

Position Paper for W3C Transportation Workshop

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Background

This document is Geotab and Neutral Vehicle's submission for the W3C's [Transportation Data Models Workshop](#), hosted by Uber. The workshop will be from the 12th to the 13th of September in Palo Alto, CA, at Uber's Palo Alto campus. The Transportation Data Models Workshop topics to address: business and technical requirements for user profiles, trip information, vehicle data, consent and accessibility and more.

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Note: please find the two page submission on the next page.

Submission

Data from modern vehicles and related infrastructure has the potential to transform our society and enable a wide variety of new data-driven innovations. Vehicles now can be viewed not only as a means of transportation, but also as mobile nodes that collect a vast, distributed array of data, report this data to cloud services in real time, and are closely linked to important societal behaviors. Geotab, a founding member of [Neutral Vehicle](#) currently processes over 4 billion data points per day from commercial and government vehicles, including light passenger vehicles, medium & heavy duty trucks, and off-road vehicles operating on all seven continents. This data has been used for analysis ranging from fuel economy studies to mapping earthquakes using only connected vehicle data. These examples are only the tip of the iceberg. Unfortunately, the potential for transformative innovation is currently blocked by the lack of open standards, insufficient adoption of industry-wide security and privacy best practices, proprietary data sources that are effectively inaccessible to most innovators, unsophisticated sampling industry-specific sampling methodologies, and a lack of sufficient data attributes and data semantics. This Transportation Workshop is a step towards the discovery, collaboration and innovation to overcome these barriers, to show how one can apply the data in non-linear ways, and most importantly enable new innovative uses of the data by the broad community of researchers, commercial, and government.

This is a pivotal time for vehicular data. A vast number of proprietary systems are already in place for collecting vehicular data and the number of non-interoperable systems is increasing. Automotive manufacturers (i.e., original equipment manufacturers “OEMs”) have proprietary systems (e.g. GM OnStar, HondaLink, Ford Sync). Fleet managers rely on telematics vendors for (often times, mixed fleet) vehicle data and each telematics vendor has their own proprietary format. New services such as aftermarket devices from insurance carriers (e.g., StateFarm and Progressive) collect vehicle data in yet another proprietary format. Security researchers have demonstrated successful exploits in data collection systems and, in some cases, even remotely gaining control of a vehicle. The current solutions are all proprietary, and they must exist in an environment that includes a number of different proprietary OEM systems. In other words, the smart community, commercial fleets, and often even the vehicles owned by a single household are not limited to a single vendor. This patchwork of incompatible, insecure, and inaccessible data is blocking even basic innovation and inhibits automated reasoning about this rich set of data. We believe this is exactly the scenario this Transportation Workshop is designed to address.

A key outcome of this Transportation Workshop will be the development of W3C task force that supports bi-directional interoperability of vehicles, as well as related data from other transportation infrastructure and IoT communities. Neutral Vehicle, is an international consortium that is committed to developing open and secure standards for vehicular data. Our work will directly leverage the Neutral Vehicle efforts on standardization, which is also aimed at expanding to a full open knowledge network. Data standardization is a key first step and the Neutral Vehicle team has already produced a draft standard with multiple industry partners and associations. Standardization and security are necessary but not sufficient steps in enabling future innovation resulting in part from interoperable data generated from vehicles. We also have to address the essential privacy rights associated with the data. Privacy considerations must accommodate the variety of stakeholders, and vehicle ownership models that include commercial fleets, government fleets, and individual vehicle owners. For the government fleets, some of this data falls under open access requirements. At the other extreme, an individual vehicle owner may choose to share data only with their insurance provider in exchange for eligibility on a ‘safe driver’ reduced rate. This scenario illustrates just one of the various use cases associated with processing

vehicular data (some of which may be considered personally identifiable) - which is further complicated by the intangible nature of data and the differing views on privacy in different regions. Another point to consider that conflicts with stricter data regulations, is the fact that data becomes more valuable the more it is processed/analyzed. EU's relatively new GDPR (General Data Protection Regulation), does provide protection of personal information, but as our data economy incorporates GDPR (and upcoming similar data regulations, i.e., California's CCPA) into practice (in this instance vehicle data) unintended consequences arise that conflict or compete with broader public good in some cases. Recent articles such as the Financial Times' -["One year on, GDPR needs a reality check; Parts of Brussels' data privacy regulation are holding European tech companies back"](#), Eline Chivot, June 30, 2019, make the case for GDPR reform in support of public purpose data processing. In the world of transportation, getting transportation right is one of the key aspects of solving problems created by growing populations, urban migration, climate change, among many others.

In addition to data reported directly by vehicles, and in support of public use cases, an interoperable vehicle network must include data from public government sources such NHTSA and DOT in the USA (and similar government regulators globally). It must incorporate reports and data on the structure of roads and transportation systems. We argue some of the most innovative applications that will come from this W3C transportation task force are not directly about vehicles. Rather, the vehicles are sensors that map to key social behaviors and an open knowledge network should include data on demographics, economic development and (smart) city planning. Data attributes and data structure are essential. As an illustration, consider reporting a very simple metric of vehicle speed. This may be an instantaneous speed, average speed, or maximum speed over an interval. An open knowledge network as part of the w3c transportation task force will include data attributes that allow correct factual analysis of data and this is structured to work with automated data learning systems.

Finally, all of the above are needed and only become useful when populated with actual data. For both data sources and convergence on the above challenges, this must be a collaborative effort among industry, government and academia. The Neutral Vehicle team has a history of collaboration with key players. For example, the National Motor Freight Traffic Association (NMFTA) has been a key partner as has the Global Alliance of Vehicle Data Access (GAVDA) which advocates before governmental groups. The team has experience developing successful industry partnerships and works with organizations such as the Automotive Information Sharing and Analysis Center (Auto-ISAC) and the Automotive Cybersecurity Industry Consortium (ACIC). We believe the a W3C transportation task force will compliment a broader vehicle open knowledge network and the most transformative impact will be new data-driven innovations. Neutral Vehicle and Geotab plan to explore a collection of automotive, environmental, economic, and societal applications. For example, on the automotive side, cities often add a traffic signal to an existing intersection only after collisions have occurred. In the worst case, serious injuries occur before a decision is made to install or modify a traffic signal. With the vehicle data, one has the potential to gather data on harsh braking, acceleration, and other factors that might indicate near misses. A more nuanced understanding of the conditions could avoid (rather than react to) serious collisions. In the environmental space, Neutral Vehicle and Geotab are already in discussions with several state and local governments on how real-time vehicle data can drive more accurate weather and pollution analysis and impacts. The economic and social impacts are interesting and range from new ways to address safety threats such as Amber alerts that could perhaps become automated to understanding economic drivers. The most interesting examples are the data-driven innovations that we have not envisioned. Our examples are meant to help us develop, test, and evaluate the open knowledge network, but we note that the true test is not whether our team can use the open knowledge network. The true

measure of success is whether our examples and open data availability can inspire others to use the data in ways we could not predict. Through outreach to both small business research and connections to research communities such as Smart and Connected Communities.