

# Creating an Accessibility index using TRACC



**EAST-WEST GATEWAY**  
Council of Governments

Creating Solutions Across Jurisdictional Boundaries

***“We needed a fresh new approach to the way we looked at accessibility and TRACC provided the exact inputs needed for our analysis”***

East West Gateway

East West Gateway Council of Governments (EWG) serves as the Metropolitan Planning Organization (MPO) for St. Louis region which serves almost 3 million residents. Traditionally, an accessibility map would look at travel times between large Traffic Analysis Zones (TAZs). EWG wanted to enhance this type of analysis to see how many key destinations are accessible by public transit and walking, within a specified time. This type of analysis allowed multiple destinations to be looked at in one go and to add a weighting to each destination type to provide a different view of accessibility. To do this, they used TRACC software provided by Basemap. This is the only product on the market which could easily load in the required data at the large scale of analysis required and then provide accurate and trusted travel times to their destination data.

## *Calculating the Score*

The score is created using four main inputs which are customizable in TRACC. For this project, it was decided to look at Census block centroids to define the origins. The destinations were split into 8 different types of POI (See Table 1) The next element was travel mode - Public transit (PT) and walking were utilized, although cycling is a consideration for future analysis.

After a calculation has been completed an accessibility function is utilized, which measures the ease in which an individual can travel from the origins to destination. A catchment is used from each origin to destination based on travel mode and maximum journey time (Walk 40 minutes and PT 60 Minutes) and this is used to create an index for each census block. This data is easily created within TRACC, as every origin to destination is given a travel time, creating hundreds of millions of possible journeys which are extracted as an O/D matrix file.

The O/D matrix files created in TRACC were used to find out how many POIs are within the catchment. Each POI within the catchment area contributes to the accessibility score of the origin. The accessibility value is between 0 and 1 and is calculated with an exponential decay function. This means that if the point of interest is in the exact vicinity of the origin then the value will be 1. As the point gets farther from the origin based on travel time, its value approaches 0.

**TRACC**  
Accurate, multi-modal  
travel time analysis



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**Basemap**  
Digital mapping and  
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The method also defines a parameter called “saturation” which is the maximum number of points of interest within a category that are counted towards the accessibility score for an origin. This is different to a traditional travel time analysis that will only look generally at access to the closest POI.

Table 1. Saturation and weights for different point of interest categories and modes of travel

POI Categories	Walk		PT	
	Saturation (# POI's)	Weight	Saturation	Weight
Education	5	2.4	-	0.1
Entertainment and Recreation	10	1	-	0.05
Food and Drink	20	0.5	-	0.02
Grocery Stores	3	10	-	0.1
Hospitals	1	6	-	1
Pharmacies	3	2	-	0.1
Public Services and Banks	20	0.8	-	0.05
Shopping	20	0.5	-	0.02

Table 1 shows the saturation for different POI's when walking. There is no saturation for PT (no limit to the maximum accessibility score) as all POI's within catchment are important. The weighting values for PT reflect this. The formulae will apply these weightings and walk saturation values to each POI category when undertaking a calculation.

### Analyzing the results

*“Analyzing accessibility in small geographies such as census blocks reveals hotspots with very poor accessibility that will not show up when bigger geographies are used. TRACC helped us estimate travel times and accessibility between tens of thousands of census blocks within a reasonable time-frame, a task no other software I was familiar with was able to handle.” Amir Poorfakhraei, Transport Analyst, East West Gateway*

*Amir went on to say “Regarding the results, there is a sad reality that the accessibility maps are showing us: The maps show a very poor transit accessibility and very poor to moderate walk accessibility in East*

*and North St Louis. East St Louis (northeast of the Mississippi river) and North St Louis. These are where a large population of low income households, racial minorities, and households with zero vehicle ownership live.”*

TRACC has allowed EWG to very quickly get a view of accessibility in their region highlighting both low accessible areas. This view is “Eye-Opening” according to Amir and it is great they now have a tool in TRACC that can assist with the monitoring.

This methodology could be replicated all over the world. If you are a transit authority, government agency or would like to find out more about TRACC please get in contact to see how it can help your organization.

