November 14, 2011

Evaluation of 13th Street Pilot Bike Lane

SUMMARY

In July 2011, the Streets Department marked pilot bike lanes on 10th Street between Market and Lombard Streets and on 13th Street between South and Hamilton Streets.

These bike lanes are considered to be pilots because they are experimental. Each street is programmed to be resurfaced – a portion of 13th Street is currently being resurfaced and 10th Street and an additional portion of 13th will be resurfaced next spring. Because of a streetscape improvement project in Chinatown, the marking of a pilot bike lane on 10th Street between Callowhill and Market Streets was delayed until November 5th.

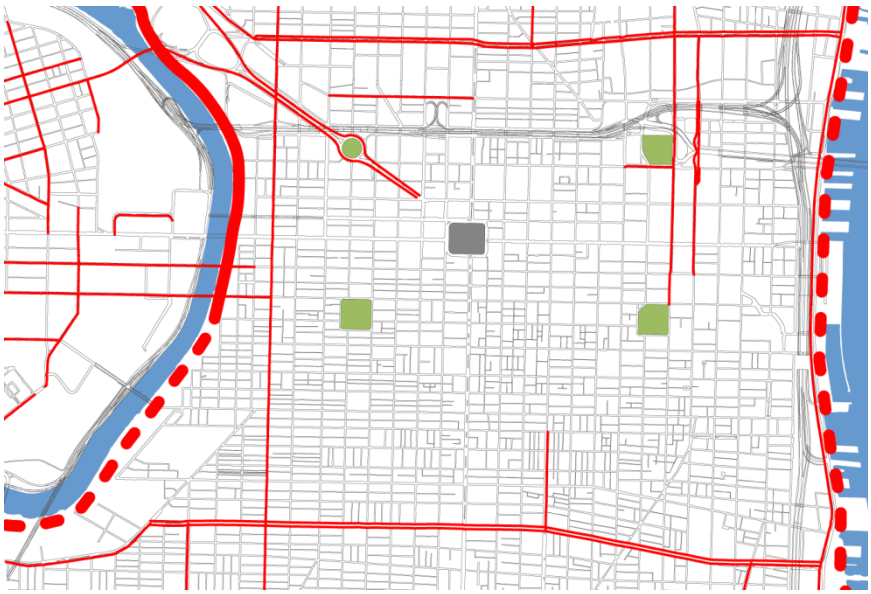
Traffic conditions were evaluated before the lines were marked; conditions on 13th Street have been evaluated again to determine what impact the bike lanes had on motor vehicle traffic. Conditions on the southern portion of 10th Street is in the process of being evaluated. The northern portion of 10th Street bike lane will be evaluated either in December or next spring, depending upon the weather. This report evaluates only the 13th Street pilot.

At this time, as described below, the Mayor's Office of Transportation and Utilities recommends that the bike lane on 13th Street be made permanent. Minor revisions to the plan for the bike lanes have been developed to improve the flow of motor vehicles in the vicinity of Market Street where the existing lane configuration had resulted in significant traffic delays even before the bike lane pilot was installed.

Project Description

Philadelphia has an extensive network of bicycle lanes and multi-use trails. In response to this infrastructure, a growing number of Philadelphians are using bicycles for transportation. Among cities with a population greater than one million, Philadelphia has the highest share of commuters who chose to bike to work. Philadelphians also use bicycles to travel to school, to shop, for recreation and for other travel purposes.

Although the bike network is extensive, there are only a limited number of bike lanes and no trails within Center City, although the trails being developed along the Delaware and Schuylkill Rivers are effective in delivering bicyclists to Center City.



In 2009 Philadelphia marked paint-buffered bike lanes on two cross-town streets in Center City – Spruce Street and Pine Street – on a "pilot" basis. That pilot test found that the streets functioned effectively with a single travel lane, and that the reduction of a through travel lane had little impact on the median speed of motor

vehicles, the delay experienced at intersections or travel volumes, while doubling the use of the streets by bicyclists. After a year in place, analysis of motor vehicle crash data indicates that the bike lanes may have also made the streets substantially safer for all users; the number of reportable motor vehicle crashes declined 44% between 2008 and 2010 on the two streets and the number of pedestrians hit by motor vehicles declined 58%.

Based on the success of the Spruce and Pine bike lanes, the Mayor's Office of Transportation & Utilities (MOTU) and the Streets Department determined that additional opportunities should be sought for marking bike lanes within Center City so that a more complete network could be established.

Initial Planning

During the fall of 2009 and winter of 2010, MOTU staff evaluated all of the north south streets through Center City to determine which streets would be most appropriate for bike lanes. Traffic volumes, bus activity and the presence of physical obstacles to bikes – trolley tracks or cobblestones – were factors that were considered.

	13TH Street at Walnut Street	13TH Street at Spruce Street
BEFORE		
AFTER		

Evaluation

Mid-block 24-hour traffic volumes and traffic speeds were counted before the bike lanes were marked. The continuous 24-hour counts were collected at the following locations on each street:

- Between Walnut and Locust Streets
- Between Noble and Callowhill Streets

Automatic traffic count data is typically collected using pneumatic rubber tubes that are placed across the roadway. At several of the count locations, the City experienced numerous instances when the rubber tubes were severed. Sufficient counts were collected

to permit evaluation of the pilot tests. However, at a proposed location on 13th Street between Vine and Race Streets, no data was collected because of repeated problems with the tubes.

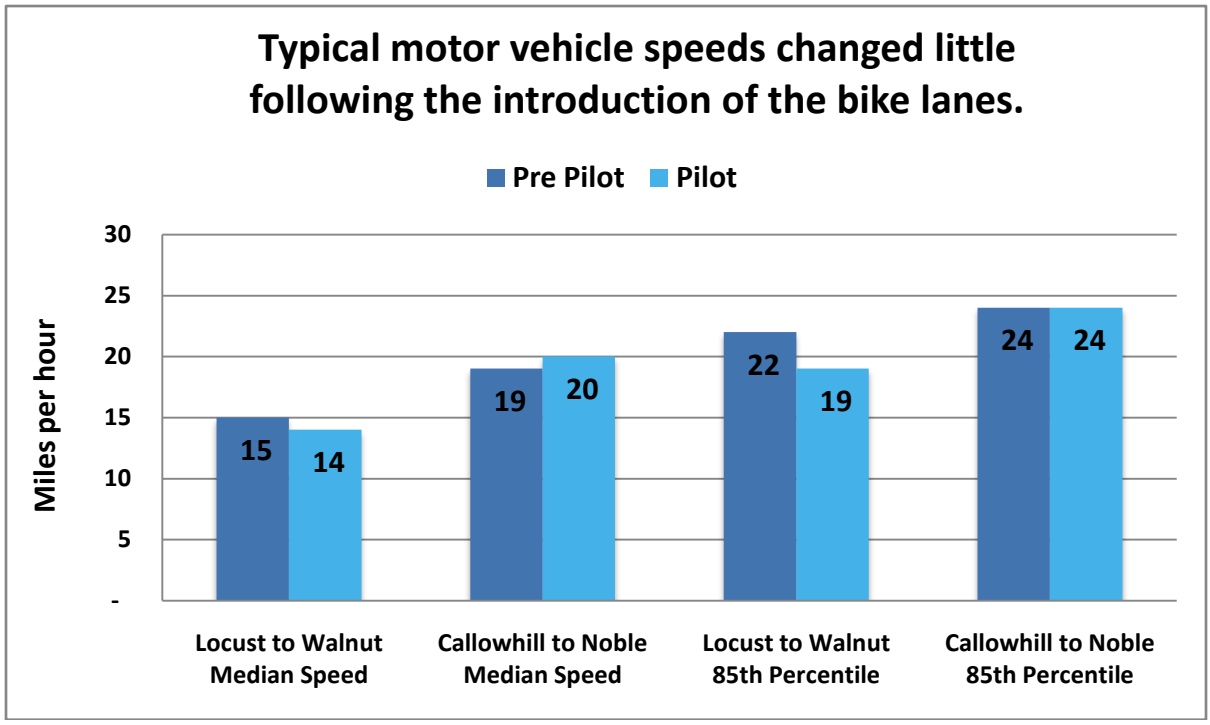
Manual traffic counts were also conducted at three intersections – Arch, Market and Walnut Streets. These manual intersection counts were collected for the morning, noon and evening peak travel periods on each street during the last two weeks of May and the first week of June, avoiding days close to the Memorial Day holiday weekend. Data collected included peak queuing length (the number of vehicles waiting at an interestion), motor vehicle turning movements and bicycle counts.

Staff from MOTU and the Streets Department also visited the site frequently to observe how each street was operating.

A second set of intersection traffic counts were collected in September and October at the same locations.

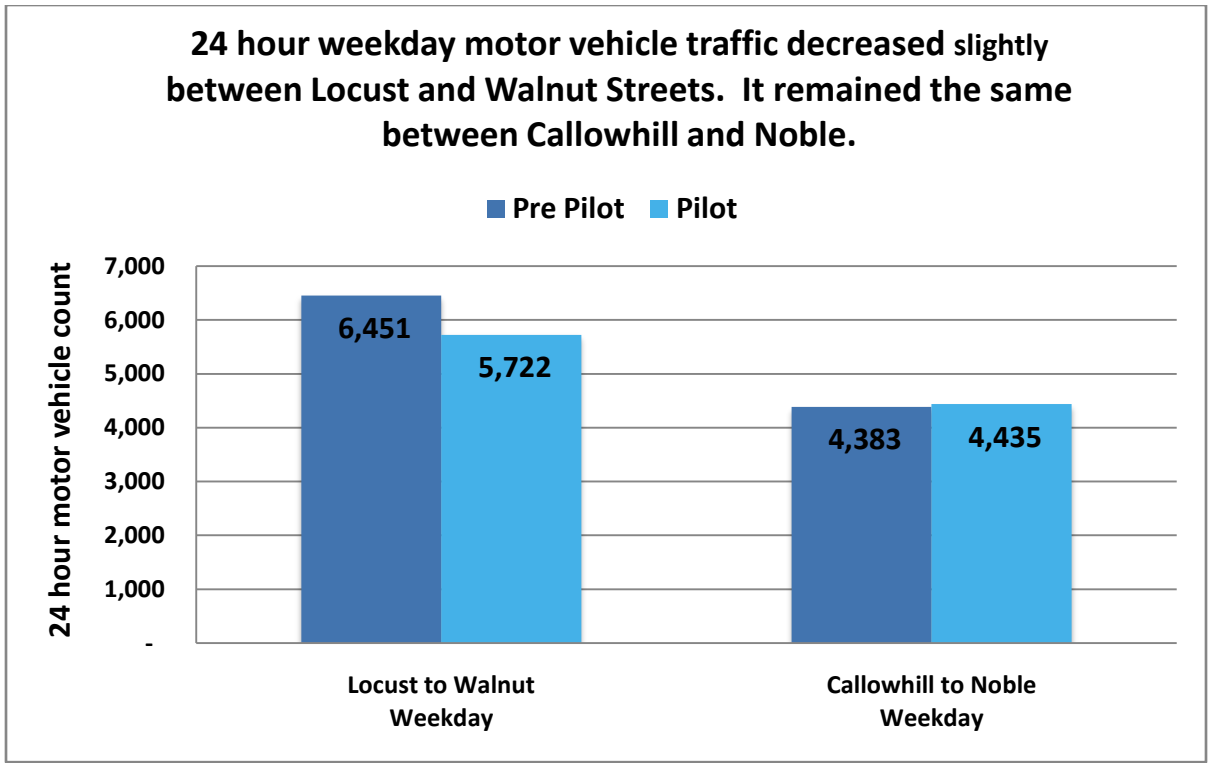
Motor Vehicle Speeds

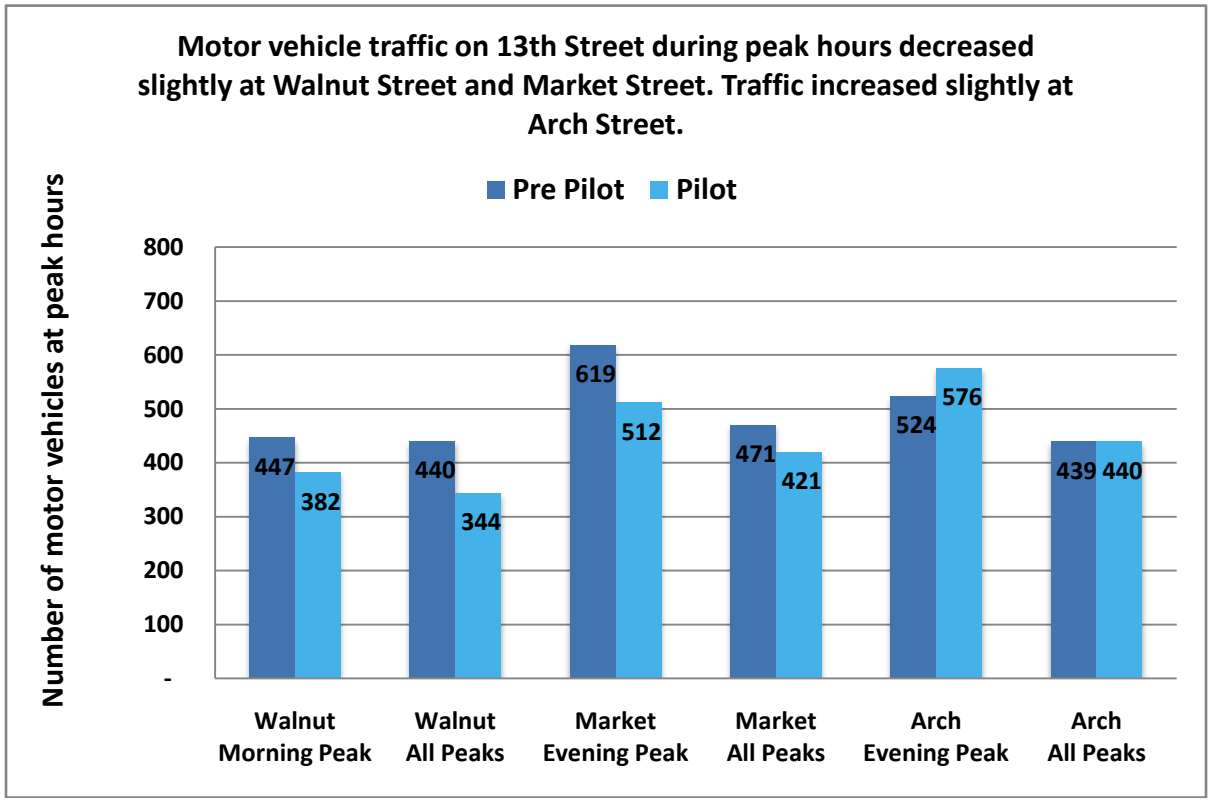
The 24 hour traffic recorders indicated that neither the median nor the 85th percentile operating speeds changed significantly on 13th Street. Compared with Spruce and Pine Streets, traffic speeds are already low on 13th Street, controlled by the frequency of traffic signals and the density of pedestrian traffic.



Motor Vehicle Volumes

The 24 hour traffic counts indicated that average weekday traffic volumes declined slightly between Locust and Walnut Streets and remained the same between Callowhill and Noble Streets. The difference in traffic volume is well within the typical variance day-to-day on streets within Center City. The 24 hour volume is well within the capacity of a single lane urban street.





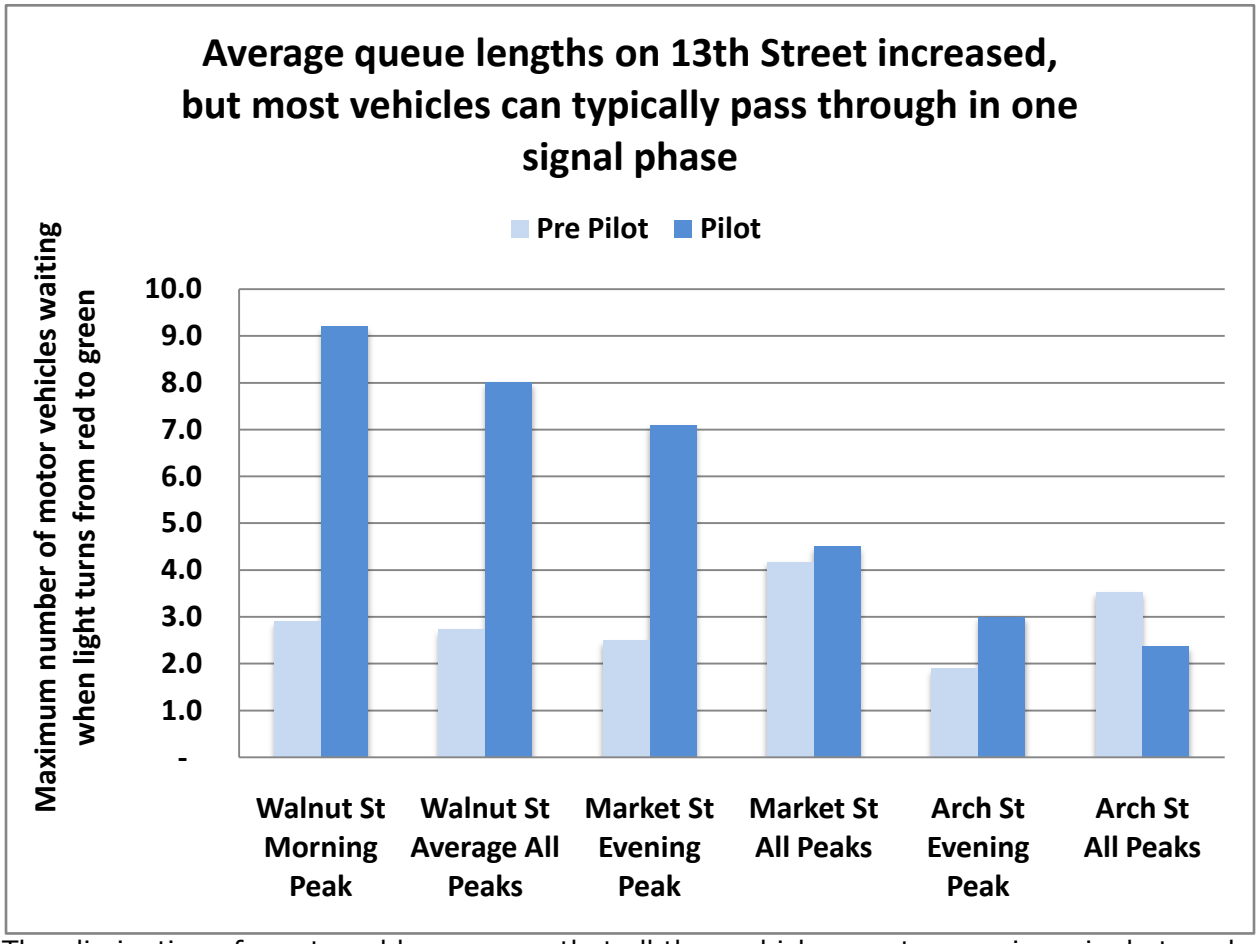
Peak hour traffic appeared to decline slightly on 13th Street during the pilot except at Arch Street, where volumes remained approximately the same. The volumes recorded are well

within the capacity of a single lane Center City street, which is assumed to be at least 800 vehicles per hour.

Traffic volumes at Market Street are constrained by pedestrians who restrict the number of vehicles that can turn left or right. Because of the geometrics of the street, these turning vehicles can limit the ability of cars to travel thru the intersection as well.

Vehicle Delay

Within Center City vehicle delay is generally associated with the time spent at traffic lights. One measure of this delay is the length of the queues that form while the traffic signal is red.



The elimination of one travel lane means that all thru vehicles must queue in a single travel lane, potentially lengthening the queue so far that vehicles at the end of the queue are not able to pass through the intersection before the light turns red.

Typically vehicles can pass through an intersection at the rate of one vehicle every two seconds. At that rate, queue lengths in excess of 12 to 15 vehicles may result in some vehicles being unable to pass through the intersection during a 25 or 30 second signal phase respectively.

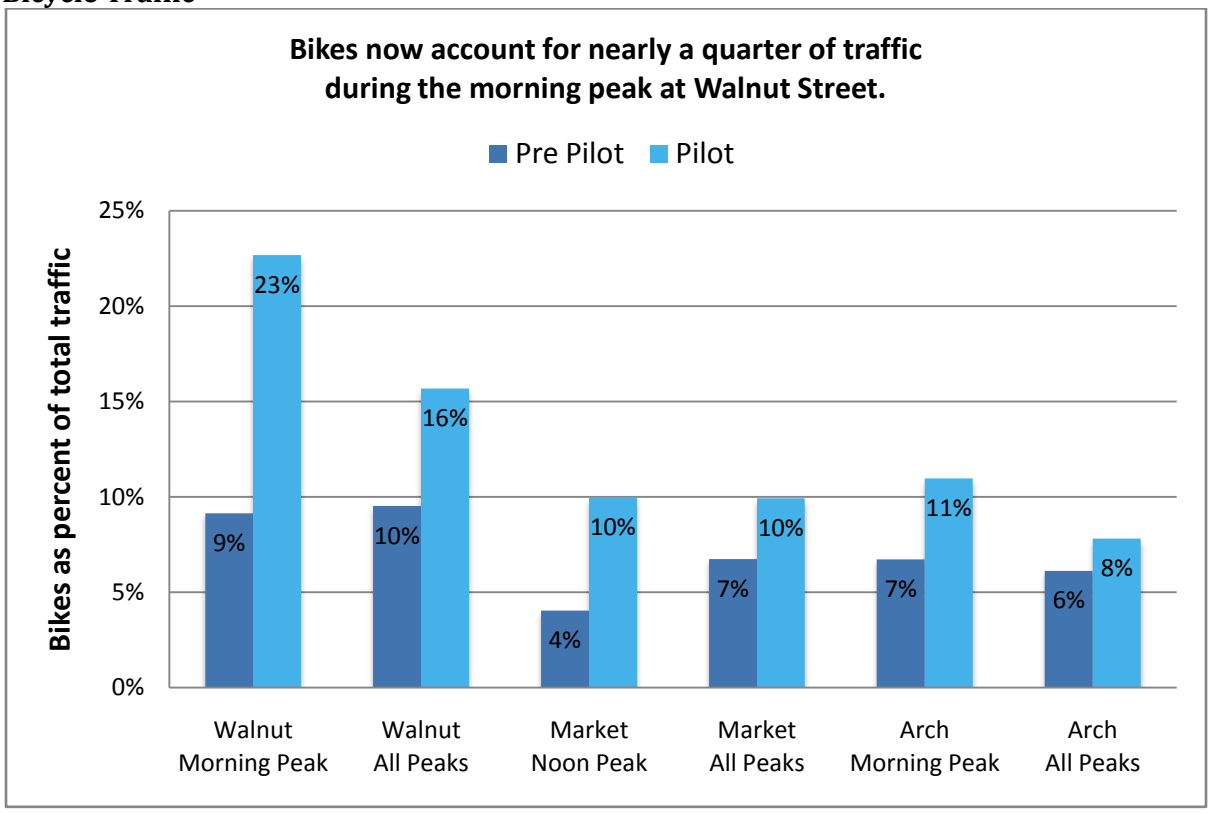
A number of factors can result in short periods when queue lengths lengthen. As a result, both the maximum queue length within each peak travel period and the average queue length were calculated. Factors affecting queue lengths include conflicts with cars entering or leaving parking spaces, times when the intersection is blocked by cross traffic that fails to

clear the intersection, illegal pedestrian crossings, bus loading activities, taxis stopping for passengers or simple driver attention deficits.

At most intersections the average queue length during each of the peak periods remained below five vehicles, well within the number that can pass through an intersection while the light is green. Market Street in the evening and the Walnut Street intersection in the morning and at noon had queues of 7.1 and 9.2 vehicles respectively.

Observations indicated that at each intersection conflicts with crossing pedestrians was the cause of most intersection delay. This is common in Center City and reflects the high volumes of pedestrians on Center City streets and the respect most drivers give to pedestrians when crossing in a crosswalk. At both Market and Walnut Streets, turning vehicles can block the passage of through vehicles. Staff observations indicated that this was occurring before the pilot bike lanes were marked and continue to occur now.

Bicycle Traffic



Not surprisingly, the marking of the bike lanes along 13th Street attracted bicyclists. The number of bicyclists observed increased substantially, especially in the morning peak hour.

Observations of bicyclists also indicated that on 13th Street over 90% of bicyclists who were observed were riding in the correct direction on the roadway. The very few bicyclists observed riding on the sidewalk rode only short distances either to or from the building where the trip either ended or started.

As a result, the bike lane appears to be encouraging bicyclists to ride with respect.

Public Outreach

A public meeting was held on May 10th at Thomas Jefferson University's Alumni Hall prior to the initiation of the pilot bike lanes, a meeting that was well attended. Some business people from Chinatown expressed opposition to the pilot test, and facility planners from Jefferson Hospital expressed concern. No opposition was expressed concerning the marking of bike lanes on 13th Street.

The pilot process allows citizens to participate in the evaluation of the bike lines. Rather than modeling the potential impacts of closing a travel lane, the experimental installation of the bike lanes allows residents, workers, employers and guests to experience the changed conditions and provide feedback regarding the initiative.

A second "open house" session was held on November 2nd at Gershman Hall at the University of the Arts, to review findings from the evaluation of 13th Street. A smaller group attended this meeting, in part reflecting the generally non-controversial nature of the pilot lane marking on 13th Street. After the 10th Street bike lane has been evaluated, a second "open house" will be held to present findings regarding that street to the public.

Stakeholder Meetings

Prior to the first public meeting, staff met with leaders of the community organizations in the area – Washington Square West Civic Association, Philadelphia Chinatown Development Corporation, Midtown Village Business Association and the Callowhill Neighborhood Association. These groups were also invited to attend each of the public sessions regarding the 13th Street pilot.

In addition to the public meetings, several meetings have been held with stakeholders along 10th Street – the Philadelphia Chinatown Development Corporation and Thomas Jefferson Hospital and University. These meetings will continue while the 10th Street pilot bike lane is being conducted.

Staff also met with stakeholders along 13th Street located close to the Market Street intersection – SEPTA operations staff, the General Manager of the Downtown Marriott Hotel and the managers of the Wanamaker Building. These meetings were held to discuss the continuing problem of congestion at Market Street, especially in the evening, and possible remedies.

Meetings were also held with Councilman DiCicco and his staff. Staff was also kept informed of the progress of the pilot projects.

Conclusion and Recommendation

Based on the findings, which indicated that the pilot bike lane on 13th Street was not resulting in substantial impacts to motor vehicle traffic and was successfully attracting bicyclists, the Streets Department and the Mayor's Office of Transportation have decided to make the bike lane on 13th Street permanent. Community groups will receive a copy of this report and the report will be posted on the Mayor's Office of Transportation and Utilities website.

Modifications

Market Street

As indicated, the Market Street intersection was a source of intersection delay before the bike lane was installed and continued to be a problem afterwards. To mitigate this impact, SEPTA has agreed to move its bus "layover" location from the south side of Market Street to the north side of Market Street. This will allow three lanes of traffic to approach Market Street at all times – one for left turns, one for right turns and one for through movements. This modification would recommended even in the absence of a bike lane.

Walnut Street

Two metered parking spaces should be removed south of Walnut Street in order to create a short queue for left turning vehicles.

Hamilton Street to Spring Garden Street

The Callowhill Neighborhood Association has requested that the bike lane be extended north to Spring Garden Street. This will allow a right turn lane to be added at the intersection, making that intersection function more efficiently. The current markings require that bicyclists merge into a shared travel lane near the top of a hill at a location where motor vehicles are traveling relatively fast.

After reviewing the location, staff concurs with this request. When this section is resurfaced in 2012, the marking plan will be revised to permit the bike lane to be extended.