LADCO Responses to EPA's January 6th Preliminary Interstate Ozone Transport Modeling Data for the 2015 Ozone National Ambient Air Quality Standard - Notice of Data Availability

[EPA–HQ–OAR–2016–0751; FRL–9958–02– OAR].

Lake Michigan Air Directors Consortium (LADCO) states and staff have reviewed the significant quantity of data released under this Notice of Data Availability (NODA) and convened two separate committees to discuss impact and solutions for some of the problematic data. While our assessment is that overall the data meets our expectations. LADCO identified 4 critical areas of comment for the NODA. We believe that most of the information to solve these problems is currently available and changes should be made before a final rule promulgation based on these results. For those elements where improved data could not be obtained in time for this NODA we ask that EPA work with the states to outline a process for the states to acquire and submit the data as soon as possible.

Electric Utility Growth and IPM model.

LADCO and the states have repeatedly commented over the last 3 years over the applicability of EPA's Integrated Planning Model (IPM) results for regional air quality planning. Those comments have been, and continue to be related to 3 separate issues.

a. IPM is an economic model that is attempting to calculate the least cost solution to air pollution related economies including control costs, fuel costs, control availability, and generation dispatch. Tools related to IPM are then used to translate those economic solutions into emissions estimates for the future year. While economic models can be informative about the changes one might expect in the electric utility sector with a given control scenario, economic models can be quite problematic when it comes to setting a baseline for activity. The reason is that there are many decisions that are made within the system that are independent of cost and price. The net effect of this within the IPM model based predictions EPA is using are problematic fuel mix and biased dispatch to plants in a different geographic area than in the base year. Many of these changes can require significant infrastructure changes that may not be planned.
b. IPM has a long history of shuttering active coal plants because it decides that they have limited economic viability. Repeatedly, those plants have not shut down and the resulting budgetary problems of a large older plant with higher emissions rates than the average plant can mean difficulty for that state in achieving an EPA defined budget. This latest round of EPAs runs has followed past exercises and retired significant units in the Midwest including Columbia Power Plant in central Wisconsin, and Oak Creek near Milwaukee, and Dan E. Karn north of Saginaw Michigan.
c. IPM simplifies its numerical representation of the Electric Utility System to provide reasonable run times. Currently some plants are aggregated into "model plants" and the model runs for winter and summer seasons instead of all 8760 hours per year. This process can lead to unrealistic results like modeled generation exceeding the physical capacity of a unit. Therefore to develop the best emissions estimates from IPM, EPA must disaggregate the results to real plants and spread the seasonal emissions out to all hours.

In the final CSAPR update rule EPA has partially mitigated these problems by not directly using IPM outputs in their budget-defining calculations. This has largely, although not completely, mitigated the impact of these problems. EPA should continue to use and improve their techniques to define budgets as they did in the final CSAPR update.

Onroad Mobile Sources

LADCO continues to work with various groups including the Coordinating Research Council, Metropolitan Planning Organizations (MPOs), and states to improve the inputs to MOVES and the estimate methodologies MOVES uses. Because of the difficulty in running national runs of MOVES, even in cloud-based computing environments where it takes over 35,000 CPU hours to generate 1-year's emissions rates, LADCO and most areas have become increasingly reliant on EPA for Onroad based estimates. That means that we must provide MOVES inputs much earlier in EPA's modeling inventory development process. Until EPA can create models and tools that reduce that computational burden we will need to rely on EPA's results.

LADCO and the states reviewed the NODA data files and identified 4 aspects of the moves inputs that we would like EPA to examine and work with LADCO to improve. They are:

a. Why is diesel idling such a dominant contributor to the 2023 inventories? LADCO's review of the emissions estimates provided by EPA shows that the diesel idling components of the 2023 inventory contribute significant quantities of NOX emissions to the inventory. Chart 1 Shows the relative contribution from diesel idling

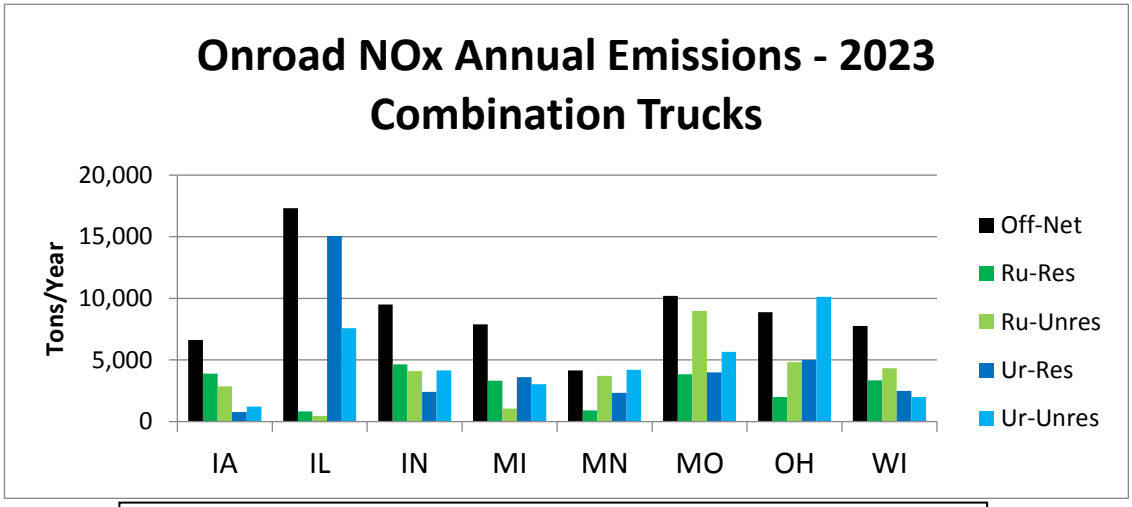


Chart 1. 2023 Combination Truck Emissions by Emission Type.

b. Why is there significant increases in light duty diesel vehicle populations and vehicle miles traveled given the recent Volkswagen legal actions? Is EPA planning on updating the future year fleet mix and travel to be more reflective of this reality?

c. There is a 40+ fold increase in E85 from 2011 to 2023. Does this make sense? Why do the 2017 numbers have nearly a 600 times increase from 2011(?) in E85?

LADCO is recommending to our states that they update the 2023 VMT estimates in the form of SMOKE VMT files. The states are working to update this info with their MPO's but given schedules for updated modeling runs necessary for the travel demand models, this information will not be available to EPA before the end of the comment period. We hope EPA will be receptive to this data at that time.

LADCO will continue to enhance our review of EPA's MOVES inputs and share those with states and EPA. Chart 2 below shows the 2011 to 2023 absolute changes in emission by sector. This graphic helped LADCO identify changes in specific sectors that are most likely to influence results. Graphics are available that explore the many reports LADCO generates to characterize these inputs. We use the LADCO MOVES Tool. It is an R based tool that extracts all the MOVES inputs including SMOKE files and generates national, state, and county level reports of numerous input variables. You can find the latest reports at www.ladco.org/tech/emis/LMT/

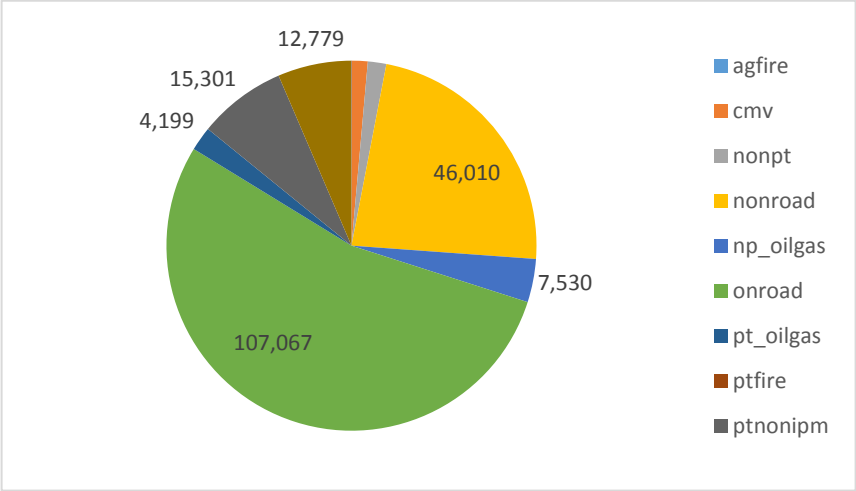


Chart 2. Absolute Annual Contribution to 2011 to 2023 Changes in Emissions

Recreational Equipment.

After review of the emissions estimates and the related increase in emissions from all sectors of the inventory LADCO has identified specific sectors that need further review. See Chart 2 for sector breakdown. The first of these is recreational equipment where review of the MOVES non-road input file NATION.GRW revealed a national growth rate for growth indicator #95 much higher than expected for recreational equipment. See Chart 3. After review with the states we believe this number should be more reflective of a flat growth between 2011 and 2023.

Chart 2. Absolute Annual Contribution to 2011 to 2023 Changes in Emissions.

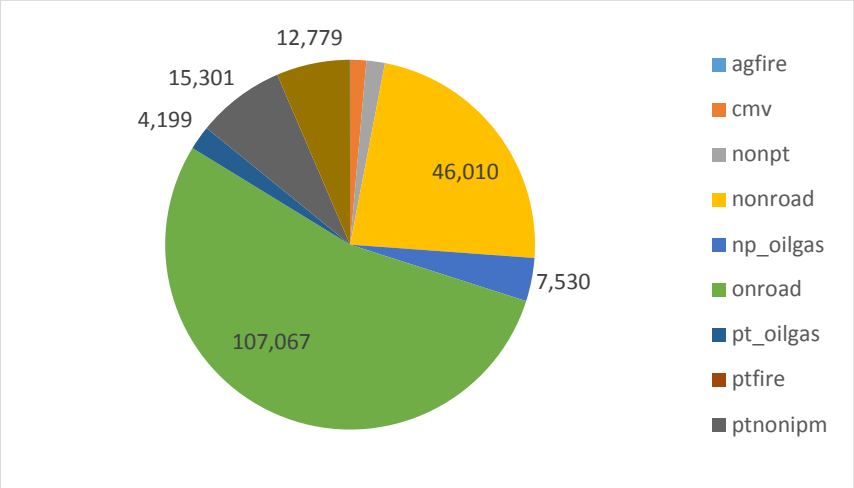
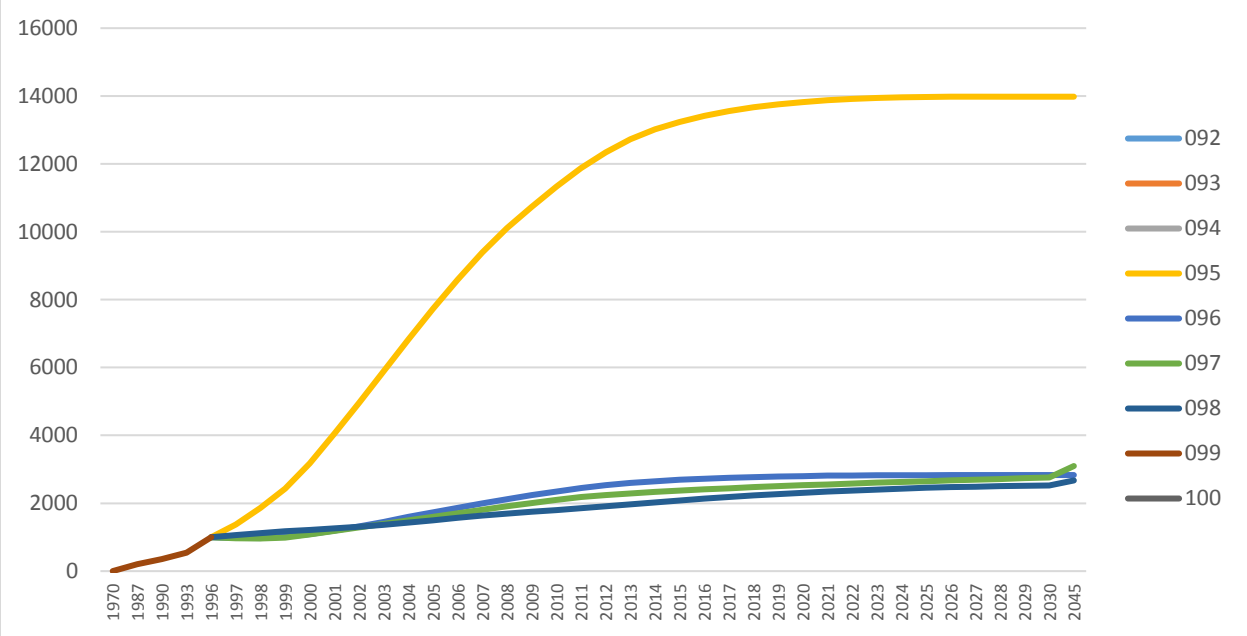
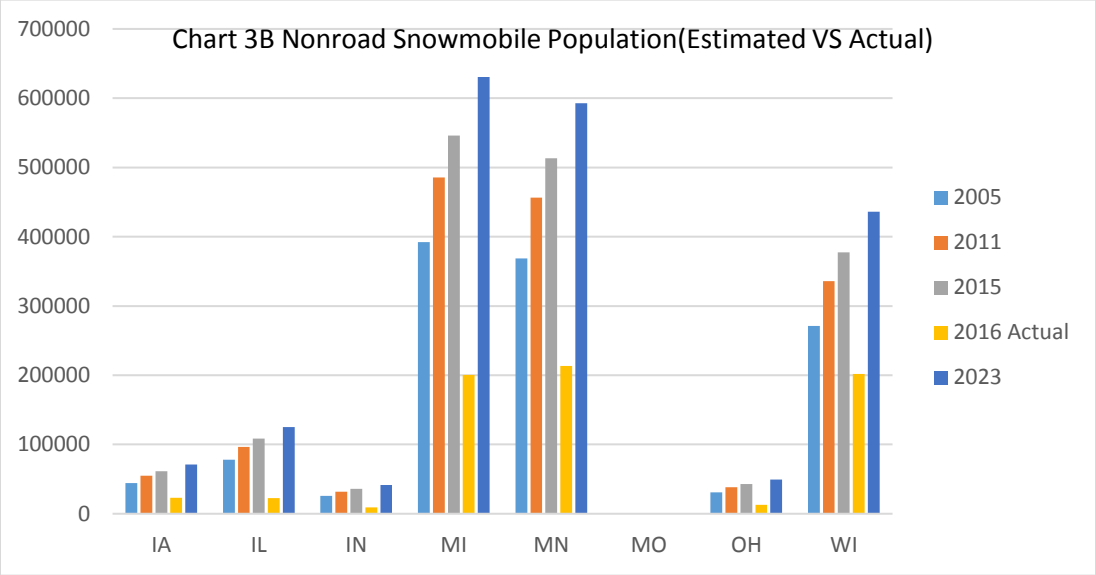


Chart 3. National growth rate indicators for recreational equipment nonroad categories.



LADCO states reviewed the equipment populations used in NONROAD for 2011 to 2023 and compared those to historic registration databases at the states for these equipment types. We believe the local data is clear that the current growth rates and derived populations are incorrect. Snowmobile populations are compared in Chart 3B. We can see that the model is overestimating between 2 and 5 times too many snowmobiles in the LADCO region. We found similar problems in all terrain vehicles and offroad motorcycles where the models predicted two to three times as many vehicles as registrations would indicate. We believe that the growth rate in Chart 3 for the pre-2011 equipment populations is resulting in 2011 population that are too high. Second, we accept the growth curve that flatten out post

2011. Our data shows that overall registrations are relatively flat between 2000 and 2015 in most states. The growth rates should show uniform positive year over year growth in the 1-2% per year range.



Regarding nonroad emissions for recreational equipment, as well as pleasure craft, large increases in NOx from 2011 to 2023 are found for the 2-stroke gasoline categories in these subsectors. In contrast, VOC emissions for these categories significantly decrease from 2011 to 2023.

Chart 4 shows nationwide NOx emissions for these categories from the EPA's 2011 Modeling Platform, version el, and Chart 5 shows these same emissions from a default MOVES run, using the national scale, provided by the state of Wisconsin. Similarly, Chart 6 shows nationwide VOC emissions for these categories from the EPA's version el and Chart 7 shows these same emissions from Wisconsin's default MOVES run. Finally, Chart 8 shows the nationwide vehicle populations from Wisconsin's default MOVES run.

Chart 4. National NOx emissions for 2-stroke gasoline categories, recreation and pleasure craft, from EPA's Modeling Platform, version el.

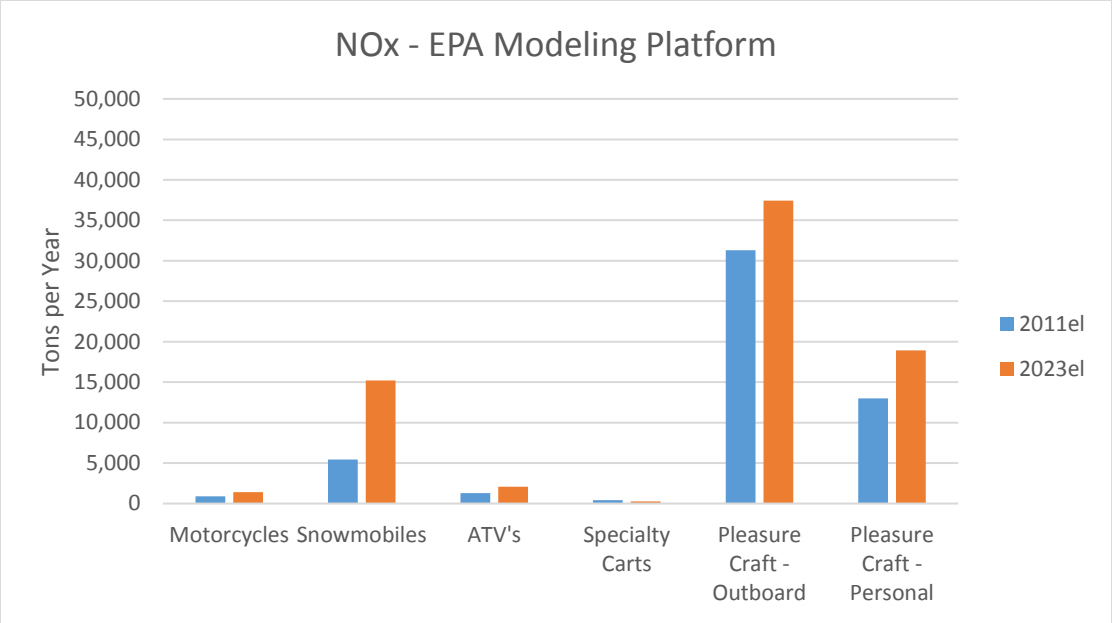


Chart 5. National NOx emissions for 2-stroke gasoline categories, recreation and pleasure craft, from default MOVES run at national scale.

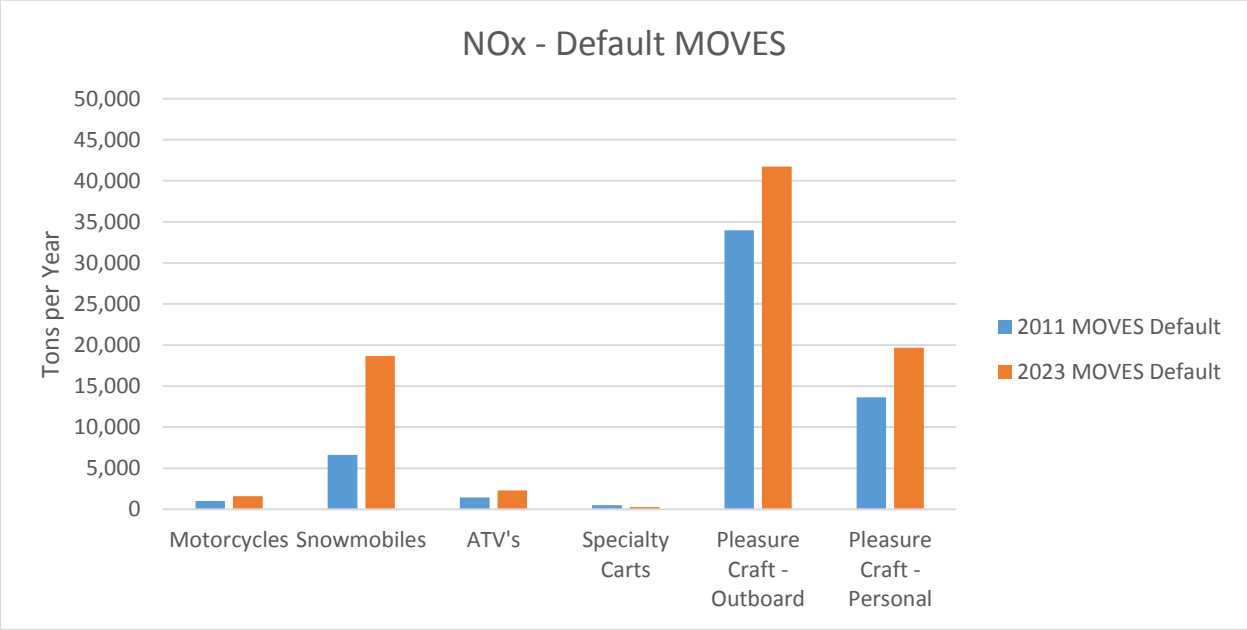


Chart 6. National VOC emissions for 2-stroke gasoline categories, recreation and pleasure craft, from EPA's Modeling Platform, version el.

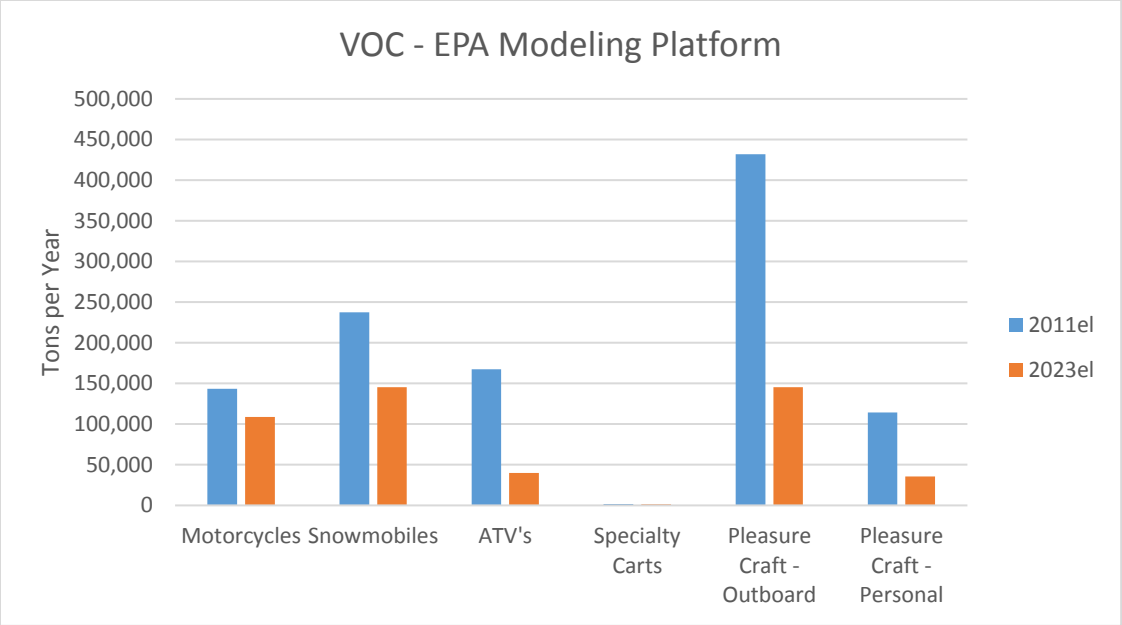


Chart 7. National VOC emissions for 2-stroke gasoline categories, recreation and pleasure craft, from default MOVES run at national scale.

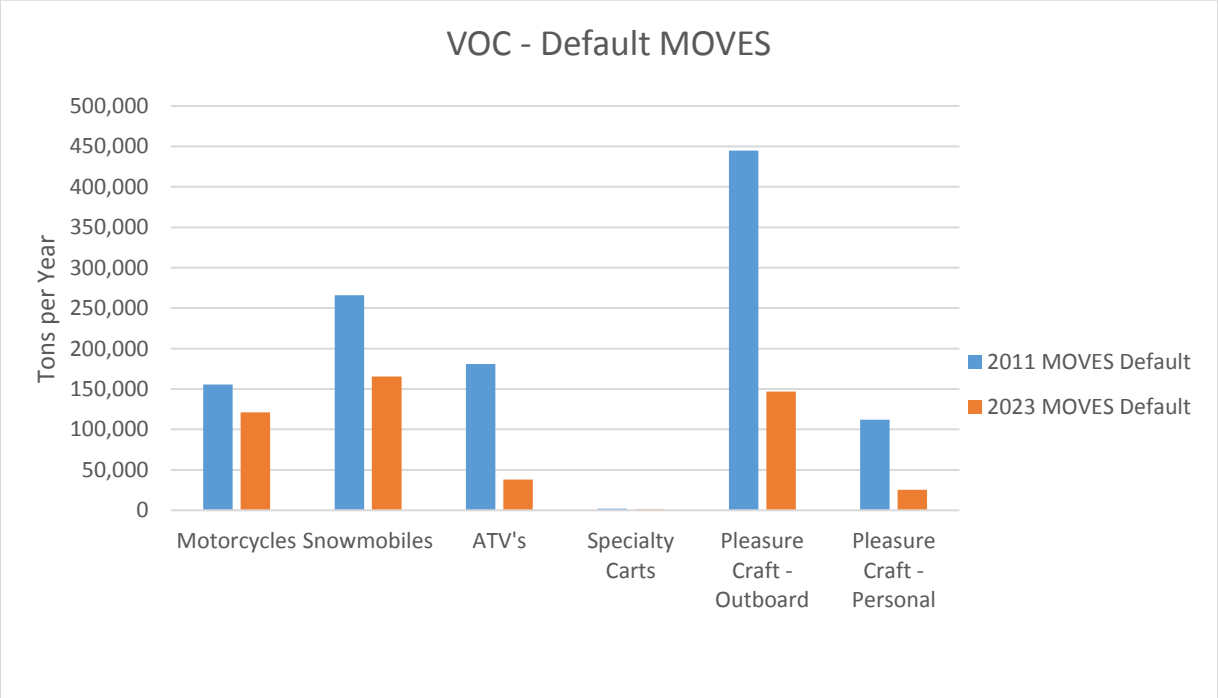
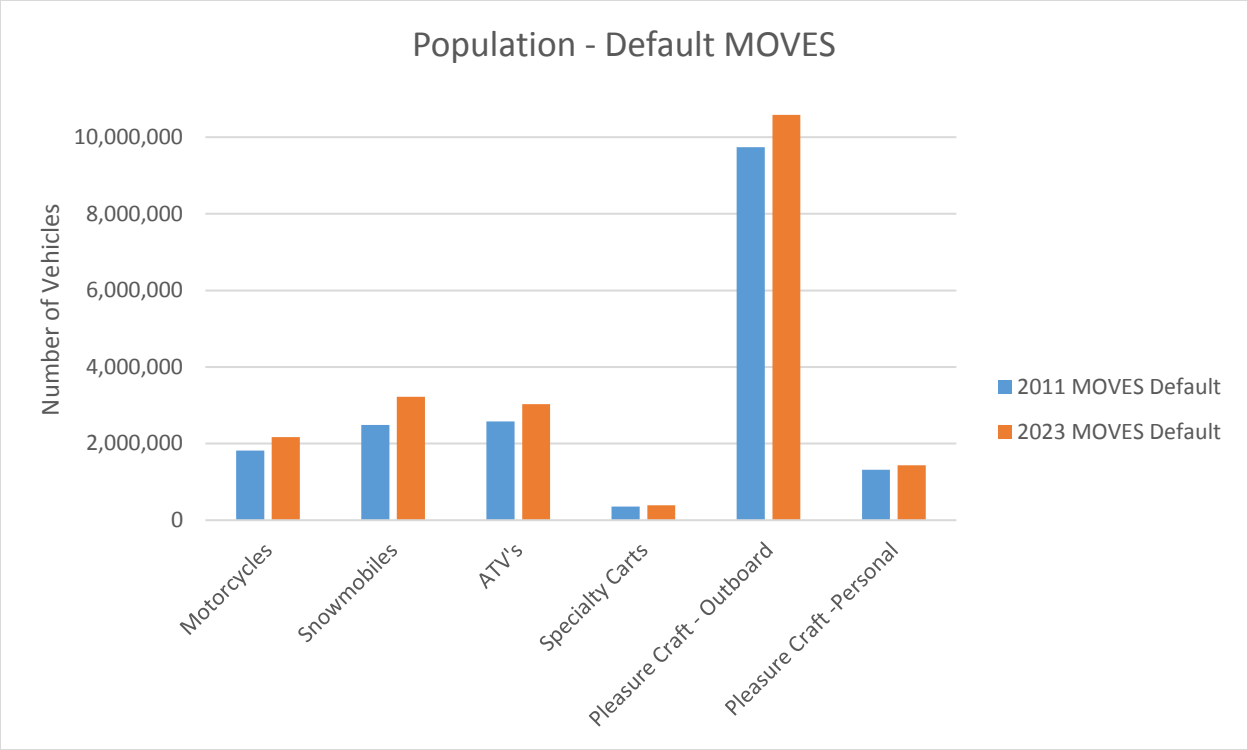


Chart 8. National populations for 2-stroke gasoline categories, recreation and pleasure craft, from default MOVES run at national scale.



These charts show similar emission levels and changes over time between the Modeling Platform runs and the default MOVES runs. (One reason for the modest differences is that the default MOVES runs were done at the national scale instead of the more precise county scale.) This similarity suggests that the changes in emissions from 2011 to 2023 largely come from the NOx emission rates in the MOVES model. Since the NOx emissions increase more than the vehicle populations increase, compare Chart 5 with Chart 8[1], the NOx emission rate in MOVES look to be higher in 2023 than in 2011. We suggest that EPA examines the NOx emission rate trends in the MOVES model for 2-stroke gasoline recreation equipment and 2-stroke gasoline pleasure craft and adjust the emissions in the Modeling Platform if the trends are not realistic.

[1] For example, from 2011 to 2023 for snowmobiles, NOx increases by 182% (6,612 to 18,643 tons), while the population increases by 30% (2,483,280 to 3,226,120). And, from 2011 to 2023 for pleasure craft – outboard, NOx increases by 23% (33,987 to 41,718tons), while the population increases by 9% (9,736,320 to 10,581,300).