Proposed Updates to Highway Mobile Source Classification Codes (SCC)

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Source Classification Codes (SCCs)

- SCCs are 10 digit numerical values used to classify different types of anthropogenic emission activities.

- Currently highway mobile sources are classified into 156 unique SCCs.

- MOVES users can specify output into SCCs.

- SCCs are used in other EPA applications, such as SMOKE.

Current Classifications

- Current Highway vehicle onroad mobile source SCCs contain codes that identify:
  - Onroad source.
  - Fuel type.
  - Vehicle class.
  - Road type.
  - Time interval.
- Time interval is not used by MOVES.

Current SCC Classifications (AABBCCCDDE)

AA	Sector Description
22	Mobile sources

BB	Fuel Type Description
01	Gasoline
30	Diesel

CCC	Vehicle Type Description
001	Light-Duty Vehicles (Passenger Cars)
020	Light-Duty Gasoline Trucks (0-6,000 lbs. GVWR)
040	Light-Duty Gasoline Trucks (6,001-8,500 lbs. GVWR)
060	Light-Duty Diesel Trucks (0-8,500 lbs. GVWR)
070	Heavy-Duty Gasoline Vehicles and Buses (8501+ lbs. GVWR)
071	Class 2b Heavy-Duty Diesel Vehicles (8501-10,000 lbs. GVWR)
072	Heavy-Duty Diesel Vehicles (10,001-19,500 lbs. GVWR) Class 3, 4 & 5.
073	Heavy-Duty Diesel Vehicles (19,501-33,000 lbs. GVWR) Class 6 & 7.
074	Heavy-Duty Diesel Vehicles (>33,001 lbs. GVWR) Class 8a & 8b.
075	Diesel Transit and School Buses
080	Motorcycles (Gasoline)

Current SCC Classifications (AABBCCCDDE)

DD	Road Type Description
11	Rural Interstate
13	Rural Other Principal Arterial
15	Rural Minor Arterial
17	Rural Major Collector
19	Rural Minor Collector
21	Rural Local
23	Urban Interstate
25	Urban Freeway
27	Urban Principal Arterial
29	Urban Minor Arterial
31	Urban Collector
33	Urban Local

E	Time interval
0	Total
1	Time 1
2	Time 2
3	Time 3
4	Time 4

Problems and Issues

- Current SCCs better match vehicle classes and road types used in previous models (MOBILE6).
- Available activity data better matches source types and road types used in MOVES.
- Mapping between MOVES inputs and results and current SCCs is difficult.
- Current SCCs do not account for alternate fuels.
- Current SCCs are more detailed than necessary for some applications (such as the NEI), but different resolution will be needed for other applications.
- Current SCCs are needed for speciation.

Speciation

- Current SCC vehicle classes are based on vehicle emission certification weight classifications.

- Vehicle classes by emission standards assist in breaking down emission results into chemical species (speciation) needed for air quality analysis and toxic emissions.

- Proper speciation requires breakout of results by fuel properties.

- Speciation will now be done internally by MOVES.

Proposed Changes to SCCs

- Now that speciation is done internally by MOVES, vehicle classifications no longer need to reflect emission standards for speciation.

- New SCCs can be devised to better reflect the inputs and outputs used by MOVES and the available activity sources.

Proposed
New SCC Classifications

- Similar 10 digit format (AAFFVVRRPP).
  - (AA) Mobile source (22)
  - (FF) MOVES Fuel Types.
  - (VV) MOVES Source Types.
  - (RR) MOVES Road Types.
  - (PP) MOVES Emission Processes.
- Make use of the existing MOVES codes.
- Can allow for the use of aggregated emission processes, fuel types and vehicle classes.

Advantages

- Results from MOVES can be directly placed into categories by SCC without allocations.

- Codes used in the SCCs can be the same as the codes used in MOVES.

- Activity information (such as vehicle miles traveled) can be applied to rates by SCC or used directly as MOVES input without allocations.

- Mapping MOVES processes to SCCs will no longer depend on calendar year or model year.

MOVES Fuel Types

fuelTypeID	Fuel Type Description
1	Gasoline
2	Diesel Fuel
3	Compressed Natural Gas (CNG)
4	Liquefied Petroleum Gas (LPG)
5	Ethanol (E85)
9	Electricity

MOVES Source Types

sourceTypeID	sourceTypeName
11	Motorcycle
21	Passenger Car
31	Passenger Truck
32	Light Commercial Truck
41	Intercity Bus
42	Transit Bus
43	School Bus
51	Refuse Truck
52	Single Unit Short-haul Truck
53	Single Unit Long-haul Truck
54	Motor Home
61	Combination Short-haul Truck
62	Combination Long-haul Truck

MOVES Road Types

roadTypeID	Road Type Description
1	Off-Network
2	Rural Restricted Access
3	Rural Unrestricted Access
4	Urban Restricted Access
5	Urban Unrestricted Access
8	Rural Ramps
9	Urban Ramps

MOVES Emission Processes

processID	Emission Process Name
1	Running Exhaust
2	Engine Start Exhaust
9	Brake Wear
10	Tire Wear
11	Evaporative Permeation
12	Evaporative Fuel Vapor Venting
13	Evaporative Fuel Leaks
15	Crankcase Running Exhaust
16	Crankcase Start Exhaust
17	Crankcase Extended Idle Exhaust
18	Refueling Displacement Vapor Loss
19	Refueling Spillage Loss
90	Extended Idle Exhaust
91	Auxiliary Power Exhaust

Aggregated Emission Processes

- Not all emission processes need to be explicitly processed by SMOKE.

- Processes can be easily combined, as long as their activity basis is identical (e.g., VMT).

- Aggregated processes would be assigned a unique SCC process ID value.

Example Aggregated Processes

processID	Aggregated Process Description
00	All processes.
50	All exhaust (1,2,15,16,17,90,91).
51	Exhaust, except extended idle and APU (1,2,15,16,17).
52	Extended idle and Auxiliary Power Unit exhaust (90,91)
60	All evaporative and refueling (11,12,13,18,19).
61	Evaporative (11,12,13).
62	Refueling (18,19).

Impacts of New SCCs

- SCCs can explicitly account for fuel types other than gasoline and diesel.

- Activity by SCC can be used directly in MOVES without allocations.

- Comparison of old and new SCC results will be difficult.

- SCCs will no longer reflect weight (regulatory) classifications of vehicles.

  - MOVES output will be adding regulatory classification.

Implementation

- Many scripts used to process MOVES results may need to be updated to use the new SCCs.

- Several tables in the default MOVES database will need to be altered.

- The number of SCCs will increase and vary depending on MOVES categories.

- Other issues may arise.