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# **IoT Solution Serves Micro-mobility, Emergency Response, Cold Chain**

Internet of Thing (IoT) technology company Particle targets a diverse set of customers to provide solutions that manage assets, inventory and individuals, as well as capturing sensor

data. But since its launch in 2018, the company says it has found that whether a user is a municipal scooter manager or a factory tracking preventative maintenance on equipment, the technology requirements are similar.

Every use has a need for edge hardware, the company says, including sensors, transmitters, connectivity and cloud-based management software. Therefore, says Zach Supalla, Particle's CEO, the company last week released its new Tracking Services, a turnkey solution that requires a limited amount of customization no matter the use case, thereby offering a more seamless deployment.



Tracking Services enables the wireless, automated capture of data about location, as well as information such as temperature or acceleration, while also allowing two-way communications between a server or operator and the tracking device. The San Francisco-based company says the technology is aimed at quickly collecting data and real-time intelligence from mobile assets in order to solve problems for those users'

customers. Targeted industries include transportation and logistics, cold chain, emergency management and micro-mobility.

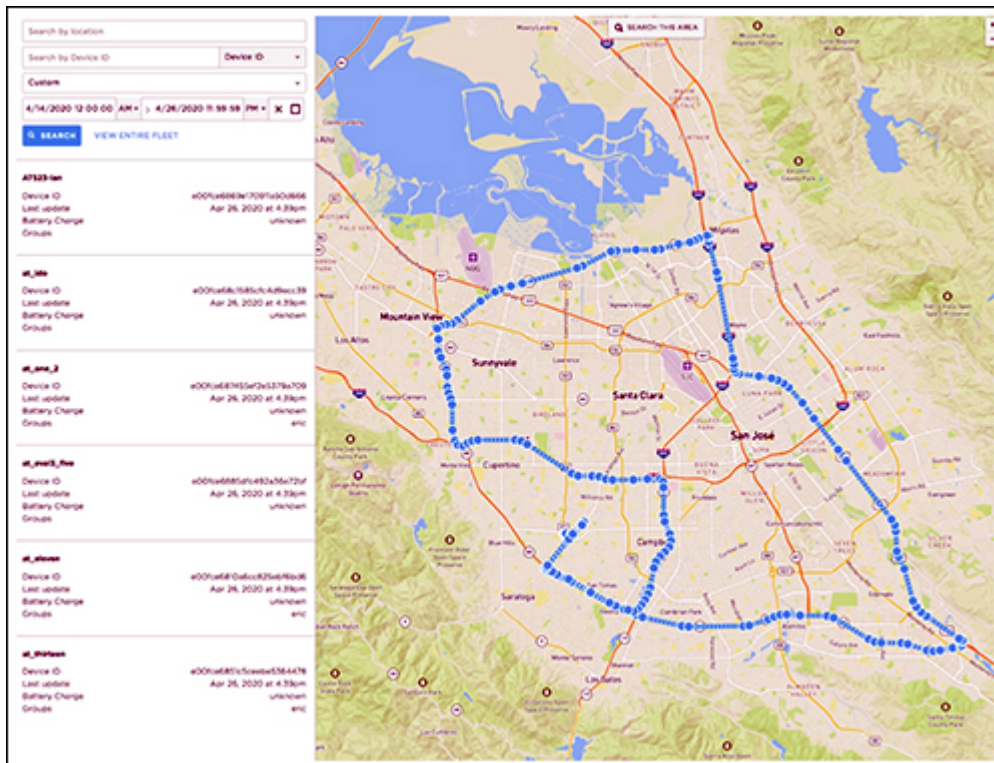
The service consists of the newly released TrackerOne unit, a wireless device with a built-in cellular LTE module, a GPS unit and a built-in Tracker System-on-Mobile (SoM) to help users build applications or integrate sensors into the device. Particle's cloud service manages the data captured by the TrackerOne, then provides that information to customers who subscribe to the service.

The Tracker One unit, with an open source code for modification, is about the size of a deck of cards. However, it can be designed with custom-sized enclosures. It serves as a physical tracker that can be attached or built into a bicycle, carried in a pocket or affixed to a piece of machinery. Since the demand for IoT solutions is broad, Supalla says, Particle has designed the solution to be broad as well, in order to serve different applications. "We saw an opportunity to do more for those customers," Supalla states, "especially since they have very similar sets of needs in terms of mapping and geolocation services" (see [Internet of Things Brings Intelligence to Hot Tubs and Particle Releases Mesh-based IoT Solution for Developers](#)).

Supalla says the new solution is the result of the company having studied the deployments that its customers already had in place. For instance, an emergency-response technology company is using Particle's IoT trackers and software to provide a solution for monitoring ambulances and firetrucks. The company provides emergency-response entities with real-time information regarding the locations of ambulances or other emergency vehicles. It can then customize the Particle technology to provide the solution to its customers' dispatchers.

For such a deployment, Particle's trackers could be mounted on a vehicle and could forward cellular-based location data to indicate where a particular vehicle is located. Dispatchers, viewing that data in the software in real time, can then direct the responders whose vehicles are geographically closest to an event. The system can be modified to enable integration of other data as well, such as whether or not the siren is in use, to help dispatchers identify which vehicles may already be responding to an incident. "Existing products typically don't offer that kind of customizing," Supalla says.

Another emergency-response application that uses Particle technology is offered by Dynamis, a government contractor that provides services for emergency management planning and operations. The solution is aimed at providing visibility into the emergency responders in the case of a disaster, such as a flood or fire, or during a training operation. In this case, the tracker needs to be pocket-sized but also ruggedized. The device could be carried by each individual, and the location data could help emergency managers understand who has entered or left a given building or a zone, thereby letting them know, for instance, if anyone was potentially exposed to any hazards.



Micro-mobility solutions enable operators of public bicycle and scooter systems to manage where their assets are located, as well as ensure they are properly charged, and that customers pay for a bike or scooter before using it. The captured data enables operators to know the battery level of each scooter or bike, along with its location, and receive alerts if it leaves a specific zone. The Particle software can send data to the bidirectional IoT unit as well, to authorize the use of a bike after a payment is received and to prompt the locking mechanism to release.

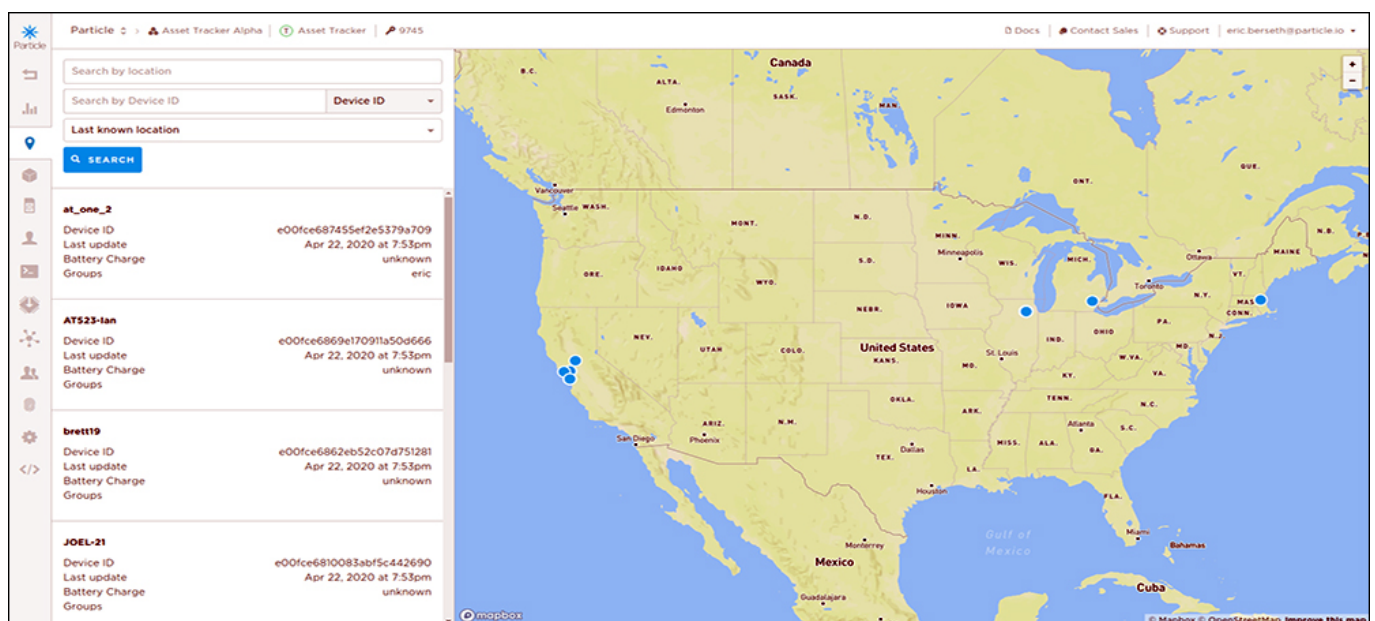
As with other applications, Supalla says, the customers in this industry tend to require minimal modification to a solution. The system also targets transportation and logistics. The cold supply chain can often be complex, he adds, since those who are part of that chain not only have responsibility for the movements of products, such as perishable foods or drugs, but also are responsible for maintaining temperature levels to ensure goods remain at optimal quality.

With the Tracking Services solution, temperature or humidity

sensors could be integrated with the tracker. The system would then send cellular data indicating its location and the surrounding conditions, even if the product is in transit. The tracker could be attached to a pallet or carton, enabling it to follow the product from the field or factory to a store.

At present, Particle is in conversations with several equipment rental companies that provide assets for use at construction sites. Similarly, these assets could be tracked according to their location on a worksite, while geolocating zones could be established so that managers would receive alerts if an item left a specified zone.

In all scenarios, users would purchase the trackers and pay a monthly or annual fee for access to the data, and they could modify the solution based on zones or other data that they need to manage, modifying the hardware with the sensors they require. The cost of the technology would depend on use case, Supalla says, adding that because customization is eliminated, the solution is designed to be lower in cost than similar IoT solutions.



Depending on the location granularity required, Particle's devices can provide GPS-based data, cellular location data,

and dead-reckoning (DR) GPS and GNSS (satellite) data to identify location. Typically, Supalla notes, that location can be pinpointed to about 1.8 meters (5.9 feet).



Particle's  
Zach  
Supalla

The company provides a majority of its solutions using cellular connectivity, thanks to the ubiquity of cellular networks and the low-power, low-cost availability. When it comes to cellular networks, Supalla says, "The carriers have been investing in next-generation technology that allow low-power, lower-cost functionality." For that reason, he states, "We've really doubled down on cellular."

For customers deploying the solution from various industries, Supalla says, "I think the building blocks of what they need are the same," while the specific hardware components, sensors, form factor of enclosure, firmware capabilities and other features highly vary from one customer to the next. "Our ability to offer tailored capabilities across those domains is our unique differentiation and value."



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