



## Transportation Committee

## Item #17-6-9 Information

May 25, 2017

### Usage of Big Data for Transportation Planning

**Issue:** Update on SACOG projects and initiatives using “big data” and new planning tools based on big data.

**Recommendation:** None, this is for information only.

**Discussion:** “Big data” is fast becoming a part of almost every area of professional practice, including transportation planning. Each year, new services, data products and tools become available and are being utilized for different transportation planning applications. SACOG is participating in the big data realm of transportation planning in several key projects and initiatives. This item is to inform the Board about these activities, and provide a clear idea of the principles guiding our work and further exploration.

“Big data” is not perfectly defined, and the term is used in many different ways. Common themes in what constitutes big data are:

- Volume—big data usually refers to very large datasets, which are difficult to manage because of their size;
- Currency—big data usually refers to datasets which accumulate and are updated quickly and often instantaneously; and
- Detail—big data usually implies detailed “agent” level datasets gathered from individual people, devices like smartphones, vehicles, etc.

In addition to datasets, businesses and other organizations are developing transportation planning tools for managing or using big data, as well as providing services for assisting customers in processing and using big data.

Based on this thematic definition of big data, SACOG is involved in several big data projects or initiatives:

- National Performance Management Research Data Set (NPMRDS)—The Federal Highway Administration has contracted with independent vendors of GPS device “traces” (i.e., data collected from GPS devices in smartphones and vehicle navigation systems), to make available current and very detailed measurements of vehicle speeds on the National Highway System (NHS). NPMRDS data are made available to MPOs like SACOG and state departments of transportation for use in implementing new requirements for performance monitoring on the NHS. SACOG partnered with the University of the Pacific Graduate Program in Data and Analytics to develop

programming to efficiently process NPMRDS data. SACOG is utilizing the data for several projects related to vehicle speed measurement, reliability, and congestion. More information on the NPMRDS is available at:

[https://ops.fhwa.dot.gov/freight/freight\\_analysis/perform\\_meas/vpds/npmrdsfaqs.htm](https://ops.fhwa.dot.gov/freight/freight_analysis/perform_meas/vpds/npmrdsfaqs.htm)

- The State Smart Transportation Initiative (SSTI), a research institute based at the University of Wisconsin (<http://www.ssti.us/about-ssti/>), is finalizing a demonstration of several big data products and tools for use in measuring and assessing accessibility to transit. Funding for this project came from the Transit Center and the Lincoln Institute for Land Policy. Sacramento Regional Transit was selected as the test site for this demonstration, and SACOG was active in helping to launch the project, commenting on the work, and organizing meetings and presentations on this project locally. SSTI will be using this demonstration to illustrate the potential uses of big data for assessments of accessibility to transit, and for identifying potential high-impact improvement projects. SACOG is organizing agencies interested in exploring “on-boarding” of some of the data products and tools demonstrated in this project.
- Uber has established the “Movement” program (<https://movement.uber.com/cities>), through which Uber passenger trip origins and destinations will be released to agencies and organizations with an interest in using the data for transportation planning purposes. SACOG has registered to receive data through this program, and is advocating (so far unsuccessfully) for Uber to make the release soon. When made available, SACOG will use Uber Movement data for assessing the prevalence of Uber use in different parts of the region, and characteristics of demographics and land use in areas with unusually heavy (or light) Uber use.
- Sidewalk Labs is a civic-oriented software, data and technology initiative started by Alphabet (then Google) in 2015. One specific Sidewalk Labs project is “Model Lab,” which focused on improving travel demand modeling by linking it to big data, machine learning, and more powerful computing, with the goal of making models more quickly adaptable to answer important policy questions. Sidewalk Labs is looking for MPO partners to demonstrate this modeling potential at a regional scale, and has approached SACOG and several other MPOs to assess their level of interest. SACOG is bringing Sidewalk Labs project team staff to Sacramento to explore this opportunity further. Additional information is at <https://www.sidewalklabs.com/blog/a-key-to-democratizing-urban-solutions-is-building-better-models/>.

Moving forward, staff will continue to look for productive opportunities to engage and on-board big data products and services for the agency’s data and analysis work. Staff will be mindful of the following principles in this exploration and engagement:

- Relevance to agency work program. The range of big data products, services and tools is expanding quickly. SACOG will identify and pursue big data where a direct relationship to the agency work program exists, and where big data can provide a better way to solve a problem or meet a need.

- Staff capacity and skills. Using big data efficiently requires strong programming skills, and these skills will be considered in future recruitment and hiring. Where practical, SACOG will partner with other organizations (e.g., universities) for specific projects.
- Partnering to spread costs. Access to some of the most compelling big data products, services, and tools is often costly. Licensing fees are common, and individual data buys can be expensive. SACOG will seek out opportunities to partner to share costs or to pursue grant funding related to on-boarding of big data.
- Member service opportunities. Some of the complexities of managing big data may be difficult for individual member agencies to support on their own. SACOG will look for opportunities to provide targeted access to big data products, services or tools as a service to member agencies.

Approved by:

James Corless  
Chief Executive Officer

JC:BG:ds

Key Staff: Kirk E. Trost, Chief Operating Officer/General Counsel, (916) 340-6210  
Matt Carpenter, Director of Transportation Services, (916) 340-6276  
Bruce Griesenbeck, Data Modeling Manager, (916) 340-6268  
Yanmei Ou, Senior Analyst (916)340-6204