Improving Speed and Reliability: The Role of City Leadership
Some Problems are Outside SEPTA’s Control

In a city as dense as Philadelphia, the ability of transit to run quickly and reliably is most often the result of things outside the transit agency’s control. High transit ridership results from a four legged stool:

- **Transit Service**: a well-connected network with high frequency, long spans, reasonable speeds, high reliability and sufficient capacity (as described on page 31).
- **Land Use**: the density, walkability, linearity and proximity of residents, jobs, and other land uses.
- **Street design**: the ability of transit to use certain streets, to make turns, and whether transit has priority that protects it from congestion.
- **Pricing**: the cost of transit fares relative to competing modes.

The transit agency only has complete control of the first element (service). It has partial control over the fourth (price) but only in terms of the transit fare. In general, local or state governments have complete or partial control over the other three elements.

Cities and state governments control the density of land by determining the zoning and approving or not approving development. They set parking policies, which dramatically affect both the density of land use and the cost of competing modes. They control walkability through land use decisions and the management of streetscapes, signal timing, and crossing locations. They manage curbs and determine parking locations, parking enforcement, loading zone locations, and traffic enforcement. They manage street priority by allocating lanes among competing uses. Overall, cities have as much control, if not more, over the success of transit than transit agencies, particularly in congested downtowns like Center City Philadelphia.

Figure 42 and Figure 43 show some examples of the problems that SEPTA faces operating on the streets of Philadelphia. While bus lanes exist on Market Street, they are rarely enforced and regularly blocked by other vehicles parking, loading, or unloading.

On narrow north–south streets like 8th, buses regularly face obstacles that slow them down or delay boarding and alighting such as parked vehicles in bus stops (see Figure 42) or large vehicles that block the street. These are issues that require leadership by the City of Philadelphia or the state, in partnership with SEPTA, to prioritize transit.

Figure 42: On-street parking interferes with a bus stop on Route 47 at 8th and Norris Streets.

Figure 43: Traffic congestion leads to bunching and delays on Route 33 on Market Street on a Friday afternoon.
Prioritizing Center City Streets

Making transit a priority on the busiest streets of Center City Philadelphia is a two-way partnership between the City and SEPTA. A major challenge is that SEPTA operates east–west frequent service on five different streets, as shown in Figure 45. Most routes use either the Chestnut/Walnut couplet or Market Street. Some routes, like the 33, use JFK Boulevard in addition to Market Street. Route 48 uses Arch Street westbound from Penn’s Landing to 22nd. Maximum SEPTA bus volumes are generally found in the PM Peak (see Figure 46) and reach a maximum of about 55 buses per hour around City Hall. Market Street sees the highest bus volumes with 48 SEPTA buses per hour just west of City Hall and 30 buses per hour east of it. The Chestnut/Walnut couplet sees at most about 30 buses per hour.

In addition to SEPTA buses, PHLASH buses (which only operate seasonally) and NJ Transit buses also use Market Street. PHLASH service adds four buses per hour when it operates. NJ Transit adds 4 buses per hour west of City Hall and 18 buses per hour east of it in the peak. Thus, in total there are 56 buses per hour on Market west of City Hall and 52 per hour east of City Hall (when PHLASH is running).

A standard bus lane can handle about 60 buses per hour, in ideal conditions, while a double bus lane can handle 180 per hour in ideal conditions. The current bus lanes on Market, Chestnut and Walnut are not enforced and suffer from significant interference from turning traffic, parked vehicles, and delivery vehicles, like the example in Figure 44.

Figure 45: East–west bus service in Center City is spread across five streets.

Figure 44: Parked vehicles in the bus lane on Market Street.

Figure 46: Peak bus volumes in the afternoon reach about 50 buses per hour around City Hall.
For the Chestnut/Walnut couplet, the existing bus lane on the right side of the street is a challenge as it is shared with bicycles, turning traffic and is regularly impeded by delivery trucks (see Figure 47). Traffic turning right is a particular problem when pedestrian activity is high, because cars must wait for a gap in pedestrian traffic to turn. The backup of turning traffic prevents buses from reaching the bus stops, which are on the nearside of almost every intersection. Thus, at nearly every other street, buses on Chestnut or Walnut encounter serious delays from turning traffic. Figure 48 shows this pattern clearly, where buses on Walnut see this problem at 16th, 18th, and 20th and buses on Chestnut see this problem at 15th, 17th, and 21st.

Changing stop spacing to every other block with stops placed at cross streets with left turning traffic would help address this problem as could moving some or all stops to the far side of each intersection. A combination of both tactics would improve bus speeds through this slow stretch of Center City.

A renewed partnership between SEPTA and the City of Philadelphia would require rethinking the priority of streets in Center City. Selecting one or two east–west streets and designating up to four travel lanes could moving some or all stops to the far side of each intersection. A combination of both tactics would improve bus speeds through this slow stretch of Center City.

Curb Management

Road space for moving buses is not the only major challenge in Center City. With the increased use of ride-hailing services (like Uber and Lyft), more home delivery of goods from companies like Amazon, increasing use of just-in-time delivery to businesses, and the continuing desire for on-street parking from residents and retail merchants, the demands on curb space in the city have increased dramatically in recent years. This is a major challenge in Center City, but the issue is not limited to just Center City. And the fragmentation of responsibility for curb space and enforcement among the Streets Department, Philadelphia Parking Authority, and Philadelphia Police Department leads to difficulty in updating policies, loading zone locations, and other important steps to meet the changing demands on curb space.

One area where SEPTA and the City can cooperate to improve curb management is to widen bus stop spacing. As noted above, most routes, particularly in Center City, stop nearly every block, about every 450 feet. For most people, it is easy to walk to any of several stops on a route. But a customer does not need several stops. They need one stop. Standard practice in North America is to space stops about every 1000 to 1500 feet. Widening stop spacing has many benefits and trade-offs, discussed further in Chapter 6 on page 93, but a key one is that having fewer stops means that there is more funding per stop to provide amenities and there are fewer stops on which to focus enforcement of parking and loading restrictions. Therefore, widening stop spacing would ease the coordination among the various agencies who manage curb space in Philadelphia.
Leadership in Other Cities

In other major metropolitan areas, core cities are leading initiatives to make transit a faster and more reliable option for more people by making transit a higher priority than cars on urban streets.

Seattle

In 2007 the City of Seattle led development of its own transit plan, even though transit was operated by a regional authority: King County Metro. It clearly stated that Seattle’s needs were greater than and different from the needs of surrounding (suburban) cities and counties.

The plan developed city policies and actions relating to:

- Speed
- Reliability
- Frequency
- Land Use
- Walkability

The Seattle Transit Plan provided a framework for city traffic and transportation staff to maintain or improve operating speed and reliability for buses. It set priorities to improve the frequency of service for routes within the city and led to funding for those improvements from the city.

The plan also set policies and direction on planning and zoning to support transit, including reduced parking requirements.

It set all of the policies and goals and tied them directly to the fundamental need to keep people moving through Seattle. This clearly tied the potential for growth and development in the city to the speed, reliability, frequency, and ridership of the city’s transit network.

The plan set the goals and policies in the context of a transit service that is provided by a regional entity. By taking the lead, the City of Seattle was able to dramatically improve transit service in the city and ultimately succeeded in getting local funding approved by voters to further invest in transit, in partnership with the regional transit agency.

New York City

The Metropolitan Transit Authority (MTA) and the City of New York have made some progress in improving bus service in the city through their Select Bus Service (SBS) program. SBS service has been implemented on 13 corridors and it includes:

- Dedicated bus lanes withcamera enforcement,
- Off-board fare collection,
- Sidewalk extension for bus stops, and
- Turn restrictions for general traffic.

SBS service has generally been implemented as an addition to existing local bus service, instead of replacing service. The City and MTA have faced some challenges similar to issues in Philadelphia with enforcement of bus only lanes and difficulty with implementation of transit signal priority.

Figure 49: Frequent service within the City of Seattle is funded in part by the city per city policy.

Figure 50: Curb extension bus stop on an SBS route in New York
San Francisco

The MUNI Forward program is currently implementing numerous improvements to increase the speed and reliability of MUNI service in San Francisco. Major initiatives include wider stop spacing, bus only signals and transit signal priority, dedicated bus lanes, and the elimination of stop signs on neighborhood streets. The MUNI Forward improvements are largely funded by a set of bonds approved by voters in 2014 referendum and the program is administered through the regular capital budgeting process for the transit agency.

The San Francisco Municipal Transportation Agency (SFMTA) estimates that every stop sign along a bus route causes at least 18 seconds of delay for deceleration, stopping, looking for cross traffic and accelerating back to speed. On average, the delay at any given stop sign will be higher than 18 seconds due to the wait for crossing pedestrians and crossing vehicular traffic. For SEPTA there is also the added delay of boarding and alighting passengers at stops located on nearly every block.

San Francisco’s experience with stop signs is particularly informative for the City of Philadelphia. Many north–south routes in the city must stop at dozens of stop signs on their way through the city. For example, Route 45, which runs on 11th and 12th Streets from Center City to South Philadelphia, is only a 7.5 mile round trip, but encounters 30 stop signs along its way. Assuming 18 seconds of lost time per stop sign, if just half the stop signs were removed, it would save the route 4.5 minutes per round trip. With 127 round trips per weekday, that would save 9.5 hours of travel time per day, or about 6% of the daily service hours.

In addition, if bus stop consolidation and traffic signal priority were combined with these stop sign changes in Philadelphia, it is likely that significantly higher travel time savings could be achieved. And these time savings can benefit both riders and SEPTA. The time savings benefit riders because riders can reach their destinations faster if bus speeds increase. The time savings benefit SEPTA and riders because they can reduce the cost of service.

The bulk of transit operating cost arises from hours of service (rather than distance, or the size of vehicles, or other factors). If a bus route can operate faster, the time savings can be used to extend the route farther or increase the frequency of service.

Or if the time savings are large enough, the route may require fewer buses and drivers to maintain the scheduled frequency. Put another way, a sufficient increase in speed can “save a bus” which reduces SEPTA’s operating costs. Those cost savings can be reallocated to other routes or to other needs.

Figure 51: Transit priority and bicycle lanes on Market Street in San Francisco

Figure 52: Toolbox of approaches for improving speed and reliability from SFMTA MUNI Forward program
Baltimore

Baltimore has recently implemented a major bus network redesign in conjunction with significant bus-priority investments. The bus-priority investments include:

- extending existing dedicated bus lanes on two streets downtown.
- adding dedicated bus lanes on six additional streets in the downtown area.
- adding a peak only bus lane north of downtown.
- implementing Transit Signal Priority on two frequent bus routes in North Baltimore that feed into downtown.

Initial analysis of the new and extended dedicated lanes shows that travel times have improved by about 7% over the entire day, with the time savings during peak hours reaching 17-25%.

The overall results of the system redesign have not achieved ridership increases as of December 2017, but ridership in the first six months after implementation was down only 5% compared to other similar cities where ridership has declined from 9 to 13%. It is important to note that in the first few months after implementation of any system redesign a decline in ridership is likely to occur. This is because the few riders whose trips are made more difficult are more likely to stop riding immediately. But for the much larger population of people who do not ride today or do not ride for some trips, it takes time for them to figure out how useful the new system is for their needs.

On-time performance has improved across the system, in part due to the dedicated bus lanes and transit priority investments. Overall system on time performance has improved from 60% to 66%.

As part of the system redesign, the new high frequency routes, branded CityLink, are being tracked based on headway reliability, instead of schedule adherence. The goal for CityLink routes is to have at least 75% of trips arrive at the scheduled headway and in the first six months CityLink routes were arriving on the scheduled headway 76% of the time.¹

Philadelphia Experience

The City of Philadelphia has identified transit as its first transportation priority in the Philadelphia2035 Citywide Vision and includes the goal of increasing transit use to reduce environmental impacts and travel time. The City’s vision calls for more investment in existing infrastructure and the expansion of the Transit First program to improve transit speed and reliability. It also recommends more collaboration between city departments and SEPTA to encourage the development of transit-oriented development policies and support for the creation of transit-friendly development guidelines. These are important steps toward city leadership on transit needs in Philadelphia.

Through the Transit First program, SEPTA and the City of Philadelphia have experimented with bus lanes and traffic signal priority, but the outcome so far has had limited success. As previously noted, dedicated bus lanes on Market, Chestnut and Walnut have not been enforced and are therefore largely ineffective at improving speed and reliability of service.

Transit signal priority (TSP) has been implemented on a few corridors in the outer parts of the city. In general, only small gains in speed and reliability, on the order of 3-6%, have been seen with the implementation of transit signal priority. However, anecdotes from SEPTA staff indicate that schedules were not significantly re-timed at the time of TSP implementation. Without re-timing schedules in response to time savings, bus drivers are not likely to increase their speed because they might reach a time point early, which would reduce their on-time performance.

Based on an April 2014 Delaware Valley Regional Planning Commission report, Market Street in Center City is among the 10 most promising TSP corridors in the city. Implementing truly dedicated lanes and TSP through Center City, along with rethinking the distribution of east–west service, could make a major difference in the speed and reliability of bus service in Philadelphia. A key factor in expanding the use of TSP is to ensure all buses have the necessary equipment to use TSP.

Working from examples like the Muni Forward Implementation Workbook, there are a number of ways the city could take a stronger leadership position in making transit a priority in Philadelphia. The MUNI Forward Implementation Workbook provides many examples of specific tools that the City could use to improve transit, such as replacing stop signs with signals on the busiest and most frequent routes in the city, shifting stops to the far side of intersections, or adding queue jump lanes at congested intersections. Figure 56 shows an example of the combination of tools that MUNI proposed for Haight Street to improve speed and reliability on that corridor.

We have noted previously that widening stop spacing and far side stops would likely help address speed and reliability issues on Chestnut and Walnut Streets. This is just one example of the ways different tools can be used in combination to address transit issues in Philadelphia. It is beyond the scope of this report to analyze in more detail specific issues on all the other routes and corridors in the city. For that level of detail, the City should look to the example of the Seattle Transit Master Plan. In that planning process, the City of Seattle exerted its own power and influence to make transit a priority in the many city agencies, policies, and programs that affect transit. And through development of a clear and comprehensive transit master plan it has pushed all the various City agencies and departments to make transit central to the life and growth of the city.

Figure 56: Example of MUNI Forward proposed improvements

<table>
<thead>
<tr>
<th>Summary of Proposals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relocate Stop</td>
</tr>
<tr>
<td>Stop Removal</td>
</tr>
<tr>
<td>New Pedestrian Bulbs</td>
</tr>
<tr>
<td>Turn Restrictions</td>
</tr>
<tr>
<td>Bus-Only Signal</td>
</tr>
</tbody>
</table>

7/7R Haight-Noriega Transit Priority Project

Figure 55: Example of a queue jump lane from Seattle.