DRISI

Caltrans Division of Research, Innovation and System Information

Research Notes

Modal

Organize and run a Working Group to address the current Automated Passenger Count (APC) issues

The working group will include transit agencies of San Francisco Bay Area, municipal and regional representatives and private industry. The group will confront key questions

WHAT IS THE NEED?

Transit service has been very cost ineffective and the level of service, when measured by connectivity and service frequency, has been generally undesirable in the majority of suburban regions in California. The recent development of Connected Vehicle technologies (broadly defined as communication and positioning technologies) and real-time information about the overall transportation systems (both transit and highway networks) has begun to make dynamic transit operation feasible.

Dynamic transit operations, including Dynamic Dispatch (T-DISP) and Connection Protection (T-CONNECT) can substantially improve transit service quality by providing faster, more convenient, and cost-effective trips to the traveling public. T-CONNECT application scenarios are intended to improve the successful transfer between mode (from car to bus, train to bus) and between different bus routes of an individual agency.

T-CONNECT enables public transportation providers and travelers to communicate to improve the probability of successful transit transfers. T-DISP application scenarios are intended to adjust transit operation to be more responsive to traveler's demand and traffic conditions. UC Berkeley California Partners for Advanced Transportation Technologies (PATH) proposes transforming current fixed route operation into dynamically focused transit services in suburban regions across California.

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WHAT ARE WE DOING?

Transit ridership data come from automated passenger count (APC) systems. APC systems are electronic machines that count the number of passengers that board and disembark at every bus stop. APC systems are supposed to generate robust ridership information on a stop by stop basis and to enable assessment of bus occupancies on different segments of bus routes.

APC data can be used to assess bus utilization, to determine schedule adherence and whether bus routes need more or less running time to get between endpoints. In the mid- and post-COVID-19 environment the real-time APC data can help travelers plan their trips to avoid overcrowded transit. To summarize, accurate APC data are critical for effective transit planning, efficient operation, and traveler comfort.

This research proposes to organize and run a working group to address the APC issues. The working group will include transit agencies of San Francisco Bay Area, municipal and regional representatives, and private industry.

WHAT IS OUR GOAL?

The goal is to confront key questions, such as the value of APC data, what would incentivize transit agencies to cooperate – provide access to passenger counting, what should be a feasible integrated end-to-end solution, what technologies, primarily for passenger counting, must be considered, who would be invited to participate in the challenge, and what will be the role of transit agencies, how to ensure that APC data end up in the public domain. This research will potentially include functional prototypes or live deployment with an agency.

WHAT IS THE BENEFIT?

This research is urgent to support transit agencies in their critical need. Due to the COVID-19 Pandemic, transit ridership has collapsed throughout California and the nation. Potential transit riders are concerned about increased COVID-19 exposure through transit use.

In addition, transit agencies need the best, most current information to better manage their scarce resources and advocate further resources in the right areas. This research is critical in providing the information to ensure the public that transit is safe and not overcrowded and to allow decision-makers to best manage their funding.

WHAT IS THE PROGRESS TO DATE?

October 1st to December 31st , 2021

Task 1 & 2. APC Provider Engagement

- Generated Automated People Counting Market Research Study Memo for Task 1 and 2: Summary of Findings.

Task 4. Use Case Development

1. Outlined different validation techniques and fault techniques.
2. Captured use cases for extraction transformation.
3. Captured APC solutions starting from the sensor technology data to data storage.
4. Worked Report specifying sensing, ETL workflows for different APC solutions and validation approaches by agency.