T-24. Implement Market Price Public Parking (On-Street)

GHG Mitigation Potential

Up to 30.0% of GHG emissions from vehicle travel in the plan/community

Co-Benefits (icon key on pg. 34)

Climate Resilience

Implementing market price public parking could incentivize increased use of public transit and thus result in less traffic, potentially reducing congestion or delays on major roads during peak AM and PM traffic periods. In addition, this reduces illegal loading/standing in bus stops and travel lanes. When these reductions occur during extreme weather events, they better allow emergency responders to access a hazard site.

Health and Equity Considerations

Pricing on-street parking at market rates reduces illegal loading/standing in bus stops and travel lanes, improving transit times.

Measure Description

This measure will price all on-street parking in a given community, with a focus on parking near central business districts, employment centers, and retail centers. Increasing the cost of parking increases the total cost of driving to a location, incentivizing shifts to other modes and thus decreasing total VMT to and from the priced areas. This VMT reduction results in a corresponding reduction in GHG emissions.

Subsector

Parking or Road Pricing/Management

Locational Context

Urban, suburban

Scale of Application

Plan/Community

Implementation Requirements

When pricing on-street parking, best practice is to allow for dynamic adjustment of prices to ensure approximately 85 percent occupancy, which helps prevent induced VMT due to circling behaviors as individuals search for a vacant parking space. In addition, this method should primarily be implemented in areas with available alternatives to driving, such as transit availability within 0.5. mile or areas of high residential density nearby (allowing for increased walking/biking). If the measure is implemented in a small area, residential parking permit programs should be considered to prevent parking intrusion on nearby streets in residential areas without priced parking.

Cost Considerations

Municipalities may incur costs from installing the meter network, which may require meters at individual spaces or at more central terminals. There would also be staffing costs to monitor the metered spaces and collect payments. Residents also incur a cost by having to pay for on-street parking. A portion of costs to the municipality may be offset through revenue collected by the parking system.

Expanded Mitigation Options

Pricing on-street parking also helps support individual projects with priced onsite parking by removing potential alternative parking locations.

GHG Reduction Formula

$$A = \frac{B}{C} \times \frac{D - E}{E} \times F \times G \times H$$

GHG Calculation Variables

ID	Variable	Value	Unit	Source
Output				
A	Percent reduction in GHG emissions from vehicle travel in plan/community	0–30.0	%	calculated
User Inputs				
B	VMT in priced area without measure	[ ]	VMT per day	user input
C	VMT in plan/community without measure	[ ]	VMT per day	user input
D	Proposed parking price	1.00–5.00	$ per hour	user input
E	Initial parking price	0.00–5.00	$ per hour	user input
F	Default percentage of trips parking on street	5–75	%	user input
Constants, Assumptions, and Available Defaults				
G	Elasticity of parking demand with respect to price	-0.4	unitless	Pierce and Shoup 2013
H	Ratio of VMT to vehicle trips	1	unitless	assumption

Further explanation of key variables:

- (B and C) – Total daily VMT in both the priced area and the plan/community area should represent the expected total VMT generated by all land use in that area, including office, residences, retail, schools, and other uses. The most appropriate source for this data is from a local travel demand forecasting model. An alternate method uses VMT per worker or VMT per resident as calculated for SB 743 compliance and screening purposes multiplied by the population in the area.
  - These variables for VMT by area are used to ensure that the percent GHG reduction from the priced area is at the same geographic scale as the vehicle travel in the plan/community. If the area priced is a business district and the analysis is limited to the business district, then the VMT would be equal (B=C).
- (D) – The proposed parking price can be presented in cost per minute, hour, or day, provided that the same units are used for variable (E)
- (E) – Because this is used to calculate the percent change in parking price, if parking is free under existing conditions, (E) should be set to (1/2×D), resulting in a percentage change of 100 percent. In areas where metered parking is common, E may instead by set to equal the average metered parking price in nearby areas or districts.
- (F) – On-street parking represents only a portion of the total available parking supply. An estimate will typically range from 5 percent (in locations with offsite parking garages available) to 75 percent (in locations where most parcels have little to no onsite parking for visitors). The user should provide a project-specific value within this range, by surveying the total on-street vs. off-street parking spaces within ¼ mile of the study area.

- (G) – An evaluation of the SFPark program in San Francisco found that a 0.4 percent decrease in parking demand occurs for every 1 percent increase in parking price (Pierce and Shoup 2013). Price elasticity of parking demand varies by location, day of the week, and time of day.
- (H) – The adjustment factor from vehicle trips to VMT is 1. This assumes that all vehicle trips will average out to typical trip length ("assumes all trip lengths are equal"). Thus, it can be assumed that a percentage reduction in vehicle trips will equal the same percentage reduction in VMT.

GHG Calculation Caps or Maximums

Measure Maximum

(A_{max}) The total reduction in VMT due to on-street parking pricing is capped at 30 percent, which is based on the following assumptions:

- $\left(\frac{D-E}{E}=100\%\right)$ – Parking prices double (i.e., increase by 100 percent) or parking pricing is introduced in previously free areas.
- (F) – 75 percent of all vehicle trips utilize on-street parking. Note that only within a small-scale commercial district is 75 percent of parking likely to occur on street.

This maximum scenario is presented in the below example quantification.

Subsector Maximum

Same as (A_{max}). Measure T-24 is the only measure at the Plan/Community scale within the Parking or Road Pricing/Management subsector.

Example GHG Reduction Quantification

The user reduces VMT by increasing hourly on-street parking costs. In this example, the hourly parking cost increases from $1.00 (E) to $2.00 (D) in a business district. The business district daily VMT is 1,000,000 (B), and the scale of implementation is the business district (B=C). If around 75 percent of the district's parking supply is on street (F), the user would reduce GHG emissions from VMT by 30 percent.

$$A = \frac{1{,}000{,}000\,\frac{\text{VMT}}{\text{day}}}{1{,}000{,}000\,\frac{\text{VMT}}{\text{day}}} \times \frac{\$2.00 - \$1.00}{\$1.00} \times 75\% \times -0.4 \times 1 = -30\%$$

Quantified Co-Benefits

Improved Local Air Quality

The percent reduction in GHG emissions (A) would be the same as the percent reduction in NO_X, CO, NO_2, SO_2, and PM. Reductions in ROG emissions can be calculated by multiplying the percent reduction in GHG emissions (A) by an adjustment factor of 87 percent. See *Adjusting VMT Reductions to Emission Reductions* above for further discussion.

Energy and Fuel Savings

The percent reduction in vehicle fuel consumption would be the same as the percent reduction in GHG emissions (A).

VMT Reductions

The percent reduction in VMT would be the same as the percent reduction in GHG emissions (A).

Sources

- Pierce, G., and D. Shoup. 2013. Getting the Prices Right: An Evaluation of Pricing Parking by Demand in San Francisco. *Journal of the American Planning Association* 79(1)67–81. May. Available: https://www.tandfonline.com/doi/pdf/10.1080/01944363.2013.787307?needAccess=true. Accessed: January 2021.