pacct

Platform for Analytics of Connected Car Trajectories

Unleashing the Power of Connected Vehicle Data

PACCT is a fully scalable web-based analytics platform for connected car trajectories. The platform can ingest, warehouse, analyze, and visualize billions of connected vehicle datapoints per month. The platform utilizes the latest cloud and distributed computing technologies to dynamically scale the infrastructure based on the cyclical load of datapoints that are received from Wejo.

Transportation Operations Staff can use PACCT to monitor roadway conditions in near real-time and Planners can use it to support data-driven decision making by analyzing recurring congestion or quantifying the effects of roadway improvements.

Understand historical trip patterns and monitor travel conditions in near real-time

Live Speed Layer

Visualizing your roadway network with our Live Speed Layer will give your Operations Team an unprecedented look at how your roadway network is performing in near real-time.

Origin and Destination (O/D) & Trip Analytics

Transportation Planners can leverage PACCT to understand changes to mobility patterns, conduct before/after studies, and determine safety issues on the roadway network.

Turning Movements

Traffic Engineers can view turning movement percentages and traffic flow maps within PACCT with just a few clicks. With a live feed of Connected Vehicle data, Turning Movements will be available in near-real time.

Reducing Traffic Congestion with Data-Driven Solutions

In today's world, traffic congestion has a direct impact on the economy. Traffic delays on already overcrowded roadways can occur in a matter of seconds. Traffic Management Centers need more than Dynamic Message Boards and traveler information websites to address recurring and non-recurring congestion. Traffic Planners need constantly updating data as travel patterns change monthly or even daily as motorists adapt to ever changing roadway conditions.

PACCT offers users the ability to make data-driven decisions by leveraging connected vehicle data that has unparalleled accuracy and granularity with low latency. Each of the tools in PACCT was developed with engineers, planners, and operations staff use cases in mind to distill the information in a user-friendly and intuitive manner.

> We developed an analytics infrastructure to ingest, process, and render CV data in near real-time. This means that on a daily basis in the Tri-State Region (NY, NJ, CT), we received and processed approximately:
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> | | | | |
> |---|---|---|---|
> | 1.2 Billion | - GPS points per day | 334 Million | - GPS points per rush hour period |
> | 3.5 Million | - Journeys per day | 1.1 Million | - Journeys per rush hour period |

Vehicle Movement Dataset

The Wejo Vehicle Movement Dataset that is used in PACCT is sent directly from the vehicles, has an update interval of 3 seconds, and latency under a minute. Some characteristics of this data include:

- CV Data is precise to +/- 10 feet (under 3 meters) 95% of the time. This can help to identify individual lanes of a highway, back of queue, or even parking spots.
- The Mobility Dataset differs from probe data and other data sources because it is transmitted directly from the vehicle itself. It is more precise, updated more frequently, and has significantly less latency than traditional datasets.
- Data from Connected Vehicles covers better than 95% of roadways in the United States and transmits 24 hours a day, 365 days a year.
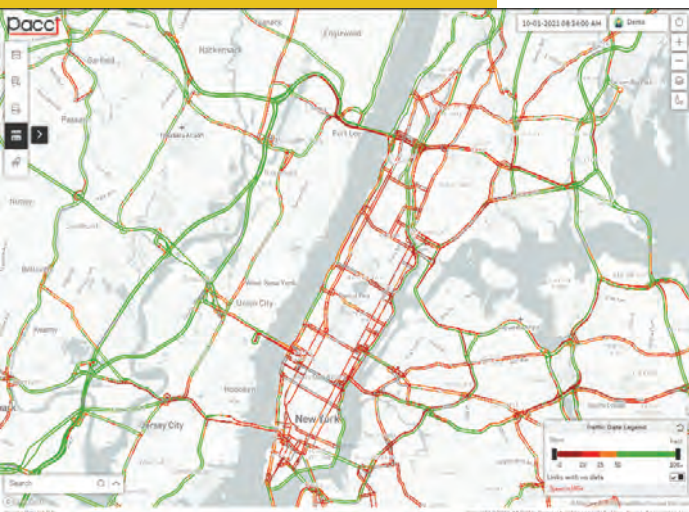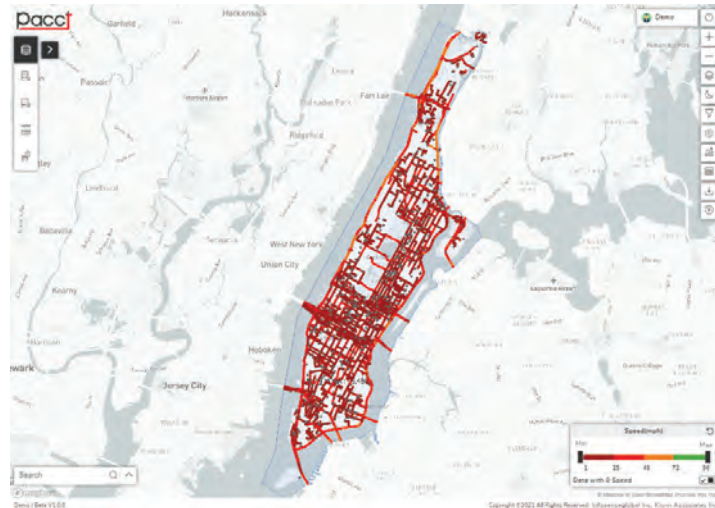
Realtime Conflation

Infosenseglobal & Kisnn has developed a proprietary conflation architecture to connect the vehicle datapoints to a linkset in real-time. This unique process allows data to be usable for analysis in ~30 seconds. Origin/Destination insights are available in ~5 minutes after the trip ends.

- With this architecture, users can view trip & O/D analytics at the link level, utilize particular links in a pass-through query, and calculate link-based speeds for the live speed layer.
- Operators are able to monitor the roadway network in near-real time and make effective decisions based on the latest available data.
- The Live Speed Layer can also be integrated into open source maps, like OpenStreetMap, or paid mapping services.

Turning Movement Counts

Turning movement analyses that traditionally required field staff/equipment, added months to the project duration, and cost hundreds of thousands of dollars can now be completed with a few clicks within PACCT.

- Users can specify a polygon and select the intersections for which they would like turning movement count volumes and percentages.
- Having 24/7 turning movement count data can enable a multitude of planning and traffic engineering applications, such as corridor analyses, traffic signal optimizations, and more.
- Data is exportable with a single click for use in traffic simulation or capacity analysis modeling.
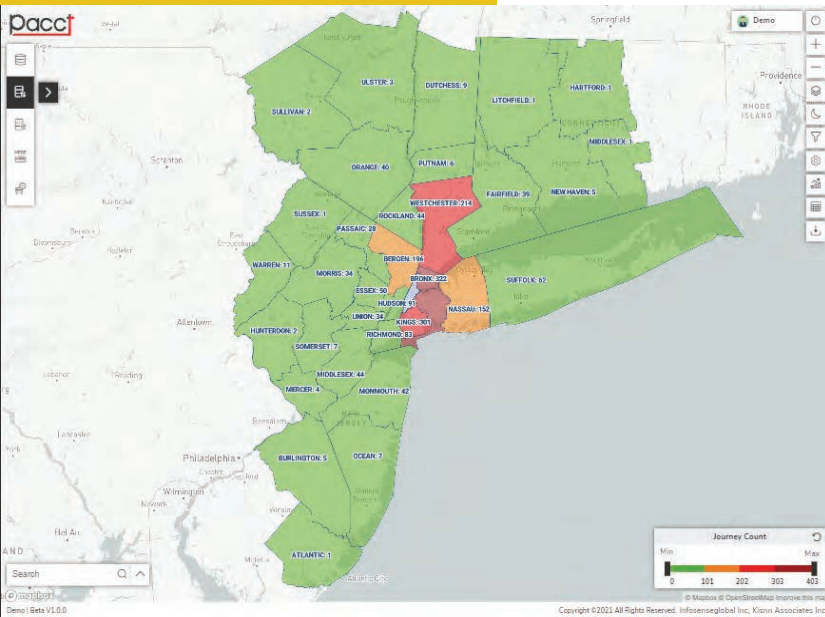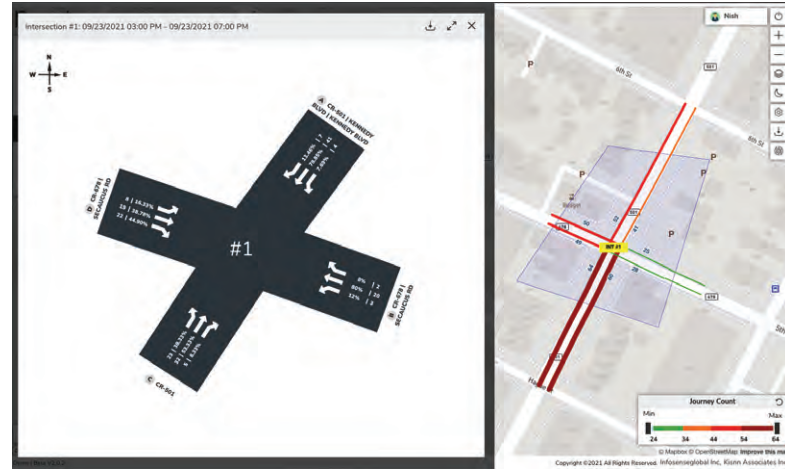
Origin and Destination (O/D)

Insights into the origins and destinations of trips are another benefit of the Wejo CV data. Because of the high degree of location accuracy +/-10 feet (under 3 meters) we are able to accurately determine the origin and destination of a vehicle, as well as the precise route that vehicle took.

- Each trip is assigned an anonymized unique identifier that allows us to determine the origin and destination.
- Each GPS point contains geolocation information, direction of travel, and speed. This information is parsed and connected to previous GPS points per trip to create the vehicle's route.
- Multiple spatial aggregations are available for analysis in PACCT. These include county, city, or point of interest levels as well as an option to upload custom zone shapefiles.

Driver Event Dataset

The Wejo Driver Event Dataset includes information on when/where the vehicle was started/stopped (ignition on/off), exterior temperature, seatbelt status change, windshield wiper status, harsh braking events, and rapid acceleration events.

- The seat belt status, harsh braking, and rapid acceleration events data can be used to determine hazardous roadway conditions or identify potential safety issues.
- Exterior temperature or windshield wiper status can provide explanatory power for harsh braking events during a weather event. The data elements can be used together in this manner to create greater insights.

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