PTV GROUP
the mind of movement

SUCCESS STORY

Designing on-demand feeder service for public transit

CITY OF PORTLAND

GOAL

The goal is to explore potential feasibility and impacts of mobility on-demand service which integrated with mass transit in the city of Portland.

APPROACH

Using the demand model from the regional planning authority as base model to determine trip volumes, travel times, mode chice in PTV Visum. Using the PTV MaaS Modeller to evaluate on-demand fleet operation scenarios.

THE IMPACT OF ON-DEMAND: A COMPLEX DILEMMA

Designing an integrated mobility system is a complex matter. How and when will mode choice shift toward shared services? And what is a minimum fleet size for OnDemand services to meet the flexible demand while delivering high quality service at acceptable operating costs?
This study highlights how existing tools can help both city planners, transit planners as weil as shared service operators to evaluate the impact of various future mobility scenarios.

LAYING THE BASICS IN PTV VISUM

Trip tables for travel in the Portland Metro area were analyzed in Visum, providing insight in travel patterns and travel delays: it turned out that the largest delays were caused by Eastbound traffic on bridges across the Willamette River in the afternoon peak hours between 4pm and 6pm. 50% of the 6500 bridge crossing vehicles were used by persons traveling from the blue area to the red area. The study assumed that 50% of these trips could be replaced by an attractive combination of OnDemand service and the Public Transit Yellow Max line. (meaning 25% of bridge crossing traffic).

DETERMINING FLEET SIZE PTV MAAS MODELLER

The pick-up and drop-off pairs were generated in Visum to determinethe fleet size for the OnDemand operations in PTV MaaS Modeller. The following conditions were considered in the application: maximum wait time of 10 minutes, pre-booking time of 5 minutes, a maximum detour factor of 2.5 and a maximum detour time of 30 minutes. The outcome was a fleet of 249 vehicles with 8-seat capacity.

RESULT

Getting a clear picture of required on-demand fleet size, costs and revenues, while understanding reduction in congestion and impact on travelers. Insight in which policies are most effective to simulate changes in mobility behavior.

PASSENGER PERSPECTIVE

PTV MaaS Modeller demonstrated that 90% of passengers experience up to 18 minutes increase in trip time compared to car travel. The per day cost savings were estimated at $14 per day with assumed $200 per month car parking costs and $700 per month operating costs versus the $25 per hour value of time lost in transit. The study highlighted the importance of sustainable policies to drive modal shift.

MASS TRANSIT PERSPECTIVE

The study demonstrated that an additional $3M-$4M operating revenues could be generated for TriMet. This required operating the Yellow line at 10-minute headway instead of 15-minute headway. It demonstrated the service level of the rail line and inidated what crowding levels were expected.

ROADS AND CONGESTION PERSPECTIVE

The example showed a significant reduction in flows across the bridges ranging from 6-18% due to switch from car to shared mobility. There were small increases in flows in some local areas due to MOD vehicle traffic. The total VMT saving of 10,000 miles (49%), for SOV and HOV vehicles going from blue to red. Increase in VMT from MOD relocation/empty trips does not outweigh the benefits of the switch from car.

SCENARIO MANAGEMENT

PTV MaaS Modeller combined with PTV Visum Demand Models authorities and operator are able to test various concepts before putting these in place. PTV Visum provides the analytical visualization tool to understand city transportation and impacts at high level as well as drilling down to the details. PTV MaaS Modeller provides the dispatching simulation in a commercial solution. Both are integrated toghether so that insights in to MOD and mobility-as-a-service can be made considering all stakeholders and empowering the decision-making process.