

2012 ATP Accessibility Measure

“Accessibility” measures the number of activity opportunities which are reachable in a defined distance or travel time. Accessibility measures are made up of two related parts:

- A definition of activity opportunities of interest
- A definition of the transportation network and travel time or distance of interest

Common accessibility measures are:

- Number of jobs reachable within a 30 minute drive
- Number of jobs reachable within a 30 minute transit trip
- Number of dwellings reachable within a 3-mile bike or walk

Accessibility measures are one of the most powerful ways of characterizing both land use (i.e. the activity opportunities) and transportation (i.e. travel time or distance) in a single measure. In general, accessibility measures are becoming more commonly used in transportation and land use planning. This increasing popularity is occurring for a couple of reasons. First, a lot of research on land use and transportation has showed that accessibility has a strong effect on how people travel. Probably the best single article on this is a recent “meta-analysis” by Reid Ewing and Robert Cervero¹. The Victoria Transport Policy Institute provides a comprehensive document on accessibility as a transportation planning measure². Second, advances in available land use data, network data, and tools for network path-building and data processing are making accessibility measures easier to produce, including several high-profile web-based tools³.

This combination of advances in research, data, and computing has made accessibility measures both more common and more useful in transportation planning. Some common uses of accessibility measures are:

- **Context assessment:** How accessible are areas now? Where is accessibility higher or lower?
- **Assessment of plans and change over time:** Based on planned changes to both land use and transportation, how much will accessibility change?
- **Analysis of context and opportunity identification:** In areas where accessibility is low (or high), is this because of the land use (i.e. what activity opportunities exist in

¹ Ewing, Reid and Cervero, Robert, “Travel and the Built Environment”, Journal of the American Planning Association, Summer 2010, Vol. 76, No. 3.

² Littman, Todd, “Evaluating Accessibility for Transportation Planning: Measuring People’s Ability to Reach Desired Goods and Services”, Victoria Transport Policy Institute, <http://www.vtpi.org/access.pdf>, March 23, 2016.

³ See <https://www.walkscore.com/> and <http://alltransit.cnt.org/metrics/?addr=sacramento%2C+ca>, though many others exist.

an area), or because of the transportation network in that area (i.e. what activity opportunities does the transportation network allow a traveler to reach)? Or both?

- **Project evaluation:** How much can a given proposed change (either a change to land use, or a change to transportation network) increase accessibility?

For purposes of assessment active transportation program (ATP) projects, SACOG prepared a mapped data layer portraying accessibility to activity opportunities via the 2012 roadway network:

- The roadway network is a special version of SACOG’s regional GIS centerline file. Since the network is intended to assess walkable access, freeways and freeway ramps were excluded. *NOTE:* Ideally, Class 1 multi-use trails would be included in the network used for measuring accessibility for this purpose, but this was not done for this data layer. This change will be considered for future iterations of this data layer.
- Activity opportunities were measured by a combination of dwelling units (locations where residents live, plus destinations for social activities), non-basic jobs (including retail, food service, other services, medical and educational sectors), and school enrollments (both K12 and university). These job sectors are likely generators of walking-mode trips by residents. SACOG parcel-level estimates of dwellings, jobs, and school enrollments for year 2012 were used. *NOTE:* although there is a logic to the subset of jobs, plus dwellings and enrollments, for development of this data layer, there is no “law” on what can be included, and SACOG is willing to flex this definition in future versions of this data layer.
- The accessibility measure is generated using software which “skims” the roadway network to tally all activity opportunities within a pre-defined threshold distance (or time) from a “subject” parcel. For purposes of this data layer, the threshold used was 0.75 miles. At 3 miles per hour, 0.75 miles takes about 15 minutes. This distance represents a compromise—long-ish distance for a walk trip, short-ish for a bike trip. *NOTE:* there is no “law” on what threshold should be use, and SACOG is willing to flex this threshold in future versions of this data layer.

Figure 1 provides a screen capture of the 2012 ATP accessibility measure, available on the SACOG Active Transportation Program Mapping website.

For the map data layer provided, for a location showing in the 5,000 to 10,000 range, the correct interpretation of that number is that within a 0.75 miles of that location, a pedestrian or cyclist could reach between 5,000 to 10,000 dwellings, non-basic jobs, or school enrollments.

The ranges of accessibility provided on the map are as follows:



- Less than 1,500—Low accessibility (approximately 31 percent of the population in the region resides in areas like this)
- 1,501 to 3,000—Medium accessibility (approximately 31 percent of the population in the region resides in areas like this)
- 3,001 to 5,000—Medium/high accessibility (approximately 25 percent of the population resides in areas like this)
- 5,001 to 10,000—High accessibility areas (approximately 11 percent of the population resides in areas like this)
- Greater than 10,000—Very high accessibility areas (approximately 2 percent of the population lives in areas like this)

As with other aspects of accessibility measures, there is no “law” on what ranges to use.

Use of the 2012 ATP Accessibility Measure

For purposes of the ATP proposals, the 2012 ATP accessibility measure is intended primarily for context assessment, and secondarily for project evaluation.

- **Context assessment:** identify the location of a proposed ATP project, and look at the general range of accessibility of that location. In some cases, a project will be located fully in one “range” or color on the map. In some cases, a project will be located in a “boundary” area between two or more ranges. The accessibility of that location can be described using the range or ranges in the project location. Because the data layers are consistent, this language of describing context is consistent, at least for the SACOG region and for this definition of accessibility.
- **Project evaluation:** all other things being equal, a project located in an area of high accessibility is likely to serve more active mode trips than a project located in an area of low accessibility. Clearly, there are factors besides accessibility which are important in ATP project evaluation (e.g. safety benefits of project, design characteristics, etc.), but areas where there are more activities reachable by the current network are likely to be more active and used more by active mode travelers.
 - *Caveat:* projects which have a significant impact on the network are intended to improve accessibility by providing a new route or closing a significant gap in the active transportation network. Project applicants with projects which fall into this category are encouraged to work with SACOG staff to assess the improvement in accessibility their project would generate.

For questions on this data layer or its potential use in ATP applications, contact:

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Figure 1. 2012 ATP Accessibility Measure

