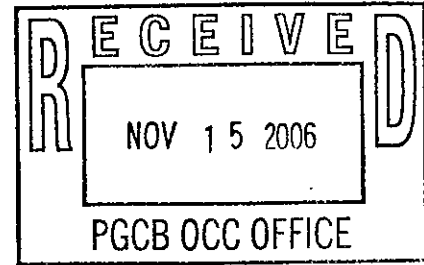213 Market Street, 9th Floor, P.O. Box 865, Harrisburg, PA 17108-0865
Tel: (717) 237-7160 ■ Fax: (717) 237-7161 ■ www.WolfBlock.com

Direct Dial: (717) 237-7191
Direct Fax: (717) 237-2771
E-mail: mstewart@wolfblock.com

November 14, 2006

VIA HAND DELIVERY

Frank T. Donaghue
Chief Counsel
Pennsylvania Gaming Control Board
5th Floor, Verizon Tower
Strawberry Square
Harrisburg, PA 17106-9060

> Re: IOC Pittsburgh, Inc. – Traffic Study Report
>   Category 2 Slot Machine License Application;
>   Docket No. 1357

Dear Mr. Donaghue:

Enclosed please find the reply of IOC Pittsburgh, Inc.'s traffic expert, Trans Associates, to the comments of McCormick Taylor on IOC Pittsburgh's Pittsburgh First Master Plan Traffic and Parking Study and supplemental materials filed with the Pennsylvania Gaming Control Board at Supplement 5, Exhibit A. The response fully addresses, and we believe resolves, all comments made by McCormick Taylor. IOC Pittsburgh, Inc. and Trans Associates look forward to continuing to cooperate with McCormick Taylor, the City of Pittsburgh and the Board in considering the traffic issues related to its proposed Pittsburgh casino.

Notably, IOC Pittsburgh has learned from McCormick Taylor that it did not receive, and thus could not consider, IOC Pittsburgh and Trans Associates' response to its September 7, 2006 traffic study review of IOC Pittsburgh's traffic study. As a result, the comments from McCormick Taylor's earlier review reappear, unaltered, in its November 8, 2006 report to the Pennsylvania Department of Transportation. Accordingly, IOC Pittsburgh has again addressed and responded to these issues. We trust that this responsive information will be considered by McCormick Taylor in making its final comments to the Board.

HAR:69641.1/ISL005-221764

Thank you for your consideration of our response. If you have any questions or require additional information, please feel free to contact me at your convenience.

Sincerely,

Mark S. Stewart
For WOLF, BLOCK, SCHORR and SOLIS-COHEN LLP

MSS
Enclosures

cc: Cynthia A. Jamople, P.E.
Richard Meister
Elizabeth Tranchina, Esq.
Tami B. Steinberg, Esq.

Trans Associates

November 14, 2006

Mr. Albert Federico, P.E., PTOE
Senior Traffic Engineer
McCormick Taylor, Inc.
75 Shannon Road
Harrisburg, PA 17112

Subject: Response to McCormick Taylor Review of Traffic Study
            Proposed Isle of Capri Casino
            City of Pittsburgh, Pennsylvania

Dear Mr. Federico:

Trans Associates (TA) has reviewed the comments from McCormick Taylor dated November 8, 2006 on our December 13, 2005 traffic study for the proposed Isle of Capri casino and Pittsburgh First Master Plan. In response to a September 7, 2006 review by McCormick Taylor, TA prepared a response in a letter dated October 11, 2005. We understand that this response was submitted to the Pennsylvania Gaming Board, but was not received by McCormick Taylor, and thus were not considered by McCormick Taylor in their most recent review. Accordingly, our responses below incorporate the responses in our previous letter, a copy of which is attached.

Following are McCormick Taylor's comments and findings for the initi0al review of the above-referenced submission, as well as TA's responses.

Comment 1. It would be appropriate for the engineer preparing this analysis to have stamped and signed the report.

The report is both signed and stamped by both Cynthia A. Jampole, P.E., Principal at Trans Associates, and Darryl C Phillips, P.E., PTOE, Senior Engineer at Trans Associates.

Comment 2. The study did not include evaluations of the new intersections internal to the site (e.g., Wylie Avenue and Mario Lemieux Place). An evaluation of these intersections is considered appropriate.

The exact components of this portion of the Master Plan, as well as square footages, land uses, driveway locations, and other parameters, were estimated for use in this analysis. As design
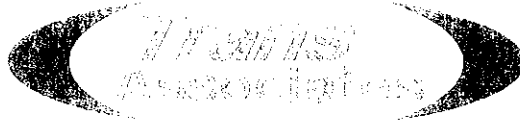
proceeds, details will be developed that allow for greater accuracy in trip projections. At that time, it will be appropriate to analyze the internal intersections.

Comment 3. Summary reports for the 2008 Saturday Casino Peak conditions capacity analysis was omitted from the technical appendix for numerous intersections, including but not limited to:

- Centre Avenue/Casino Exit
- Fifth Avenue/Washington Place
- Forbes Avenue/Armstrong Tunnels
- Grant Street/Boulevard of the Allies
- Grant Street/Fort Pitt Boulevard/I-376 Off-Ramp
- Second Street/Court Street/Ross Street

Copies of these pages from Appendix L are attached.

Comment 4. Numerous intersection counts were completed over the Thanksgiving Holiday weekend. Generally, data is not collected during holidays due to the atypical traffic patterns.

A.M. and P.M. peak hour counts were not conducted over the Thanksgiving holiday weekend. Only counts of evening/Saturdays were conducted, due to the short time window available for data collecting. Since this area is not typically active during evenings, background traffic variances were not expected to be significant.

Comment 5. The study does not indicate if seasonal or other adjustments were applied.

The City of Pittsburgh does not require or expect seasonal adjustment factors. As per Section 4.2.1, an annual traffic growth factor, obtained from the Southwestern Pennsylvania Commission, was used.

Comment 6. Due to lack of available data in ITE trip generation regarding gaming facilities, the trip generation estimates for the gaming facility were based upon patronage data as well as assumptions regarding mode split and vehicle occupancy provided by the Isle of Capri for a "similar" urban casino facility in Kansas City, Missouri.
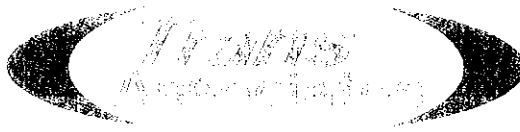
This is the only urban casino data which we were able to obtain. In TA's opinion, it is important to use urban data, and there is essentially none of the type needed in the literature. It is also virtually impossible to obtain operational data from other casino operators. Therefore, TA used the Kansas City data for trip generation purposes and utilized very conservative travel mode assumptions.

Comment 7. The study does not clearly indicate if additional traffic was generated for the new Arena or if future Arena traffic is simulated by existing Arena capacity during the existing counts.

As documented in Section 4.1.1, trip generation for the new arena was calculated based on the parking supply assigned for arena patrons and staff. Counts of rates of parking entry and exit at the existing arena lots were performed during a maximum event to obtain trip rates. Base volume counts during the Friday and Saturday evening casino peak periods were conducted on non-event nights so that arena traffic would not need to be subtracted from base traffic. Parking assignments for arena executive staff, premium patrons, and patrons who would park in the study area are tabulated in Table 12 of the report. Trip generation to the parking used by these persons within the study area was performed on a per-space basis. The details are presented in the Technical Appendix to the report.

Comment 8. When comparing trip generation estimates for the gaming component of the three Pittsburgh gaming sites, the trip generation for Pittsburgh First is consistent with projections for Majestic Star Casino and higher than Station Square.

Comment Acknowledged. The Pittsburgh First study used conservative assumptions to allow for variations in site-specific data and projections of traffic flow.

Comment 9. The 2008 Combined traffic volumes do not account for the effect of restricting the eastbound I-579 Off-Ramp left turns at the intersection of Centre Avenue/Washington Place/I-579 Off-Ramp.

As part of the proposed mitigations, a left-turn prohibition was proposed for eastbound Centre Avenue at the intersection with Washington Place and the I-579 Off-Ramp. "No left turn" restrictions were proposed for movements off the eastbound I-579 Off-Ramp, which operates as a separate, protected signal phase. Left turns from eastbound Centre Avenue were reassigned
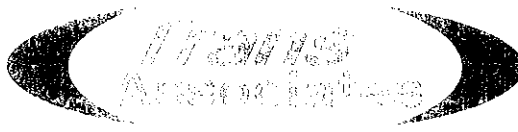
via Centre Avenue, Bigelow Square, and Bigelow Boulevard to the intersection with Washington Place, Bedford Avenue, and the Bigelow Boulevard/I-579 On-Ramp.

Comment 10. This study does not include an evaluation of future conditions 10 years after the project build out, which is typically required by PennDOT.

The study was performed according to the requirements of the City of Pittsburgh Department of City Planning, which established the approved scope. DCP required analysis of existing and 2008 conditions both with a nd without the project.

Comment 11. The report identifies extensive queuing during the existing weekday evening peak hour period but does not provide an evaluation of vehicle queuing and the adequacy of existing and proposed turning bays at the study ar ea intersections.

In a similar fashion to existing conditions in the Pittsburgh CBD, and in most, if not all, other urban CBD areas, extensive queuing does exist during the afternoon rush hour period at the study intersections. This is a preexisting condition that is independent of the implementation of the casino project.

Comment 12. The capacity analysis did not address the effect of existing on-street parking or bus stops. Accounting for these items would be expected to reduce the capacity of study intersections resulting in less desirable operations.

The capacity analysis as shown in Appendices E, J, and L include the effect of on-street parking. Parking data was entered on an intersection- and approach-specific basis based upon our review of study area conditions. Parking is currently prohibited on a significant number of streets within the study area in order to accommodate traffic flows. Bus stop details were not included in the analysis. While this would slightly reduce intersection capacity, the same methodology was used for analysis of all scenarios, providing for a comparative analysis of existing and proposed conditions.

Comment 13. There are numerous inconsistencies between the traffic volumes presented in the exhibits and the volumes used for 2008 Build Conditions analysis, including but not limited to:
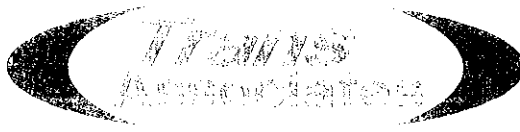
- The southbound right-turn volumes at Washington Place/Bedford Avenue during the morning peak.
- The northbound right-turn volumes at Grant Street/Sixth Avenue during the evening peak.
- The volumes for several movements at Sixth Avenue/Ross Street/Bigelow Boulevard during the evening peak.
- The eastbound left turn volumes at Washington Place/Bedford Avenue during the evening peak.
- The eastbound through volume at Washington Place/Centre Avneu/I-579 Off-Ramp during the evening peak.
- The eastbound through volume at Forbes Avenue/Armstrong Tunnel during the evening peak.

Upon review, we identified errors in a traffic reassignment calculation for Figure 30, showing 2008 combined traffic volumes for the weekday P.M. peak period. A revised Figure 30 is attached, along with revised HCS output. The HCS analysis was performed based upon the correct traffic volumes shown in the revised figure, and thus no changes in LOS occurred due to this revision.

Comment 14. The analysis of 2008 Build Condition analyses did not consistently assume the use of actuated traffic signals. This assumption should be verified with the City of Pittsburgh and PennDOT.

Consistent with City of Pittsburgh standard practice and existing conditions, pre-timed signal operation was assumed for analysis of most study area intersections. The City of Pittsburgh prefers pre-timed signal operation in the CBD and other areas with significant pedestrian flows. Actuated operation was assumed at the intersection of Bedford Avenue/Mario Lemieux Place which is currently actuated, and was proposed as a mitigation measure to accommodate varying traffic flows at the intersection of Centre Avenue and Washington Place.

Comment 15. The analysis of 2008 Build Conditions include permissive "Right Turn on Red" movements at locations (e.g. Centre Avenue Casino Access) where pedestrian activity may preclude these movements.
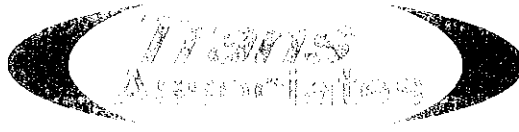
Right turn on red (RTOR) prohibitions used for analysis were based upon existing postings. For the proposed driveway intersection, it was assumed that adequate sight distance and low major-street volumes would permit the right turns on red to be made safely. The projected RTOR volumes are relatively low and are not anticipated to be precluded by pedestrian activity.

Comment 16. The analysis of Sixth Avenue/Ross Street/Bigelow Boulevard excluded the channelized southbound right turn movements. Including these movements is considered appropriate due to several factors, including the high volume of observed pedestrian activity and the lack of a dedicated receiving lane.

These intersections have been re-analyzed including the southbound tight turn movement. Capacity analysis is attached. Some changes in approach LOS occurred as a result of this change in analysis, but no change in intersection LOS was noted, and no movements failed due to this change in analysis methodology.

Comment 17. The location and operational interaction of the casino accesses to Centre Avenue may result in increased congestion, particularly if vehicles stopped at the egress queue past the entrance and possibly Logan Street. An analysis of vehicle queuing at the casino entrance and exit should be provided.

Queuing analysis was performed using the Synchro 6 analysis package, as shown in Appendix M. The maximum queue length of 112 feet projected for the eastbound through movement will extend to the site driveway and past Logan Street. However, a dedicated right turn lane is proposed for traffic entering the site, and a median will prohibit left turns into and out of Logan Street. Thus, the projected queue is not anticipated to interfere with either Logan Street traffic or traffic entering the site driveway.

Comment 18. The proposed mitigations for several locations are based on the "optimization" of traffic signal timings; however it does not appear as if the pre-development signal timings were optimized, which would be considered appropriate when assessing project impacts.

As noted in Section 4.2.4.1, optimized signal timings were used to analyze the 2008 base conditions.
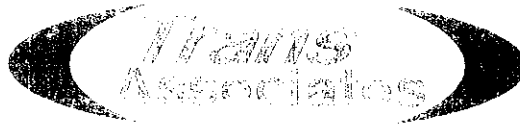
Comment 19. The report recommends the installation of traffic signals at several intersections however, signal warrant analyses are not provided.

Only one new signal installation, on Centre Avenue at the exiting casino garage driveway, has been recommended. Signal warrant calculations for this location are contained in the Technical Appendix to the report. Additional signals may be proposed in the future as part of the Master Plan development. Full analysis including signal warrants, will be conducted as plans for that area progress.

Comment 20. The traffic impact for the majority of the study area intersections is either inconsequential or successfully mitigated by the proposed transportation program. However, the following intersections are projected to operate with deficient levels of service during at least two or more of the peak periods evaluated.

- Liberty Avenue/Eleventh Street
- Washington Place/Bedford Avenue
- Washington Place/Centre Avenue/I-579 Off-Ramp
- Grant Street/Fort Pitt Boulevard EB/I-376 Off Ramp
- Second Avenue/Court Place /Ross Street
- Grant Street/Sixth Avenue
- Centre Avenue/Mario Lemieux Place

Most of these intersections operate at poor levels of service currently in at least one of the time periods analyzed. This is not an unusual situation in downtown Pittsburgh and most urban central business districts. While LOS can be a useful tool to evaluate congestion impacts of development, in urban areas other measures must also be considered. In particular, queuing and presence or absence of gridlock reflect whether the roadway network can accommodate the projected traffic volumes. Poor LOS often cannot be mitigated without additional pavement, which would require removal of sidewalks, buildings or both, which is often not practical in urban areas. In such cases, the overall functionality of the network must be considered.

Comment 21. Except as noted above, it appears that the proposed improvements adequately mitigate the project impacts based on the results presented in the analysis. It should be noted that the omissions in the capacity analysis (as noted above) may be influencing the reported
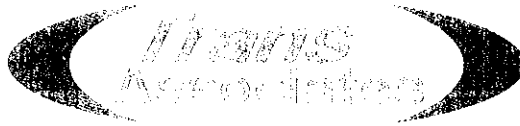
results and the analyzed operation of the intersection. Additionally the inclusion of the evaluation of the 2018 d esign year may identify additional deficiencies requiring mitigation.

As noted above, revised analysis has been conducted in response to the comments from McCormick Taylor. This revised analysis did not significantly affect the findings or conclusions of our study.

The McCormack Taylor review letter also noted several issues raised by Mr. Sidney Kaikai of the City of Pittsburgh Department of City Planning. To address these issues, the following responses are provided:

The site has good regional access but local str eet traffic issues remain troublesome.

Our study demonstrates that the local roadway network is able to accommodate site traffic. Centre Avenue, Washington Place and the pair of Fifth Avenue and Forbes Avenue provide high-capacity roadways to connect the site to I-579, the Veterans Bridge, the Liberty Bridge, Bigelow Boulevard, the Boulevard of the Allies, and to downtown Pittsburgh. The developer will continue to work with the City and the adjacent communities to adequately mitigate any traffic issues on the local street network.

The loading area access on Fifth Avenue is problematic.

The proposed loading dock will be able to completely accommodate all site loading, including WB-67 trucks, completely internal to the site. The loading dock entrance will be at the signalized intersection of Fifth Avenue and Stevenson Street, and as shown in Figures 40 and 41 of the report, will be designed to safely accommodate all turning movements. Consistent with the City's truck route ordinance, we anticipate that essentially all truck traffic will enter the site via Forbes Avenue and Stevenson Street, and will exit the site via Fifth Avenue. Truck traffic within the site will be completely separated from automobile traffic.

The impact of traffic on local neighb orhoods and Duquesne University are concerns.

The site driveways are located to provide for ready access to regional roadways, and to minimize traffic through the adjacent residential neighbor hood. Our evaluation of site access
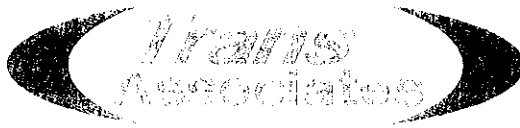
was based upon a review of regional roadways and the connections to the site on adjacent roadways, followed by a review of population by municipality and neighborhood. This analysis indicates that nearly all traffic will approach the site from the west, either directly from the regional highway network or through commercial sections of the downtown area and Uptown. Only 1.1 percent of site-generated traffic is anticipated to approach the site from the west, split between Bedford Avenue, Centre Avenue and Fifth and Forbes Avenues. Most of this traffic is anticipated to be patrons traveling to and from the adjacent neighborhoods.

A somewhat higher volume of site-generated traffic is anticipated to pass the borders of the Duquesne University campus on Stevenson Street, and on Forbes Avenue. These streets presently carry significant traffic volumes, and function as major arterials or connections from the regional highway system. Our recommendations include upgrading the traffic signal at the intersection of Forbes Avenue/Chatham Place/McAnulty Drive to include pedestrian signal heads to ensure safe pedestrian crossings at this location.

The developer will continue to work with the City of Pittsburgh, the adjacent community and Duquesne University to identify ways to satisfactorily mitigate any remaining traffic concerns.

Finally, the McCormick Taylor letter discusses a number of issues related to Highway Occupancy Permits (HOP) for the project. These issues, and our response, are as follows:

The project does not access a state highway, therefore an HOP is not required for the site driveways. Improvements proposed to mitigate project impacts do include modifications to state facilities, which would require an HOP. Additionally, PennDOT approval is typically required for the installation and/or modification of traffic signals and/or regional guide sighs.

As a city of the Second Class, the City of Pittsburgh generally has responsibility for installation and modifications to traffic signals. We do not anticipate that any of our recommended improvements will affect state facilities or require an HOP, with the possible exception of upgrades to the traffic signal at the intersection of Bedford Avenue/Mario Lemieux Place, and the I-579 HOV Ramp. This signal work may require coordination with PennDOT, but an HOP is not anticipated. Signage on local streets is anticipated to be included in the City's Wayfinder program. Regional signage on expressways and bridges, if appropriate, will follow PennDOT procedures.

The convergence of numerous regional routes and significant destinations within the vicinity of the Pittsburgh First site may present additional challenges to providing adequate destination signing for the proposed gaming facility.

The City's Wayfinder program is especially intended to provide for signing of complex routings and clustered destinations. It has been used successfully throughout the City, including the heavily-developed Downtown and Oakland areas. In addition, the construction of the proposed new arena immediately next to the site will provide a well-known regional landmark to assist in directing people to the site.

The study does not include an evaluation of future conditions 10 years after the project build-out date, which is typically required by PennDOT for a highway occupancy permit (HOP) submission.

As noted, none of the mitigations proposed for this project are anticipated to require an HOP. Should an HOP be necessary, additional analysis will be conducted of the future conditions to satisfy the HOP requirements.

Insufficient information was available to adequately assess the potential impacts of proposed improvement to existing utilities. However, transportation improvements within urban locations such as the proposed site typically require extensive utility coordination and relocation.

The roadway improvements for this project include the reconstruction of Centre Avenue from Washington Place to Crawford Street and of Washington Place from Centre Avenue to Fifth Avenue. It is anticipated that this work will require extensive utility coordination. Other improvements consist primarily of signage, pavement markings and signal upgrades. It is not anticipated that these improvements will have a significant utility impact.

To conclude, we believe that our responses address the concerns raised by McCormick Taylor, Inc., in their review of the Pittsburgh First Master Plan Traffic and Parking Study, dated December 13, 2005. In response to the comments received from McCormick Taylor, reanalysis was conducted of several intersections; however this did not result in any significant change in the findings of our study. We believe that our analysis accurately reflects the anticipated traffic
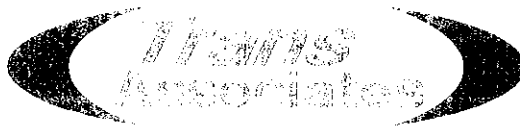
and parking impacts of the proposed casino, including accommodating traffic generated by a new arena as well as extensive adjacent residential and commercial development. We believe that our recommended plan will adequately mitigate the project impacts.

Respectfully submitted,

Cynthia A Jampole, P.E.
Principal

Enclosure

CAJ:DCP:pah

cc: Alan Solomon – Isle of Capri
       Les McMackin – Isle of Capri
       Tami Bogutz Steinberg – WolfBlock
       Mark Stewart – Wolf Block
       File – iocap00/05380/McCormick Response 11.13.06

October 11, 2006

Mr. Richard Meister
Isle of Capri Casinos
1641 Popps Ferry Road, Suite B1
Biloxi, Mississippi 39532

Subject: Pittsburgh First Master Plan Traffic and Parking Study
            Response to McCormick Taylor Comments

Dear Mr. Meister:

The purpose of this letter is to provide Trans Associates' (TA's) responses to comments contained in the September 7, 2006 initial review letter prepared by McCormick Taylor and submitted to Mr. Glenn Rowe of the Pennsylvania Department of Transportation (PennDOT), Central Office.

The McCormick Taylor comments and TA's responses are detailed below, and are all in reference to the report entitled *Pittsburgh First Master Plan Traffic and parking Study* prepared by Trans Associates, Inc., dated December 13, 2005.

Following are McCormick Taylor's comments and findings for the initial review of the above-referenced submission, as well as TA's responses.

<u>Approach</u>

Comment 1:   The traffic assessment was completed in a manner generally consistent with the accepted guidelines established by PennDOT and ITE, except as noted within this review.

Response 1:   Comment acknowledged. Scope was defined and approved by the City of Pittsburgh Department of City Planning (DCP).

Comment 2:   It would be appropriate for the engineer preparing this study to have stamped and signed the report.

Response 2:   The report is both signed and stamped by both Cynthia A. Jampole, P.E., Principal at Trans Associates, and Darryl C. Phillips, P.E. Senior Engineer at Trans Associates, on the title page.
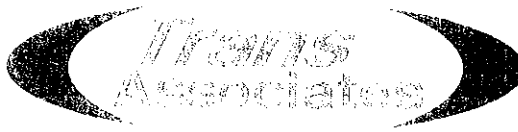
Comment 3:   The study indicates that a scoping meeting was held with the City staff to establish the study area and analysis scenarios.

Response 3:   That is correct.

Comment 4:   The study included an evaluation of five peak periods: the weekday morning and evening, the Arena peak, Friday "Casino" peak and Saturday "Casino" peak. The Arena and Casino peaks occur during the late-evening period.

Response 4:   That is correct.

Comment 5:   The study includes a discussion of available public transportation services and non-vehicular modes of travel and assumes that an appreciable portion of the hotel and residential traffic will utilize these modes.

Response 5:   That is correct.

Comment 6:   The study did not include an evaluation of the new intersections internal to the site (i.e. Wylie Avenue and Mario Lemieux Place). An evaluation of these intersections is considered appropriate.

Response 6:   The exact components of this portion of the Master Plan, as well as square footages, land uses, driveway locations, and other parameters, were estimated for use in this analysis. As design proceeds, details will be developed that allow for greater accuracy in trip projections. At that time, it will be appropriate to analyze the internal intersections.

Data Collection

Comment 7:   All intersections were counted manually. The intersection turning movement traffic counts were conducted on the following dates:

> o Tuesday, November 15, 2005
> o Wednesday, November 16, 2005
> o Thursday, November 17, 2005
> o Saturday, November, 19, 2005
> o Tuesday, November 22, 2005
> o Friday, November 25, 2005
> o Tuesday, November 29, 2005
> o Friday, December 2, 2005
> o Saturday, December 3, 2005

The counted volumes were balanced between intersections.
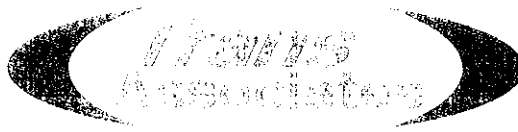
Response 7:   Comment acknowledged.

Comment 8:   Numerous intersection counts were completed over the Thanksgiving Holiday weekend. Generally data is not collected during holidays due to the atypical traffic patterns.

Response 8:   AM and PM peak hour counts were not conducted over the Thanksgiving Holiday weekend. Only counts of evening/Saturdays were conducted then, due to the short time window available for data collecting. Since this area is not typically active during evenings, background traffic variances were not expected to be significant.

Comment 9:   Automatic count data was collected at fourteen locations around the perimeter of the project area for two days in early November 2005.

Response 9:   Comment acknowledged.

Comment 10:   The study does not indicate if seasonal or other adjustments were applied.

Response 10:   The City of Pittsburgh does not require or expect seasonal adjustment factors. As per Section 4.2.1, an annual traffic growth factor, obtained from the Southwestern Pennsylvania Commission, was used.

Trip Generation

Comment 11:   Due to the lack of available data in ITE Trip Generation regarding gaming facilities, the trip generation estimates for the gaming facility were based upon patronage data as well as assumptions regarding mode split and vehicle occupancy provided by the Isle of Capri for a "similar" urban casino facility located in Kansas City, Missouri. A study based on a single site is considered an insufficient sample size from which to base trip generation.

Response 11:   This is the only *urban* casino data which we were able to obtain. In TA's opinion, it is important to use urban data, and there is essentially none of the type needed in the literature. It is also virtually impossible to obtain operational data from other casino operators. Therefore, TA used the Kansas City data for trip generation purposes and utilized very conservative travel mode assumptions.

Comment 12:   The arrival patterns of the assumed gaming facility traffic were based on information from the published article: Box, Paul C. and Bunte, William. "Gaming Casino Traffic." *ITE Journal*, Institute of Transportation Engineers, March 1998.
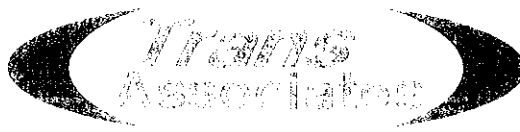
Response 12:   Comment acknowledged.

Comment 13:   Trip generation for the hotel, residential, retail, and office components of the First Pittsburgh Master Plan were based on the data published by ITE in Trip Generation, 7th Edition.

Response 13:   Comment acknowledged.

Comment 14:   The calculated trips for the Hotel and Residential components were reduced by 20% and 25% respectively to account for the urban setting of the development and the availability of non-vehicular modes of travel.

Response 14:   Comment acknowledged.

Comment 15:   The study does not clearly indicate if additional traffic was generated for the new Arena or if future Arena traffic is simulated by existing Arena traffic captured during the existing counts.

Response 15:   As documented in Section 4.1.1, trip generation for the new arena was calculated based on the parking supply assigned for arena patrons and staff. Counts of rates of parking entry and exit at the existing arena lots were performed during a maximum event to obtain trip rates. Base volume counts during the Friday and Saturday evening casino peak periods were conducted on non-event nights so that arena traffic would not need to be subtracted from base traffic. Parking assignments for arena executive staff, premium patrons and patrons who would park in the study area are tabulated in Table 12. Trip generation to the parking used by these persons within the study area was performed on a per-space basis. The details are presented in the Technical Appendix to the report.

Comment 16:   Based on the information provided the applicant assumed that Pittsburgh First Master Plan will generate 2,015 total trips during the weekday morning peak (1,096 from the gaming facility), 3,563 total trips during the weekday evening peak (2,456 from the gaming facility), 3,221 total trips during the \weekday evening Arena peak (2,332 from the gaming facility), 4,557 total trips during the Friday evening Casino peak (3,851 from the gaming facility) and 4,212 total trips during the Saturday Casino peak (3,558 from the gaming facility).

Response 16:   Comment acknowledged.

Comment 17:   The future volumes for the morning, evening and Arena peak periods were adjusted (reduced) to account for the elimination of existing parking resulting from the proposed development.
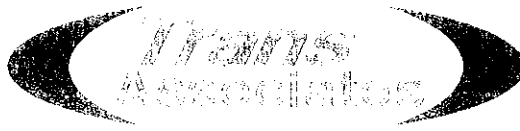
Response 17:   Comment acknowledged.

Comment 18:   The assumed trip distribution is based on county of origin information provided by the Department of City Planning.

Response 18:   Comment acknowledged.

Comment 19:   The study included the evaluation of three conditions: 2004 existing, 2008 with and without the proposed redevelopm ent.

Response 19:   Comment acknowledged.

Comment 20:   This study does not include an evaluation of future conditions 10 years after the project build out, which is typically required by PennDOT.

Response 20:   The study was performed according to the requirements of the City of Pittsburgh Department of City Planning, which established the approved scope. DCP required analysis of existing, which was actually 2005, not 2004 conditions as listed in the comment, and 2008 conditions both with and without the project.

Comment 21:   An annual traffic growth factor of 0.5% per year was assumed based on discussions with the Southwestern Pennsylvania Commission (SPC).

Response 21:   Comment acknowledged. This was required in the DCP scope.

Comment 22:   No other development projects in the vicinity of the site were identified based on discussions with the Department of City Planning.

Response 22:   Comment acknowledged.

Comment 23:   The study included capacity and level-of-service analysis completed based on the methodologies presented in the Highway Capacity Manual, using two types of analysis software: HCS+, Version 5.2 and SYNCHRO Version 6.

Response 23:   Comment acknowledged.

Comment 24:   The report identifies extensive queuing during the Weekday Afternoon peak hour period but does not evaluate the adequacy of existing and proposed turning bays at the study area intersections.
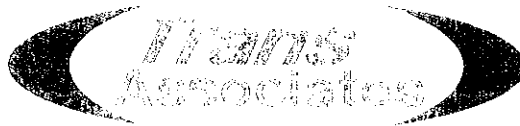
Response 24:   In a similar fashion to existing conditions in the Pittsburgh CBD, and in most, if not all, other urban CBD areas, extensive queuing does exist during the afternoon rush hour period at the study intersections. This is a preexisting condition that is independent of the implementation of the casino project.

Special Events and Opening Day Plans

Comment 25:   The report does not discuss special traffic control needs for opening day or other special events.

Response 25:   Opening day is assumed to occur during 2008, the year of analysis. The analysis presented is conservative in that it includes traffic to be generated by ALL components of the master plan, all of which surely would not be in place by 2008. Special events traffic control is detailed in Section 8.4.

Mitigation Measures

Comment 26:   The proposed mitigation for several locations is based on the "optimization" of traffic signal timings; however it does not appear as if the pre-development signal timings were optimized, which would be considered appropriate when assessing project impacts.

Response 26:   As noted in Section 4.2.4.1, optimized signal timings were used to analyze the 2008 base conditions.

Comment 27:   The analysis identifies unacceptable future operations at the following locations without presenting sufficient mitigation measures:

> o Grant Street & Liberty Avenue,
> o Liberty Avenue & Eleventh Street,
> o Grant Street & Seventh Avenue,
> o Grant Street & Sixth Avenue,
> o Sixth Avenue & Ross Street/Bigelow Boulevard,
> o Washington Place and Bedford Avenue/Bigelow Boulevard,
> o Bedford Avenue & Mario Lemieux Place,
> o Centre Avenue & Washington Place,
> o Centre Avenue & Crawford Street,
> o Fifth Avenue & Washington Place/Chatham Square,
> o Grant Street & Boulevard of the Allies/Court Place,
> o Grant Street & First Avenue.

Response 27:   Levels of service in an urban CBD routinely fall into the "unacceptable" categories of LOS E or F, which are measures of delay and congestion. In these types of locations, LOS is not a realistic measure of function, as virtually
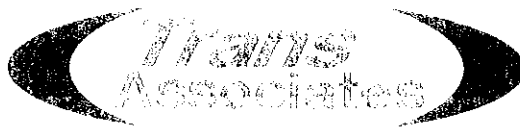
all intersections in the CBD will function in these LOS categories. Queuing and presence or absence of gridlock are better indicators of conditions, while LOS is not really very meaningful. LOS cannot be mitigated without additional pavement, which would require removal of sidewalks, buildings or both, which is not practical.

Comment 28: The study includes recommendations for improvements to the following intersections which were not analyzed as a part of this study:

   o Fifth Avenue & Magee Street/Site Driveway
   o Fifth Avenue & Stevenson Street/Loading Dock Driveway
   o Fifth Avenue & Pride Street
   o Forbes Avenue & Magee Street
   o Forbes Avenue & Stevenson Street
   o Forbes Avenue & Pride Street

Response 28: These intersections were reviewed as the project design proceeded and additional intersection legs/driveways were determined to be added on Fifth Avenue at Magee and Stevenson Streets. These signals must be upgraded to include these changes. The upgrades are so extensive that the existing (old) signal equipment should be replaced. Pedestrian upgrades for ped equipment are also recommended. At the time of the scoping of the study, the access locations had not been determined, so the intersections were not identified for study at that time.

Comment 29: The report recommends the installation of traffic signals at several intersections; however signal warrant analyses are not provided.

Response 29: Only one new signal installation, on Centre Avenue at the exiting casino garage driveway, has been recommended. Signal warrant calculations for this location are contained in the Technical Appendix to the report.

This concludes TA's responses to McCormick Taylor's comments.

Sincerely,

Cynthia A. Jampole, P.E.
Principal

CAJ:pah

cc: File – iocap00/05380/Response to Comments of McCormick Taylor

SHORT REPORT

General Information		Site Information	
Analyst	M. Southern	Intersection	CENTRE AVE & EXIT
Agency or Co.	TRANS ASSOCIATES	Area Type	CBD or Similar
Date Performed	12/6/2005	Jurisdiction	CITY OF PITTSBURGH
Time Period	SATURDAY CASINO PEAK HOUR	Analysis Year	2008 COMBINED CONDITION

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes		2			2		1		0			
Lane Group		T			T		L	LR				
Volume (vph)		150			221		958		606			
% Heavy Vehicles		2			2		2		2			
PHF		0.90			0.90		0.90		0.90			
Pretimed/Actuated (P/A)		P			P		P		P			
Startup Lost Time		2.0			2.0		2.0	2.0				
Extension of Effective Green		2.0			2.0		2.0	2.0				
Arrival Type		3			3		3	3				
Unit Extension		3.0			3.0		3.0	3.0				
Ped/Bike/RTOR Volume	0	0		124	0		0	0	50			
Lane Width		11.0			11.0		12.0	12.0				
Parking/Grade/Parking	N	4	Y	N	-2	Y	N	0	N			
Parking/Hour			20			20						
Bus Stops/Hour		0			0		0	0				
Minimum Pedestrian Time		3.2			14.0			3.2				

Phasing	Thru Only	02		03	04	NB Only	06	07	08
Timing	G = 20.0	G =	G =	G =	G = 59.0	G =	G =	G =
	Y = 5.5	Y =	Y =	Y =	Y = 5.5	Y =	Y =	Y =

Duration of Analysis (hrs) = 0.25	Cycle Length C = 90.0

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate		167			246		670	1012				
Lane Group Capacity		605			623		1044	979				
v/c Ratio		0.28			0.39		0.64	1.03				
Green Ratio		0.22			0.22		0.66	0.66				
Uniform Delay d_1		29.0			29.8		9.2	15.5				
Delay Factor k		0.50			0.50		0.50	0.50				
Incremental Delay d_2		1.1			1.9		3.0	37.8				
PF Factor		1.000			1.000		1.000	1.000				
Control Delay		30.1			31.7		12.2	53.3				
Lane Group LOS		C			C		B	D				
Approach Delay		30.1			31.7			36.9				
Approach LOS		C			C			D				
Intersection Delay		35.8			Intersection LOS				D			

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SHORT REPORT

General Information		Site Information	
Analyst	CKR	Intersection	FIFTH AVE &
Agency or Co.	TRANS ASSOCIATES		WASHINGTON/CHATHAM
Date Performed	12/6/2005	Area Type	CBD or Similar
Time Period	SATURDAY CASINO PEAK HOUR	Jurisdiction	CITY OF PITTSBURGH
		Analysis Year	2008 COMBINED CONDITION

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes				0	2	1	1	1			1	2
Lane Group					LT	R	L	T			T	R
Volume (vph)				8	1091	284	26	185			64	170
% Heavy Vehicles				4	4	4	0	0			3	3
PHF				0.81	0.81	0.81	0.84	0.84			0.73	0.73
Pretimed/Actuated (P/A)				P	P	P	P	P			P	P
Startup Lost Time					2.0	2.0	2.0	2.0			2.0	2.0
Extension of Effective Green					2.0	2.0	2.0	2.0			2.0	2.0
Arrival Type					3	3	3	3			3	3
Unit Extension					3.0	3.0	3.0	3.0			3.0	3.0
Ped/Bike/RTOR Volume				17	0	28	0	0		12	0	0
Lane Width					11.0	12.0	10.0	9.0			11.0	12.0
Parking/Grade/Parking				Y	-2	Y	N	-6	N	N	-2	N
Parking/Hour				20		20						
Bus Stops/Hour					0	0	0	0			0	0
Minimum Pedestrian Time					25.3			3.2			15.3	

Phasing	WB Only	02	03	04	NS Perm	06	07	08
Timing	G = 46.0	G =	G =	G =	G = 23.0	G =	G =	G =
	Y = 5.5	Y =	Y =	Y =	Y = 5.5	Y =	Y =	Y =

Duration of Analysis (hrs) = 0.25   Cycle Length C = 80.0

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate				1357	316	31	220			88	233	
Lane Group Capacity				1581	640	327	456			466	710	
v/c Ratio				0.86	0.49	0.09	0.48			0.19	0.33	
Green Ratio				0.57	0.57	0.29	0.29			0.29	0.29	
Uniform Delay d_1				14.3	10.1	20.9	23.6			21.5	22.4	
Delay Factor k				0.50	0.50	0.50	0.50			0.50	0.50	
Incremental Delay d_2				6.3	2.7	0.6	3.6			0.9	1.2	
PF Factor				1.000	1.000	1.000	1.000			1.000	1.000	
Control Delay				20.5	12.8	21.5	27.2			22.4	23.7	
Lane Group LOS				C	B	C	C			C	C	
Approach Delay				19.1			26.5			23.3		
Approach LOS				B			C			C		
Intersection Delay	20.5			Intersection LOS						C		

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SHORT REPORT

General Information		Site Information	
Analyst	CKR	Intersection	FORBES AVE & ARMSTRONG TUNNEL
Agency or Co.	TRANS ASSOCIATES	Area Type	CBD or Similar
Date Performed	12/6/2005	Jurisdiction	CITY OF PITTSBURGH
Time Period	SATURDAY CASINO PEAK HOUR	Analysis Year	2008 COMBINED CONDITION

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes		2	0				0		2			
Lane Group		TR						LR	R			
Volume (vph)		442	205				43		272			
% Heavy Vehicles		3	3				1		1			
PHF		0.88	0.88				0.72		0.72			
Pretimed/Actuated (P/A)		P	P				P		P			
Startup Lost Time		2.0						2.0	2.0			
Extension of Effective Green		2.0						2.0	2.0			
Arrival Type		3						3	3			
Unit Extension		3.0						3.0	3.0			
Ped/Bike/RTOR Volume	50	0	0				0	0	16			
Lane Width		11.0						11.0	11.0			
Parking/Grade/Parking	N	3	N				N	0	N			
Parking/Hour												
Bus Stops/Hour		0						0	0			
Minimum Pedestrian Time		17.3						3.2				

Phasing	EB Only	02	03	04	NB Only	06	07	08
Timing	G = 41.0	G =	G =	G =	G = 29.0	G =	G =	G =
	Y = 5	Y =	Y =	Y =	Y = 5	Y =	Y =	Y =

Duration of Analysis (hrs) = 0.25   Cycle Length C = 80.0

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	735						210	206				
Lane Group Capacity	1447						522	892				
v/c Ratio	0.51						0.40	0.23				
Green Ratio	0.51						0.36	0.36				
Uniform Delay d_1	12.9						19.0	17.7				
Delay Factor k	0.50						0.50	0.50				
Incremental Delay d_2	1.3						2.3	0.6				
PF Factor	1.000						1.000	1.000				
Control Delay	14.1						21.3	18.3				
Lane Group LOS	B						C	B				
Approach Delay	14.1						19.9					
Approach LOS	B						B					
Intersection Delay	16.2		Intersection LOS							B		

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SHORT REPORT

General Information		Site Information	
Analyst	CKR	Intersection	GRANT ST & BLVD OF ALLIES
Agency or Co.	TRANS ASSOCIATES	Area Type	CBD or Similar
Date Performed	12/6/2005	Jurisdiction	CITY OF PITTSBURGH
Time Period	SATURDAY CASINO PEAK HOUR	Analysis Year	2008 COMBINED CONDITION

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	0	2	1	2	0	0	2	0		2	0
Lane Group		LT	R	TR			LTR			TR	
Volume (vph)	24	135	111	142	29	26	560	35		826	37
% Heavy Vehicles	0	0	0	0	0	0	0	0		0	0
PHF	0.94	0.94	0.94	0.81	0.81	0.80	0.80	0.80		0.88	0.88
Pretimed/Actuated (P/A)	P	P	P	P	P	P	P	P		P	P
Startup Lost Time		2.0	2.0	2.0			2.0			2.0	
Extension of Effective Green		2.0	2.0	2.0			2.0			2.0	
Arrival Type		3	3	3			3			3	
Unit Extension		3.0	3.0	3.0			3.0			3.0	
Ped/Bike/RTOR Volume	100	0	6	100	0	0	100	0	0	100	0	0
Lane Width		11.0	12.0	12.0			11.0			11.0	
Parking/Grade/Parking	N	0	N	N	-2	N	N	1	N	N	-1	N
Parking/Hour											
Bus Stops/Hour		0	0	0			0			0	
Minimum Pedestrian Time		18.9		17.9			28.9			20.1	

Phasing	EW Perm	02		03	04	NS Perm	06	07	08
Timing	G = 33.0	G =	G =	G =	G = 46.0	G =	G =	G =
	Y = 5	Y =	Y =	Y =	Y = 6	Y =	Y =	Y =

Duration of Analysis (hrs) = 0.25   Cycle Length C = 90.0

Lane Group Capacity, Control Delay, and LOS Determination

	EB		WB		NB		SB	
Adjusted Flow Rate	170	112	211		776		981	
Lane Group Capacity	1022	547	1159		1392		1606	
v/c Ratio	0.17	0.20	0.18		0.56		0.61	
Green Ratio	0.37	0.37	0.37		0.51		0.51	
Uniform Delay d_1	19.2	19.5	19.3		15.0		15.6	
Delay Factor k	0.50	0.50	0.50		0.50		0.50	
Incremental Delay d_2	0.4	0.8	0.3		1.6		1.7	
PF Factor	1.000	1.000	1.000		1.000		1.000	
Control Delay	19.6	20.4	19.7		16.7		17.4	
Lane Group LOS	B	C	B		B		B	
Approach Delay	19.9		19.7		16.7		17.4	
Approach LOS	B		B		B		B	
Intersection Delay	17.7		Intersection LOS				B	

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SHORT REPORT

General Information

Analyst	CKR
Agency or Co.	TRANS ASSOCIATES
Date Performed	12/6/2005
Time Period	SATURDAY CASINO PEAK HOUR

Site Information

Intersection	GRANT ST & FORT PITT/1-376
Area Type	CBD or Similar
Jurisdiction	CITY OF PITTSBURGH
Analysis Year	2008 COMBINED CONDITION

Volume and Timing Input

	EB LT	EB TH	EB RT	WB LT	WB TH	WB RT	NB LT	NB TH	NB RT	SB LT	SB TH	SB RT
Number of Lanes	1			1	1			2			1	1
Lane Group	L				TR	R		T			T	R
Volume (vph)	159				88	300		592			728	180
% Heavy Vehicles	0				1	1		1			1	1
PHF	0.71				0.85	0.85		0.70			0.80	0.80
Pretimed/Actuated (P/A)	P				P	P		P			P	P
Startup Lost Time	2.0				2.0	2.0		2.0			2.0	2.0
Extension of Effective Green	2.0				2.0	2.0		2.0			2.0	2.0
Arrival Type	3				3	3		3			3	3
Unit Extension	3.0				3.0	3.0		3.0			3.0	3.0
Ped/Bike/RTOR Volume	100	0		0	0	0	0	0		0	0	0
Lane Width	12.0				13.0	12.0		10.0			12.0	12.0
Parking/Grade/Parking	N	0	N	N	2	N	N	3	N	N	-1	N
Parking/Hour												
Bus Stops/Hour	0				0	0		0			0	0
Minimum Pedestrian Time		17.6			3.2			3.2			3.2	

Phasing	EB Only	WB Only	03	04	Thru & RT	06	07	08
Timing	G = 15.0	G = 20.0	G =	G =	G = 39.0	G =	G =	G =
	Y = 5	Y = 5	Y =	Y =	Y = 6	Y =	Y =	Y =

Duration of Analysis (hrs) = 0.25   Cycle Length C = 90.0

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB		NB		SB	
Adjusted Flow Rate	224			122	335	846		910	225
Lane Group Capacity	271			376	317	1284		738	627
v/c Ratio	0.83			0.32	1.06	0.66		1.23	0.36
Green Ratio	0.17			0.22	0.22	0.43		0.43	0.43
Uniform Delay d_1	36.2			29.3	35.0	20.2		25.5	17.1
Delay Factor k	0.50			0.50	0.50	0.50		0.50	0.50
Incremental Delay d_2	24.2			2.3	66.3	2.7		116.5	1.6
PF Factor	1.000			1.000	1.000	1.000		1.000	1.000
Control Delay	60.4			31.6	101.3	22.9		142.0	18.7
Lane Group LOS	E			C	F	C		F	B
Approach Delay	60.4			82.7		22.9		117.6	
Approach LOS	E			F		C		F	
Intersection Delay	76.7			Intersection LOS				E	

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SHORT REPORT												
General Information							**Site Information**					

General Information		Site Information	
Analyst	CKR	Intersection	SECOND AVE/COURT & ROSS ST
Agency or Co.	TRANS ASSOCIATES	Area Type	CBD or Similar
Date Performed	12/6/2005	Jurisdiction	CITY OF PITTSBURGH
Time Period	SATURDAY CASINO PEAK HOUR	Analysis Year	2008 COMBINED CONDITION

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	0	1	0		1	1	0	1	0	1	1	0
Lane Group		LTR			T	R		LTR		L	TR	
Volume (vph)	1	142	1		119	128	2	362	28	176	70	10
% Heavy Vehicles	1	1	1		4	4	2	2	2	3	3	3
PHF	0.86	0.86	0.86		0.90	0.90	0.68	0.68	0.68	0.89	0.89	0.89
Pretimed/Actuated (P/A)	P	P	P		P	P	P	P	P	P	P	P
Startup Lost Time		2.0			2.0	2.0		2.0		2.0	2.0	
Extension of Effective Green		2.0			2.0	2.0		2.0		2.0	2.0	
Arrival Type		3			3	3		3		3	3	
Unit Extension		3.0			3.0	3.0		3.0		3.0	3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	3	50	0	0
Lane Width		13.0			11.0	14.0		14.0		10.0	10.0	
Parking/Grade/Parking	Y	-2	Y	N	5	N	N	2	Y	N	-3	N
Parking/Hour	10		10						10			
Bus Stops/Hour		0			0	0		0		0	0	
Minimum Pedestrian Time		13.0			13.0			12.5			8.5	

Phasing	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = 23.0	G =	G =	G =	G = 36.0	G =	G =	G =
	Y = 5.5	Y =	Y =	Y =	Y = 5.5	Y =	Y =	Y =

Duration of Analysis (hrs) = 0.25   Cycle Length C = 70.0

Lane Group Capacity, Control Delay, and LOS Determination

	EB		WB		NB		SB		
Adjusted Flow Rate		167		132	142		572	198	90
Lane Group Capacity		463		509	441		764	313	789
v/c Ratio		0.36		0.26	0.32		0.75	0.63	0.11
Green Ratio		0.33		0.33	0.33		0.51	0.51	0.51
Uniform Delay d_1		17.9		17.2	17.6		13.4	12.2	8.8
Delay Factor k		0.50		0.50	0.50		0.50	0.50	0.50
Incremental Delay d_2		2.2		1.2	1.9		6.6	9.4	0.3
PF Factor		1.000		1.000	1.000		1.000	1.000	1.000
Control Delay		20.1		18.5	19.6		20.1	21.6	9.1
Lane Group LOS		C		B	B		C	C	A
Approach Delay		20.1		19.0			20.1	17.7	
Approach LOS		C		B			C	B	
Intersection Delay		19.3		Intersection LOS				B	

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SHORT REPORT

General Information			Site Information		
Analyst	CKR		Intersection	WASHINGTON PL & BEDFORD/CENTRE	
Agency or Co.	TRANS ASSOCIATES		Area Type	CBD or Similar	
Date Performed	12/6/2005		Jurisdiction	CITY OF PITTSBURGH	
Time Period	AM PEAK HOUR		Analysis Year	2008 COMBINED CONDITION	

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	1	1					2	1	1	1	1
Lane Group	L	LTR	R					T	R	L	LT	R
Volume (vph)	525	349	340					566	79	155	169	88
% Heavy Vehicles	0	0	0					0	0	0	0	0
PHF	0.97	0.97	0.97					0.92	0.92	0.90	0.90	0.90
Pretimed/Actuated (P/A)	P	P	P					P	P	P	P	P
Startup Lost Time	2.0	2.0	2.0					2.0	2.0	2.0	2.0	2.0
Extension of Effective Green	2.0	2.0	2.0					2.0	2.0	2.0	2.0	2.0
Arrival Type	3	3	3					3	3	3	3	3
Unit Extension	3.0	3.0	3.0					3.0	3.0	3.0	3.0	3.0
Ped/Bike/RTOR Volume	150	0	0			0		0	8	0	0	0
Lane Width	11.0	11.0	12.0					12.0	12.0	16.0	10.0	12.0
Parking/Grade/Parking	N	5	N			N		-1	N	N	6	N
Parking/Hour												
Bus Stops/Hour	0	0	0					0	0	0	0	0
Minimum Pedestrian Time		15.5						3.2			3.2	

Phasing	EB Only	02	03	04	NB Only	SB Only	07	08
Timing	G = 37.0	G =	G =	G =	G = 20.0	G = 18.0	G =	G =
	Y = 5	Y =	Y =	Y =	Y = 5	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 90.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB		SB		
Adjusted Flow Rate	449	557	246				615	77	143	217	98
Lane Group Capacity	629	617	476				727	325	357	308	282
v/c Ratio	0.71	0.90	0.52				0.85	0.24	0.40	0.70	0.35
Green Ratio	0.41	0.41	0.41				0.22	0.22	0.20	0.20	0.20
Uniform Delay d_1	22.1	24.8	19.8				33.5	28.7	31.3	33.5	31.0
Delay Factor k	0.50	0.50	0.50				0.50	0.50	0.50	0.50	0.50
Incremental Delay d_2	6.8	18.9	4.0				11.6	1.7	3.3	12.7	3.4
PF Factor	1.000	1.000	1.000				1.000	1.000	1.000	1.000	1.000
Control Delay	28.9	43.7	23.8				45.2	30.4	34.6	46.2	34.3
Lane Group LOS	C	D	C				D	C	C	D	C
Approach Delay		34.5					43.5			40.1	
Approach LOS		C					D			D	
Intersection Delay		38.2			Intersection LOS					D	

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SHORT REPORT

General Information		Site Information	
Analyst		Intersection	WASHINGTON PL & BEDFORD/CENTRE
Agency or Co.	TRANS ASSOCIATES	Area Type	CBD or Similar
Date Performed	11/21/2005	Jurisdiction	CITY OF PITTSBURGH
Time Period	PM PEAK HOUR	Analysis Year	2008 COMB CONDITIONS

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	1	1					2	1	1	1	1
Lane Group	L	LTR	R					T	R	L	LT	R
Volume (vph)	895	219	63					1399	278	277	214	124
% Heavy Vehicles	1	1	1					0	0	3	3	0
PHF	0.97	0.97	0.97					0.92	0.92	0.89	0.89	0.89
Pretimed/Actuated (P/A)	P	P	P					P	P	P	P	P
Startup Lost Time	2.0	2.0	2.0					2.0	2.0	2.0	2.0	2.0
Extension of Effective Green	2.0	2.0	2.0					2.0	2.0	2.0	2.0	2.0
Arrival Type	3	3	3					3	3	3	3	3
Unit Extension	3.0	3.0	3.0					3.0	3.0	3.0	3.0	3.0
Ped/Bike/RTOR Volume	150	0	0			0		0	28	0	0	0
Lane Width	11.0	11.0	12.0					12.0	12.0	16.0	10.0	12.0
Parking/Grade/Parking	N	5	N			N		-1	N	N	6	N
Parking/Hour												
Bus Stops/Hour	0	0	0					0	0	0	0	0
Minimum Pedestrian Time		15.6						3.2			3.2	

Phasing	EB Only	02	03	04	NB Only	SB Only	07	08
Timing	G = 32.0	G =	G =	G =	G = 39.0	G = 14.0	G =	G =
	Y = 5	Y =	Y =	Y =	Y = 5	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 100.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB		SB		
Adjusted Flow Rate	600	552	62				1521	272	156	395	139
Lane Group Capacity	485	495	344				1276	570	243	206	197
v/c Ratio	1.24	1.12	0.18				1.19	0.48	0.64	1.92	0.71
Green Ratio	0.32	0.32	0.32				0.39	0.39	0.14	0.14	0.14
Uniform Delay d_1	34.0	34.0	24.5				30.5	22.9	40.6	43.0	41.0
Delay Factor k	0.50	0.50	0.50				0.50	0.50	0.50	0.50	0.50
Incremental Delay d_2	123.4	75.9	1.1				94.4	2.8	12.3	430.4	19.1
PF Factor	1.000	1.000	1.000				1.000	1.000	1.000	1.000	1.000
Control Delay	157.4	109.9	25.7				124.9	25.7	53.0	473.4	60.2
Lane Group LOS	F	F	C				F	C	D	F	E
Approach Delay	129.1						109.9		295.1		
Approach LOS	F						F		F		
Intersection Delay	150.7			Intersection LOS					F		

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SHORT REPORT

General Information

Analyst	
Agency or Co.	TRANS ASSOCIATES
Date Performed	11/21/2005
Time Period	PM PEAK HOUR

Site Information

Intersection	GRANT ST & SIXTH AVE
Area Type	CBD or Similar
Jurisdiction	CITY OF PITTSBURGH
Analysis Year	2008 COMB CONDITIONS

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	0	1	0	0	2	0	1	2	0	1	2	0
Lane Group		LTR			LTR		L	TR		L	TR	
Volume (vph)	82	322	50	145	290	200	115	376	364	171	540	44
% Heavy Vehicles	7	7	7	4	4	4	12	12	12	4	4	4
PHF	0.83	0.83	0.83	0.94	0.94	0.94	0.95	0.95	0.95	0.75	0.75	0.75
Pretimed/Actuated (P/A)	P	P	P	P	P	P	P	P	P	P	P	P
Startup Lost Time		2.0			2.0		2.0	2.0		2.0	2.0	
Extension of Effective Green		2.0			2.0		2.0	2.0		2.0	2.0	
Arrival Type		3			3		3	3		3	3	
Unit Extension		3.0			3.0		3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	224	0	0	340	0	0	569	0	0	236	0	0
Lane Width		12.0			11.0		12.0	10.0		12.0	10.0	
Parking/Grade/Parking	N	4	N	N	-5	N	N	-1	N	N	2	N
Parking/Hour												
Bus Stops/Hour		0			0		0	0		0	0	
Minimum Pedestrian Time		18.5			19.2			19.5			13.8	

Phasing	EB Only	EW Perm		03	04	Excl. Left	NS Perm		07	08
Timing	G = 7.0	G = 35.0	G =	G =	G = 7.0	G = 25.0	G =	G =		
	Y = 3	Y = 5	Y =	Y =	Y = 3	Y = 5	Y =	Y =		

Duration of Analysis (hrs) = 0.25   Cycle Length C = 90.0

Lane Group Capacity, Control Delay, and LOS Determination

	EB		WB		NB		SB	
Adjusted Flow Rate	547		676		121	779	228	779
Lane Group Capacity	397		870		189	576	194	779
v/c Ratio	1.38		0.78		0.64	1.35	1.18	1.00
Green Ratio	0.50		0.39		0.39	0.28	0.39	0.28
Uniform Delay d_1	22.5		24.1		20.9	32.5	33.0	32.5
Delay Factor k	0.50		0.50		0.50	0.50	0.50	0.50
Incremental Delay d_2	185.2		6.8		15.5	169.8	119.8	32.2
PF Factor	1.000		1.000		1.000	1.000	1.000	1.000
Control Delay	207.7		30.8		36.3	202.3	152.9	64.7
Lane Group LOS	F		C		D	F	F	E
Approach Delay	207.7		30.8		180.0		84.7	
Approach LOS	F		C		F		F	
Intersection Delay	122.0		Intersection LOS				F	

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SHORT REPORT

General Information		Site Information	
Analyst		Intersection	CENTRE/RAMP & WASHINGTON PL
Agency or Co.	TRANS ASSOCIATES	Area Type	CBD or Similar
Date Performed	11/21/2005	Jurisdiction	CITY OF PITTSBURGH
Time Period	PM PEAK HOUR	Analysis Year	2008 COMB CONDITIONS

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes		2	0	1	2	0	0	3	0	0	2	1
Lane Group		TR		L	TR			LTR		DefL	T	R
Volume (vph)		1000	96	148	374	413	13	878	32	49	97	41
% Heavy Vehicles		2	2	2	2	2	1	1	1	9	9	9
PHF		0.77	0.77	0.87	0.87	0.87	0.84	0.84	0.84	0.91	0.91	0.91
Pretimed/Actuated (P/A)		P	P	P	P	P	P	P	P	P	P	P
Startup Lost Time		2.0		2.0	2.0			2.0		2.0	2.0	2.0
Extension of Effective Green		2.0		2.0	2.0			2.0		2.0	2.0	2.0
Arrival Type		3		3	3			3		3	3	3
Unit Extension		3.0		3.0	3.0			3.0		3.0	3.0	3.0
Ped/Bike/RTOR Volume	138	0	0	291	0	0	12	0	0	57	0	0
Lane Width		13.0		12.0	10.0			12.0		12.0	12.0	12.0
Parking/Grade/Parking	N	-1	N	N	-6	N	N	6	Y	N	-3	N
Parking/Hour									10			
Bus Stops/Hour		0		0	0			0		0	0	0
Minimum Pedestrian Time		24.6			25.7			21.3			3.6	

Phasing	WB Only	EW Perm	Peds Only	04	NS Perm	06	07	08
Timing	G = 6.0	G = 30.0	G = 15.0	G =	G = 20.5	G =	G =	G =
	Y = 3	Y = 5	Y = 5	Y =	Y = 5.5	Y =	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 90.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate		1424		170	905			1098		54	107	45
Lane Group Capacity		1079		189	1056			899		80	363	285
v/c Ratio		1.32		0.90	0.86			1.22		0.68	0.29	0.16
Green Ratio		0.33		0.43	0.43			0.23		0.23	0.23	0.23
Uniform Delay d_1		30.0		21.3	23.0			34.8		31.7	28.8	27.8
Delay Factor k		0.50		0.50	0.50			0.50		0.50	0.50	0.50
Incremental Delay d_2		150.5		43.5	9.0			109.6		37.2	2.1	1.2
PF Factor		1.000		1.000	1.000			1.000		1.000	1.000	1.000
Control Delay		180.5		64.8	32.0			144.4		69.0	30.8	29.0
Lane Group LOS		F		E	C			F		E	C	C
Approach Delay		180.5			37.1			144.4			40.4	
Approach LOS		F			D			F			D	
Intersection Delay		122.0			Intersection LOS						F	

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SHORT REPORT

General Information		Site Information	
Analyst	CKR	Intersection	FORBES AVE & ARMSTRONG TUNNEL
Agency or Co.	TRANS ASSOCIATES	Area Type	CBD or Similar
Date Performed	11/21/2005	Jurisdiction	CITY OF PITTSBURGH
Time Period	PM PEAK HOUR	Analysis Year	2008 COMB CONDITIONS

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes		2	0				0		2			
Lane Group		TR						LR	R			
Volume (vph)		746	608				107		492			
% Heavy Vehicles		4	4				1		1			
PHF		0.90	0.90				0.97		0.97			
Pretimed/Actuated (P/A)		P	P				P		P			
Startup Lost Time		2.0						2.0	2.0			
Extension of Effective Green		2.0						2.0	2.0			
Arrival Type		3						3	3			
Unit Extension		3.0						3.0	3.0			
Ped/Bike/RTOR Volume	50	0	0				0	0	0			
Lane Width		11.0						11.0	11.0			
Parking/Grade/Parking	N	3	N				N	0	N			
Parking/Hour												
Bus Stops/Hour		0						0	0			
Minimum Pedestrian Time		17.3						3.2				

Phasing	EB Only	02	03	04	NB Only	06	07	08
Timing	G = 46.0	G =	G =	G =	G = 24.0	G =	G =	G =
	Y = 5	Y =	Y =	Y =	Y = 5	Y =	Y =	Y =

Duration of Analysis (hrs) = 0.25   Cycle Length C = 80.0

Lane Group Capacity, Control Delay, and LOS Determination

	EB		WB		NB		SB	
Adjusted Flow Rate	1505				308	309		
Lane Group Capacity	1567				436	739		
v/c Ratio	0.96				0.71	0.42		
Green Ratio	0.57				0.30	0.30		
Uniform Delay d_1	16.1				24.9	22.4		
Delay Factor k	0.50				0.50	0.50		
Incremental Delay d_2	15.1				9.3	1.7		
PF Factor	1.000				1.000	1.000		
Control Delay	31.2				34.2	24.2		
Lane Group LOS	C				C	C		
Approach Delay	31.2				29.1			
Approach LOS	C				C			
Intersection Delay	30.6		Intersection LOS				C	

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SHORT REPORT

General Information		Site Information	
Analyst		Intersection	FORBES AVE & CHATHAM/McANULTY
Agency or Co.	TRANS ASSOCIATES	Area Type	CBD or Similar
Date Performed	11/21/2005	Jurisdiction	CITY OF PITTSBURGH
Time Period	PM PEAK HOUR	Analysis Year	2008 COMB CONDITIONS

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	2	0					1	1	0	1	
Lane Group	L	TR						T	R		LT	
Volume (vph)	368	783	71					170	136	154	54	
% Heavy Vehicles	4	4	4					0	0	1	1	
PHF	0.88	0.88	0.88					0.71	0.71	0.80	0.80	
Pretimed/Actuated (P/A)	P	P	P					P	P	P	P	
Startup Lost Time	2.0	2.0						2.0	2.0		2.0	
Extension of Effective Green	2.0	2.0						2.0	2.0		2.0	
Arrival Type	3	3						3	3		3	
Unit Extension	3.0	3.0						3.0	3.0		3.0	
Ped/Bike/RTOR Volume	87	0	0				59	0	14	21	0	
Lane Width	10.0	11.0						10.0	11.0		10.0	
Parking/Grade/Parking	N	3	N				N	-6	N	N	10	N
Parking/Hour												
Bus Stops/Hour	0	0						0	0		0	
Minimum Pedestrian Time		14.2						12.6			12.3	

Phasing	EB Only		02		03		04		NS Perm		06		07		08
Timing	G = 36.0	G =		G =		G =		G = 34.0		G =		G =		G =	
	Y = 5	Y =		Y =		Y =		Y = 5		Y =		Y =		Y =	

Duration of Analysis (hrs) = 0.25 | Cycle Length C = 80.0

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB	
Adjusted Flow Rate	418	971						239	172	259	
Lane Group Capacity	646	1314						699	589	342	
v/c Ratio	0.65	0.74						0.34	0.29	0.76	
Green Ratio	0.45	0.45						0.43	0.43	0.43	
Uniform Delay d_1	17.1	18.1						15.5	15.1	19.5	
Delay Factor k	0.50	0.50						0.50	0.50	0.50	
Incremental Delay d_2	5.0	3.8						1.3	1.3	14.5	
PF Factor	1.000	1.000						1.000	1.000	1.000	
Control Delay	22.0	21.9						16.8	16.4	34.0	
Lane Group LOS	C	C						B	B	C	
Approach Delay		21.9						16.6		34.0	
Approach LOS		C						B		C	
Intersection Delay		22.4		Intersection LOS						C	

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SHORT REPORT

General Information		Site Information	
Analyst	CKR	Intersection	SIXTH AVE & ROSS ST/BIGELOW
Agency or Co.	TRANS ASSOCIATES	Area Type	CBD or Similar
Date Performed	11/21/2005	Jurisdiction	CITY OF PITTSBURGH
Time Period	PM PEAK HOUR	Analysis Year	2008 COMB CONDITIONS

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	0	3	0	0	2	0	0	2	0	0	2	0
Lane Group	DefL	TR			LTR			LTR		DefL	TR	
Volume (vph)	276	538	42	38	374	213	88	286	266	174	264	173
% Heavy Vehicles	1	1	1	2	2	2	2	2	2	1	1	1
PHF	0.82	0.82	0.82	0.93	0.93	0.93	0.77	0.77	0.77	0.87	0.87	0.87
Pretimed/Actuated (P/A)	P	P	P	P	P	P	P	P	P	P	P	P
Startup Lost Time	2.0	2.0			2.0			2.0		2.0	2.0	
Extension of Effective Green	2.0	2.0			2.0			2.0		2.0	2.0	
Arrival Type	3	3			3			3		3	3	
Unit Extension	3.0	3.0			3.0			3.0		3.0	3.0	
Ped/Bike/RTOR Volume	200	0	4	200	0	21	200	0	27	200	0	17
Lane Width	12.0	11.0			11.0			12.0		12.0	11.0	
Parking/Grade/Parking	N	5	N	N	-6	N	N	-1	N	N	-1	N
Parking/Hour												
Bus Stops/Hour	0	0			0			0		0	0	
Minimum Pedestrian Time		18.3			17.8			20.8			8.0	

Phasing	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = 32.0	G =	G =	G =	G = 29.0	G =	G =	G =
	Y = 5.5	Y =	Y =	Y =	Y = 5.5	Y =	Y =	Y =
Duration of Analysis (hrs) = 0.25					Cycle Length C = 72.0			

Lane Group Capacity, Control Delay, and LOS Determination

	EB		WB		NB		SB	
Adjusted Flow Rate	337	702	649		795		200	482
Lane Group Capacity	248	1325	1121		889		171	591
v/c Ratio	1.36	0.53	0.58		0.89		1.17	0.82
Green Ratio	0.44	0.44	0.44		0.40		0.40	0.40
Uniform Delay d_1	20.0	14.5	15.0		20.1		21.5	19.1
Delay Factor k	0.50	0.50	0.50		0.50		0.50	0.50
Incremental Delay d_2	185.4	1.5	2.2		13.4		121.8	11.8
PF Factor	1.000	1.000	1.000		1.000		1.000	1.000
Control Delay	205.4	16.1	17.1		33.4		143.3	30.9
Lane Group LOS	F	B	B		C		F	C
Approach Delay	77.5		17.1		33.4		63.9	
Approach LOS	E		B		C		E	
Intersection Delay	51.1		Intersection LOS				D	

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SHORT REPORT

General Information		Site Information	
Analyst	CKR/M. Southern	Intersection	SIXTH AVE & ROSS ST/BIGELOW
Agency or Co.	TRANS ASSOCIATES	Area Type	CBD or Similar
Date Performed	11/21/2005	Jurisdiction	CITY OF PITTSBURGH
Time Period	AM PEAK HOUR	Analysis Year	2008 COMBINED CONDITIONS

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	0	3	0	0	2	0	0	2	0	0	2	0
Lane Group	DefL	TR			LTR			LTR			LTR	
Volume (vph)	132	373	46	23	441	107	52	128	240	174	398	285
% Heavy Vehicles	2	2	2	3	3	3	2	2	2	1	1	1
PHF	0.93	0.93	0.93	0.84	0.84	0.84	0.88	0.88	0.88	0.89	0.89	0.89
Pretimed/Actuated (P/A)	P	P	P	P	P	P	P	P	P	P	P	P
Startup Lost Time	2.0	2.0			2.0			2.0			2.0	
Extension of Effective Green	2.0	2.0			2.0			2.0			2.0	
Arrival Type	3	3			3			3			3	
Unit Extension	3.0	3.0			3.0			3.0			3.0	
Ped/Bike/RTOR Volume	200	0	5	200	0	11	200	0	24	200	0	29
Lane Width	12.0	11.0			11.0			12.0			11.0	
Parking/Grade/Parking	N	5	N	N	-6	N	N	-1	N	N	-1	N
Parking/Hour												
Bus Stops/Hour	0	0			0			0			0	
Minimum Pedestrian Time		18.3			17.8			20.8			8.0	

Phasing	EW Perm	02		03		04		NS Perm	06		07		08
Timing	G = 26.0	G =		G =		G =		G = 33.0	G =		G =		G =
	Y = 5.5	Y =		Y =		Y =		Y = 5.5	Y =		Y =		Y =
Duration of Analysis (hrs) = 0.25								Cycle Length C = 70.0					

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB		NB		SB	
Adjusted Flow Rate	142	445		666		449		931	
Lane Group Capacity	183	1083		1019		964		995	
v/c Ratio	0.78	0.41		0.65		0.47		0.94	
Green Ratio	0.37	0.37		0.37		0.47		0.47	
Uniform Delay d_1	19.4	16.3		18.3		12.5		17.5	
Delay Factor k	0.50	0.50		0.50		0.50		0.50	
Incremental Delay d_2	26.9	1.2		3.3		1.6		16.7	
PF Factor	1.000	1.000		1.000		1.000		1.000	
Control Delay	46.3	17.5		21.5		14.1		34.2	
Lane Group LOS	D	B		C		B		C	
Approach Delay		24.5		21.5		14.1		34.2	
Approach LOS		C		C		B		C	
Intersection Delay		25.4		Intersection LOS				C	

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SHORT REPORT

General Information		Site Information	
Analyst	CKR	Intersection	SIXTH AVE & ROSS ST/BIGELOW
Agency or Co.	TRANS ASSOCIATES	Area Type	CBD or Similar
Date Performed	12/6/2005	Jurisdiction	CITY OF PITTSBURGH
Time Period	PENS PM PEAK (6 PM-8 PM)	Analysis Year	2008 COMB CONDITIONS

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	0	3	0	0	2	0	0	2	0	0	2	0
Lane Group	DefL	TR			LTR			LTR			LTR	
Volume (vph)	250	764	25	15	227	158	27	120	297	175	170	170
% Heavy Vehicles	0	0	0	2	2	2	2	2	2	1	1	1
PHF	0.87	0.87	0.87	0.78	0.78	0.78	0.86	0.86	0.86	0.83	0.83	0.83
Pretimed/Actuated (P/A)	P	P	P	P	P	P	P	P	P	P	P	P
Startup Lost Time	2.0	2.0			2.0			2.0			2.0	
Extension of Effective Green	2.0	2.0			2.0			2.0			2.0	
Arrival Type	3	3			3			3			3	
Unit Extension	3.0	3.0			3.0			3.0			3.0	
Ped/Bike/RTOR Volume	100	0	3	100	0	16	100	0	30	100	0	17
Lane Width	12.0	11.0			11.0			12.0			11.0	
Parking/Grade/Parking	N	5	N	N	-6	N	N	-1	N	N	-1	N
Parking/Hour												
Bus Stops/Hour	0	0			0			0			0	
Minimum Pedestrian Time		17.7			17.2			20.2			7.5	

Phasing	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = 32.0	G =	G =	G =	G = 27.0	G =	G =	G =
	Y = 5.5	Y =	Y =	Y =	Y = 5.5	Y =	Y =	Y =

Duration of Analysis (hrs) = 0.25   Cycle Length C = 70.0

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB	
Adjusted Flow Rate	287	903		492			481			600	
Lane Group Capacity	339	1394		1213			943			735	
v/c Ratio	0.85	0.65		0.41			0.51			0.82	
Green Ratio	0.46	0.46		0.46			0.39			0.39	
Uniform Delay d_1	16.8	14.7		12.7			16.4			19.3	
Delay Factor k	0.50	0.50		0.50			0.50			0.50	
Incremental Delay d_2	22.2	2.3		1.0			2.0			9.7	
PF Factor	1.000	1.000		1.000			1.000			1.000	
Control Delay	39.0	17.0		13.7			18.4			29.0	
Lane Group LOS	D	B		B			B			C	
Approach Delay		22.3		13.7			18.4			29.0	
Approach LOS		C		B			B			C	
Intersection Delay		21.5		Intersection LOS						C	

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SHORT REPORT

General Information		Site Information	
Analyst	CKR	Intersection	SIXTH AVE & ROSS ST/BIGELOW
Agency or Co.	TRANS ASSOCIATES		
Date Performed	12/7/2005	Area Type	CBD or Similar
Time Period	CASINO FRIDAY PM PEAK (9-10PM)	Jurisdiction	CITY OF PITTSBURGH
		Analysis Year	2008 COMBINED

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	0	3	0	0	2	0	0	2	0	0	2	0
Lane Group		LTR			LTR			LTR			LTR	
Volume (vph)	104	637	25	7	267	46	41	56	367	38	106	106
% Heavy Vehicles	1	1	1	2	2	2	2	2	2	1	1	1
PHF	0.82	0.82	0.82	0.93	0.93	0.93	0.77	0.77	0.77	0.87	0.87	0.87
Pretimed/Actuated (P/A)	P	P	P	P	P	P	P	P	P	P	P	
Startup Lost Time		2.0			2.0			2.0			2.0	
Extension of Effective Green		2.0			2.0			2.0			2.0	
Arrival Type		3			3			3			3	
Unit Extension		3.0			3.0			3.0			3.0	
Ped/Bike/RTOR Volume	200	0	3	200	0	0	200	0	37	200	0	11
Lane Width		11.0			11.0			12.0			11.0	
Parking/Grade/Parking	N	5	N	N	-6	N	N	-1	N	N	-1	N
Parking/Hour												
Bus Stops/Hour		0			0			0			0	
Minimum Pedestrian Time		18.3			17.8			20.8			8.0	

Phasing	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = 30.0	G =	G =	G =	G = 29.0	G =	G =	G =
	Y = 5.5	Y =	Y =	Y =	Y = 5.5	Y =	Y =	Y =

Duration of Analysis (hrs) = 0.25   Cycle Length C = 70.0

Lane Group Capacity, Control Delay, and LOS Determination

	EB		WB		NB		SB	
Adjusted Flow Rate	931		344		555		275	
Lane Group Capacity	1497		1215		923		991	
v/c Ratio	0.62		0.28		0.60		0.28	
Green Ratio	0.43		0.43		0.41		0.41	
Uniform Delay d_1	15.6		13.0		16.0		13.6	
Delay Factor k	0.50		0.50		0.50		0.50	
Incremental Delay d_2	2.0		0.6		2.9		0.7	
PF Factor	1.000		1.000		1.000		1.000	
Control Delay	17.5		13.6		18.9		14.3	
Lane Group LOS	B		B		B		B	
Approach Delay	17.5		13.6		18.9		14.3	
Approach LOS	B		B		B		B	
Intersection Delay	16.8		Intersection LOS				B	

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SHORT REPORT

General Information		Site Information	
Analyst	CKR	Intersection	SIXTH AVE & ROSS ST/BIGELOW
Agency or Co.	TRANS ASSOCIATES	Area Type	CBD or Similar
Date Performed	12/6/2005	Jurisdiction	CITY OF PITTSBURGH
Time Period	CASINO SAT PM PEAK (9-10PM)	Analysis Year	2008 COMBINED CONDITIONS

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	0	3	0	0	2	0	0	2	0	0	2	0
Lane Group		LTR			LTR			LTR			LTR	
Volume (vph)	84	486	8	5	232	28	44	29	278	36	96	99
% Heavy Vehicles	1	1	1	2	2	2	1	1	1	1	1	1
PHF	0.89	0.89	0.89	0.84	0.84	0.84	0.79	0.79	0.79	0.81	0.81	0.81
Pretimed/Actuated (P/A)	P	P	P	P	P	P	P	P	P	P	P	P
Startup Lost Time		2.0			2.0			2.0			2.0	
Extension of Effective Green		2.0			2.0			2.0			2.0	
Arrival Type		3			3			3			3	
Unit Extension		3.0			3.0			3.0			3.0	
Ped/Bike/RTOR Volume	100	0	1	100	0	3	100	0	28	100	0	10
Lane Width		11.0			11.0			12.0			11.0	
Parking/Grade/Parking	N	5	N	N	-6	N	N	-1	N	N	-1	N
Parking/Hour												
Bus Stops/Hour		0			0			0			0	
Minimum Pedestrian Time		17.7			17.2			20.2			7.5	

Phasing	EW Perm	02		03		04		NS Perm		06		07		08	
Timing	G = 32.0	G =		G =		G =		G = 27.0		G =		G =		G =	
	Y = 5.5	Y =		Y =		Y =		Y = 5.5		Y =		Y =		Y =	
Duration of Analysis (hrs) = 0.25								Cycle Length C = 70.0							

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate		648			312			409			273	
Lane Group Capacity		1643			1341			896			920	
v/c Ratio		0.39			0.23			0.46			0.30	
Green Ratio		0.46			0.46			0.39			0.39	
Uniform Delay d_1		12.6			11.5			16.0			14.9	
Delay Factor k		0.50			0.50			0.50			0.50	
Incremental Delay d_2		0.7			0.4			1.7			0.8	
PF Factor		1.000			1.000			1.000			1.000	
Control Delay		13.3			11.9			17.7			15.7	
Lane Group LOS		B			B			B			B	
Approach Delay		13.3			11.9			17.7			15.7	
Approach LOS		B			B			B			B	
Intersection Delay		14.5		Intersection LOS							B	
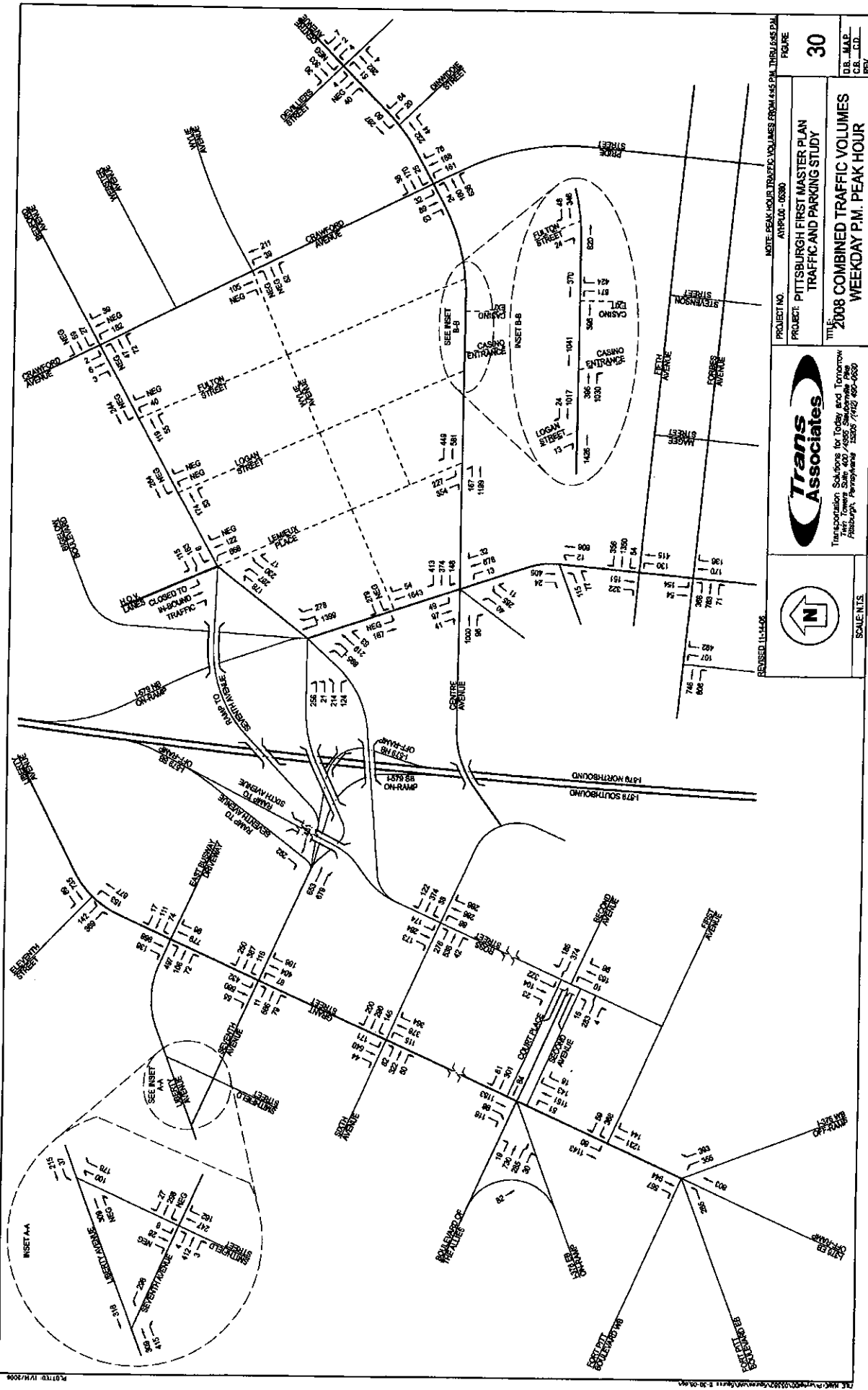
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11/14/2006

2008 COMBINED TRAFFIC VOLUMES WEEKDAY P.M. PEAK HOUR

NOTE: PEAK HOUR TRAFFIC VOLUMES FROM 4:45 P.M. THRU 5:45 P.M.

PROJECT: PITTSBURGH FIRST MASTER PLAN TRAFFIC AND PARKING STUDY

PROJECT NO. AYHPL00-00380

FIGURE 30

Trans Associates

Transportation Solutions for Today and Tomorrow
Twin Towers, Suite 400, 4955 Steubenville Pike
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SCALE: N.T.S.

REVISED 11-14-06