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Bus to Rail: a Crucial Link

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ISSUE

When cities and regions examine which transit options provide the best access at the lowest price—for operators as well as riders—rail is commonly found to be less cost-effective than bus rapid transit (BRT) or ordinary buses. However, most investigations to date have assumed that riders walk to transit stops, and these walks are of equal distance. Such assumptions penalize rail transit since stations are usually spaced farther apart than are bus stops.

But what if riders were able to access rail stops via other means, such as feeder buses? Or what if riders were clustered around transit hubs, enabling them to walk-and-ride, as envisioned in transit-oriented development (TOD)?

To answer these questions, we simulated hypothetical transit systems consisting of ordinary bus, and BRT and rail that were served by feeder buses. The cities these hypothetical systems served were of varying geographic and population sizes and had different socio-economic characteristics.

RESEARCH FINDINGS

We found that adding feeder-bus service had a dramatic effect on rail's cost-effectiveness. For medium-to-large cities with mid-to-high levels of transit demand, a feeder-bus/rail hybrid outperformed BRT and, remarkably, even ordinary buses. Costly investments in rail extensions or BRT networks can therefore be avoided.

Figure 1. Bus and rail sharing the same platform, enabling a seamless connection.

Key to success is ensuring that bus-rail transfers are seamless and easy to make. This most likely occurs where there are shared platforms and fare cards as well as tightly coordinated schedules.

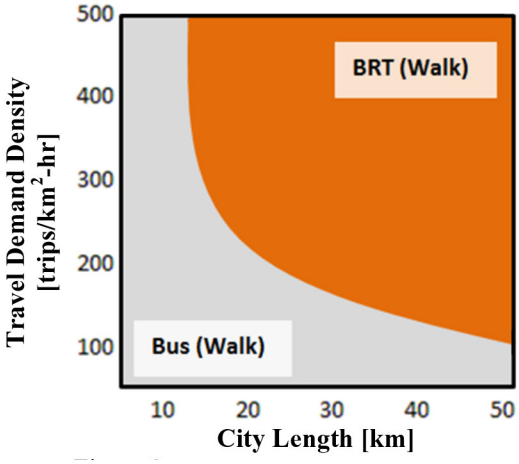

Figure 2. Most Cost-Effective Transit Technology Walk Acccess

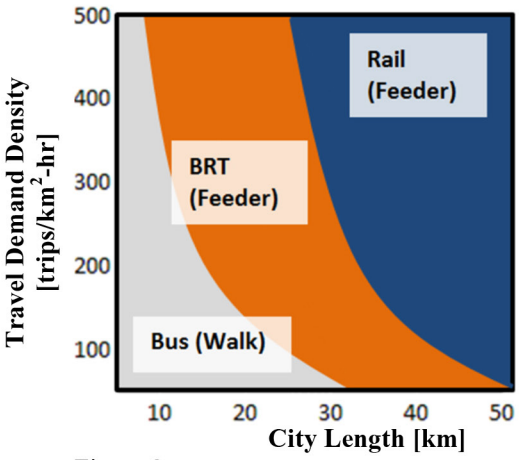

Figure 3. Most Cost-Effective Transit Technology Feeder Bus Access to Bus Rapid Transit and Rail

Compared to enhancing feeder services, TOD was found to only marginally improve the performance of rail systems. While TOD allows some passengers to reach stations by foot, often the majority of riders still live or work outside the TOD, requiring some means of motorized access. Improving bus-rail linkages and TOD can be complementary strategies, providing good station connections whether someone arrives by foot or bus.

RECOMMENDATIONS

In designing transit systems, a crucial consideration is how people get to stops, whether bus, BRT or rail. This can be every bit as important to the cost-effectiveness of transit systems as the design of much pricier mainline services. Programs that improve bus-rail connections should receive high funding priority, especially in cities where increasing transit ridership is a key component of congestion management or air quality plans. Improved bus-to-rail feeder services are especially important where there is market or political resistance to TOD. While TOD promotes more cost-effective transit, the system should be designed with the convenience of riders outside the TOD area in mind as well. Lastly, follow-up work is needed on whether improved taxi-rail and bicycle-rail connections would yield similar benefits.

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