

# MEMO

**TO:** Sheng Chen (IDOT)  
**FROM:** Vince Bernardin, PhD (RSG)  
**DATE:** June 19, 2018  
**SUBJECT:** Passive OD Data for the Illinois Statewide Model

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The data-driven form recommended for the Illinois statewide model requires large scale passive (origin-destination) OD data for both passengers and trucks. In order to support the completion of the first phase during the term of the contract it is necessary to have the OD data in hand by the end of 2018 at the latest. Since it does not seem that the Sidewalk Labs data will be available in that timeframe, other data will need to be used.

IDOT also provided OD data as well as travel time information from HERE. The HERE travel time data will be helpful in supporting the development of the model. However, review of the HERE OD data has shown that it does not provide an adequate sample for model development. For example, key destination zones such as O'Hare Airport and Millennium Park showed trips to and from less than a dozen origin zones.

It will therefore be necessary to acquire passive OD data in support of the statewide model development. We propose the purchase of data from Cuebiq (for passenger modeling) and ATRI (for truck modeling). Both of these datasets are of high quality and have been successfully used for statewide and regional modeling.

Cuebiq is less well known in transportation because they do not market directly but are the supplier of location-based services (LBS) or smartphone app data for Streetlight, one of the leading suppliers of passive OD data for transportation analysis. A direct purchase from Cuebiq is recommended rather than through Streetlight both for reasons of cost effectiveness and because obtaining the raw data directly from Cuebiq allows the model development team greater flexibility in and control over the data processing. Cuebiq now offers data from over 55 million or roughly 1 in 4 smartphones in the US. Their data is substantially more precise regarding location than data based on trilateration from cellular signaling (such as available from AirSage or Teralytics) and orders of magnitude higher in sample penetration compared to pure navigational GPS-based data (such as available from INRIX and HERE). While there are other providers of LBS data, some are known to have infrequent locational observations (few pings per day). Cuebiq averages roughly 150 sightings per device per day, and they are the only source of LBS data with proven travel modeling applications. We have worked successfully with their data both directly and through Streetlight in multiple states across the country from Virginia to California and in neighboring Indiana.

The American Transportation Research Institute (ATRI) is the non-profit research arm of the American Trucking Association. They have been providing truck GPS data to FHWA for nearly twenty years. Their sample includes roughly 1 in 10 heavy trucks on the road, equal to or greater than the penetration rate of all competing data sources in every study known to the model development team. Since pioneering the use of truck GPS data in statewide modeling in the Indiana statewide model in 2011, the model development team has successfully incorporated ATRI's truck GPS data in more than a statewide model a year for Iowa, Tennessee, Florida, Pennsylvania, Maryland, Ohio, Michigan, and Nebraska.

In our proposal we stated that we would “help IDOT evaluate the purchase of data to support the statewide model development,” and provided a preliminary recommendation that IDOT acquire Cuebiq and ATRI data. While we did not include the cost of such a data purchase in our fee estimate, and subsequently believed first that Sidewalk Labs and then possibly HERE data purchases by IDOT may serve the statewide model rather than Cuebiq and possibly ATRI, at this point in time, it appears that neither of these sources will serve for this purpose. Therefore, in order to avoid delay to the project which might result from a separate IDOT procurement process, we recommend the purchase of Cuebiq and ATRI data by the model development team out of the project budget. While this would reduce the budget available for model development activities, we are confident that the remaining amount would be adequate to produce a state-of-the-practice data-driven (advanced trip-based) statewide model with a modular design as initially proposed and further refined and detailed through and following the model design workshop.

In summary, it is our opinion that both the Cuebiq and ATRI datasets are uniquely well-suited to the development of the Illinois statewide model and that a separate procurement process would jeopardize the ability to deliver the project on schedule while a purchase of the data out of project funds would not jeopardize, but rather, best support the success of the project. The total cost of the purchases would be \$120,000. Please advise us if we can purchase these datasets out of project funds.

Please also be advised that RSG would obtain license to the disaggregate Cuebiq and ATRI datasets for the purpose of producing and delivering derived OD data products for IDOT. These OD matrices, and not the raw trace data, would be licensed to IDOT for their use in statewide modeling. ATRI has requested an additional \$30k to extend license for the use of its data to MPO modeling for IL MPOs and a further additional \$15k to extend that license to the Gateway MPO. We are not proposing to pay for these additional licenses out of the project funds because it is not necessary to the project. However, we would recommend that IDOT consult with the MPOs and consider exercising this option and we can explore whether we could secure the option for IDOT to extend the license to the MPOs at this price for some period of time, such as a year, to allow IDOT time to coordinate with the MPOs.