

# Fort Bend to Downtown Houston Seamless Regional Transit

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## Literature Review

**Transportation systems throughout the U.S. must increase coordination to meet the needs of passengers due to factors such as long-range commuting by workers, spread-out activity centers across different transit districts, and decreasing funding from federal and state transit sources. Now more than ever, agencies must work together and pool resources to provide needed transportation service in both urban and rural areas. Through improved coordination and integration of the provision of transit, agencies can provide seamless transit service that is more cost-effective, efficient, and beneficial for individuals.**

### *Difficulties and Barriers*

There are many barriers to creating and keeping integrated transportation systems together, including ones institutional, financial, and political in nature, but “chances of success are greatly enhanced with the presence and strong action of a regional champion(s), such as the regional metropolitan planning organization or association or council of governments (Miller & Lam, 2003, p. ii).” Across the US, transit providers in conjunction with state departments of transportation have worked to promote and emphasize the necessity of seamless transportation services. However, few systems have achieved a truly seamless network that includes all elements of transit integration. Typically, there are few resources to promote regional coordination and MPOs do not have the political power or will to generate funding for coordinated efforts (Rivasplata, Iseki, & Smith, 2012).

A 2012 study involving regional coordination and integration conducted by Charles Rivasplata, Hiroyuki Iseki, and Adam Smith, “Transit Coordination in the U.S.: A Survey of Current Practice,” provides the results of a nationwide survey conducted. The authors invited 590 transit agencies to participate and received 202 respondents. The results of the survey found that the larger the region the more likely transit coordination is prevalent. The results of the survey also suggest that if a region contains two transit agencies, one serving an inner city and the other serving affluent suburbs, conflicts over funding may prevent operators from working together. The survey results indicated that regional coordination is still lacking in many parts of the U.S.

A study by Carol Lewis et al., “Public Transportation Solutions for Regional Travel: Technical Report (2008),” provides a summary of the challenges and barriers involved in coordination. Urban, rural, and human services transportation are funded separately with different regulations and reporting

requirements attached to each funding source. The funding sources utilized by each agency may inherently change the agency's mission and goals, thus making it difficult to seamlessly cooperate or coordinate service with neighboring entities. Because each agency is usually funded from separate sources they each have different rules and regulations to follow for spending their money. For example, a county transit agency that operates on local tax dollars may be able to transport passengers only within the county, even though passengers desire to travel to activity centers outside of the county. This hurdle is often more perceived than actual, and in reality coordination can still happen within the regulatory structures which transit agencies operate in (Lewis, Higgins, Perkins, Zhan, & Chen, Public Transportation Solutions for Regional Travel: Technical Report, 2008, p. 7). Lewis also cites that issues over "turf" lead to the perception that coordination may limit control of operations, or an agency may fear losing passengers. Another challenge cited by Lewis is the lack of infrastructure, such as differing fare mechanisms, scheduling and dispatching issues, and staffing.

The article, "Institutional Aspects of Multi-Agency Transit Operations," by Mark Miller and Amy Lam, provides information on the institutional barriers involved in transit coordination. The study conducted 15 case studies of regional coordination. The purpose of the case studies was to understand the what, how, and why of regional coordination initiatives. The article indicates that a key component of regional transit coordination is establishing a common vision among all stakeholders, leadership and persistence of individuals, and the ability to utilize new technology to assist in coordination or integration of services.

Some agencies allow passenger to transfer from one system to another without an additional fare, thus reducing the total price to the user for the entire trip. Often these reductions in price are for students, seniors, or people with disabilities. While individuals are encouraged to use transit based on lower fares, this can be a financial problem for agencies that consequently receive less money in the farebox (Rivasplata, Iseki, & Smith, 2012, p. 60). Another issue can be the distribution of revenues between agencies that are sharing farebox revenues, especially if ridership tends to be disproportionate to one agency over another. Any such problem must be worked out in the initial financial and coordination agreements to determine the most appropriate methods for fare collection and distribution.

Regional travel studies are a good way to gauge travel within a region across transit agency boundaries. Travel studies can provide the agencies with a better picture of activity centers, peak travel times, and demand to help them coordinate services (Lewis C. A., Higgins, Perkins, Zhan, & Chen, 2009, p. 66). The Greater Golden Horseshoe area in Canada conducts the Transportation Tomorrow Survey every five years to determine individuals' mode choice, trip purpose, trip timing, origin and destination, and other related travel issues (Greater Toronto Transportation Authority, 2008, p. 56).

### ***Coordination Opportunities***

The following paragraphs summarize the different methods and approaches which can be used for regional transit coordination.

A visible way to coordinate transit agency services is to create a common fare which riders pay once and use between services. These one-fare tickets make it much easier for individuals to transfer from one transit vehicle to another, both in terms of payment and time saved. Smart cards are newer technology that allow for easier fare collection that can be assigned to each agency as fares are paid. In accordance with its plan to improve transportation use in its region, Toronto and its surrounding cities created the Presto smart card system for individuals to use in all 10 transit agencies in the region (Greater Toronto Transportation Authority, 2008, p. 42). Los Angeles and San Francisco are just two of the U.S. cities that have moved to smart card technology (Miller & Lam, 2003). There are also time savings and stored flexible fare information benefits for users when using a smart card rather than paying at each service point (Iseki, Taylor, & Yoh, 2008, p. iii). Smart cards are a more permanent link for sharing fares between transit agencies than temporary paper pass, but they come with an added cost of new equipment installation and technological sophistication which many providers cannot afford (Rivasplata, Iseki, & Smith, 2012, p. 61).

Coordinating service between agencies at transfer points is an important activity for creating a seamless regional transportation system. This initiative does not require the creation of a new regional transportation entity but can be done through communication between the transit agencies. Public transportation should strive to make the time of the journey as short as possible in order to be competitive with personal automobiles. Transportation riders become discouraged when they must transfer between vehicles, so it is up to agencies to synchronized systems in order to minimize wait times at those points. Better scheduling reduces the overall travel time and makes public transit a more viable option for individuals. Most regional transportation efforts try to coordinate schedules to help riders use all of the agencies in the region. An example is the work done by the Puget Sound Regional Council, which created the Coordinated Transit-Human Services Plan to help regional agencies work together and improve mobility for special needs passengers in King, Kitsap, Pierce, and Snohomish counties.

Regional agreements between agencies can take on various forms depending on the needs and issues in the area. Agencies can consolidate to form a new regional transportation entity which encompasses multiple counties and cities, they can create an umbrella agency to coordinate services between the various agencies, or they can enter joint agreements to coordinate services while still remaining autonomous (Lewis, Higgins, Perkins, Zhan, & Chen, Public Transportation Solutions for Regional Travel: Technical Report, 2008, p. 6). Some of the most successful transportation partnerships occur in areas with either a dominant agency or agencies on more or less equal footing. The key to coordination is fostering strong working relationships on the individual level (Preston, 2012, p. 11). Often partnerships can be created with non-transit agencies such as academic institutions, health and human service agencies, and other area stakeholders to create the best solutions for coordinating service (Greater Toronto Transportation Authority, 2008, p. 57). Building a coalition of stakeholders, including non-transit agencies in the region, helps identify needs, create goals, and communicate the best possible ways to achieve them (Lewis C. A., Higgins, Perkins, Zhan, & Chen, 2009, p. 22).

Long-range and capital planning for regional transportation helps agencies set long term plans into motion to eliminate gaps in service and create the desired seamless system. Once goals, objectives,

and activities are set, long-range plans must be prioritized by importance of need, possibility of funding, and timetables for completion (Greater Toronto Transportation Authority, 2008, p. 79). During this process it is important to create and analyze projections of future growth in the region so that the transportation system dynamically anticipates change within its service area. These economic, social, and environmental changes must be analyzed over time to understand how trends have actually moved and what needs to be adjusted in plans previously made (Greater Toronto Transportation Authority, 2008, p. 67). Increasing modal choice, connectivity, and levels of service are all goals that most long range plans strive for, whether it be through rail, bus, or other forms of transportation.

A way for transit agencies to save money is by pooling resources together while still continuing to provide the same level of service. This could include assets such as vehicles, workers, or even facilities. The end result of consolidated transit service is less overall financial resources used and less duplicative service in the region (Lewis, Higgins, Perkins, Zhan, & Chen, Public Transportation Solutions for Regional Travel: Technical Report, 2008, p. 7). The key is taking care to ensure there is not a reduction in the level and availability of service when agencies are consolidated. Otherwise the strength of seamless regional transit decreases rather than becoming better for passengers.

Transit agencies are often focused on providing the public with information about their own system, but it should also be a priority to provide information for other partnering agencies as well. For passengers crossing jurisdictions, providing them with information for all of the transit agencies they must use makes it easier to use the overall system (Rivasplata, 2012, p. 62). Methods for providing information include sharing signage design between agencies for easier recognition, making other agencies' transit service pamphlets available, and trip-planning applications that can schedule between multiple agencies. There are also services via telephone offered in many parts of the country that provide transportation information assistance for callers. 511 is usually designated for transportation information while 211 is oriented towards human services. Depending on local jurisdictional preferences these kinds of numbers can be used to assess callers' transportation needs and help them decide which systems they can use to best serve them. These tools help increase opportunities for passengers to figure out and utilize cross-jurisdictional transit services.

Trip planners are an impersonal method of delivering route and time information between regional agencies. Users with internet access can go online and enter their origin and destination address to see which services and transfers are available at that time. Google Transit is one such trip planner which can calculate schedules for many of the transit agencies in larger American cities. Some cities, such as Los Angeles and Chicago, provide their own trip planner online in addition to Google's to allow users further choice.

Providing real-time information about vehicle routes, delays, and arrival times is another important service to consider providing to individuals. While it is also associated with increased equipment costs, it allows individuals to view real time data, make adjustments to their travel plans as necessary, and potentially decrease agitation over poor service. These data can be projected through information screens at stops and stations or to users' mobile devices. Chicago currently provides expected wait times for next available trains at stations, while Los Angeles has posted QR Codes at bus stops that link to their web site and show the mobile user how far away their bus is.

The greater Toronto area is one of the regional transportation systems pushing to provide real-time information in the future (Greater Toronto Transportation Authority, 2008, p. 39).

New technology that is already a reality in some larger metropolitan regions is intelligent transportation systems. These systems help with vehicle tracking, route scheduling, avoiding delays, and a multitude of other critical activities by providing real-time data for the internal use of agencies. Using intelligent transportation systems technologies makes more regional coordination activities possible and creates both opportunities and incentives to coordinate transit operations (Miller & Lam, 2003, p. ii). These systems can help agencies with providing aforementioned smart card payment options, information for travelers, and additional personal safety for passengers through surveillance cameras and microphones (Miller & Lam, 2003, p. v).

All of these strategies can be used to create a connected, seamless transportation system operated by different agencies in a region. The expected benefits are a better transit experience that will consequently boost ridership for all agencies involved.

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