Resolution 2022-35
ATTACHMENT 2

DRAFT

CMAQ Performance Plan

Baseline Performance Period Report

(2022-2025)

Houston-Galveston Area Council

Scheduled for approval by the Transportation Policy Council
September 23, 2022

Introduction

The Moving Ahead for Progress in the 21st Century Act (MAP-21) in 2012, the Fixing America's Surface Transportation Act (FAST Act), in 2015, and the Infrastructure Investment and Jobs Act, in 2021, charged metropolitan planning organizations (MPOs) and state departments of transportation to develop performance measure targets to assist the Federal Highway Administration (FHWA) in assessing the conditions on the nation's roads in a consistent manner and to improve the performance of the National Highway System. These targets are developed in four-year increments and include a number of target categories. The performance measure categories that will receive focus in this report include activities funded through Congestion Mitigation and Air Quality (CMAQ) funds.

The purpose of this Performance Plan Report is to document the baseline performance for CMAQ-funded transportation projects in the Houston-Galveston-Brazoria non-attainment region for ozone. This is the initial performance period report for the second federal performance period which is from 2022 through 2025. This report details methodology, as well as two- and four-year targets that have been developed for peak hour excessive delay, non-single occupancy vehicles, and on-road mobile source emissions.

These targets were approved by the Houston-Galveston Area Council (H-GAC) Transportation Policy Council with regional stakeholder input, and in coordination with the Texas Department of Transportation (TxDOT), H-GAC subcommittees, as well as other regional metropolitan planning organizations within the State of Texas.

Baseline Conditions

To establish targets, H-GAC and TxDOT looked at baseline conditions in the Houston-Galveston region for three specific measures that relate to the CMAQ program:

- Peak Hour Excessive Delay Measure (PHED)
- Non-Single Occupancy Vehicle Travel Measure (Non-SOV)
- On-Road Mobile Source Emissions Measure

The results of these analyses for the baseline years are documented below.

Traffic Condition Measures

Two of the measures relate to traffic conditions: PHED and Non-SOV. The PHED measure is defined as the annual hours of peak hour excessive delay per capita. For this second performance measure cycle, FHWA has decreased the minimum population to require an urbanized area to be included in the PHED and Non-SOV performance measure process. Previously, an urbanized area was required to participate in these measures when the population exceeded 1,000,000 residents, however for this second cycle, a new target setting requirement decreases the population requirement for participation in these performance targets to 200,000 residents. This decreased population limit has resulted in the creation of target setting for a second urban area within the H-GAC region that includes the areas of Conroe and The Woodlands, in addition to target setting for the Houston Urban Area.

Peak Hour Excessive Delay, or PHED, the annual average hours of extra travel time on the National Highway System spent in excessive delay, is defined as the time spent the when the average highway speed is less than 60% of the existing speed limit during peak periods. On a roadway segment with a speed limit of 60 mph, the excessive delay (60% of 60 mph) would be 36 mph. Peak periods are defined as Monday through Friday 6:00 AM – 10:00 AM and 3:00 PM – 7:00 PM. The baseline annual 2022 PHED per capita measure for the Houston Urban Area is 13.5 hours. This baseline is unusually low compared to the 2018 PHED of 16.8 hours which is reflective of pre-COVID pandemic conditions. In the second performance period, H-GAC elected to switch the evening peak monitoring period from the 4-8 pm peak period to the 3-7 pm peak period to capture the accurate evening peak congestion. The 3-7 pm peak period has an hour more of PHED, when compared to the 4-8 pm peak period, therefore, H-GAC chose to set the 2022 and 2024 PHED targets at 16.0 hours. The baseline annual 2022 PHED per capita measure for the Conroe-The Woodlands Urban Area is 8.1 hours and the 2022 and 2024 targets are 8.0.

The Non-SOV measure is computed as the percent of the working population that do not drive alone to work in a car, van or truck and is measures the percent of those who ride public transit, rideshare, bicycle, or telecommute to work. Based on federal procedures, three data collection methods are available to calculate this measure. For the second federal performance period of 2022 through 2025, H-GAC selected Method "A", which uses data from the American Community Survey (ACS) Journey to Work dataset. ACS data is aggregated in five-year bins. The baseline 2022 calculated Non-SOV measure for the Houston Urban Area is 21.1%, the 2022 target is 21.1%, and the 2024 target is 22.0% to reflect an increase in Non-SOV commuter travel. For the Conroe-The Woodlands Urban Area, the baseline 2022 calculated Non-SOV measure is 19.7%, the 2022 and 2024 targets are 20.0% to reflect an increase in Non-SOV travel.

On-Road Mobile Source Emissions Measures

For an initial estimate of on-road mobile source emissions reductions related to CMAQ-funded projects, H-GAC and TxDOT used the CMAQ Public Access System (PAS) to compile the estimated emissions reduction benefits of projects that were funded through H-GAC's Transportation Improvement Program (TIP) by fiscal year. The emission reductions include Nitrogen Oxides (NO_x) and Volatile Organic Compounds (VOC), the two component pollutants that combine, in the presence of sunlight, to form ozone. For this initial estimate, projects in federal fiscal years 2018 through 2021 with emission reductions in kilograms per day were summed to determine an estimate of baseline and targets. These estimates from the CMAQ PAS match those recorded in the TIP as well as follow guidance from FHWA on the development of baseline emission factors.

Table 1 – Baseline On-Road Mobile Source Emissions (2018-2021)

Pollutant	Baseline Emissions per Year (kg/day)
NO_x	345.760
VOC	24.717

Targets

For this second performance period, to take place between 2022 and 2025, H-GAC has once again coordinated with TxDOT as well as other statewide MPOs to establish target methodologies for the CMAQ traffic congestion and on-road emissions measures.

Through the consultations process with TxDOT and other MPOs within the state, H-GAC staff has revised the methodology used to develop the air quality performance measures for the second performance measure cycle. This methodology uses planned TIP projects from 2022 through 2025 to develop a base estimate of two- and four-year targets, then applies a "project delivery success rate" to the base estimate to determine the final two- and four- year targets. The project delivery success rate is developed by comparing the planned emission reductions from the beginning of the previous 2018-2021 performance period cycle with the actual emission reductions recorded for funded projects over the same period. Applying this ratio helps to account for challenges in moving programmed TIP project towards receiving final federal obligation; a problem that resulted in difficulties meeting our region's goals during the first performance period cycle. Project scheduling or letting delays, project cancellations, and project funding changes to a non-CMAQ funding source are some of the challenges that occur in moving Transportation Improvement Program (TIP) projects to federal obligations.

Based on these described procedures as well as the target baselines, H-GAC and coordination partners have developed two- and four-year targets for the second CMAQ performance period which will include projects funded during the 2022 through 2025 period. These targets can be found in Table 2, below.

The H-GAC Transportation Policy Council approved these targets on September 23, 2022 prior to the October 1, 2022 deadline for inclusion in the State DOT Baseline Performance Period Report.

Table 2 – Established CMAQ-focused Two- and Four-year Targets (2022-2025)

Performance Measure	2-Year Targets	4-Year Targets
Annual PHED per Capita – Houston Urban Area	16.0	16.0
Annual PHED per Capita – Conroe-The Woodlands Urban Area	8.0	8.0
Percent of Non-SOV Travel – Houston Urban Area	21.1%	22.0%
Percent of Non-SOV Travel – Conroe-The Woodlands Urban Area	20.0%	20.0%
Emission Reductions – NO_x	221.251	601.465
Emission Reductions - VOC	69.939	172.864

Nitrogen Oxides (NO_x) – Volatile Organic Compounds (VOC)

Description of Projects

The Houston-Galveston Area Council coordinates with local stakeholders to select CMAQ projects for deployment in the Houston-Galveston-Brazoria nonattainment area. These projects are selected to meet the program goals of reducing congestion and/or reducing emissions of ozone precursor pollutants. Emissions estimates for these projects are estimated by H-GAC using methodologies developed as part of the Texas Guide to Accepted Mobile Source Emission Reduction Strategies (MOSERS). In cases where no practical MOSERS methodology exists, verified past emission reduction performance is used to create an

emissions reduction estimate. The results from these analyses are then uploaded by H-GAC, approved by the Texas Department of Transportation and the Federal Highway Administration into the CMAQ Public Access System upon the obligation of funding to projects and are accounted for in the expected emission reduction benefits outlined in the table below. To simplify reporting, projects are grouped in the table based on general categories H-GAC uses to report project types in the TIP.

H-GAC is not required to report benefits for pollutants other than Nitrogen Oxides (NO_x) and Volatile Organic Compounds (VOC). As such, Table 3, below, reports only on these pollutants. Benefits for later years in the reporting period tend to be lower than earlier years. H-GAC has not yet fully programed all CMAQ funding into the TIP for these later years. Expected emissions benefits will change as additional CMAQ projects are programmed later in the reporting period.

Table 3 – Expected Benefits of CMAQ Projects in the Houston-Galveston Region (2022-2025)

Project	MPOID	Project Description	Year of Anticipated CMAQ Obligation	NOx Benefit (kg/day)	VOC Benefit (kg/day)	PHED Benefit	Non-SOV Benefit
Air Quality	11760	Regional vanpool operations	**2022**	31.680	6.540	Yes – reduces peak hour delay	Yes – Increases non-SOV travel
Air Quality	11762	Regional vanpool operations	**2022**	31.680	6.540	Yes – reduces peak hour delay	Yes – Increases non-SOV travel
Air Quality	11763	Regional vanpool operations	**2022**	31.680	6.540	Yes – reduces peak hour delay	Yes – Increases non-SOV travel
Traffic Flow Improvements	17076	US 90A ITS Implementation	**2022**	1.200	1.400	Yes – reduces peak hour delay	No
Air Quality	17141	Regional vanpool operations	**2022**	16.500	3.410	Yes – reduces peak hour delay	Yes – Increases non-SOV travel
Air Quality	18361	Regional vanpool operations	**2022**	31.680	6.540	Yes – reduces peak hour delay	Yes – Increases non-SOV travel
Air Quality	18362	Regional vanpool operations	**2022**	16.500	3.410	Yes – reduces peak hour delay	Yes – Increases non-SOV travel
2022 Emissions Total				**160.920**	**34.380**		

Project	MPOID	Project Description	Year of Anticipated CMAQ Obligation	NOx Benefit (kg/day)	VOC Benefit (kg/day)	PHED Benefit	Non-SOV Benefit
Pedestrian/Bicycle	7814	Construct Variable Width Sidewalk	**2023**	0.318	0.224	Yes – reduces peak hour delay	Yes – increases non-SOV travel
Transit	11473	Construct Multimodal Bus Rapid Transit Facility	**2023**	3.410	19.340	Yes – reduces peak hour delay	Yes – increases non-SOV travel
Traffic Flow Improvements	14173	Intersection Improvements	**2023**	3.070	0.750	Yes – reduces peak hour delay	No
Transit	15243	Diesel to Electric Transit Bus Replacement	**2023**	2.800	0.377	No	No
Pedestrian/Bicycle	15321	Projects to improve and expand pedestrian experience	**2023**	0.110	0.030	Yes – reduces peak hour delay	Yes – increases non-SOV travel
Traffic Flow Improvements	17041	Construct Access Ramp to Existing HOV Facility	**2023**	2.350	16.970	Yes – reduces peak hour delay	Yes – increases non-SOV travel
Traffic Flow Improvements	17045	Install ITS equipment and infrastructure	**2023**	0.066	0.023	Yes – reduces peak hour delay	No

Traffic Flow Improvements	17047	Install ITS equipment and infrastructure	**2023**	0.530	0.130	Yes – reduces peak hour delay	No
Traffic Flow Improvements	17051	Intersection Improvements	**2023**	0.160	0.020	Yes – reduces peak hour delay	No
Traffic Flow Improvements	17062	Install ITS equipment and infrastructure	**2023**	1.750	0.430	Yes – reduces peak hour delay	No
Pedestrian/Bicycle	17122	Construct multi-use path	**2023**	1.037	0.227	Yes – reduces peak hour delay	Yes – increases non-SOV travel
Air Quality	17138	Travel Demand Mgmt. Marketing, Education and Public Outreach	**2023**	106.510	22.000	Yes – reduces peak hour delay	Yes – increases non-SOV travel
Traffic Flow Improvements	18020	Install ITS equipment and infrastructure	**2023**	0.700	0.400	Yes – reduces peak hour delay	No
Traffic Flow Improvements	18031	Intersection Improvements	**2023**	0.208	0.135	Yes – reduces peak hour delay	No
Transit	18238	Commuter bus purchase	**2023**	2.510	0.012	Yes – reduces peak hour delay	Yes – increases non-SOV travel
Air Quality	18355	Regional vanpool operations	**2023**	31.680	6.540	Yes – reduces peak hour delay	Yes – increases non-SOV travel

Air Quality	18363	Regional vanpool operations	**2023**	16.500	3.410	Yes – reduces peak hour delay	Yes – increases non-SOV travel
Transit	18846	Regional Fare System Implementation	**2023**	0.600	0.570	Yes – reduces peak hour delay	Yes – increases non-SOV travel
2023 Emissions Total				**174.309**	**71.588**		
Project	**MPOID**	**Project Description**	**Year of Anticipated CMAQ Obligation**	**NOx Benefit (kg/day)**	**VOC Benefit (kg/day)**	**PHED Benefit**	**Non-SOV Benefit**
Air Quality	16088	Travel Demand Mgmt. Marketing, Education and Public Outreach	**2024**	29.51	44.168	Yes – reduces peak hour delay	Yes – increases non-SOV travel
Traffic Flow Improvements	17088	Install ITS equipment and infrastructure	**2024**	0.584	0.701	Yes – reduces peak hour delay	No
Traffic Flow Improvements	18036	Construct Railroad Grade Separation	**2024**	0.137	0.108	Yes – reduces peak hour delay	No
Air Quality	18356	Regional vanpool operations	**2024**	31.68	6.54	Yes – reduces peak hour delay	Yes – increases non-SOV travel
2024 Emissions Total				**61.911**	**51.517**		
Project	**MPOID**	**Project Description**	**Year of Anticipated CMAQ Obligation**	**NOx Benefit (kg/day)**	**VOC Benefit (kg/day)**	**PHED Benefit**	**Non-SOV Benefit**
Traffic Flow Improvements	11380	Construct railroad underpass	**2025**	454.52	92.07	Yes – reduces peak hour delay	No

Traffic Flow Improvements	17067	Construct railroad underpass	**2025**	0.86	0.21	Yes – reduces peak hour delay	No
Air Quality	17125	Travel Demand Mgmt. Marketing, Education and Public Outreach	**2025**	58.79	12.15	Yes – reduces peak hour delay	Yes – increases non-SOV travel
2025 Emissions Total				**514.170**	**104.430**		