



February 15, 2011

Mr. Donald Charley
UPMC
Director, Parking & Security
200 Lothrop Street
PUH South, Suite 3657
Pittsburgh, PA 15213

Subject: UPMC Shadyside – CHP Parking Lot Shuttle Study – Report

Dear Mr. Charley:

As requested, Trans Associates has completed the subject transportation engineering services for the UPMC Shadyside Hospital Campus. The purpose of these services was to provide traffic engineering consulting services related to the recommended operational characteristics for shuttle service between UPMC Shadyside and the CHP employee shuttle lot of approximately 200 spaces located in Lawrenceville.

The following is a brief description of engineering services provided and results of the study.

Background Information

As part of the Children's Hospital of Pittsburgh of UPMC (CHP) master plan for the new CHP hospital campus in the Lawrenceville section of the City of Pittsburgh, an off-site employee shuttle lot was constructed. This shuttle lot is located on 55th Street off of Butler Street. As of this date, CHP does not require full use of this off-site shuttle lot. Therefore, unused parking spaces within this lot have the potential to be utilized by other UPMC facilities.

Within the CHP employee shuttle lot is a section providing 200 parking spaces that is physically separated and fenced in from the remainder of the shuttle lot. Access to the lot for vehicles is by use of magnetic card gates and swipe cards. No hourly parking or cash parking is permitted. This section of the CHP employee shuttle lot would serve principally as a weekday daytime employee parking facility, with primary hours of operation from 6:00 AM until 6:00 PM for the UPMC Shadyside Hospital Campus.



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Data Collection

The following data collection efforts have been completed by Trans Associates:

- Collection of travel times for travel between the proposed shuttle stop on the UPMC Shadyside campus at the main governor's driveway on Centre Avenue (Posner Tower) and the CHP Lot on a typical weekday during the morning and evening peak activity periods, estimated to be between 6:00 to 9:30 AM and 2:00 to 5:30 PM.

Two potential shuttle routes were evaluated. The two shuttle routes chosen were selected based on the extensive study and community coordination performed as part of the CHP master plan study process. These two routes include the 40th Street route (preferred due to use of collection roadways) and the Stanton Avenue route (secondary route). Figure 1 presents a map of the two evaluated shuttle bus routes.

Shuttle Travel Time Survey.

Results of the travel time survey conducted by Trans Associates are presented in **Table 1**. As summarized in this table, the shuttle route #1 (40th Street) was determined to be the preferred travel route of the two choices (see above). Assuming an unloading/loading time of approximately four (4) minutes, the combined round trip for route #1 is estimated to take approximately 41 minutes in the AM peak hour and 36 minutes in the PM peak hour.

Estimated Shuttle Buses Required

The number of passenger shuttle runs needed to accommodate the employee demand was calculated for 24 passenger shuttles. Shuttles are assumed to operate at 90% capacity; therefore, each shuttle is estimated to have an effective passenger capacity of 21 persons. For analysis purposes, the 200 parking space shuttle lot is expected to be 100% utilized with a vehicle occupancy ratio of 1.1 persons per vehicle. Three periods of arrival/departure activity were used as scenarios for analysis for this study: 60 minutes, 90 minutes, and 120 minutes.

For shuttle route #1, it was determined that, due to distance and traffic conditions in the area, each shuttle could complete 1.46 round trips per hour (60 divided by 41) in the AM peak hour. However, if the shuttle were to begin at the passenger origin (AM conditions = shuttle parking lot), a total of two (2) passenger transport trips could be completed. This would



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not include a complete return trip of the shuttle to the parking lot (complete round trip). For each scenario, numbers of shuttles needed hourly were calculated.

During the PM peak hour, a total of two (2) passenger transport trips could be completed per hour.

As shown in **Table 2**, the following numbers of shuttle buses are required for each arrival/departure scenario for the preferred shuttle route #1 (40th Street):

- **AM Peak Hour**
 - 60 minute arrival/departure
 - Six (6) shuttle buses are required
 - 90 minute arrival/departure
 - Four (4) shuttle buses are required
 - 120 minute arrival/departure
 - Three (3) shuttle buses are required
- **PM Peak Hour**
 - 60 minute arrival/departure
 - Six (6) shuttle buses are required
 - 90 minute arrival/departure
 - Four (4) shuttle buses are required
 - 120 minute arrival/departure
 - Three (3) shuttle buses are required

This concludes Trans Associates shuttle route evaluation for use of the CHP employee shuttle lot for UPMC Shadyside. If you have any questions or need additional information, please do not hesitate to contact our office.

Yours truly,

A handwritten signature in black ink, appearing to read 'Cynthia A. Jampole', is written over a light blue background.

Cynthia A. Jampole, P.E.
Principal

CAJ:CAD:mz

cc: File: upmcs00-11044/CHP Parking Lot Shuttle Study Report

TABLE 1
SHUTTLE TRAVEL TIME SUMMARY, IN MINUTES
UPMC Shadyside CHP Parking Lot Shuttle Study
City of Pittsburgh, Allegheny County, Pennsylvania

Route Number	Run	Travel Time (mins)	
		AM	PM
		(6:00 - 9:30 AM)	(2:00 - 5:30 PM)
From CHP Lot to UPMC Shadyside			
1 (40th Street)	1	19.68	15.23
	2	24.00	18.10
	3	22.25	16.97
	Average	21.98	16.77
2 (Stanton Avenue)	1	17.87	14.58
	2	16.97	17.58
	3	17.27	17.02
	Average	17.37	16.39
From UPMC Shadyside to CHP Lot			
1 (40th Street)	1	12.30	13.45
	2	15.33	15.17
	3	15.25	15.62
	Average	14.29	14.75
2 (Stanton Avenue)	1	18.87	15.07
	2	15.87	14.63
	3	15.03	14.83
	Average	16.59	14.84

Route 1 Round Trip	AM:	36.27
Travel Time	PM:	31.52
(Preferred Route)		

Route 2 Round Trip	AM:	33.96
Travel Time	PM:	31.23

AM round trip average travel time: 36.27
 Assumed loading/unloading time: 4.00
Total AM round trip travel time (rounded): 41.00

PM round trip average travel time: 31.52
 Assumed loading/unloading time: 4.00
Total PM round trip travel time (rounded): 36.00

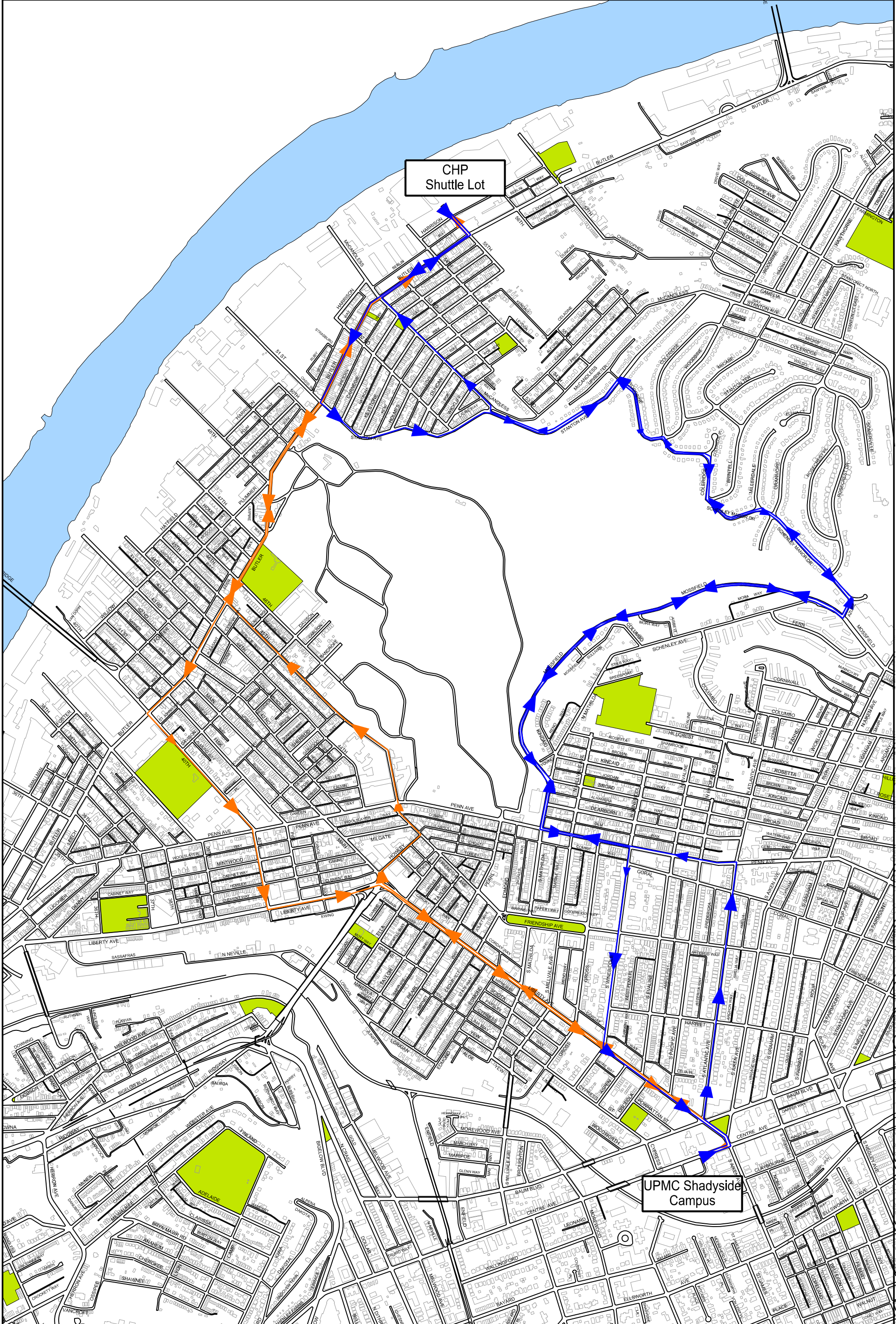
Source: Analysis and data collection by Trans Associates.

TABLE 2
SHUTTLE REQUIREMENTS
UPMC Shadyside CHP Parking Lot Shuttle Study
City of Pittsburgh, Allegheny County, Pennsylvania

	Arrival/Departure over 60 mins	Arrival/Departure over 90 mins	Arrival/Departure over 120 mins
AM Peak Hour			
Number of Parking Spaces	200	200	200
Estimated Total Number of Persons (assume 1.1 persons per vehicle occupancy rate)	220	220	220
Round Trip Travel Time (minutes)	41	41	41
Number of persons to be transported per hour	220	2	110
Number of passenger transport trips per shuttle per hour ⁽¹⁾	2	2	2
Shuttle Bus Passenger Capacity (assume 90% occupancy)	21	21	21
Number of Shuttles Required	6	4	3
PM Peak Hour			
Number of Parking Spaces	200	200	200
Estimated Total Number of Persons (assume 1.1 persons per vehicle occupancy rate)	220	220	220
Round Trip Travel Time (minutes)	36	36	36
Number of persons to be transported per hour	220	147	110
Number of passenger transport trips per shuttle in time period ⁽¹⁾	2	2	2
Shuttle Bus Passenger Capacity (assume 90% occupancy)	21	21	21
Number of Shuttles Required	6	4	3

(1) In the peak flow direction



Source: Analysis by Trans Associates.



CHP Shuttle Lot

UPMC Shadyside Campus

Legend:

-  - Route #1
-  - Route #2



SCALE: 1" = 500'



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PROJECT NO. UPMCS00-11044

PROJECT: UPMC Shadyside
 CHP Parking Lot Shuttle Study

TITLE: Shuttle Bus Routes

FIGURE

1

D.B. cad
 C.B. caj
 REV. _____