



## A DATA DRIVEN AND PEOPLE CENTERED APPROACH TO OPTIMIZING STATION DEVELOPMENTS

A proof of concept modelling and analysis work was carried out by BuroHappold Engineering in collaboration with one of the main public transport operators in the USA West coast. The aim was to utilize a data driven evidence based approach using advanced simulation tools to review and optimize the design strategy for an interchange metro station, bus terminal and public realm. The site is adjacent to a proposed mixed-use development of approximately 15.6 acres – which is anticipated to generate additional pedestrian activity as well as trips of all modes. Ease of circulation, intuitive wayfinding and safety for pedestrians, bicycles, and vehicles throughout the site and the adjoining blocks are the main drivers of the design.

Key questions from our client concerned a review of whether the Metro station needed expansion and reconfiguration of the main portal for better accessibility and enhanced capacity at peak times, optimizing vertical circulation, and mitigating existing congestion issues.

A key consideration for the development was to evaluate the possibility of opening a new access for better access, capacity and wayfinding.

**Analysis approach:** Our Smart Space team utilized their passenger centred approach to optimise all aspects of station and public realm design, including arrivals and departures lobby spaces, stairs/escalator/lift requirements, entrance and exit barriers, multi-modal transport links, etc. Design decisions are driven by several what-if scenarios and sensitivity analysis against various design options, operational parameters and development scenarios. The team used its in-house software SmartMove for rapid modelling of passenger flows and several scenario testing.

**Impacts:** BuroHappold's team modelled the way people travel around the station now and in the future using predictive modelling of the station performance under various design options, layouts & configurations. The team proposed

strategies for improved access, and transfers between services.

The work saved significant costs of development and provided the confidence in the final design, obviating the need for the additional access.

A quantitative and qualitative assessment of the various design options was presented under the headings of capacity, wayfinding and costs. Refinements to the public realm interface between station and bus stands, escalator layouts, directions, ticket control facilities and gateline configurations were proposed.

The outcome of the work including various simulation outputs were made available on a 3D visual interactive platform for further exploration and operational refinement.

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