



The City of San Diego

Staff Report

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TO: Environment Committee

FROM: Planning

SUBJECT: A Planning Tool to Help Determine whether Community Plan Updates adequately contribute to Climate Action Plan Mobility and Vehicle Miles Traveled Targets

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Council District(s): Citywide

OVERVIEW:

In December 2015, the City Council adopted the Climate Action Plan (CAP), an aggressive and forward-thinking plan aimed at reducing greenhouse gas emissions by 50% percent by 2035. Among many strategies and targets identified, the CAP included targets to shift commuters away from private vehicles and towards reliance on alternative mode use such as bicycling, walking, and transit ridership.

In fall 2016, the City Council adopted four community plan updates (CPUs) – San Ysidro, North Park, Golden Hill, and Uptown. While the CPUs were determined consistent with the CAP, there was interest amongst the Councilmembers in developing a tool that would assist staff, public and decision-makers in determining whether future individual CPUs adequately contributed to the CAP’s citywide goals for mode split and vehicle miles traveled within Transit Priority Areas (TPAs). Because of the number of CPUs within the City and the time required to update, a guidance tool was desired to ensure that each CPU took on the appropriate residential density and employment intensity consistent with achieving the CAP targets.

The Planning Department, as part of the Fiscal Year 2018 Work Program, initiated work to develop a citywide model that analyzes the effects of land use planning on future commuter mode usage, which could be tested for various land use residential densities and employment intensities during the community plan update process. The tool will provide density and employment target ranges for each community based on the numeric assumptions used in development of the CAP.

PROPOSED ACTIONS:

This item is for information only

DISCUSSION OF ITEM:

The development of land use and policies under a CPU is influenced by a variety of factors, including existing built environment, physical constraints, environmental constraints, state and federal regulations, General Plan and other citywide policies, as well as current and projected market conditions. The mobility and VMT strategies outlined in the City’s CAP are one of several factors planners, public and decision-makers must take into consideration when comprehensively updating a community plan. All of these factors help guide the orderly growth and development of a community and provide the resources to enhance areas of preservation, as well as growth and prosperity for community transition over the next 30 years. Further, due to the unique characteristics of each community planning

area and its location within the City, the land use approach is not the same for each community, which ultimately influences and affects how much growth and development is appropriate for a particular neighborhood.

A. CAP Targets and the Challenges

Pursuant to CAP Strategy 3: Bicycling, Walking Transit & Land Use, the following 2035 commuter mode share and vehicle miles traveled (VMT) targets within Transit Priority Areas (TPAs) were established:

- 25% Mass Transit
- 18% Bicycle
- 7% Walking
- 2 Mile Reduction in Vehicle Miles Traveled

As part of the hearings for the four CPUs adopted in Fall 2016, staff provided an analysis showing how each individual CPU contributed towards achieving the citywide mode share targets listed above. However, as explained in those hearings, the analysis only looked at the resulting mode share for a particular community without consideration given to extraneous factors that further influence commuter mode usage.

An individual’s trip is comprised of the entire journey from origin to destination. Individuals may combine a number of modes to complete the journey, including walking, driving, or biking to transit station or stop. Transit services frame the core of such trips, but an individual must complete the first and last portion of the journey, often referred to as the “First Mile-Last Mile”.

In many cases, the first mile is initiated in one community, but the last mile is located in a different community. Therefore, the connecting mobility network and infrastructure that comprise the first and last mile trip segments are critical components of an effective citywide multi-modal transportation system. Simply put, the density, intensity and mobility improvements in one community can influence and affect usage/ridership in another. This is why the mode split goals in the CAP are looked at **citywide** and not assessed on a community-by-community basis.

Given this understanding, a more appropriate method of measuring mode share and VMT was desired.

B. Improved Approach to Measuring Mode Share

As part of the development of an improved tool to assist planners in the preparation of land use planning for the CPUs, the assumptions used in generating the CAP targets were consulted. While the mobility targets reflected in the CAP text are reflected as a percentage (i.e., 25% transit), staff looked into the assumptions used to establish those percentages. Pursuant to the CAP Appendices, GHG emissions reductions calculated for each mode percentage were based on specific numerics involving the amount of labor force, or employed persons, within TPAs.

The target mode share percentage for each mode in 2020 and 2035, respectively, is a factor of the total number of potential labor force commuters within a TPA. This value was multiplied by the average round trip commute distance and the number of working days per year to obtain the total VMT offset by each mode in TPAs. Finally, the VMT is multiplied by the weighted fleet emissions factor derived from EMFAC2011 to obtain the total GHG emissions reduction by each mode in TPAs. The following tables illustrate the aforementioned steps in calculating GHG reductions attributed to mode share.

Table 1: Key Assumptions and Results for Mass Transit within citywide TPAs

Year	Labor Force in TPAs ⁸⁸	Mass Transit Commuter Ridership in TPAs	Projected Number of Commuters Using Mass Transit in TPAs	Average Commute Distance of Labor Force Living in TPAs	VMT Avoided due to Mass Transit Use	GHG Reduced
		(%)		(Miles)		(MT CO _{2e})
2020	433,128	12%	51,977	25	331,350,936	119,234

2035	482,540	25%	120,635	25	769,048,125	213,573
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Table 2: Key Assumptions and Results for Commuter Walking within citywide TPAs

Year	Labor Force in TPAs ⁹³	Mode Share Goals in TPAs	Projected Number of Commuters Commuting by Walking	Round-trip Commute Distance	VMT Avoided Due to Pedestrian Commuters	GHG Reduced
		(%)		(Miles)	(Miles)	(MT CO ₂ e)
2020	433,128	4.1%	17,759	0.67	3,034,070	1,092
2035	482,540	6.5%	31,365	0.67	5,358,727	1,488

Table 3: Key Assumptions and Results for Commuter Bicycling within citywide TPAs

Year	Labor Force in TPAs ⁹⁷	Mode Share Goals in TPAs	Projected Number of Commuters Commuting by Bike	Round-trip Commute Distance	VMT Avoided Due to Bicycle Commuters	GHG Reduced
		(%)		(Miles)	(Miles)	(MT CO ₂ e)
2020	433,128	6.0%	25,988	8	53,016,150	19,077
2035	482,540	18.5%	89,270	8	182,110,596	50,574

Instead of focusing on the specific mode share percentages, it is more appropriate to measure the projected total reduction in VMT, a proxy for the GHG emissions reductions necessary to achieve the targets of the CAP. VMT is a more direct metric for measuring GHG reductions and provides more flexibility to achieve GHG emissions in a time when rapid technological improvements are happening in transportation. These include the emergence of Transportation Network Companies (TNCs) (e.g., Lyft and Uber), expansion of electric vehicle technology, the expansion of bike share and car share technology, and the potential advent of autonomous vehicles. Traditional share of automobile, transit, walk, and bike travel may shift as new technology emerges, and keeping these as the City’s targets may limit the City’s ability to achieve its primary goal of reducing GHG emissions.

C. The Improved ‘Planning Tool’

The City’s adopted CAP has unique strategies and goals, for which no existing tool or model was presently “on the shelf” to utilize as the Planning Tool. Thus, in February 2017, the City Planning Department retained the consultant services of Fehr & Peers, a professional engineering firm working with other large municipalities on VMT reduction policies and programs, to assist in the development of the Planning Tool that could provide a quick-response analysis and visualization of how different land use, transportation infrastructure, and policy scenarios affect commuter mode use.

The Planning Tool will provide a numeric range of target housing density and employment intensity that a community should assume to help achieve the assumptions used in the CAP to reduce single occupant vehicle use and to reach VMT targets

A number of existing models and programs were reviewed and evaluated for applicability based on their sensitivity, ability, and reliability to capture the effects of changes to land use and transportation infrastructure on commuter mode use. Performance testing and coverage of factors influencing commuter mode use resulted in the selection of the following calculation models.

- SANDAG Activity Based Model (ABM),
- SCAG Active Transportation Tool;
- Person Trip Generation by Purpose; and,
- SANDAG Model Trip Lengths.

The Planning Tool integrates these calculation methods into a single set of algorithms to estimate commuter mode use and ultimately VMT in a manner that is sensitive to land use and transportation characteristics. A first of its kind in the San Diego region.

The Planning Tool provides a quick visualization of VMT reductions related to land use and mobility infrastructure scenario planning. This is achieved through two methods. One, reduce commuter vehicle trip length within TPAs, and thereby reduce VMT. Two, shift travel from automobile travel for the entire trip, to transit, walking, or bicycle, or a combination of those commuter uses for “First Mile-Last Mile” improvements as discussed above.

Communities in lower density, vehicle oriented areas will have more difficulty reducing VMT than communities in higher density, compact areas. Therefore, CPU targets are expected to vary between communities to achieve the overall citywide targets. Additionally, neighboring community plans can share targets by encouraging the type and quantity of land use development that reduces VMT citywide and not just in their community. Communities can also work on developing non-automobile infrastructure that links communities (bike & pedestrian trails, transit connections) under “First Mile-Last Mile” techniques.

This Planning Tool provides a more effective approach for land use planning that takes into consideration growth constraints, as well as the jobs-housing balance citywide. As an example, if two communities are primarily housing focused, but one is closer to an employment center, it makes sense for growth to occur in the community that is closer to the employment center and would result in less VMT. This may not result in a lower VMT for the community that adds the housing, but it would reduce VMT on a per capita basis citywide, which is one of the primary objectives of the CAP.

The Planning Tool would produce heat maps that depict the effect of changes to residential density and employment intensity onto commuter mode use while taking into consideration a various built environment and sociodemographic factors at the community plan area scale as well as Citywide. The heat maps would also depict the individual and combined effect of changes to residential density and employment intensity.

Ultimately, the Planning Tool will provide a numeric range of housing density and employment intensity that each community should assume to achieve the assumptions used in the CAP to reach mode split and VMT targets. The Planning Tool will also identify the positive impact of enhancing the built environment and implementing transportation demand management (TDM) strategies.

However, it must be stressed that this tool is one of many resources used in updating a community plan. As noted previously in the staff report, several other factors influence the ability of a community to take on growth and intensity. As such, there may be situations where a particular community may be able to take more growth than the Planning Tool assigns, while another will take less --- the overall objective is to ensure housing density and employment intensity is assigned within the citywide TPAs, pursuant to the assumptions described in the CAP Appendix.

D. Next Steps

City Planning staff is presenting this information item on the modeling development and programming completed to date. Staff is still going through the beta testing of the model and anticipate that it will be fully functional by late Winter 2018, and incorporated into the planning information that will be presented to the City Council with each CPU programmed for 2018 and beyond.

City Strategic Plan Goal(s)/Objective(s):

Goal 3: Create and sustain a resilient and economically prosperous City.

Fiscal Considerations:

Not applicable.

Environmental Impact:

This is an informational item only; there is no discretionary action before the committee at this time, and therefore, this item is not subject to review under the California Environmental Quality Act (CEQA) pursuant to section 15060(c)(1).

Equal Opportunity Contracting Information (if applicable):

Not applicable

Previous Council and/or Committee Actions:

Not applicable.

Key Stakeholders and Community Outreach Efforts:

Not applicable.

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