



MEMORANDUM

To: CMAP Transportation Committee

From: CMAP Staff

Date: September 8, 2022

Re: ON TO 2050 Plan Update /TIP Conformity Analysis & TIP Amendment Memo with Supplemental Information

After the ON TO 2050 Plan Update/TIP Conformity Analysis & TIP Amendment had been released for public comment CMAP staff was provided with additional information regarding a few Regionally Significant Projects (RSP's). Incorporating this information into CMAP's RSP evaluation process necessitated rerunning the emissions model for transportation conformity so that this new information could be reflected in CMAP's transportation conformity modeling. Since CMAP had decided to rerun the emissions model for transportation conformity this presented an opportunity to incorporate some model improvements in the transportation demand model that could not be incorporated when transportation conformity was done in May 2022.

The revised transportation conformity analysis showed an increase in emissions, particularly for NOx. The increase in emissions however did not cause the region to exceed its Motor Vehicle Emissions Budget (MVEB) - the maximum emissions allowed in the approved state implementation plan (SIP) for all on road motor vehicles in the region -- for VOC or NOx. As a result, the region is able to demonstrate that projects in the ON TO 2050 plan update and the TIP conform to the region's MVEB. After consultation with regulatory agencies, staff recommends that the CMAP Board and MPO Policy Committee approve the revised conformity analysis and TIP amendment as presented.

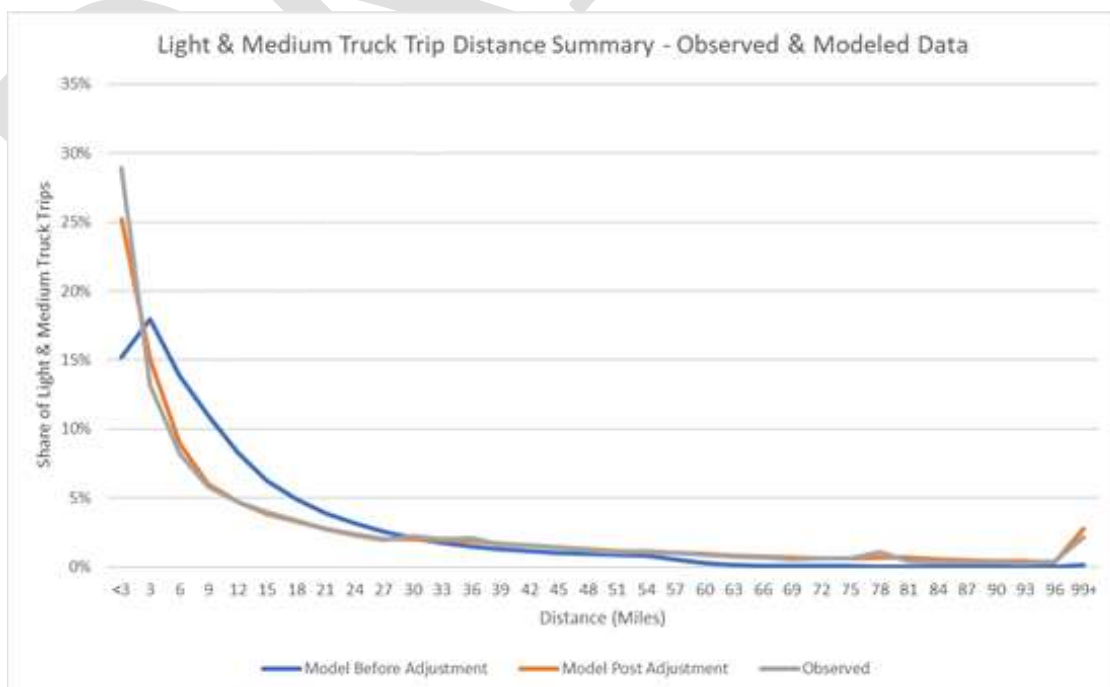
Consultation process

At the September 7, Tier II consultation meeting the committee discussed the change in modeled emissions along with the fact that the newly modeled emissions had not gone through CMAP's public comment process. The committee noted that the mix of projects did not change from what was available for public comment, but that the emissions results did change. The committee also noted that while the revised emission estimates for the ON TO 2050 Plan Update/TIP Conformity Analysis & TIP Amendment did not go through the 30 public comment period it will be subject to public review when it is

posted for the Transportation committee in September and the CMAP Board/MPO Policy Committee meeting in October, thus there will be opportunities for the public to review and comment on the revised emission estimates. The Tier II committee reviewed and discussed the revised estimates and recommended that CMAP present the revised results to the transportation committee and the CMAP Board and MPO Policy Committee and to provide about what had transpired to these committees, along with the fact that while the original emissions modeling results went through the public comment process the revised estimates did not. An explanation of the changes associated with CMAP's travel demand model are below.

Modeling Change

The modeling procedure change introduced in the revised transportation conformity analysis impacted the distribution of commercial vehicle trips in the model, increasing the average distance of these trips. Following the release for public comment of the original ON TO 2050 Plan Update/TIP Conformity Analysis, CMAP staff analyzed commercial vehicle trips in the region using two commercial datasets – a database of trips made by light- and medium-sized trucks purchased from INRIX and a database of heavy truck trips purchased from ATRI. Frequency distributions of truck trip distances were developed from both datasets and were compared to travel model results, with the finding that the model was creating commercial vehicle trips that were on average too short. The trip length distribution parameters for commercial vehicle trips in the model were modified to better reflect the distance distribution found in the observed data.



Original Emission Modeling results:**VOC and NO_x Emissions in Tons per Summer Day for Ozone Conformity**

Year	Volatile Organic Compounds		Nitrogen Oxides	
	Northeastern Illinois	SIP Budget	Northeastern Illinois	SIP Budget
2025	41.89	60.13	112.04	150.27
2030	36.31	60.13	85.63	150.27
2035	32.56	65	75.86	110
2040	29.49	65	75.02	110
2050	27.55	65	80.17	110

Conformity is demonstrated by comparison of analysis year emissions to the SIP budgets

Notes:

Off-model benefits are not included in the total emissions estimates

Results updated as of May 2022

Revised Emission Modeling results:**VOC and NO_x Emissions in Tons per Summer Day for Ozone Conformity**

Year	Volatile Organic Compounds		Nitrogen Oxides	
	Northeastern Illinois	SIP Budget	Northeastern Illinois	SIP Budget
2025	42.5	60.13	122.48	150.27
2030	36.84	60.13	94.53	150.27
2035	32.73	65	79.94	110
2040	29.89	65	84.35	110
2050	27.97	65	90.44	110

Conformity is demonstrated by comparison of analysis year emissions to the SIP budgets

Notes:

Off-model benefits are not included in the total emissions estimates

Results updated as of August 2022

ACTION REQUESTED: Approval



MEMORANDUM

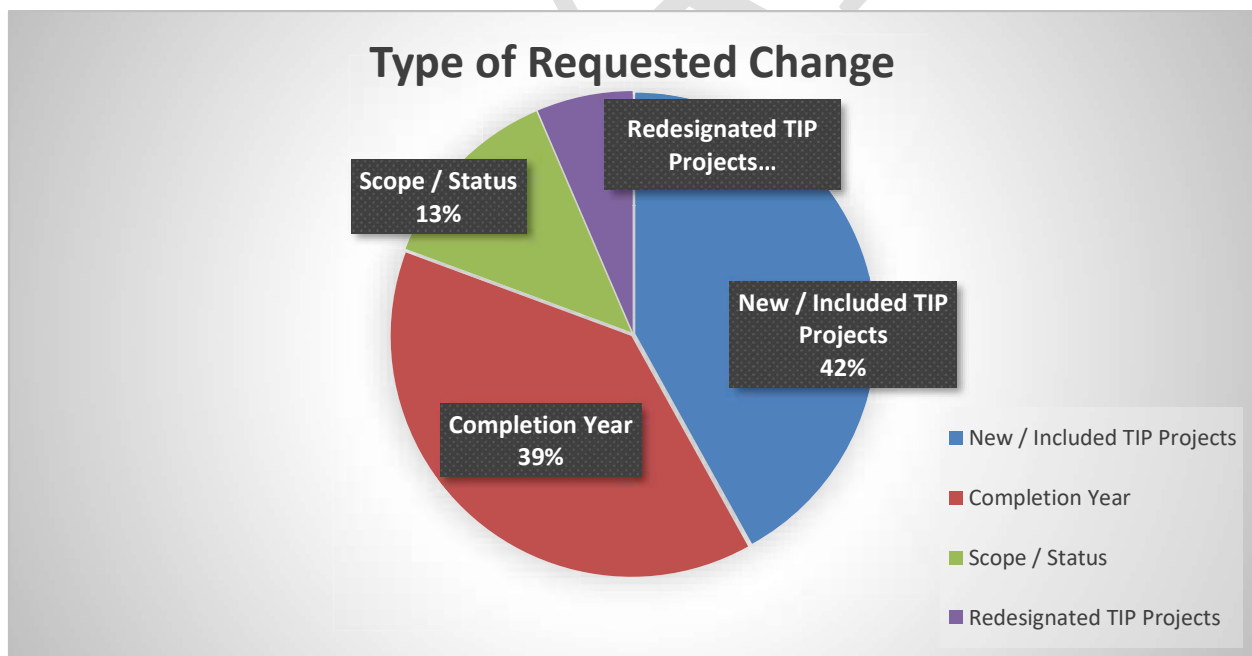
To: CMAP Transportation Committee

From: CMAP Staff

Date: May 27, 2022

Re: ON TO 2050 Plan Update /TIP Conformity Analysis & TIP Amendment

In accordance with the semi-annual conformity analysis policy, CMAP staff asked programmers to submit changes, additions, or deletions to non-exempt projects for inclusion in the regional air quality analysis of the FFY 2023-27 Transportation Improvement Program (TIP) and ON TO 2050 Plan Update. Of the changes requested, twenty-nine projects require air quality conformity analysis. Below is a summary by type of requested changes.



If the TIP amendment is approved, two non-exempt projects, with one being a former RSP will no longer be considered conformed and not part of the analysis. Twenty-nine non-exempt projects will be included in the TIP. These types of projects are included in the conformity analysis because funding for phases beyond preliminary engineering has been identified in the TIP. Non-exempt projects with only preliminary engineering funding and exempt tested projects are excluded from conformity analysis.

A former exempt tested project indicated a change in scope, and is a new not exempt addition:

- TIP ID [17-94-0008](#): Pace - Purchase/Replace Fixed Route Buses

The new not exempt projects are:

- TIP ID [10-20-0004](#): Ill 120 Belvidere Rd - Ashford Ln to US 45
- TIP ID [17-21-0001](#): Pulse 95th Street Line

Identified by the sponsor and have met the thresholds to be noted as newly designated RSPs:

- TIP ID [01-22-0022](#): Elston-Armitage-Ashland-Cortland Intersection Improvement RSP 152
- TIP ID [01-22-0023](#): Ashland-Ogden Metra Infill Station - RSP 153
- TIP ID [16-22-0004](#): Brown Line Core Capacity Improvement - RSP 165
- TIP ID [17-22-0002](#): I-294 Tri-State Express Bus Stations RSP 155
- TIP ID [12-22-0034](#): US 6 from I-55 to US 52 RSP 158
- TIP ID [06-22-0022](#): IL 7/143rd from Will-Cook Rd to IL7/SW Highway RSP 161
- TIP ID [09-22-0063](#): IL 47 from south of I-90 to south of Old Plank Rd - RSP 162
- TIP ID [08-22-0046](#): IL 56 from IL 25 to IL 59 - RSP 163
- TIP ID [10-22-0010](#): IL 60 from IL 120 to IL 176 - RSP 164
- TIP ID [12-22-0005](#): I-57 - At Eagle Lake Rd - RSP 157

Other changes to existing projects are described below.

Limits are the cross-streets, mileposts or other boundaries which define the extent of a project. There are no projects with significant limit changes.

The following RSP project begins its next phase:

- TIP ID [12-10-9001](#): I-55 Managed Lane from I-355 to I-90 I-94 (I-55 Stevenson Express Toll Lanes) - RSP 146. The project descriptive indicates expansion of I-55 from I-355 to I-294 (toll lane); I-294 to I-90/94 (2 toll lanes).

These established projects have acquired a Major Improvement Status of 2050 RSP:

- TIP ID [09-09-0040](#): IL 47 from Cross Street to FAU 3793 Kennedy Road (D3# 926) - RSP 166
- TIP ID [09-09-0099](#): US 30 from IL 47 to Albright Rd - RSP 159
- TIP ID [10-09-0146](#): US 45 McHenry Rd from IL 173 to N of the Milburn Bypass to South of Milburn Bypass to IL 132 – RSP 160. The bypass begins north of Independence Blvd. and ends north of Country Pl. to the south.

The completion year indicates when a project is anticipated to be in service to users. The conformity analysis is conducted for selected analysis years between now and 2050. The analysis years are currently 2025, 2030, 2035, 2040 and 2050. If a change in completion year results in moving a project across an analysis year, the project must be revised in the conformity analysis.

The sponsor indicates an earlier completion year of the following project, therefore requiring a revision to the conformity analysis.

- TIP ID [12-19-0038](#): Gougar Road: Laraway Road to US Route

These non-exempt projects crossed an analysis year and are included in the conformity analysis:

- TIP ID [02-09-0003](#): Willow Rd from E of I-294 to E of IL 43, from IL 43 to I-94, and over Middle Fork of N Branch of Chicago River to W of Sunset Ridge Rd
- TIP ID [02-94-0001](#): Willow Rd from East of Des Plaines River to Waterview Dr / Protection Parkway
- TIP ID [02-97-0001](#): IL 21 Milwaukee Ave from N of Sanders Rd to S of Euclid Ave
- TIP ID [03-14-0010](#): US 14 NW Hwy at CN Railroad
- TIP ID [03-99-0018](#): CH V62 Quentin Road from CH A50 Lake Cook Road to IL 68 Dundee Road
- TIP ID [08-16-0024](#): IL 56 Butterfield Rd from IL 53 to I-355
- TIP ID [12-15-0002](#): Bell Rd (CH 16) from 131st St to IL 7 (159th St) with omissions at 151st Street and 143rd Street Intersections. (Bell Road Corridor)
- TIP ID [13-16-0005](#): Barrington Rd from IL 62 to Central Rd

The following not exempt Regionally Significant Projects (RSP) crossed an analysis year:

- TIP ID [08-95-0024](#): IL 83 Kingery Hwy from 31st St to N of 55th St, 63rd St (south of) to Central Avenue - RSP 111
- TIP ID [11-06-0018](#): IL 47 from Charles Rd to US 14 - RSP 110
- TIP ID [11-07-0014](#): IL 47 Eastwood Drive from US 14 Northwest Hwy to Reed Road - RSP 110

The scope of a project is determined by the [work types](#) associated with the project.

- Non-exempt work types are expected to affect air quality and must be included in the conformity analysis. Examples of non-exempt work types are adding lanes to a road, interchange expansion, new bridge, and the major expansion of bus route service.
- Exempt tested work types do not require an air quality conformity analysis, but the region has chosen to include the impacts of these types of projects in the travel demand model. Exempt tested projects include new commuter parking lots, rolling stock replacement, and road reconstruction with lane widening to standard widths (e.g., 10 feet to 12 feet).

Exempt work types do not require an air quality conformity analysis. Examples of exempt work types are intersection improvements and rail station modernization.

The following project with a change in scope is being re-designated:

- TIP ID [07-20-0072](#): Richton Park: Richton Road/Poplar Avenue- Sauk Trail to Governors Hwy

The individual project sponsor indicated a change for the following project and is no longer conformed and is now considered unconstrained:

- TIP ID [01-19-0009](#): O'Hare Express Service: RSP - A1

Newly submitted changes are found in the [23-01 Conformity Amendments](#) report.

The regional travel demand model was run using the updated networks. The resultant vehicle miles traveled (VMT) by vehicle class, speed, time of day, and facility type were entered into U.S. Environmental Protection Agency's new MOVES3 model. The MOVES3 model is a significant upgrade from the previous model, MOVES 2014a that CMAP had been using. MPO's are required to start using the MOVES3 model by January of 2023 but CMAP chose to use the new model for the ON TO 2050 plan update which is part of this conformity analysis. The MOVES3 model has updated data for vehicle populations, travel activity, and emission rates as well as updated fuel supply information. MOVES3 also adjusted modeling to better account for vehicle starts, long-haul truck hotelling, and off-network idling and incorporated the impacts of the Heavy-Duty Greenhouse Gas Phase 2 rule and the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule. In various test of the MOVES3 model by U.S. EPA and practitioners, both ozone precursors, volatile organic compounds (VOC) and nitrogen oxides (NOx) produced changes in the mobile source emission results compared to the previous model even when the input data was relatively unchanged. Specifically, VOC emissions went down, and NOx emissions increased in urbanized areas. While all emissions decreased in rural areas. CMAP's modeling produced similar results with a decrease in VOC and an increase in NOx compared to the emissions estimated using MOVES 2014a. As part of the migration to MOVES3 all of the data inputs into the model were reviewed and updated. The changes in data inputs and modeling procedures make it nearly impossible to attribute a percentage change in the emissions estimates to the MOVES3 model. CMAP did conduct some internal testing of MOVES3 prior to using it for conformity and has a high degree of confidence that a substantial amount of the changes seen in the emissions estimates shown in the table below can be attributed to a change in emissions models and not changes attributed to transportation projects in the TIP or travel behavior modeled in the travel demand model.

Using the MOVES3 model on-road emission estimates for each precursor or direct pollutant in each analysis year were produced. The MVEB for the NEIL nonattainment area for 2035 and beyond was revised in a federal register notice on May 20, 2022 (87 FR 30828) to correspond to the 2008 ozone maintenance SIP that was approved in that noticed by U.S. EPA. The result is that the MVEB changes to 65 tons/day of VOCs and 110 tons/day of NOx in 2035. Prior year MVEB remain unchanged. In addition to a revised MVEB the analysis year of 2035 is now being modeled as that corresponds to the last year of the 2008 ozone maintenance plan and demonstrates conformity for the 2008 ozone maintenance SIP. For ozone precursors volatile organic compounds (VOC) and nitrogen oxides (NOx), the resulting mobile source emissions estimates fell below the applicable motor vehicle emissions budgets for ozone as shown in the table below.

VOC and NOx Emissions in Tons per Summer Day for Ozone Conformity

Year	Volatile Organic Compounds		Nitrogen Oxides	
	Northeastern Illinois	SIP Budget	Northeastern Illinois	SIP Budget
2025	41.89	60.13	112.04	150.27
2030	36.31	60.13	85.63	150.27
2035	32.56	65.00	75.86	110.00
2040	29.49	65.00	75.02	110.00
2050	27.55	65.00	80.17	110.00

Conformity is demonstrated by comparison of analysis year emissions to the SIP budgets

Notes:

Off-model benefits are not included in the total emissions estimates

Results updated as of May 2022

Direct PM_{2.5} and NOx Emissions in Tons per Year for PM_{2.5} (Informational Only)

Year	Fine Particulate Matter		Nitrogen Oxides	
	Northeastern Illinois	Historical SIP Budget	Northeastern Illinois	Historical SIP Budget
2025	1,372.71	5,100.00	38,187.65	127,951.00
2030	1,088.06	2,377.00	29,082.15	44,224.00
2035	945.13	2,377.00	25,591.97	44,224.00
2040	940.36	2,377.00	25,218.07	44,224.00
2050	978.19	2,377.00	26,610.41	44,224.00

Greenhouse Gas Mobile Source Emissions (Informational Only)

CO ₂ Equivalent in Tons per Year	
Year	Northeastern Illinois
2025	33,674,602.03
2030	31,539,569.41
2035	30,598,332.46
2040	30,725,751.45
2050	31,878,970.25

ACTION REQUESTED: Recommend finding of conformity and approval of TIP amendment 23-01 by the MPO Policy Committee.