9 Auto Operating Costs, Pricing and Transit Fares

9.1 Auto Operating Costs

SACSIM19 uses consumer full "out-of-pocket" auto operating costs as a key concept and input for driving mode choice and usage. Cost include gasoline, maintenance and tires, and federal and state taxes; computed on a per mile basis (Table 9-1). Gasoline costs are the largest share of per-mile out-of-pocket operating costs for most vehicles. Within SACSIM19 Cube® scripts, the auto operating cost is split into the portion related to direct costs (fuel, tires, and maintenance) and the portion related to fuel tax (for base year model, and future scenarios with no Pay-as-You-Go or mileage-based fees), or for representing a PAYGO fee for future scenarios assuming transition from fuel tax to PAYGO fees.

Table 9-1 Calculation of SACSIM9 Auto Operating Costs

Variable	2016
Fuel Price Per Gal. (Yr. 2017 $)[†]	$2.81
Avg. Auto Miles / Gal[††]	23.2
Gas Cost Per Mile (Yr. 2017 $)	$0.12
Tire+Maint Cost Per Mile (Yr. 2017 $)[‡‡]	$0.065
Total Auto Ops Cost Per Mile (Yr. 2017 $)	$0.186
Total Auto Ops Cost Per Mile (Yr. 2000 $)	$0.128
Fuel tax shares of Auto Ops Cost Federal + State Fuel Tax per Mile (Yr. 2017 $)	$0.023
Non-fuel-tax Auto Ops Cost per Mile (Yr. 2017 $)	$0.164

Source: SACOG 2020.

[†]Based on California Energy Commission spot prices

[‡]Inflation adjustments based on Bureau of Labor Statistics "Western States Urban" CPI.

[††] From EMFAC2014 passenger car vehicle fleet miles per gallon

[‡‡]From CSAA "Your Cost of Driving" reports.

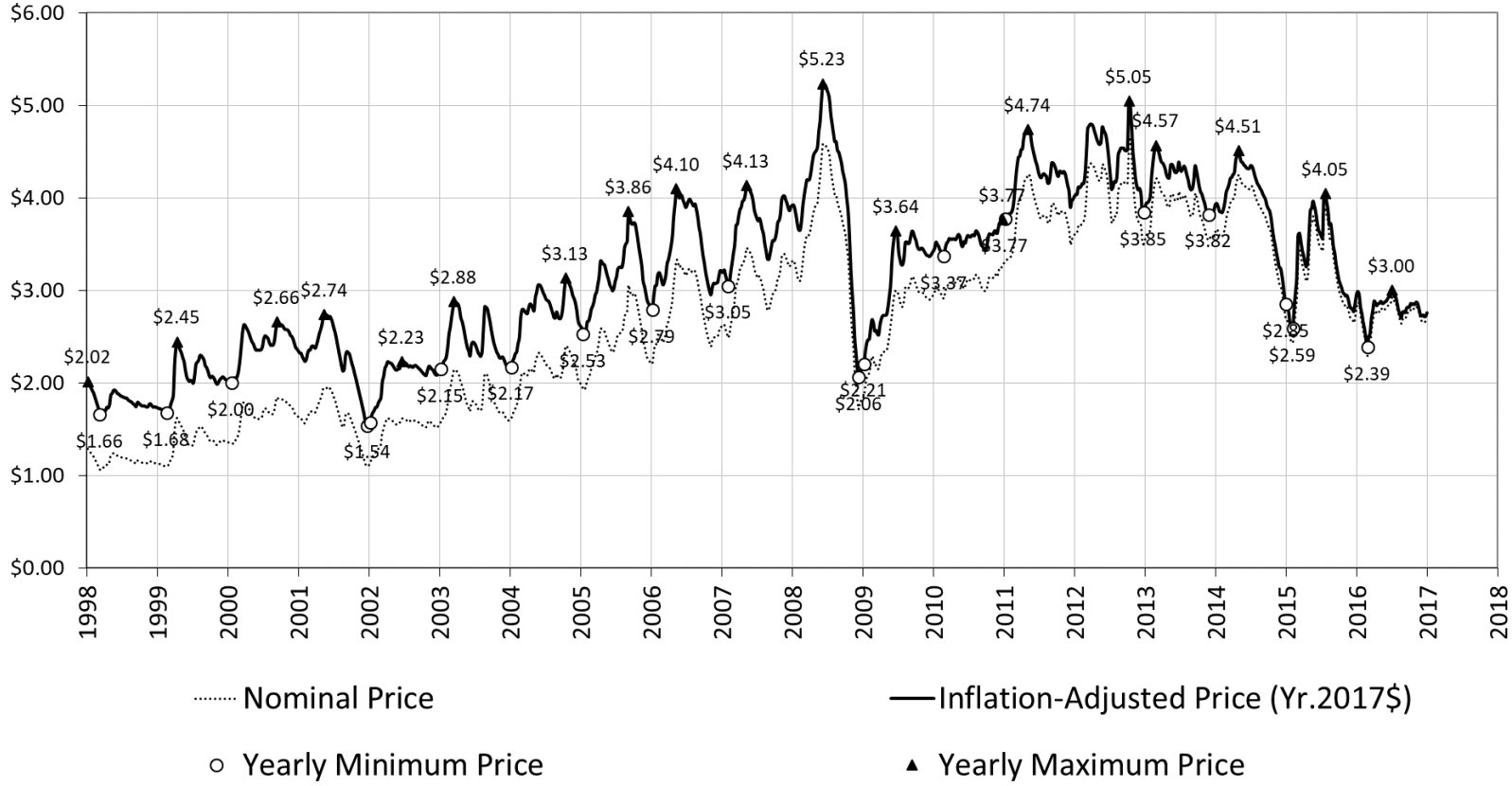
For future scenarios analyzed as part of the 2020 MTP/SCS, a similar approach used in the 2012 and 2016 MTP/SCS was used to represent future auto operating costs within SACSIM. The approach used:

- recent federal Energy Information Administration "Low" and "High" forecasts of gasoline prices;
- average passenger vehicle fleet MPG forecasts using the EMFAC emissions model;
- non-fuel costs projected based on AAA "Your Cost of Driving" data; and
- update the CA/US price differential using most recent data.

The approach to forecast auto operating costs were detailed in documents submitted to the California Air Resources Board *SACOG Technical Methodology for Greenhouse Gas Calculations for the 2020 MTP/SCS" and associated addendums*.

SACSIM and other MPO Travel Demand models have shifted to average cost per mile as standard practice (integrated as part of SACSIM since 2009). Use of average variable cost per mile have been shown to be more predictive of trip-making behavior than average "full" costs (which include vehicle ownership costs like finance charges, depreciation, insurance, etc.). The behavioral theory underpinning this is that for most households, vehicle ownership is a necessity, and choices of use of a vehicle (number of trips, length of trip, etc.) do not factor in auto ownership costs.

Figure 9-1 California Gasoline Prices, 1998 to 2017



Source: SACOG 2020.
Based on gasoline price data from the California Energy Commission, with inflation adjustments calculated using the Western States Urban consumer price index.