diesel engine that uses alternative fuels (e.g., LNG, LPG) in combination with diesel fuel with the alternative fuel supplying 85% of the total engine fuel requirement on a BTU basis.

General Guideline for Purchasing New Vehicles
(PCs, LDVs, MDVs)

Introduction

This guideline and the accompanying decision tree are intended to provide general guidance for purchasing the cleanest and most efficient new vehicles. The final decision in purchasing any new vehicle needs to take into consideration the specific operational requirements of the City of Los Angeles, Harbor Department's divisions and whether these vehicles can meet these requirements. In some cases, operational necessity may require purchasing vehicles of the same make (manufacturer) that already exists in the fleet in order to benefit from improved maintenance, training costs, and compatible charging infrastructure. However, the objective is to always purchase the cleanest vehicle feasible.

When purchasing other types of equipment please refer to "General Guidelines for Purchasing Other On-Road and Off-Road Equipment." Please refer to "Specifications for Purchasing New Vehicles, Equipment and Vessels for the Port of Los Angeles" for more details on what specifications these types of equipment need to meet prior to procurement. The Port's Environmental Management Division (EMD) must be consulted for any deviations from the specifications below.

The primary tool for buying new clean vehicles is the California Air Resources Board's (CARB) "Drive Clean" website at http://www.driveclean.ca.gov/. The site contains basic information on all new vehicle makes/models (e.g., engine displacement, number of cylinders, transmission type, fuel/technology) manufactured from 2000 to present, up to 10,000 pounds gross vehicle weight (GVW). For each vehicle make/model, ratings of the Emission Certification Standard and the Environmental Performance (EP) are provided in the form of "Smog Rating" and "Greenhouse Gas Rating"[1], respectively. Each rating is from 1 to 10 with the cleanest and most efficient cars receiving the highest scores. The Smog Ratings are based on the vehicle's Non-Methane Organic Gases (NMOG) and Oxides of Nitrogen (NOx) emission levels while the Greenhouse Gas Ratings are based on a calculated CO_2-equivalent value (Carbon Dioxide). If the vehicle of interest is not found on the "Drive Clean" site (e.g., greater than 10,000 pounds GVW), another source of information for the vehicle's emission standard is CARB's On-Road New Vehicle and Engine Certification Program website at http://www.arb.ca.gov/msprog/onroad/cert/cert.php .

Smog & Greenhouse Gas Rating

The following tables present the definition of the Smog and Greenhouse Gas Ratings. The Smog Rating table (Table 1) provides the rating from 1 to 10, and the corresponding CARB Emission Standards and emission rates (g/mile). The Greenhouse Gas Rating table (Table 2) provides the scores from 1 to 10, along with the corresponding CO_2 equivalent emission rates (g/mile).

[1] The EP label is required on all new cars sold in California that are manufactured after January 1, 2009. On CARB's "DriveClean" site, Smog Ratings are provided for every vehicle dating back to model year 2000. Beginning with model year 2009, Greenhouse Gas Ratings are provided when available from manufacturers.

If the Smog Rating is not available on the "Drive Clean" website, but the CARB Vehicle Emission Standard of a vehicle is known (e.g. PZEV, SULEV, etc.), Table 1 below can be used as a quick reference to find the Smog Rating. For example, if a vehicle has an Emission Standard of Bin 3, then the corresponding Smog Rating is 7 using Table 1. If the Greenhouse Gas Rating is not available on the "Drive Clean" website, it can be obtained from the vehicle's Environmental Performance label or from the manufacturer/dealer.

Table 1: Smog Rating

Smog Rating	Emission Standard	NMOG + NO_x (gram per mile)
10	ZEV, Bin 1	0.000
9	SULEV20, TZEV, PZEV	0.020 - 0.030
8	SULEV30, SULEV, Bin 2	0.030
7	ULEV50, ULEV70, Bin 3	0.05, 0.07, 0.085
6	ULEV, ULEV125, Bin 4	0.110 - 0.125
5	LEV, LEV160, Bin 5	0.160
4	LEV option 1, Bin 6	0.190 - 0.200
3	Bin 7	0.240
2	SULEV lg trucks, Bin 8	0.325
1	ULEV & LEV lg trucks	0.343 - 0.395

Definitions:
ZEV = Zero Emission Vehicle
SULEV = Super Ultra-Low Emission Vehicle
TZEV = Transitional Zero Emissions Vehicle
PZEV = Partial Zero Emission Vehicle
ULEV = Ultra-Low Emission Vehicle
LEV = Low Emission Vehicle
Bin 1 to 8 = EPA's certification bins

Table 2: Greenhouse Gas Rating

Greenhouse Gas Rating	CO_2 Equivalent (grams per mile)
10	0-200
9	201-243
8	244-291
7	292-335
6	336-378
5	379-456
4	457-539
3	540-613
2	614-658
1	659+

Guideline for Purchasing New Vehicles

The following guideline describes the steps which will assist in identifying and purchasing the cleanest and most efficient vehicles, making use of the information provided from the "Drive Clean" website. The Port's objective should always be to purchase the cleanest "feasible" vehicle. The steps below are designed to assist you in accomplishing that objective along with the associated decision tree.

1) Identify Vehicle Class/Type:

   The first step in purchasing a new vehicle is to identify the general class and type of vehicle of interest. The vehicle classes covered under this guideline include passenger cars (PCs), light-duty vehicles (LDVs), and medium-duty vehicles (MDVs). Under each vehicle class, there can also be various vehicle types. For instance, under PCs, the vehicle types can include 4-door compact sedans or 4-door sedans. Under LDVs and MDVs, the vehicles types can include SUVs, passenger/cargo vans, and various types of pickup trucks.

2) Determine if an electric vehicle is available:

   A search must be conducted to determine if an electric version of the identified vehicle class/type is available and feasible. To search for electric vehicles, access the "Drive Clean" website, and do a quick search by vehicle class/type by clicking one of the vehicle icons under "By Category" (e.g. sedans, SUVs, vans, pickups). The search results show a listing of all vehicles using different technologies and fueling in that vehicle class ranked from highest to lowest Smog and Greenhouse Gas Ratings. An alternative way to perform a search is by clicking on "Technologies & Fuel Types" and selecting "View Vehicles" under the technology of interest (e.g. Battery Electric). The search results in this case show a listing of all vehicles available with that technology or fuel type from

different vehicle manufacturers and in different vehicle classes. Search results are for the current model year. Other model years can be selected from a drop-down menu.

3) Selecting an electric vehicle and charging infrastructure:

When selecting an electric vehicle for purchase, the duty cycle and charging cycle needs to be considered prior to purchase. A comparison between electric vehicles can be made using the U.S. Department of Energy "Fuel Economy" website at http://www.fueleconomy.gov/ . Under the "Find & Compare Cars" heading, click on the "Compare Side-by-Side" link. Input the information of the desired electric vehicles found in Step 2 from the "Drive Clean" website and compare. Review the estimated Total Range of the vehicles and determine if any are feasible for the expected daily mileage (duty cycle) of the purchased vehicle.

Determine the type of charging that would be required for the purchased vehicle, if there is enough power to supply the charger, and if the charger can be readily installed on Port property. All new Plug-in Electric Vehicles (PEV) can be charged using a 120-volt standard connector (J1772). Fully recharging an electric vehicle from an empty battery can take up to 17 hours using a 120-volt charging plug. Fully charging an electric battery from an empty battery can take up to 4 to 8 hours using a 240-volt charger. The 240-volt requires the purchase and installation of specialized charging equipment. A "fast charge" to 80% capacity takes at least 30 minutes using a 440-volt charging plug. A 440-volt charging plug varies by car manufacturer. An adapter maybe required if current electric charging infrastructure cannot charge the desired vehicle. A list of charging along with power supply needed for the vehicle can be found on the "Drive Clean" website at http://driveclean.ca.gov/pev/Charging.php .

In some cases, operational necessity may require purchasing vehicles of the same make (manufacturer) that already exists in the fleet in order to benefit from improved maintenance, training costs, and compatible charging infrastructure. However, the objective is to always purchase the cleanest vehicle feasible. If electric technologies are not feasible, then hybrid and/or CNG vehicles may be selected, per the process outlined in Step 4 below.

4) Determine whether hybrid and/or CNG vehicle is available:

If electric vehicle purchase is not feasible, a search must be conducted to determine if hybrid and/or CNG (alternative fuel) versions of the identified vehicle class/type are available and feasible. To search for hybrid and/or CNG vehicles, access the "Drive Clean" website, and do a quick search by vehicle class/type by clicking one of the vehicle icons under "By Category" (e.g., sedans, SUVs, vans, pickups). The search results show a listing of all vehicles using different technologies and fuels in that vehicle class, ranked from highest to lowest Smog and Greenhouse Gas Ratings. An alternative way to perform a search is by clicking on "Technologies & Fuel Types" and selecting "View Vehicle" under the technology of interest (e.g. Hybrid Electric, CNG, etc.). The search results in this case show a listing of all vehicles available with that technology or fuel type from different vehicle

manufacturers and in different vehicle classes. Search results are for the current model year. Other model years can be selected from a drop-down menu.

5) Select the hybrid and/or CNG vehicle with the combined highest Smog and Greenhouse Gas Ratings:

The primary tool for determining and comparing vehicles' Smog and Greenhouse Gas Rating is the "Drive Clean" website. The search results from Step 4 above show a listing of vehicles listed from highest to lowest Smog and Greenhouse Gas Ratings.

a. Identify all the comparable new hybrid and/or CNG vehicles in the search results from Step 4, above.
b. For these hybrid and/or CNG vehicles, find their Smog and Greenhouse Gas Ratings and add these scores together.
c. Select the hybrid or CNG vehicle with the highest combined Smog and Greenhouse Gas Ratings.
d. In a case where the highest combined Smog and Greenhouse Gas Ratings are tied but individual scores are different, (e.g. Vehicle X with Smog Rating 8 and Greenhouse Gas Rating 9 vs. Vehicle Y with Smog Rating 9 and Greenhouse Gas Rating 8), preference should be given to the higher Smog Rating.
e. If the Smog and Greenhouse Gas Ratings of vehicles are identical, the choice should be based on Port division preference.

For example, from the following list of comparable SUV hybrids, the 2015 Ford Fusion has the best EP score among the three vehicles, which can be selected for purchasing.

Model Year	Vehicle Make	Vehicle Model	Smog Rating	Greenhouse Gas Rating	Total Score	Emissions Cert. Std.
2015	Ford	Fusion HYBRID FWD	7	9	16	Bin 3
2015	Nissan	Pathfinder HYBRID 4WD	6	6	12	LEV-II ULEV
2015	Toyota	Highlander HYBRID 4WD	8	7	15	LEW-II SULEV

In some cases, operational necessity may require purchasing vehicles of the same make (manufacturer) that already exist in the fleet, in order to benefit from improved maintenance and training costs, however the objective is always to purchase the cleanest vehicle feasible. If hybrid or CNG technologies are not feasible, gasoline or diesel vehicles may be selected, per the process outlined in Step 6, below.

6) <u>If Hybrid and/or CNG vehicles are **NOT** available, follow the steps below:</u>

If hybrid and/or CNG vehicles meeting operational criteria are not available, it is necessary to select a gasoline or diesel vehicle with the highest Smog and Greenhouse Gas Ratings.

a. Identify all the comparable new gasoline/diesel vehicles following the same instructions from Step 4 above for a gasoline/diesel vehicle search.
b. For these gasoline/diesel vehicles, find their Smog and Greenhouse Gas Ratings and add them together.
c. Select the vehicle with the highest combined Smog and Greenhouse Gas Ratings.
d. In a case where the highest combined Smog and Greenhouse Gas Ratings are tied but individual scores are different, (e.g. Vehicle X with Smog Rating 8 and Greenhouse Gas Rating 9 vs. Vehicle Y with Smog Rating 9 and Greenhouse Gas Rating 8), preference should be given to the higher Smog Rating.
e. If the Smog and Greenhouse Gas Ratings of vehicles are identical, the choice is based on division preference.

In some cases, operational necessity may require purchasing vehicles of the same make (manufacturer) that already exist in the fleet, in order to benefit from improved maintenance and training costs, however the objective is always to purchase the cleanest vehicle feasible.

NOTE: If the cost of the equipment is determined to be prohibitive by the Department, then choose the next feasible and cleanest equipment.

General Guidelines for Purchasing Other On-Road and Off-Road Equipment

The following guidelines and the accompanying flow diagrams are intended to provide guidance for purchasing the following equipment:

1) New Off-Road Diesel Equipment
2) New On-Road Heavy-Duty Vehicles (up to 750 hp)
3) New Off-Road Large Spark-Ignited (LSI) Equipment (under 25 hp)

These guidelines are based on a hierarchy of available technologies in each of the three categories. The final decision in purchasing any new vehicle would also take into consideration the specific operational requirements of the City of Los Angeles, Harbor Department's (Port) divisions (which will be using these vehicles) and whether these vehicles can meet these requirements. Alternative fuels include but are not limited to propane, CNG, and LNG. If technologies are not feasible, hybrid, gasoline, or diesel vehicles may be selected. When purchasing passenger cars, light duty and medium duty vehicles; please refer to "General Guideline for Purchasing New Vehicles (PCs, LDVs, MDVs)."

The following are instructions that correspond to the decision tree for each category. The steps are to be followed in order until an available technology is found. Please refer to "Specifications for Purchasing New Vehicles, Equipment and Vessels for the Port of Los Angeles" for more details on what specifications these types of equipment need to meet prior to procurement.

The Port's objective should always be to purchase the cleanest "feasible" vehicle. The steps below are designed to assist in accomplishing that objective. In some cases, operational necessity may require purchasing vehicles of the same make (manufacturer) that already exists in the fleet in order to benefit from improved maintenance, training costs, and compatible charging infrastructure. Additionally, the Port's Environmental Management Division (EMD) must be consulted for any deviations from the specifications below.

1) New Off-Road Diesel Equipment (up to 750 hp)

a. Determine whether electric equipment is commercially available as an alternative to diesel.
b. If NO, go to step F
c. If YES, determine if charging infrastructure is available
d. If YES, select electric equipment. (STOP)
e. If NO, determine if charging infrastructure can be obtained
f. If YES, select electric equipment. (STOP)
g. If NO, determine whether hybrid equipment is commercially available.
h. If YES, select hybrid equipment. (STOP)
i. If NO, determine whether alternate fuel equipment is commercially available.
j. If YES, select alternative fuel equipment. (STOP)
k. If NO, determine the cleanest available off-road diesel equipment. Cleanest off-road diesel equipment is equipped with engines that meet or exceed Tier 4 engine standard.

2) **New On-Road Heavy Duty Vehicles**

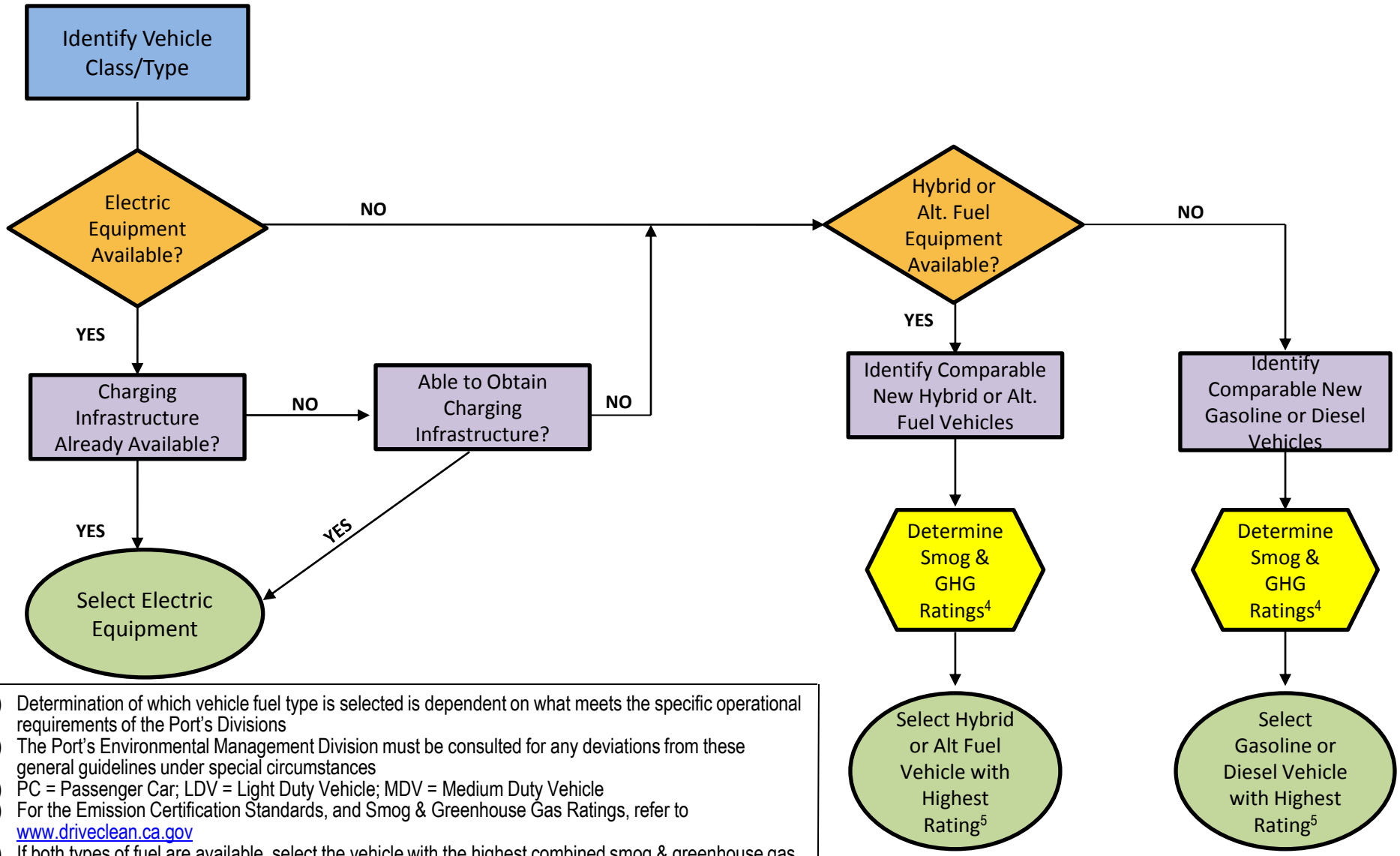
a. Determine whether electric equipment is commercially available as an alternative to diesel.
b. If NO, go to step G
c. If YES, determine if electric charging infrastructure is available

d. If YES, select electric equipment. (STOP)
e. If NO, determine if charging infrastructure can be obtained
f. If YES, select electric equipment. (STOP)
g. If NO, determine whether hybrid equipment is commercially available.
h. If YES, select hybrid equipment. (STOP)
i. If NO, determine whether alternative fuel equipment is commercially available.
j. If YES, select alternative fuel equipment. (STOP)
k. If NO, determine whether dual-fuel equipment is commercially available. (This includes dual fuel using CNG, LNG, etc. that meets or exceeds the 2010 on-road heavy-duty diesel engine emission standards).
l. If YES, select dual-fuel equipment. (STOP)
m. If NO, determine the cleanest heavy-duty gasoline or diesel vehicle. Contact EMD if gasoline or diesel heavy-duty vehicle is selected due to unavailability of equipment fueled by other fuel types.

3) **New Off-Road Large Spark-Ignited (LSI) Equipment (under 25 hp)**
   a. Determine whether electric equipment is commercially available as an alternative to diesel.
   b. If NO, go to step G
   c. If YES, determine if electric charging infrastructure is available
   d. If YES, select electric equipment. (STOP)
   e. If NO, determine if charging infrastructure can be obtained
   f. If YES, select electric equipment. (STOP)
   g. If NO, determine whether hybrid equipment is commercially available.
   h. If YES, select hybrid equipment. (STOP)
   i. If NO, determine whether alternate fuel equipment is commercially available.
   j. If YES, select alternative fuel equipment. (STOP)
   k. If NO, determine the cleanest available gasoline equipment meeting or exceeding current LSI engine emission standards.

NOTE: If the cost of the equipment is determined to be prohibitive by the Department, then choose the next feasible and cleanest equipment.

General Guideline for Purchasing New Vehicles (PCs, LDVs, MDVs) [1,2,3]

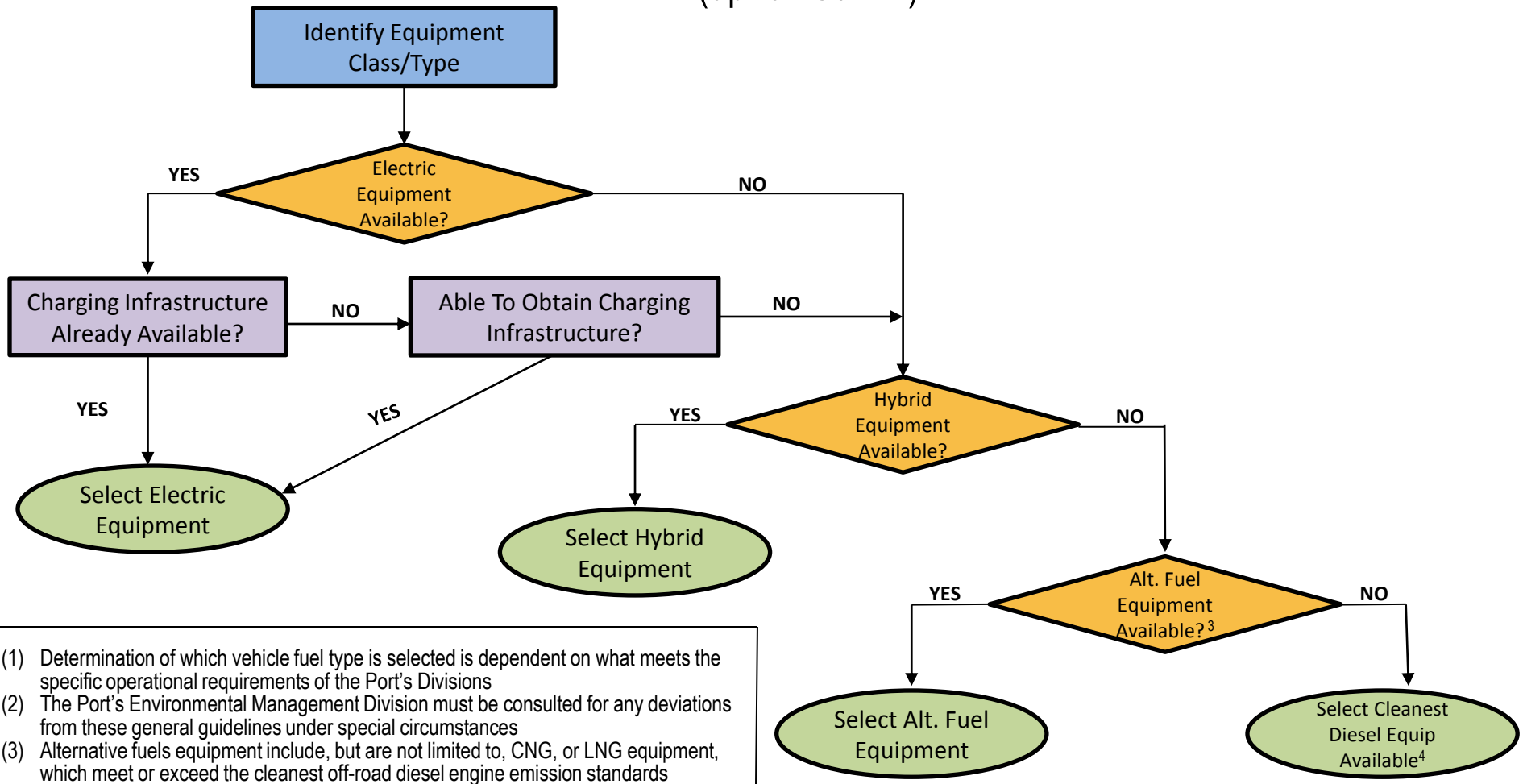


(1) Determination of which vehicle fuel type is selected is dependent on what meets the specific operational requirements of the Port's Divisions
(2) The Port's Environmental Management Division must be consulted for any deviations from these general guidelines under special circumstances
(3) PC = Passenger Car; LDV = Light Duty Vehicle; MDV = Medium Duty Vehicle
(4) For the Emission Certification Standards, and Smog & Greenhouse Gas Ratings, refer to www.driveclean.ca.gov
(5) If both types of fuel are available, select the vehicle with the highest combined smog & greenhouse gas ratings

Note: If the cost of the equipment is determined to be prohibitive by the Department, then choose the next feasible and cleanest equipment. In some cases, operational necessity may require purchasing vehicles of the same make (manufacturer) that already exists in the fleet in order to benefit from improved maintenance, training costs, & compatible charging infrastructure. Port Environmental Management should be consulted for any deviations from the specifications above.

General Guidelines for Purchasing New Off-Road Diesel Equipment and Alternatives[1,2]

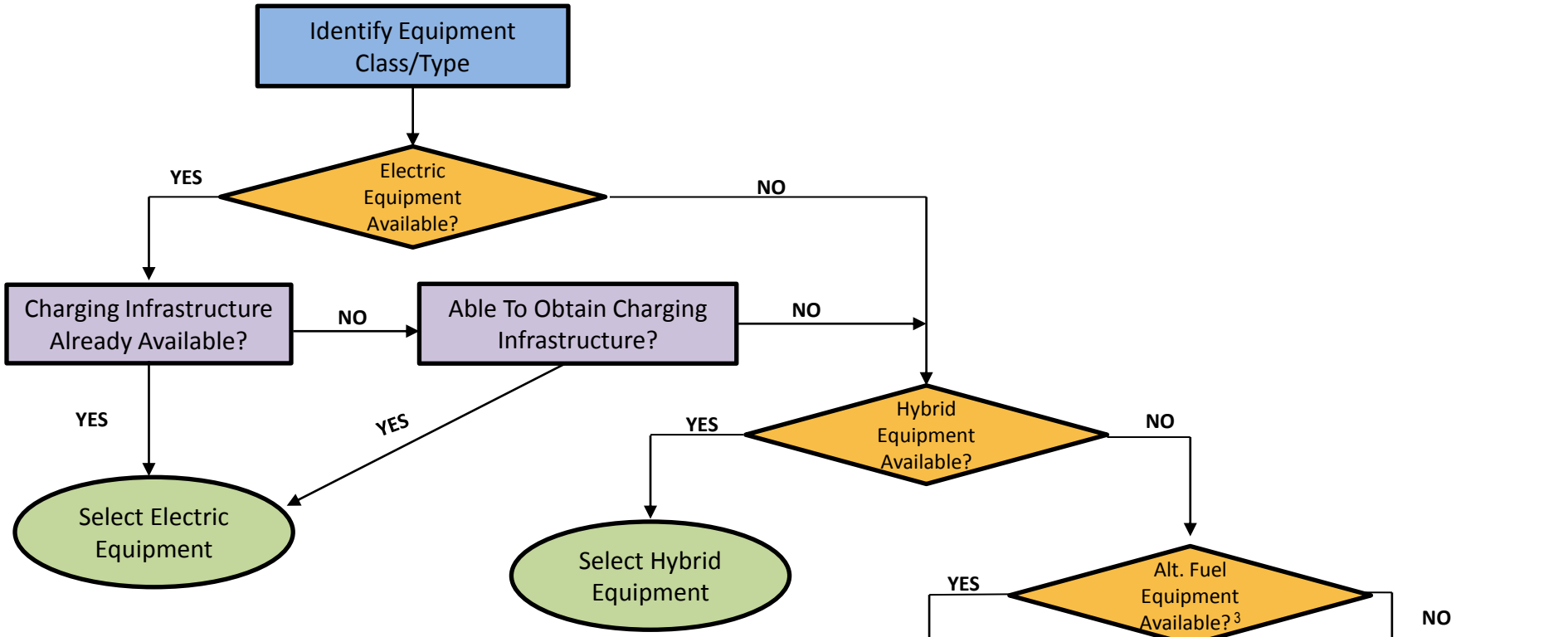
(up to 750 HP)



(1) Determination of which vehicle fuel type is selected is dependent on what meets the specific operational requirements of the Port's Divisions
(2) The Port's Environmental Management Division must be consulted for any deviations from these general guidelines under special circumstances
(3) Alternative fuels equipment include, but are not limited to, CNG, or LNG equipment, which meet or exceed the cleanest off-road diesel engine emission standards
(4) Cleanest off-road diesel equipment are equipped with engines that meet Tier 4 Final or better standards

Note: If the cost of the equipment is determined to be prohibitive by the Department, then choose the next feasible and cleanest equipment. In some cases, operational necessity may require purchasing vehicles of the same make (manufacturer) that already exists in the fleet in order to benefit from improved maintenance, training costs, & compatible charging infrastructure. Port Environmental Management should be consulted for any deviations from the specifications above.

General Guidelines for Purchasing New On-Road Heavy-Duty Vehicles[1,2]

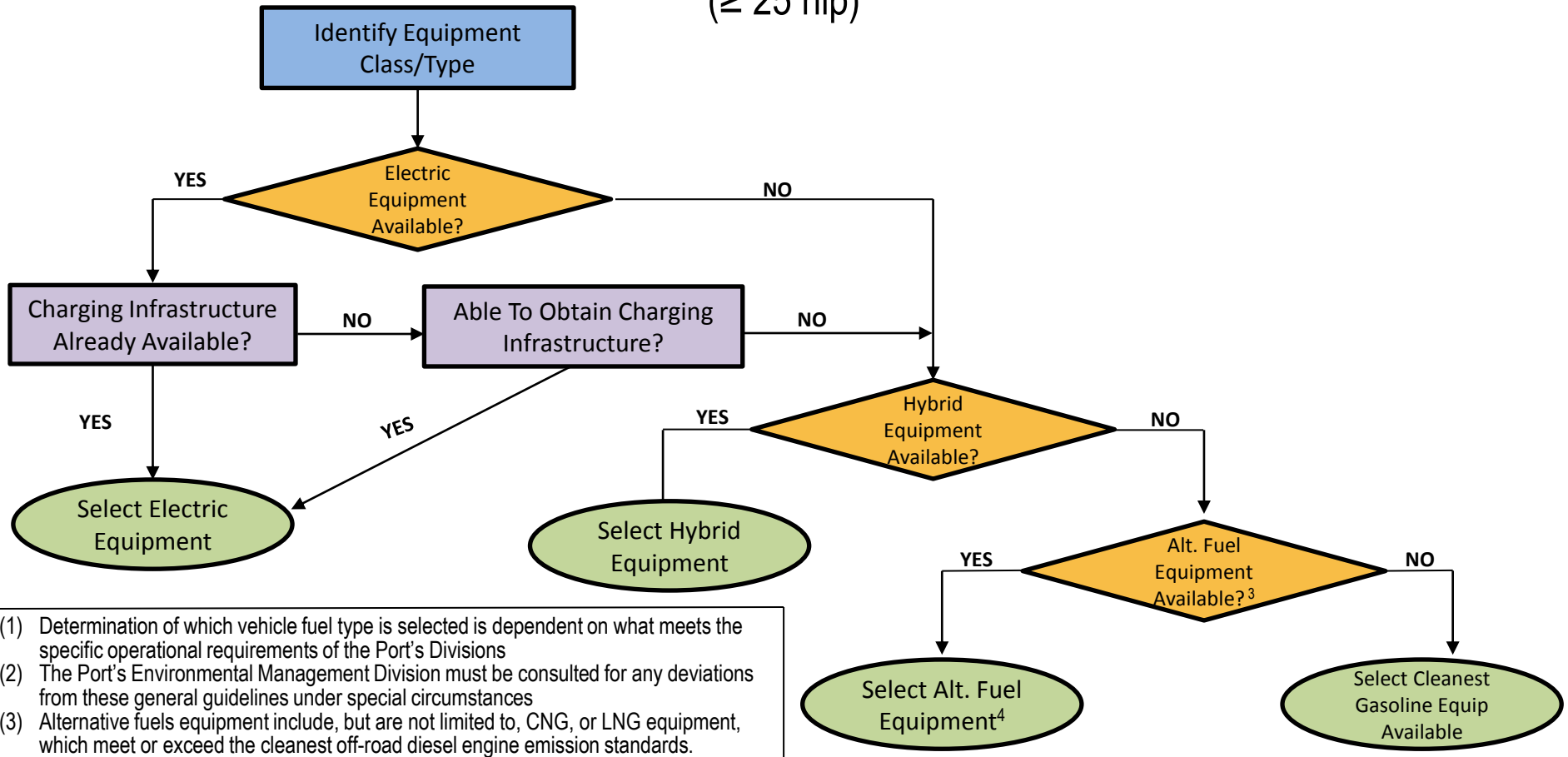


(1) Determination of which vehicle fuel type is selected is dependent on what meets the specific operational requirements of the Port's Divisions.
(2) The Port's Environmental Management Division must be consulted for any deviations from these general guidelines under special circumstances
(3) Alternative fuels equipment include, but are not limited to, CNG, or LNG equipment, which meet or exceed the cleanest off-road diesel engine emission standards.
(4) Dual-Fuel vehicles must use alternative fuel to supply at least 85% of the total engine fuel requirement (e.g., HPDI trucks), and must meet or exceed the 2010 on-road heavy-duty diesel engine emission standards.

Note: If the cost of the equipment is determined to be prohibitive by the Department, then choose the next feasible and cleanest equipment. In some cases, operational necessity may require purchasing vehicles of the same make (manufacturer) that already exists in the fleet in order to benefit from improved maintenance, training costs, & compatible charging infrastructure. Port Environmental Management should be consulted for any deviations from the specifications above.

General Guidelines for Purchasing New Off-Road Large Spark-Ignited (LSI) Equipment and Alternatives[1,2]

(≥ 25 hip)



(1) Determination of which vehicle fuel type is selected is dependent on what meets the specific operational requirements of the Port's Divisions
(2) The Port's Environmental Management Division must be consulted for any deviations from these general guidelines under special circumstances
(3) Alternative fuels equipment include, but are not limited to, CNG, or LNG equipment, which meet or exceed the cleanest off-road diesel engine emission standards.
(4) Alternative fuels equipment must meet or exceed the current LSI engine emission standards.

Note: If the cost of the equipment is determined to be prohibitive by the Department, then choose the next feasible and cleanest equipment. In some cases, operational necessity may require purchasing vehicles of the same make (manufacturer) that already exists in the fleet in order to benefit from improved maintenance, training costs, & compatible charging infrastructure. Port Environmental Management should be consulted for any deviations from the specifications above.