



MEMORANDUM

Date: August 17, 2012 Project #: 11406.0
To: David Rogers, Costco Wholesale Corporation
From: Chris Brehmer, P.E., Kittelson & Associates, Inc.
Subject: Lynnwood Costco Gasoline Trip Generation Characteristics

Kittelison & Associates, Inc. previously documented the estimated trip generation of the proposed Costco Wholesale project to be located at Lynnwood Crossing in a March 31, 2011 memorandum. Those trip estimates have subsequently been incorporated into the trip generation scenarios for the Draft Environmental Impact Statement (DEIS) prepared for the development site. The March 31, 2011 trip estimates remain valid; however, they reflect the combined trip generation of the warehouse and the fuel uses associated with the site.

At your request, this memorandum provides documentation of the individual trip generation associated with the five-island Costco Gasoline and is intended for informational purposes only.

FUEL TRIP GENERATION ESTIMATE

The unique nature of Costco operations and its membership requirements result in different trip characteristics than those observed at the standard fuel stations summarized in the Institute of Transportation Engineers (ITE) *Trip Generation* guidebook. For example, the percentage of pass-by trips at Costco Gasoline is lower than that quoted in *Trip Generation* for typical fuel stations. Correspondingly, membership requirements also have a significant effect on trip internalization (or sharing of trips) between the warehouse and the fuel station. Fewer people exclusively visit a Costco Gasoline (in comparison to a typical standalone station) because they have another primary purpose for visiting the site (that being a trip to the warehouse).

Trip type and trip generation estimates for the proposed Lynnwood Costco Gasoline were developed based on data collected at other other Costco Gasoline sites as described below.

Trip Type

Trips to 17 different west coast Costco sites have been recorded and classified into internal, pass-by, diverted, and net new (primary) trips consistent with ITE analysis methodologies. The 17-site database includes three-, four-, and five-island Costco Gasoline facilities and was used after reviewing the available data and determining that trip type is generally independent of the number of fueling positions (also consistent with ITE).

Internal Trips

Internal trips account for those members who patronize both the warehouse and the gasoline pumps during a single visit to a Costco site. As such, although they account for a trip to both the warehouse and the fuel station, they only account for one overall vehicle trip to and from the site. Using data from 17 west coast Costco Fuel station sites, on average 34% of the weekday p.m. peak hour trips to and from Costco Gasoline facility are internal capture trips.

Pass-by Trips

Pass-by trips represent members (and trips) that are currently traveling on roadways adjacent to the site for some other primary purpose (such as a trip from work to home) and stop into the site en route during their normal travel. As such, pass-by trips do not result in a net increase in traffic on the surrounding transportation system and, typically, their only impact occurs at the site driveways where they become turning movements. On average, 37% of the weekday p.m. peak hour trips are pass-by trips from the surrounding street system. This is lower than the average capture rate quoted in *ITE Trip Generation* for typical service stations (58% in the a.m. and 42% in the p.m.) and, again, is attributable to the unique travel characteristics that result from Costco's membership requirements.

Diverted Trips

Diverted trips represent members (and trips) that are currently traveling on the surrounding street system in the site vicinity for some other primary purpose (such as a trip from work to home) and divert from their normal route to travel to Costco. An example would be someone who normally travels on SR 525 on their trip home from work who diverts to travel to the Costco site. As such, diverted trips do not result in a net increase to those intersections further from the site that they normally travel through, but they do become additional trips on the roadways along their diverted route and at the site driveway(s). Based on customer surveys collected at the 17 Costco Gasoline facilities, on average 37% of the weekday p.m. peak hour trips are diverted.

Net New Trips

Net new (primary) trips are made by those drivers who travel to the Costco Fuel for the specific purpose of purchasing fuel and would otherwise not travel to the site.

Trip Rate

As previously documented in preparing trip estimates for the Lynnwood site, there is limited trip rate data available for five-island Costco Gasoline facilities as there currently are only two operational in the continental United States. Table 1 shows trip generation data collected at the five-island Costco Gasoline facilities located in Scottsdale and Tucson, Arizona sites.

Table 1 Trip Generation for Five-Island Costco Gasoline Facilities

Location	Weekday PM Peak Hour Total Trip Ends		
	In	Out	Total
Scottsdale, AZ	250	250	500
Tucson, AZ	170	170	340

As shown in Table 1, the Scottsdale location had a higher trip generation rate than Tucson, which was found to be consistent with the recorded fuel transactions over an annual period (the data was collected within weeks of each other and there was no apparent variation in the relationship between the site transactions over an extended period). This data, while limited, suggests that several market factors including population, competition, and other unknowns influence the site trip generation.

Taking a conservative approach, we have used the highest observed trip generation at an existing five-island location (Scottsdale) to prepare a trip estimate for the Lynnwood Costco Gasoline site. We note that using the highest trip rate coincidentally happens to be essentially the same as applying the ITE *Trip Generation* trip rates. While this approach likely is an overestimation of the trip generation impacts given our trip findings at other four-island Costco sites, it will ensure the analysis is conservative and extremely defensible. The resultant trip generation estimate for the proposed five-island Lynnwood Costco Gasoline is shown Table 2.

Table 2 Costco Gasoline Trip Generation Estimate
(Based on Highest Five-Island Site Observed)

	Five-Island Expanded Trip Generation		
	In	Out	Total
Total Trip Ends	250	250	500
Internal Trips (34%)	(85)	(85)	(170)
External Trips	165	165	330
Pass-by Trips (37% PM)	(60)	(60)	(120)
Diverted Trips (37% PM)	(60)	(60)	(120)
Net New Trips	45	45	90

I trust this information provides you with an understanding of trips to and from the proposed Lynnwood five-island Costco Gasoline facility. Please let us know if you have any questions regarding the contents of this memorandum or other Costco trip generation attributes.