vhb viewpoints

COVID-19 Series

Keeping Connections. Sharing Perspectives. Moving Forward Together.

Dynamic Service Planning in the COVID-19 World

Transit mobility in our modern reality

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As states and communities reopen their businesses and economies after stay-home orders due to COVID-19, transit systems are challenged with how to provide mobility services in the new normal. The need for social distancing and changes in travel demand and travel patterns have caused transit systems to quickly re-think their existing services and networks. Further changes are anticipated over the next year or two as transit agencies are faced with evolving funding scenarios and balancing capacity with changing ridership levels.

Increasing Connectivity

Medical facilities, including hospitals and urgent care centers, are critical destinations during the pandemic. Shopping and major job centers, including logistics and industrial hubs, are also important—both for consumer access and companies producing essential supplies. Connections to bus operating facilities are a high priority so that drivers, mechanics, and support staff can get to work and keep the bus system running. **Flexibility, and openness to making network adjustments, is important for transit agencies to provide connections to essential services and destinations.**

MARTA Creates Essential Services Network in Response to COVID-19

As the pandemic began to impact Atlanta, VHB supported the Metropolitan Atlanta Rapid Transit Authority (MARTA) by developing quantitative frameworks to respond to ridership changes and social distancing guidelines while still providing necessary connectivity. VHB helped to identify a reduced coverage network serving essential locations so that vehicles and operators could be re-allocated from non-essential routes to provide the capacity needed to meet social distancing guidelines. VHB and MARTA defined the network based on connections to medical facilities, shopping and job centers, and bus operating facilities.

Routes connecting job centers and industrial hubs, as well as shopping destinations for essential supplies, were added to the network until all available vehicles were in service. Additionally, VHB assisted MARTA in developing a prioritization framework for bringing suspended bus routes back on-line to facilitate reopening. **Read the full story**.

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Leveraging Data

The current challenge for transit agencies is that service planning is in a short-term continuum. Conditions are changing by the day. **Transit systems have been collecting volumes of data that can be of great assistance in redirecting resources to adjust capacities. There is an ongoing need to be able to visualize that data to quickly identify emerging trends and respond to them.** A good example is passenger boarding, alighting, and load data gathered from automatic passenger counters (APCs). VHB developed a Dynamic Mapping Tool to visualize APC data and determine the impacts schedule changes will have on operations.

As shown in the map to the right, selected bus trips by stop segments in the 8 AM hour with loads over 40 passengers are shown in red, and those with loads of 10-20 passengers are shown in green. Transit planners, schedulers, and dispatchers can quickly review any route at any hour of the service day to see where loads are increasing and require additional capacity, and where lighter loads on other bus routes could allow resources to be shifted to lines requiring additional capacity. **This Dynamic Mapping Tool allows transit agencies to make necessary route adjustments in real-time.**
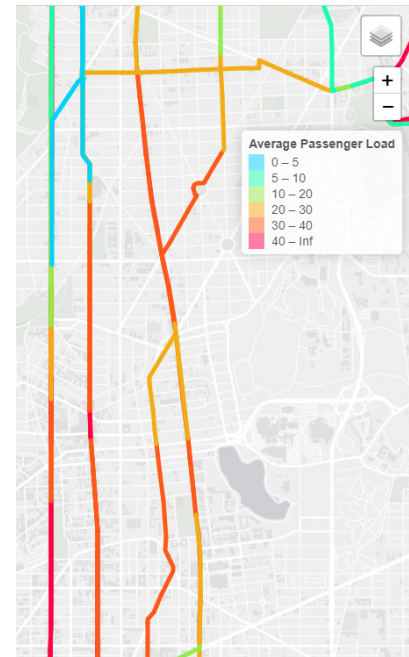
VHB's Dynamic Mapping Tool helps transit planners, schedulers, and dispatchers to visualize data and make route adjustments in real-time.

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Another issue emerges for larger multi-line, multimodal systems when dynamic scheduling is desired. For these systems, analyzing ridership trends at the route level provides too much detail to make systemwide decisions. To assist with post-pandemic restoration, services can be defined by the markets they serve to visualize ridership data. With this approach, both ridership data from the transit agency and overall travel data provided by sources such as Replica are compared to evaluate which markets are most likely to require additional capacity in the near term.

As with APC-based ridership data, VHB's Dynamic Mapping Tool will also visualize either APC or automatic vehicle location (AVL) vehicle travel time and schedule adherence data. **This tool assists schedulers in determining if changing traffic conditions and/or passenger volumes warrant adjustments to scheduled run and dwell times.**

For rail systems, a tool that can simulate the impact of potential future schedules is Rail Traffic Controller (RTC). With RTC, proposed timetables are simulated to determine how the new schedules are likely to perform with the existing infrastructure. RTC can also simulate the impact of trackwork-driven or other related outages on existing and proposed schedules.

Leveraging data and technology can assist transit agencies is making smart decisions related to passenger ridership, from route capacity to system scheduling.

Improving Mobility

For some agencies that have relied on fixed-route rail and bus services to move large masses of people, the new normal is requiring a rethinking of the types of mobility services offered, as well as service planning and scheduling business processes. Flex routes and microtransit can better meet the mobility needs for some communities and markets than fixed-route services, address equity issues where there are gaps in the fixed-route network, and allow fixed-route resources to be redeployed on higher-demand corridors. Current models include offering these services directly by the agency, through a contract-provider relationship, or through a partnership relationship with a transportation network company (TNC). Regardless of how these services are offered, transit agencies need to demonstrate to stakeholders that these services are an integrated part of the agency's overall network and that they deliver service equivalent to or superior than its traditional fixed-route offerings. Transit agencies also have to work with organized labor to demonstrate that implementing these services are not a threat to their existing work and that they can expand it without sacrificing resources.

Changing the service mix can be challenging in the best of times, but in the current pandemic environment the traditional slower implementation methods are not effective. Many business processes related to implementing service changes need to change—and may remain changed permanently. These range from public notification to administering operator run assignment selections. Agencies do not want to end up where, due to the complexity of the run selection process, the transit system's only option is to restore all of its pre-pandemic service because it can not effectively administer a mid-period operator run selection. **With more dynamic tools to visualize and evaluate performance data, transit systems can more quickly adapt to provide continued mobility during uncertain times.**

How VHB Can Help

Planning for an uncertain—and rapidly evolving—future is difficult. **Is your transit agency faced with changes in travel demand and patterns, mobility challenges, or questions about how to leverage data to make smart decisions?** VHB is here to help you visualize your data, evaluate effective service solutions, and implement changes to your transit network. Contact **Olen Daelhousen** or **Darrell Smith** today to start planning for tomorrow.

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