

Powerhouse Ultimo Renewal (SSD-32927319) | Response to Submissions- Addendum Transport Assessment

1. Introduction

SSD-32927319 to support the Powerhouse Ultimo Renewal project was publicly exhibited by the Department of Planning and Environment (DPE) from 21 June 2022 to 21 July 2022. During the consultation period, submissions from Transport for NSW (TfNSW) and City of Sydney Council ('Council') were provided which raised a number of items in relation to traffic and transport associated with the transport impact assessment report supporting the proposal. In addition a number of matters were raised by DPE in their issues letter dated 12 August 2022.

This document has been prepared by JMT Consulting to respond to the transport related feedback provided in City of Sydney Council and Transport for NSW submissions as well as the DPE issues letter.

Reference is made throughout the document to the transport impact assessment supporting the proposal, dated 04 May 2022 and prepared by JMT Consulting.

2. Response to Submissions

The Powerhouse Ultimo Renewal Stage 1 State Significant Development Application (SSDA) sets out the concept proposal for the development, establishing overarching guidelines, principles and development controls for the detailed design, construction and operation of buildings and public domain that will be subject to a detailed (Stage 2) SSDA.

In response to submissions received during the public exhibition of the Stage 1 SSDA, the building envelopes above the state heritage listed Boiler House and Turbine Hall/ Engine Room and North Annex have been removed. These buildings remain largely intact externally and the removal of the envelopes above these structures reinforces the commitment to the retention and celebration of heritage within the site.

The proposed building envelope has been reduced above the Switch House, enabling a design response that reimagines the modern rooftop/ mezzanine addition. The envelope above the Pump House has also been reduced to ensure views to the Boiler House will remain unobstructed from Pier Street and Harris Street.


To provide further clarity of future built form (whilst providing for maximum potential design innovation through the design competition), the Applicant has determined a maximum gross floor area (GFA) that will apply to the future development. It is proposed that a maximum amount of GFA across the site of 40,000 square metres will apply, which represents an increase of 10,000 square metres compared to existing built form within the site. As such, with the retention of the state heritage listed buildings, any new built form will only form a relatively small proportion of the proposed envelope.

The Design Guidelines require a minimum of 2,200 square metres of publicly accessible open space to be delivered within the site, limiting the extent of new building footprint able to be developed.

This addendum to the Transport Assessment (Appendix J to the EIS) confirms the conclusions of that report remain valid accounting for the amended envelope and proposed maximum 40,0000 square metres of GFA across the site.

Responses to the submissions provided by Transport for NSW and City of Sydney Council are provided in Table 1 and Table 2 on the following pages. Responses are also provided to the transport related items contained in the DPE issues letter in Table 3.

TABLE 1 – RESPONSES TO TfNSW SUBMISSION (TAB B - Advice)

TfNSW Submission (Tab B – Advice)	Response
<p>Charter Buses and On Street Parking</p> <p>An assessment should be undertaken to determine the quantum of charter bus parking required to adequately support the forecast demand of the development and whether this parking demand can be accommodated on Harris Street or alternative options investigated. The assessment should consider school groups and simultaneous visiting groups from multiple schools.</p>	<p>As indicated in Figure 1 below the Powerhouse Ultimo site benefits from having an existing short-term coach area on Harris Street immediately adjacent to the building. This area, approximately 75m long, is available between the hours of 10am and 3pm Monday to Friday and 9am-5pm on Saturdays. The zone can accommodate approximately four coaches at any one time. Assuming coaches park for the maximum allowable 15 minutes, this zone can therefore accommodate up to 16 coaches per hour.</p>  <p><i>Figure 1 Existing short term coach parking area on Harris Street</i></p> <p>Currently all school group tours to the Powerhouse Ultimo are managed through a centralised booking system managed by Powerhouse staff. This management system includes the time of arrival and departure for the school group – ensuring that the kerbside space for coaches on Harris Street can be appropriately managed and demand does not exceed capacity.</p>

TfNSW Submission (Tab B – Advice)	Response
	<p>Data provided by the Powerhouse Museum for school group arrivals (pre-COVID) has indicated the following key statistics:</p> <ul style="list-style-type: none"> • Average of approximately 4 school groups per day during school term • 61% of school groups arrive between 10am-11am (average of 2.5 vehicles per hour) • 90% of school groups arrive prior to 1pm <p>The Powerhouse has confirmed that the proposed expansion of the Powerhouse Ultimo will not significantly alter the number of school group arrivals compared to current conditions. However, for the purposes of this analysis, a 120% increase in demand has been assumed which is consistent with the overall travel demand analysis. Given school group bookings are closely managed by the Powerhouse team it is unlikely this additional demand would be concentrated within the hours of 10am-11am, however the analysis has assumed a worst case scenario. This would result in an average of 5.2 coaches arriving on Harris Street between 10am -11am and each parking for an average of 15 minutes.</p> <p>A queuing analysis has been undertaken using a poisson¹ distribution using queuing theory (M/M/∞) to determine the suitability of the coach parking area on Harris Street. The assessment considers the probability of certain number of vehicles being on site at one time. The queuing analysis takes into consideration:</p> <ul style="list-style-type: none"> • The future number of vehicles forecast to access the Harris Street coach parking zone in the peak hour of the day (i.e. between 10am and 11am); and • The maximum dwell time of fifteen minutes per vehicle <p>The findings of the queueing assessment are provided Table 1 which indicates the existing four spaces on Harris Street will continue to be suitable to accommodate coach parking demand following the redevelopment of the site. The probability of more than 4 coaches being parked on Harris Street (during the busiest hour of the day) at any one time is modelled at being less than 1%. As previously noted all school group bookings are managed by Powerhouse staff through a centralised system to ensure that demand for the Harris Street coach parking area does not exceed available supply. This will continue to be in place moving forwards following the future redevelopment of the site.</p>

¹ A mathematical model which captures the variability in arrivals and resulting queuing, provided an average arrival rate, time window and service time (i.e. length of stay)

TfNSW Submission (Tab B – Advice)	Response																							
	<div>Table 1Probability of number of coaches on Harris Street during peak periods</div> <table><tr><th rowspan="2">Vehicle type</th><th colspan="7">Probability of different numbers of vehicles on site at one time</th></tr><tr><th>0</th><th>1 or less</th><th>2 or less</th><th>3 or less</th><th>4 or less</th><th>5 or less</th><th>6 or less</th></tr><tr><td>Coaches on Harris Street</td><td>27.25%</td><td>62.68%</td><td>85.71%</td><td>95.69%</td><td>98.93%</td><td>99.78%</td><td>99.96%</td></tr></table>	Vehicle type	Probability of different numbers of vehicles on site at one time							0	1 or less	2 or less	3 or less	4 or less	5 or less	6 or less	Coaches on Harris Street	27.25%	62.68%	85.71%	95.69%	98.93%	99.78%	99.96%
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Charter Buses and On Street Parking In addition, consideration should be given to the provision of bus shelters (or adequate alternative weather protection (e.g. awnings) on Harris St for public and charter buses. If adopted, TfNSW is willing to work collaboratively with Create NSW, DPE and Council on development/design for bus shelter options.	The revised Urban Design Guidelines submitted with the Response to Submissions require design teams to incorporate weather protection within the design that would be subject to the Stage 2 SSDA.																							
Pedestrian Connections The reference design provided in the Landscape Plans identifies two opportunities for pedestrian connections to the Exhibition Centre Light Rail Stop: <ul style="list-style-type: none">A pedestrian connection under Pier Street into the northern façade of the Powerhouse site; andA pedestrian connection alongside Boiler House, connecting the Goods Line to Pyrmont Street as per the Pyrmont Peninsula Place Strategy. It is unclear if the pedestrian connection alongside Boiler House is proposed to be located within the light rail corridor. TfNSW supports the provision of new pedestrian connections to the Exhibition Centre Light Rail Stop, however any facilitation of a pedestrian connection within the light rail corridor should be undertaken in consultation with TfNSW. TfNSW is willing to work collaboratively with Create NSW, DPE and Council on development/design of pedestrian connections.	<p>The indicative pedestrian connection identified in the revised Urban Design Guidelines and Analysis submitted with the Response to Submissions would support the objectives of the transport strategy by improving access to public transport and supporting active transport as a mode of travel to the site. The connection is largely consistent with the pedestrian link already identified in the Pyrmont Peninsula Place Strategy to support movements between Pyrmont and Central Station along the Goods Line.</p> <p>The revised Urban Design Guidelines submitted with the Response to Submissions require the design to consider provision of pedestrian access to the Powerhouse via a connection underneath Pier Street and improved connections from Pyrmont Street to the Goods Line. The indicative pedestrian connection identified on reference design adjacent to the boiler house is outside of the site boundary and scope of this SSDA. Any proposal to provide this connection would have to be agreed with the TfNSW and would be the subject of a new development application.</p>																							

TfNSW Submission (Tab B – Advice)	Response
<p>Mode Share</p> <p>The nature of the development would cater to visitors such as school groups and potentially simultaneous visitation from multiple schools that are likely to be transported in charter buses.</p> <p>Clarification should be sought on whether the travel surveys undertaken at the existing Powerhouse Museum had included school groups and simultaneous visiting groups from multiple schools. If the survey had not accounted for such scenarios, reasonable adjustments should be made to the forecasted demand.</p> <p>The forecast total travel demand of the proposed development should also be provided.</p>	<p>The travel surveys conducted at the Powerhouse Ultimo in early 2020 did not specifically include school groups so as not to unfairly skew the data obtained. As indicated in the graphs contained in Section 3.1 of the transport impact assessment travel by coach was not captured in the data analysis.</p> <p>Taking this into account, the forecast travel mode shares have been modified to reflect the expected demand for bus/coach related travel - including simultaneous visiting groups from multiple schools. The adopted mode share reflects historical demand at the Powerhouse Museum for school groups, with further details provided in the response under 'Charter Buses and On Street Parking' contained in this document. Therefore the travel demand analysis has contemplated this mode of travel and no amendments are required.</p> <p>As requested by TfNSW the forecast total travel demand for both a weekday and weekend period has been provided and is presented in Appendix A of this document.</p>
<p>Implementation Strategy</p> <p>Consideration should be given to adopting the preliminary GTP into a comprehensive Implementation Plan. The Implementation Plan should include all of the initiatives and incentives within the GTP, timing and completion dates to ensure the overall effectiveness of the GTP as an implementation strategy. Ideally each part of the Implementation Plan should be managed overall by a Travel Plan Coordinator/Steering Committee. The Strategy should:</p> <ul style="list-style-type: none"> • Include a strategy for the relevant tenant(s) to take over the ongoing responsibilities for the GTP, making it clear to the tenants that there are requirements to try and achieve sustainable transport mode shares for the site, as a condition of the development, for its lifecycle. • Identify the party or parties responsible for delivery and implementation of each element of the updated, including for its ongoing implementation, monitoring and review, for a period of at least 5 years post- operation. • Updated both on an annual basis, and when future transport services are upgraded. • Include current communication strategies and initiatives 	<p>It is noted that a detailed Green Travel Plan (GTP) has been recommended by TfNSW as a suggested condition of consent. This detailed GTP would contain an implementation strategy inclusive of the items listed in the TfNSW submission. Given the proposal is at a concept phase, it is not considered appropriate to develop the implementation plan at this early stage of the project.</p> <p>No objection is raised to the suggested condition of consent for a detailed GTP nor the inclusion of the requirement for an implementation plan to be prepared prior to the issue of a completion certificate. This detailed GTP, including the implementation plan, would be undertaken in close consultation with TfNSW.</p>

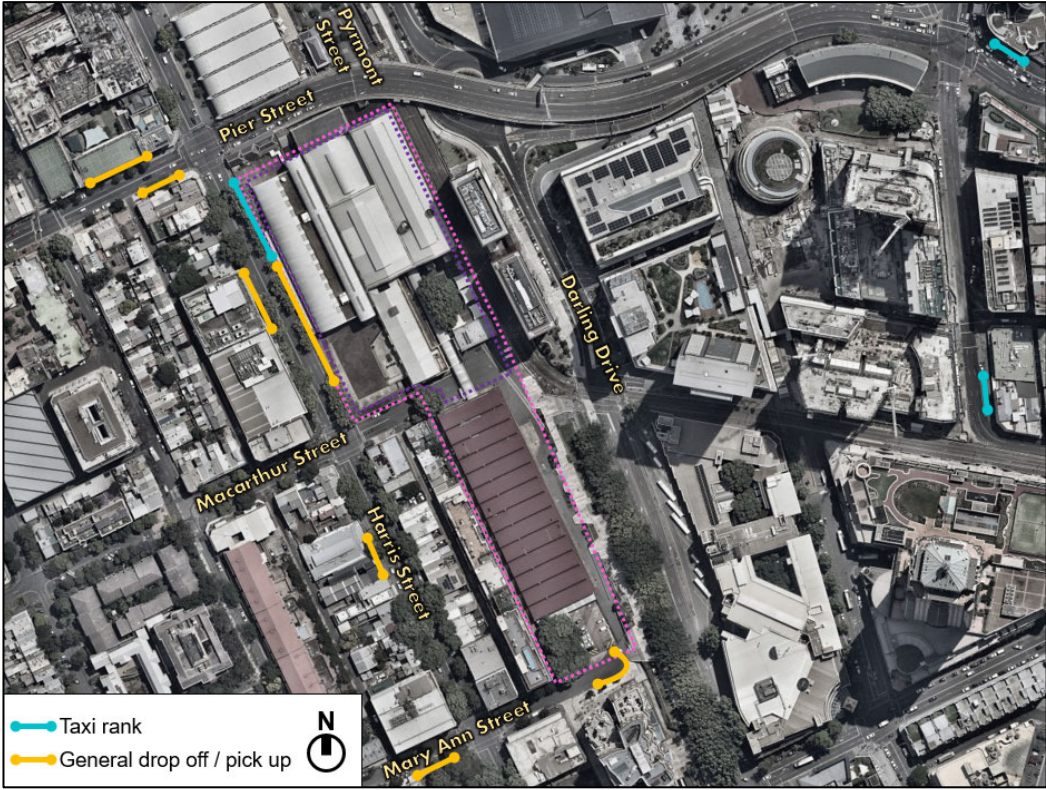
TfNSW Submission (Tab B – Advice)	Response
<p>Passenger Drop Off</p> <p>The Transport Assessment identifies that passenger drop-offs (i.e., taxi and uber etc) are forecast to increase as part of the proposed development however does not identify how they are proposed to be accommodated, including location/s.</p> <p>Further information should be provided on the type of facilities and locations for passenger drop-off, including the additional demand generated by the proposed development.</p>	<p>The Powerhouse Ultimo site benefits from a range of locations that provide for suitable drop off and pick up opportunities. These areas are identified in <i>Figure 2</i> and include taxi ranks as well as ‘No Parking’ zones that can be used for general drop off and pick up including for ride-share vehicles. The eastern side of Harris Street, directly adjacent to the Powerhouse Ultimo site, contains a large taxi rank capable of accommodating 5-6 vehicles at a time. Additional drop off areas in and around the site provide for capacity for approximately 40-50 vehicles for general drop off and pick up. This provision is considered more than adequate to accommodate the expected increase in peak hour demand of 17 passengers – equivalent to less than 10 vehicles when considering typical vehicle occupancies.</p>  <p><i>Figure 2 Drop off / pick up areas surrounding Powerhouse Ultimo</i></p>

TABLE 2 – RESPONSES TO CITY OF SYDNEY COUNCIL SUBMISSION

<i>City of Sydney Council Submission</i>	<i>Response</i>
<p>The submitted reference design orients the building entrance to The Goods Line is supported but not at the expense of an appropriate frontage and entrance on Harris Street. Although not contained within the development boundary, the use of the Goods Line for visitors is likely to increase and necessary improvements to the Goods Line should be investigated further. This includes an investigation into the current use of the Goods Line for pedestrians and cyclists and any improvements that would be required to the existing infrastructure to be able to support an increased pedestrian use due to the proposed renewal works. The City stresses that good quality pedestrian connections need to be incorporated early in the design process and not "following occupation" as suggested in the submitted EIS.</p>	<p>The pedestrian connections identified in the revised Urban Design Guidelines and Analysis submitted with the Response to Submissions, including a future connection adjacent to the Boiler House which extends the Goods Line, would support the objectives of the transport strategy by improving access to public transport and supporting active transport as a mode of travel to the site. The connections are largely consistent with the pedestrian link already identified in the Pyrmont Peninsula Place Strategy to support movements between Pyrmont and Central Station along the Goods Line.</p> <p>Should the indicative pedestrian connection adjacent to the Boiler House be pursued as part of a future separate development application with TfNSW, the current use of the Goods Line by pedestrians and cyclists can be further investigated to determine the need for any improvements, within that development application. These investigations will consider the increased level of pedestrian and cyclist activity generated by the project along the Goods Line and any associated upgrades that may be triggered by this additional demand.</p>
<p>It is noted that the reference design also provides bicycle parking within the forecourt areas around the site however, it is unclear where a complete and compliant number of bicycle spaces are and where end of trip facilities would be located for staff use. Any future Design Excellence Strategy and detailed design must ensure that staff and visitor bicycle parking and associated end of trip facilities are provided in accordance with the requirements of the Sydney Development Control Plan 2012.</p>	<p>Noted, further details around the number and location of bicycle parking for staff and visitors will be provided as part of the detailed Stage 2 Development Application.</p>

TABLE 3 – RESPONSES TO DPE ISSUES LETTER

Department of Planning and Environment Issues	Response
Forecast total travel demand for the development	Forecast total travel demand for the development, based on the maximum GFA and anticipated visitor numbers is contained in Appendix A of this document.
Indicative vehicle access and servicing arrangements	<p>A number of options exist for the future servicing of the site. The key parameters for the design of the loading dock as part of the design (subject to the Stage 2 SSDA) include:</p> <ul style="list-style-type: none"> • No direct vehicle access to the site via Harris Street • Site access driveway to be located at least 20 metres east of the Macarthur Street / Harris Street intersection. <p>The largest vehicle required to service the site include 19m trucks (semi-trailers), which would be utilised to transport very large objects of the collection. Such servicing would be infrequent owing to the significant logistics required to transport such objects. As such the loading dock required for the precinct would only be required to service 12.5m Heavy Rigid Vehicles (HRV). There would be a number of configurations in which both the loading from semi-trailers and HRVs could be provided within the site. The final location of these facilities would be determined through the design competition and assessment undertaken as part of the Stage 2 SSDA.</p> <p>Appendix B of this document presents a range of possible solutions for the servicing of the site by semi-trailers that would meet the above requirements – building on the option presented in Figure 23 within the Transport Assessment (Appendix J to the EIS).</p>
Indicative staff and visitor bicycle parking and associated end-of-trip facilities	<p>The Transport Assessment submitted as Appendix J to the EIS confirmed at section 4.4.2:</p> <ul style="list-style-type: none"> • A minimum of 15 bicycle parking spaces would be required to service staff in line with Green Star requirements; • End-of-trip facilities would be provided to account for the number of staff bicycle spaces provided; and • A minimum of 40 bicycle parking spaces would be required to service visitors. <p>The final number and location of bicycle parking and associated end of trip facilities will be determined as part of the design competition.</p>

Department of Planning and Environment Issues	Response
Indicative pedestrian access and connections, including any potential connections to the light rail stop which have been developed in consultation with TfNSW and Council	<p>Potential pedestrian connections to the site are outlined in the Revised Urban Design Guidelines and Analysis submitted with the Response to Submissions.</p> <p>The proposed development would not require any additional pedestrian connections external to the site in order to adequately service the expected number of visitors.</p> <p>Whilst there is potential for new connections to be made to the Exhibition Light Rail stop underneath Pier Street or within the light rail corridor, these works would be subject of a separate development application as they are outside the project boundary.</p> <p>As outlined in the Revised Urban Design Guidelines and Analysis submitted with the Response to Submissions, the design will be required to consider how future connections could be facilitated through the design of the precinct within the site boundary.</p>
The type of facilities and locations for passenger drop-offs	Details of the available facilities and locations of passenger pick up and drop off in the vicinity of the site are detailed in Table 1 of this addendum transport assessment in response to the submission provided by Transport for NSW.
Impacts of simultaneous school/visiting groups	Details of the expected number of school groups arriving to the site and associated impacts on Harris Street are detailed in Table 1 of this addendum transport assessment in response to the submission provided by Transport for NSW.
Provision of charter bus parking and weather protection for public and charter buses waiting areas	The revised Urban Design Guidelines submitted with the Response to Submissions require design teams to incorporate weather protection within the design that would be subject to the Stage 2 SSDA.
Swept path analysis to support indicative vehicle access and servicing arrangements, including for the largest vehicle likely to access the site for large exhibits/installations	<p>Section 4.3 of the Transport Assessment submitted as Appendix J to the EIS provided swept path analysis of the largest vehicle likely to access the site for large exhibits/installations – noting this would be a 19m truck (semi-trailer) with up to a 4.5m height clearance. These vehicles would likely drive into the forecourt area of Macarthur Street and reverse back into the site adjacent to either the Turbine Hall, Boiler House or potentially switch house. Swept paths indicating a range of potential servicing arrangements for these large vehicles are provided in Appendix B of this addendum transport assessment.</p> <p>Servicing arrangements (including swept path analysis) will be a key design parameter for the design competition and will be confirmed within the Stage 2 SSDA to be lodged for the site.</p>
The impacts of any loss of on-street parking spaces	No existing on-street car parking spaces are expected to be impacted by the proposal. This will be confirmed following the conclusion of the design competition.

<i>Department of Planning and Environment Issues</i>	<i>Response</i>
<p>The current use of the Goods Line by pedestrians and cyclists and any improvement works that will be required as a result of the increased pedestrian use</p>	<p>The pedestrian connections identified in the revised Urban Design Guidelines and Analysis submitted with the Response to Submissions, including a future connection adjacent to the Boiler House which extends the Goods Line, would support the objectives of the transport strategy by improving access to public transport and supporting active transport as a mode of travel to the site. The connections are largely consistent with the pedestrian link already identified in the Pymont Peninsula Place Strategy to support movements between Pymont and Central Station along the Goods Line.</p> <p>Should the pedestrian connection adjacent to the Boiler House be pursued as part of the Stage 2 development application, the current use of the Goods Line by pedestrians and cyclists can be further investigated to determine the need for any improvements, within that development application. These investigations will consider the increased level of pedestrian and cyclist activity generated by the project along the Goods Line and any associated upgrades that may be triggered by this additional demand.</p>

Appendix A: Forecast Travel Demand

Table 2 Forecast travel demand - weekday

Time	Forecast Arrivals + Departures Per Hour (weekday)								
	Train / Metro	Walk only	Taxi / Uber / drop off	Bus	Coach	Car (park nearby)	Light rail	Bicycle	Total
7:00	18	12	1	2	10	12	11	1	59
8:00	57	38	4	8	15	38	34	2	192
9:00	158	105	11	21	109	105	95	5	526
10:00	264	176	18	35	55	176	158	9	879
11:00	333	222	22	44	45	222	200	11	1110
12:00	321	214	21	43	60	214	193	11	1070
13:00	288	192	19	38	65	192	173	10	960
14:00	246	164	16	33	84	164	148	8	820
15:00	206	137	14	27	30	137	123	7	685
16:00	191	127	13	25	15	127	114	6	635
17:00	182	122	12	24	10	122	109	6	608
18:00	166	111	11	22	5	111	100	6	554
19:00	170	113	11	23	0	113	102	6	565
20:00	158	105	11	21	0	105	95	5	525
21:00	106	71	7	14	0	71	64	4	353
22:00	76	51	5	10	0	51	46	3	254
23:00	43	29	3	6	0	29	26	1	143
Total	2981	1988	199	398	497	1988	1789	99	

Table 3 Forecast travel demand - weekend

Time	Forecast Arrivals + Departures Per Hour (weekend)								
	Train / Metro	Walk only	Taxi / Uber / drop off	Bus	Coach	Car (park nearby)	Light rail	Bicycle	Total
7:00	14	15	1	3	1	25	11	1	70
8:00	46	48	5	9	5	80	34	2	230
9:00	126	133	13	25	13	221	95	6	632
10:00	211	221	21	42	21	369	158	11	1055
11:00	267	280	27	53	27	466	200	13	1333
12:00	257	270	26	51	26	449	193	13	1284
13:00	217	227	22	43	22	379	162	11	1083
14:00	166	174	17	33	17	290	124	8	828
15:00	132	138	13	26	13	230	99	7	659
16:00	122	128	12	24	12	213	91	6	609
17:00	173	181	17	35	17	302	130	9	864
18:00	165	174	17	33	17	289	124	8	826
19:00	161	169	16	32	16	282	121	8	806
20:00	128	134	13	26	13	224	96	6	640
21:00	99	104	10	20	10	173	74	5	493
22:00	62	65	6	12	6	108	46	3	309
23:00	34	36	3	7	3	60	26	2	171
Total	2378	2497	238	476	238	4162	1784	119	

Appendix B: Vehicle Swept Paths

