



Board Report

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REVISED
EXECUTIVE MANAGEMENT COMMITTEE
AUGUST 18, 2022

SUBJECT: CLIMATE EMISSIONS ANALYSIS - METRO'S INDIRECT IMPACT ON GREENHOUSE GAS EMISSIONS

ACTION: RECEIVE AND FILE

RECOMMENDATION

RECEIVE AND FILE the Climate Emissions Assessment: Metro's Indirect Impact on Greenhouse Gas Emissions Report (Attachment A).

ISSUE

As transportation planner and coordinator, designer, builder and operator for the country's largest, most populous county, Metro has an important role to play in the fight against climate change and in meeting our global, state and local targets. Our current commitments and contributions to reducing greenhouse gas (GHG) emissions are detailed in several strategic documents, including the agency's *Climate Action & Adaptation Plan (CAAP)*, *Moving Beyond Sustainability (MBS)*, and the *Long Range Transportation Plan (LRTP)*.

In September 2021, to build on these strategic plans, Director Garcetti requested additional details on the projected Vehicle Miles Traveled (VMT) and GHG emission impacts resulting from Metro's planned programs and policies.

As a first step in responding to this Board direction, Metro undertook an analysis to evaluate the individual VMT and GHG impacts of Metro's planned capital expansion projects, service improvements, pricing policies, and strategic programs, most of which are included in the LRTP and were similarly analyzed on a program level in support of that document. Recognizing the limitations of a disaggregated analysis approach, the VMT and GHG emission impact calculations that are presented for each program and initiative were prepared conservatively and the analysis does not account for the synergistic benefits or dampening effects of the holistic program laid out and analyzed in the LRTP.

Additionally, this analysis acknowledges the uncertainty associated with any transportation modeling exercise that involves forecasting future trends, present in this disaggregated analysis as well as program-level analyses such as the LRTP analysis. These uncertainties are particularly notable at

this moment in time, as the data used in this analysis pre-dates COVID-related shifts in travel behavior, land use patterns, and some of the fundamental relationships between the two. Given the above uncertainties, it is not possible to generate a high level of precision in the results.

The results of the analysis do offer high-level insight into the relative impacts of Metro's programs on GHG emissions only, as just one of many metrics that guide Metro's investment decisions in order to meet the goals outlined in Metro's Strategic Plan. The results are intended to provide a foundation for further study and to be a catalyst for the refinement of the analysis methodology.

BACKGROUND

In California, climate action planning is driven by the targets established in the 2016 Senate Bill 32 (SB 32), which establishes targets for Statewide emissions reductions of 40% from 1990 levels by 2030, and 80% from 1990 level by 2050.

Los Angeles County, as part of its commitment to the Paris Agreement, is moving toward a zero-carbon energy system. The *Our County* sustainability plan includes targets of achieving a 25% reduction in greenhouse gas emissions from 2015 levels by 2025, a 50% reduction in greenhouse gas emissions by 2035, and carbon neutrality by 2050. The *Our County* sustainability plan also includes targets to increase countywide trips by foot, bike, micromobility, or public transit to 15% of total trips by 2025 and to 50% by 2045, and targets to reduce daily vehicle miles travelled per capita to 20 miles by 2025 and 10 miles by 2045.

Achieving these reductions in GHG emissions in the transportation sector is critical to achieving the State, County, and City goals and in supporting the national commitment to the Paris Agreement. The transportation sector is responsible for 41% of the GHG emissions in the State of California and 52% of the GHG emissions for the Los Angeles County. Emissions from gasoline used in on-road passenger cars, trucks, and SUVs account for approximately 78 percent of the transportation inventory. Through its core services of providing bus and rail transit, Metro enables the traveling public to reduce their VMT, encouraging mode shift and disrupting single occupancy vehicle (SOV) driving habits.

Metro's own goal is to become a zero-emissions agency by 2050. The MBS and the CAAP include the target of achieving a 79% reduction in GHG emissions from 2017 baseline, by 2030. To reduce emissions, the MBS calls for reducing energy consumption by 17% at facilities from the 2030 Business as Usual scenario, transitioning Metro's fleet to zero emissions technology, and decarbonizing Metro's energy and fuel supply.

Metro also contributes to regional GHG emission avoidance by providing low- and zero-emissions modes of transportation and through the land use changes that occur in response to the transit system. In 2019, Metro's transportation services enabled over 900,000 metric tons of carbon dioxide equivalent (MTCO₂e) to be avoided, with an estimated 20% as the direct result of individuals taking Metro rather than driving alone in SOVs, and the remaining 80% as an indirect result of changing land use patterns that result in a denser, mixed-use development pattern.

While Metro's existing transportation and mobility services already significantly reduce regional VMT,

Metro's suite of future initiatives will continue to play a key role in VMT reduction and GHG emission avoidance over time. As expectations for Metro's contribution to County and Regional GHG emissions reduction activities continue to evolve, the agency recognizes the need to understand better the relative VMT and GHG reduction benefits of Metro's various programs and policies.

DISCUSSION

Metro's 2020 Long Range Transportation Plan (LRTP) provides a detailed roadmap for planning, building, operating, maintaining, and partnering to deliver expanded transportation infrastructure and improved mobility over a 30-year timeframe. The programs and projects outlined in the 2020 *LRTP* include bus and rail infrastructure expansion, active transportation programs, transportation demand management, and highway modernization. Additionally, Metro has identified bold policies and programs to augment the implementation of the *LRTP* investments, including NextGen Bus Improvements and Congestion Pricing.

The *LRTP* quantifies the projected impact of Metro's planned programs holistically. The GHG impacts of each program had not previously been evaluated using a disaggregated approach. As Metro's responsibilities expand and VMT/GHG requirements continue to evolve, the agency recognizes the need to better understand the relative benefits of Metro's various programs.

As a result, Metro has undertaken this analysis of the individual VMT and GHG impacts of several of its major initiatives, using the 2020 *LRTP* technical document and other Metro program studies as the basis for our assumptions. This analysis (Attachment A) offers high-level insight into the relative GHG emissions reductions resulting from the implementation of each of the LRTP initiative and additional efforts that have been advanced since the adoption of the LRTP. The VMT values for each program were used to estimate GHG emissions using per mile and trip-based emission factors from the California ARB's EMFAC model for each year between 2017-2047. The EMFAC model incorporates changing fleet mix assumptions, with the vehicle fleet becoming more efficient and producing fewer emissions per mile over time.

Disaggregating Metro's major transportation initiatives' individual VMT and GHG impacts is complicated and has significant limitations. Mobility patterns and behavior in Los Angeles County are highly interconnected. *Therefore, the results of this disaggregation analysis and the potential VMT and GHG impacts of Metro's planned programs are approximate, imprecise, and do not account for the holistic program's synergistic benefits or dampening effects.*

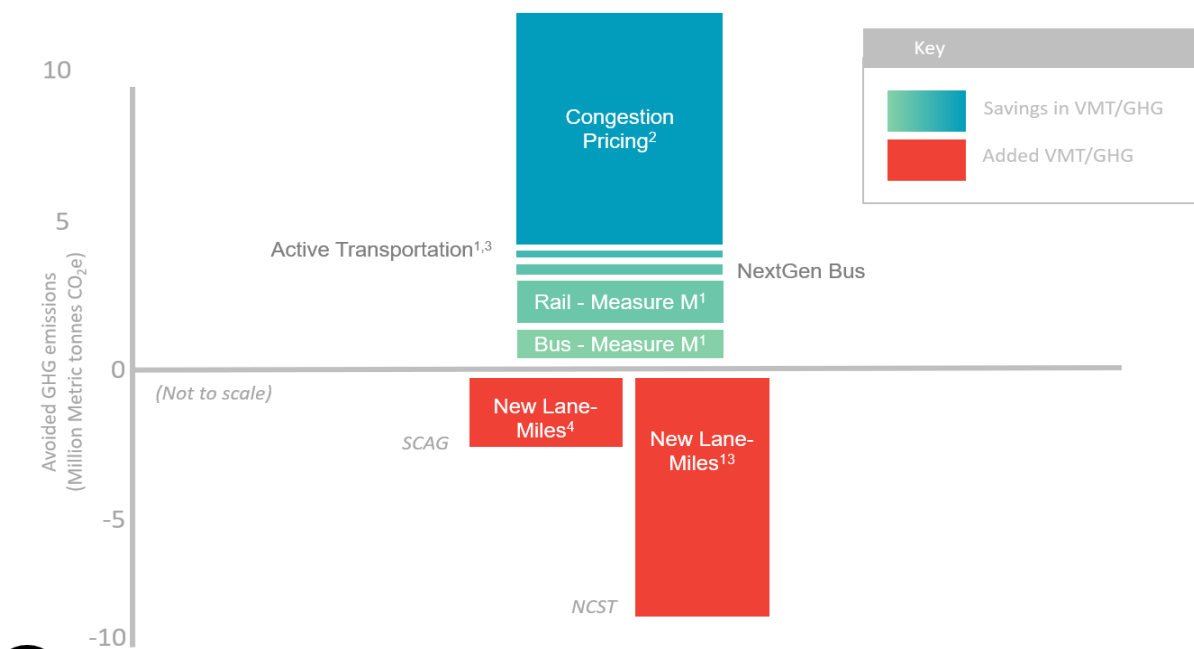
In addition, there is a lack of consensus among transportation planners about how to quantify the relationship between roadway projects and induced VMT, particularly when roadway projects incorporate multi-modal components as has been established as a priority for Metro's future roadway investments. This unresolved technical discussion is happening among planning entities in California in real time in relation to compliance with SB 743-- including in the working group for LA Metro's own VMT Mitigation Program led by Metro Planning staff. We do not attempt to resolve it these open technical questions related to the elasticity of various types of roadway facilities. The body of literature is based on historic nationwide data that is used to perform VMT calculations; however, the burden is on Self Help Counties to find locally relevant data. Instead, we point to a range of outcomes related to new capacity being added to roads and highways based on quantification approaches that

are under consideration.

Despite these limitations, this exercise is an important first step to better understanding the climate impacts of Metro programs relative to one another and throughout the county.

Disaggregated Impacts of Metro’s Initiatives

This analysis used published methodologies developed by various agencies (California Air Resources Board and Caltrans) and best-available regional and local input model parameters wherever possible to estimate the VMT impacts for individual initiatives. The resulting VMT values for each of the programs were then used to estimate GHG emissions using per mile and per trip-based emission factors from the CARB’s EMFAC model for each year between 2017-2047. Using the LRTP results and other Metro-provided data as the basis for this analysis was deemed appropriate and the quantification approach was found to be sound and acceptable by independent peer-reviewers.



¹ Included in 2020 LRTP.

² Indicates initial modeled performance analysis, further scoping and detailed analysis required.

³ This includes 244 miles of bike lanes across the County that further incentivizes the use of active transportation.

⁴ Calculations of induced VMT from highway expansion calculated based on SCAG’s Regional Travel Demand Model.

⁵ Calculations of induced VMT from highway expansion calculated based on the NCST calculator, the statewide tool included in recent Caltrans SB 743 guidance.

Overall, our preliminary calculations confirm the prior LRTP programmatic analysis showing that the implementation of Metro’s LRTP and the other complementary strategic initiatives will reduce VMT and avoid greenhouse gas emissions.

Collaboration is Key

In a region with ambitious VMT and GHG reduction goals, Metro's existing and planned system alone is insufficient to meet the necessary State and county emission reduction targets. While these preliminary calculations provide initial estimates of the relative VMT and GHG impacts of the agency's major programs, deeper analysis is needed to fully identify the impacts of programs that Metro supports or funds in the region, such as Metrolink and municipal transit agencies, and the potential synergies across these programs. This analysis is a starting point for Metro and our regional partners to build consensus on a standardized methodology for evaluating the GHG impacts of our major programs.

Partnering agencies across the region must work together to tackle this challenge through meaningful, coordinated action, including land use policies that prioritize public transit, affordable housing, and denser, mixed-use development, economic policies that account for the real cost of driving, and bringing additional resources to the task of providing accessible and affordable zero emissions travel options for all. Current and future collaboration between Metro and other agencies, including the Caltrans, the Southern California Council of Governments (SCAG), LA County, the City of Los Angeles and other local jurisdictions, and the other five regional County Transportation Commissions, amongst others, is essential for successful climate action planning and mitigation, addressing both transportation and land use policies.

EQUITY PLATFORM

The analysis is not designed to be used for decision-making and it does not recommend actions to prioritize programs or funding since issues of equity and access to opportunity have not been evaluated. While this analysis scope does not include actions to prioritize programs or funding, it is recommended that issues of equity, mobility, and access be evaluated concurrently and given equal consideration during further study on the VMT and GHG emissions impacts of Metro's programs and projects. It is important to note the very low automobile ownership among Metro's bus and rail riders. Equity must be considered concurrently because some programs that advance VMT reduction goals may not advance equitable outcomes. Likewise, some programs that advance equity may not realize the greatest VMT reduction, but that does not make them any less worthwhile - the benefits and burdens of each program and project must be viewed holistically.

Equity related considerations that should be included in any Metro programs or projects include:

- Specific impacts to Metro's Equity Focus Communities (EFCs)
- Potential for disproportionate exposure to environmental burden
- Disparities in access to Metro services
- Unique or specific barriers related to gender, race, and/or varying abilities
- Vulnerabilities related to age, income, and/or chronic health conditions

- Potential for the displacement of business and/or residents

The projected reductions in VMT and GHG emissions will result from a combination of rail and bus capital projects, revised bus operations protocols, active transportation projects, and travel pricing strategies. These beneficial impacts of Metro's programs and policies from VMT reduction, including GHG emissions avoidance and enhanced public health, are Countywide in scope and scale. These projects and programs will be implemented throughout Metro's service territory, without focusing on geographically specific impacts.

However, there may be concurrent air quality improvements that could have a locally beneficial impact, including Metro's EFCs, disadvantaged communities (DACs), and areas with high CalEnviroScreen scores for pollution burden combined with high CalEnviroScreen scores for Sensitive Populations and/or Socioeconomic Factors.

IMPLEMENTATION OF STRATEGIC PLAN GOALS

This report supports Metro's fourth and fifth Strategic Plan Goals. This analysis reaffirms the need to collaborate with regional agencies to establish meaningful GHG and VMT reduction targets for Los Angeles County (Goal #4). This analysis also demonstrates responsive, accountable, and trustworthy governance in support of Board Motion 45 (Goal #5) by providing transparency through baselining our indirect climate emissions impacts.

The staff recommends that Metro work with our regional partners to build consensus on a standardized methodology for evaluating the GHG impacts of our major programs, ensuring consistency and a more accurate comparison between projects and strategies. All future sustainability and long-range plans and reports will address progress on the development and achievement of Metro's VMT and GHG targets, as well as financially unconstrained pathways to achieve these targets.

Metro staff will leverage the findings of this analysis and work cross-departmentally to:

- Standardize methodology for calculating the VMT and GHG impacts of projects and programs;
- Re-baseline Metro's estimates for the VMT and GHG impacts of projects and programs;
- Further explore the establishment of achievable regional VMT/GHG reduction targets for Metro and set a reporting structure and timeline to achieve these targets;
- Complete the development of the VMT Mitigation Program for Roads and Highways and ExpressLanes, and;
- Continue implementing Motions 2020-0412 and 2021-0467 to Modernize the Metro Highway Program
- Consistently apply equity considerations to Metro's current and future VMT/GHG reduction programs and projects.

ATTACHMENTS

[Attachment A - Emissions Reduction Analysis: Metro's Regional Impact on Greenhouse Gas](#)

Emissions

Attachment B - Metro Board Motion 45

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