OxSRFI

OXFORDSHIRE

STRATEGIC RAIL FREIGHT INTERCHANGE

Applicant's Responses To Local Impact Report

Appendix 2 - Car Parking Technical Note

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On behalf of

Oxfordshire Railfreight Limited

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OXFORDSHIRE SRFI
CAR PARKING

Introduction

1. The National Networks National Policy Statement (NPS) is the relevant policy guidance for Nationally Significant Infrastructure Projects (NSIPs). SRFIs are defined as NSIPs, and are required to consist of a rail terminal and warehousing to enable a shift of freight from road to rail, and to support economic and environmental policy objectives defined by the NPS. The NPS is explicit about the types of locations required for SRFIs, with a major emphasis on the "*essential*" importance of SRFI connectivity to both strategic road and rail networks (NPS paragraph 3.100).

2. The NPS states at paragraph 4.81 (added emphasis) *"Given their strategic nature, it is important that new SRFIs or proposed extensions to Rail Freight Interchanges upgrading them to SRFIs are* ***appropriately located*** *relative to the markets they will serve, which will focus largely on major urban centres, or groups of centres, and key supply chain routes. The majority of freight movements by rail will end with transport by road to the final destination so, proposed new rail freight interchanges should have good road access, and* ***provide appropriate parking and associated facilities for those using the interchange*** *to ensure Heavy Goods Vehicle driver wellbeing is observed, as this will allow rail to effectively compete with, and work alongside, road freight to achieve a modal shift to rail. Due to these requirements,* ***it may be that countryside locations are required for SRFI****".* The NPS also recognises that: "*SRFIs tend to be* ***large scale commercial operations****, which are most likely to need continuous working arrangements (up to 24 hours). By necessity they involve large structures, buildings and the operation of heavy machinery*." (NPS paragraph 4.83). The NPS therefore directs SRFI schemes to certain types of locations, geared around strategic connectivity.

3. Consistent with the above, to ensure good access to the strategic road and rail networks, OxSRFI is located to the southwest of M40 Junction 10 and immediately adjacent to the Chiltern Main Line Railway, and where it can accommodate the 'large-scale' commercial operations required and expected of an SRFI. The site is in a countryside location, albeit in a context which includes consented major residential led mixed-use redevelopment nearby at Heyford Park in addition to those strategic infrastructural features. Based on the scale and types of operations seen at other SRFIs, and consistent with the NPS, the proposal allows for 24 hr operations which would be underpinned by employee shifts, which has a direct effect on peak parking demand.

4. The Sustainable Transport Strategy and the Framework Travel Plan have been developed and agreed in consultation with OCC. These documents demonstrate the Applicant's commitment to provide new infrastructure to improve and enhance sustainable travel connectivity to the nearby urban areas and communities and reduce car trips in place of increased trips by sustainable modes of travel. These measures will reduce the need for car parking at the Proposed Development by 26% from the assessed baseline and is consistent with NPS paragraph 5.278 which states *"…Mitigating measures should also look to reduce the need for any parking associated with the proposal…".* However, despite those measures, the Applicant is concerned that the rigid application of OCC's local parking standards[1] – which set out an expected upper limit (maximum) of 1 car parking space per 300 sqm of building floor space - is not appropriate for the locational characteristics that are specific to this NSIP, nor with the need to enable 24hr shift-working, and is inconsistent with the defined ambitious (but achievable) modal shift targets.

[1] Parking Standards for New Development, Oxfordshire County Council

5. In short, as an NSIP, the proposed development has a specific combination of operational and locational requirements – recognised by the NPS which provides national policy specifically for NSIPs - which do not apply equally to all 'distribution' (B8) schemes or proposals.

6. Adherence to OCC's upper limit for car parking spaces would result in a substantial risk of car parking under provision at the Proposed Development. This could lead to car parking overspilling to estate roads, or nearby village locations. This would not only have an adverse impact on the efficient operation of the Proposed Development but would also likely have an adverse effect for local communities.

7. The Applicant has developed in consultation with OCC a package of sustainable travel measures to reduce the need for parking associated with the Proposed Development and is seeking to provide an appropriate amount of car parking to meet the residual car parking requirements and ensure there are no adverse parking impacts. To achieve this, the Applicant proposes an upper limit car parking ratio of 1 space per 200 sqm of building floor area (pro-rata for mezzanine floor space[2]).

8. This technical note sets out the assessment work that supports that position. It demonstrates that the OCC upper limit car parking ratio would lead to an under provision of car parking at the Proposed Development. It provides evidence - via car parking accumulation assessments - demonstrating that the proposed ratio of 1 space per 200 sqm of building floor area would be appropriate to accommodate the residual peak parking demand after the effects of the Travel Plan have been considered, whilst still being sufficiently low to support the goals of the Travel Plan to reduce car use and increase journeys by sustainable travel modes.

9. While the OCC standards remain the adopted basis for non-NSIP proposals, the evidence below identifies why there are specific national policy and operational drivers which make an alternative approach to parking provision appropriate and necessary in this case.

Assessment

10. It is important that the Proposed Development provides sufficient car parking to accommodate the residual car parking demand once the effects of the sustainable travel improvements and Travel Plan are considered.

11. For large scale logistic sites such as this, the residual peak car parking demand will generally occur during daytime shift change times, when there is an overlap between the office workers and shift workers. During these periods, car parking spaces are occupied by office staff and staff working shifts, and the peak parking demand is generated by further shift workers arriving for their shift and requiring a car parking place prior to spaces being vacated by the previous shift.

12. To understand the potential parking demand that could be generated by OxSRFI, a car parking accumulation exercise has been undertaken. The car parking accumulation uses the agreed daily person trip generation profile (excluding HGV drivers) for the Proposed Development (Table 9 of TN3 'Trip Generation', which is Appendix 7 of the Transport Assessment (TA)).

13. The car parking accumulation considers the effect of the sustainable travel improvements and Travel Plan on reducing the demand for car parking. To illustrate this, the baseline and agreed car

[2] Mezzanine floor space is assessed as generating 50% of the trip generation of standard floor space and hence a pro rata approach to car parking is taken, i.e. mezzanine floor space requires 50% of the parking.

driver modal share targets given in **Table 1** have been applied to the daily person trip generation profile (excluding HGV drivers) to give the resultant car driver trips[3].

Table 1: Modal share targets extracted from the agreed Framework Travel Plan

Mode	Baseline	Year 1 (Opening)	Year 3	Year 4 (Completion)
Car driver	92%	82%	73%	68%

14. The car parking accumulation assessment is presented at **Appendices A** and **B**. As discussed above, the interaction and overlap of shifts with other shifts and office staff directly influences the car parking demand. TN3 (TA Appendix 7) provides a breakdown of the typical split between job types at large scale logistic facilities and confirms that warehousing staff typically comprise 50% of the workforce and would be expected to work shifts to facilitate 24-hour operation, seven days per week. Hence the car parking accumulation assumes 50% of the employees would work shifts.

15. In terms of car parking accumulation, it is necessary to input a starting car parking occupancy. That will depend on the car parking demand over the nighttime period, which in turn is related to the shift structure. Typical 3 shifts systems are 0600 to 1400 hours, 1400 to 2200 hours, and 2200 to 0600 hours. Typical 2 shifts systems operate a 12-hour system, for example from 0700 to 1900 hours and from 1900 to 0700 hours. Office staff typically work more conventional daytime hours, for example 0900 to 1700 hours. Accordingly, the nighttime shift working set out in **Table 2** has been modelled in the car parking accumulation.

Table 2: Nighttime shift working assumptions

Scenario	Description
A	Equal split (1/3 of warehousing staff work nightshift)
B	Reduced nightshift (1/4 of warehousing staff work nightshift)

16. The resulting residual car parking accumulation for Scenario A is provided at **Appendix A** and the equivalent parking accumulation assessments for Scenario B is given at **Appendix B**.

17. The results show that the greatest car parking demand would occur between 0800 and 1500 hours. **Table 3** summarises the residual peak car parking demand at the Proposed Development for the scenarios considered (based on the car driver modal share being applied to the total person trip generations).

Table 3: residual peak car parking space demand based on car driver modal share and nightshift scenario

Driver modal share		Residual peak car parking demand (in spaces)	
		Shift Scenario A	Shift Scenario B
		1/3 nightshift	1/4 nightshift
Baseline	92%	4189	3820
Opening Year	82%	3733	3404
Year 3	73%	3324	3031
Completion Year	68%	3096	2824

18. The implementation of the agreed package of sustainable travel measures and other initiatives set out in the Framework Travel Plan are forecast to have a significant positive impact on reducing the

[3] Note: to allow for the effect of the Sustainable Travel Strategy and Travel Plan to be understood, the car driver modal share has been applied to the total person trips assuming that the whole development is operational. Whereas only part of the development would be operational in the opening year, for example. For this reason, the summary of results presented at Tables 5 and 6 later in this TN are expressed both as the 'difference in number of car parking spaces' compared to the peak demand, and as a '% of the peak demand'. The difference in car parking spaces is an absolute value that would change depending on the amount of development occupied and hence peak parking demand, whereas the '% of the demand' remains fixed regardless of the amount of development occupied.

car parking demand at OxSRFI. As shown in **Table 3**, there would be a reduction in demand of 1,093 car parking spaces from the baseline car driver modal share to the Completion Year car driver modal share under Scenario A, and a reduction of 996 car parking spaces from the baseline to the Completion Year in Scenario B. In both cases, this is a 26% reduction in car parking space demand from the baseline.

19. The expected upper limit of car parking spaces that would be permitted under OCC's car parking standards, and the upper limit of car parking spaces that is proposed by the Applicant (based on 1 car parking space per 200 sqm GFA ratio) is provided at **Table 4.**

Table 4: upper limit of car parking spaces based on OCC standards and as proposed by Applicant

GFA (sqm)		Car space ratio/sqm		Upper limit of car parking spaces	
		OCC standards	Proposed	OCC standards	Proposed
Standard	603850	300	200	2013	3019
Mezzanine	201283	600*	400*	335	503
Total				**2348**	**3522**

*mezzanine space is assessed as generating 50% of the trip generation of standard floor space and hence a pro rata approach to car parking is taken, i.e. mezzanine floor space requires 50% of the parking.

20. **Tables 5** and **6** summarise and compare the residual peak car parking demand from **Table 3** with the upper limit of car parking spaces given in **Table 4**, based on OCC's parking standards, and as proposed by the Applicant, respectively. The full calculations are provided at **Appendix A** and **B**, respectively.

Table 5: difference between OCC's upper limit and peak residual car parking demand

Driver modal share		Difference between OCC's upper limit and peak residual demand			
		Shift scenario A (1/3 nightshift)		Shift scenario B (1/4 nightshift)	
		spaces	as % of demand	spaces	as % of demand
Baseline	92%	-1841	-44%	-1472	-39%
Opening Year	82%	-1385	-37%	-1056	-31%
Year 3	73%	-976	-29%	-683	-23%
Completion Year	68%	-747	-24%	-475	-17%

Table 6: difference between Applicant's proposed upper limit and peak residual car parking demand

Driver modal share		Difference between Applicant's proposed upper limit and peak residual demand			
		Shift scenario A (1/3 nightshift)		Shift scenario B (1/4 nightshift)	
		spaces	as % of demand	spaces	as % of demand
Baseline	92%	-667	-16%	-298	-8%
Opening Year	82%	-211	-6%	118	3%
Year 3	73%	199	6%	492	16%
Completion Year	68%	427	14%	699	25%

21. As shown by the results summarised at **Table 5**, despite the 26% reduction in parking demand that would be achieved at the Proposed Development due to the implementation of the Sustainable Transport Strategy and Framework Travel Plan, the residual car parking demand would exceed the expected upper maximum number of car parking spaces based on OCC's parking standards. During the opening year, application of OCC's standards could mean a shortfall of up to 1,385 car parking spaces, or 37%. In the Completion Year, with the agreed driver modal share of 68% established, the assessment indicates that there could remain a shortfall of up to 747 car parking spaces, a shortfall of up to 24%. Such a shortfall could lead to parking overspilling to estate roads, or nearby village locations. This would not only have an adverse impact on the efficient operation of the Proposed Development but would also likely have an adverse effect for local communities.

22. In contrast, the results summarised at **Table 6**, show that the Applicant's proposed upper limit for car parking spaces of 1 space per 200 sqm of floor space, would accommodate the residual peak car parking demand in the Completion Year, whilst remaining sufficiently low to encourage the uptake by staff of the proposed package of sustainable transport measures from the start of occupation of the Proposed Development.

Conclusion

23. OxSRFI must provide enough parking to meet residual demand after the agreed sustainable transport measures and Framework Travel Plan have taken effect. Those measures are forecast to reduce car-driver mode share from 92% at baseline to 68% by the Completion Year, reducing peak parking demand by 26% under both modelled nightshift scenarios. With this reduction, the residual Completion Year peak car parking demand is forecast at between 2,824 and 3,096 spaces.

24. Applying OCC's local standards would limit car parking provision to 2,348 spaces and create a Completion Year shortfall of up to 747 spaces, equivalent to 24% of demand. This level of under-provision would create a material risk of overspill parking on estate roads and in nearby communities. This would not only have an adverse impact on the efficient operation of the Proposed Development but could also have an adverse effect for local communities.

25. The Applicant's proposed upper limit of one space per 200 sqm of floor space and one space per 400 sqm of mezzanine floor space would allow up to 3,522 car parking spaces. Although this proposed ratio would not accommodate baseline demand before travel-plan benefits are realised, it would broadly meet demand from opening and provide a Completion Year reserve of 427 spaces, equivalent of 14% of demand. It therefore represents an appropriate and proportionate balance: sufficient to accommodate forecast residual peak demand and prevent harmful overspill, while remaining constrained enough to support the Travel Plan's objectives of reducing car use and increasing travel by sustainable modes. The proposed ratio should therefore be accepted in place of rigid application of OCC's local standard, which is not appropriate due to the locational characteristics that are specific to this NSIP.

26. While the OCC standards remain the adopted basis for non-NSIP proposals, the evidence presented identifies why there are specific national policy and operational drivers which make an alternative approach to parking provision appropriate and necessary in this case.

ADC Infrastructure Ltd
18/09/2026

APPENDIX A

Car parking accumulation – scenario A

Time Window	Person Trip** (excluding HGV drivers)			Person Trip (HGV driver)			Total Person Trips		
	Arrive	Depart	Two-way	Arrive	Depart	Two-way	Arrive	Depart	Two-way
00.00-01.00	83	59	141	52	80	133	135	139	274
01.00-02.00	53	17	71	76	75	150	129	92	221
02.00-03.00	36	136	172	80	80	160	116	216	331
03.00-04.00	59	76	135	54	83	138	113	159	273
04.00-05.00	188	89	277	76	51	127	264	140	404
05.00-06.00	1334	635	1968	118	75	193	1452	710	2162
06.00-07.00	629	480	1110	128	67	195	758	547	1305
07.00-08.00	723	229	952	124	157	280	847	386	1233
08.00-09.00	982	105	1087	172	159	331	1154	264	1418
09.00-10.00	471	147	617	122	113	235	592	260	852
10.00-11.00	365	223	588	140	151	291	505	373	879
11.00-12.00	276	205	482	127	123	250	403	328	731
12.00-13.00	400	447	847	108	98	207	508	545	1053
13.00-14.00	670	471	1140	89	132	220	758	602	1360
14.00-15.00	317	734	1051	102	149	252	420	883	1303
15.00-16.00	183	905	1088	75	122	197	258	1028	1285
*16.00-17.00**	236	876	1112	132	89	221	368	965	1333
*17.00-18.00**	324	1128	1452	157	143	300	481	1271	1752
18.00-19.00	723	717	1440	120	102	222	843	819	1662
19.00-20.00	105	271	376	101	73	174	206	344	550
20.00-21.00	123	141	264	106	87	193	229	229	457
21.00-22.00	299	105	404	68	96	164	367	201	568
22.00-23.00	24	216	240	63	76	138	86	292	379
23.00-00.00	17	65	83	70	80	150	87	145	233
Totals	**8618**	**8479**	**17098**	**2459**	**2461**	**4920**	**11077**	**10941**	**22018**

* light vehicle generation for 1600 to 1700 hrs from Table 3 and 3A swapped with 1700 to 1800 hrs generation to ensure worst case shoulder peak is assessed

**Based on Swan Valley Single vehicle occupancy of 92%

Table 9: Total OxSRFI person trips

Scenario A (1/3 nighttime shift working) 92% car driver modal share

Time Window	Predicted Traffic Profiles for OxSRFI with Travel Plan								
	Light vehicles			Heavy vehicles			Total vehicles		
	Arrive	Depart	Two-way	Arrive	Depart	Two-way	Arrive	Depart	Two-way
00.00-01.00	76	54	130						
01.00-02.00	49	16	65						
02.00-03.00	33	125	158						
03.00-04.00	54	70	124						
04.00-05.00	173	82	255						
05.00-06.00	1227	584	1811						
06.00-07.00	579	442	1021						
07.00-08.00	665	211	876						
08.00-09.00	903	97	1000						
09.00-10.00	433	135	568						
10.00-11.00	336	205	541						
11.00-12.00	254	189	443						
12.00-13.00	368	411	779						
13.00-14.00	616	433	1049						
14.00-15.00	292	675	967						
15.00-16.00	168	833	1001						
*16.00-17.00**	217	806	1023						
*17.00-18.00**	298	1038	1336						
18.00-19.00	665	660	1325						
19.00-20.00	97	249	346						
20.00-21.00	113	130	243						
21.00-22.00	275	97	372						
22.00-23.00	22	199	221						
23.00-00.00	16	60	76						
Totals	**7929**	**7801**	**15730**						

* light vehicle generation for 1600 to 1700 hrs from Table 3 and 3A swapped with 1700 to 1800 hrs generation to ensure worst case shoulder peak is assessed

Travel Plan car driver target 92.0%

Time Window	Net change in car parking demand	Car parking accumulation (OCC)	Car parking accumulation (Proposed)
		1477	1477
00.00-01.00	22	1499	1499
01.00-02.00	33	1532	1532
02.00-03.00	-92	1440	1440
03.00-04.00	-16	1424	1424
04.00-05.00	91	1515	1515
05.00-06.00	643	2158	2158
06.00-07.00	137	2295	2295
07.00-08.00	454	2749	2749
08.00-09.00	806	3555	3555
09.00-10.00	298	3853	3853
10.00-11.00	131	3984	3984
11.00-12.00	65	4049	4049
12.00-13.00	-43	4006	4006
13.00-14.00	183	4189	4189
14.00-15.00	-383	3806	3806
15.00-16.00	-665	3141	3141
16.00-17.00*	-589	2552	2552
17.00-18.00*	-740	1812	1812
18.00-19.00	5	1817	1817
19.00-20.00	-152	1665	1665
20.00-21.00	-17	1648	1648
21.00-22.00	178	1826	1826
22.00-23.00	-177	1649	1649
23.00-00.00	-44	1605	1605

	OCC (max) 1/300sqm	Proposed (max) 1/200sqm
max nuber of car parking spaces	2348	3522
difference from demand	-1841	**-667**
% difference	-44%	-16%

Calculation of max car parking numbers

GFA (sqm)		Car space ratio/sqm		Car parking spaces	
		OCC	Proposed	OCC	Proposed
Standard	603850	300	200	2013	3019
Mezz	201283	600	400	335	503
Total				**2348**	**3522**

Shift working			
total employees	9631	emoployeed in warehouse	50%
therefore			
warehouse staff are	4816	overnight shift	33%
night shift therefore:	1605		
apply target car modal split	1477	overnight parking demand	

Scenario A (1/3 nighttime shift working) 82% car driver modal share

Time Window	Predicted Traffic Profiles for OxSRFI with Travel Plan								
	Light vehicles			Heavy vehicles			Total vehicles		
	Arrive	Depart	Two-way	Arrive	Depart	Two-way	Arrive	Depart	Two-way
00.00-01.00	68	48	116						
01.00-02.00	44	14	58						
02.00-03.00	29	111	141						
03.00-04.00	48	62	111						
04.00-05.00	154	73	227						
05.00-06.00	1094	521	1614						
06.00-07.00	516	394	910						
07.00-08.00	593	188	781						
08.00-09.00	805	86	891						
09.00-10.00	386	120	506						
10.00-11.00	299	183	482						
11.00-12.00	226	168	395						
12.00-13.00	328	366	694						
13.00-14.00	549	386	935						
14.00-15.00	260	602	862						
15.00-16.00	150	742	892						
*16.00-17.00**	193	718	912						
*17.00-18.00**	266	925	1191						
18.00-19.00	593	588	1181						
19.00-20.00	86	222	308						
20.00-21.00	101	116	217						
21.00-22.00	245	86	332						
22.00-23.00	20	177	197						
23.00-00.00	14	53	68						
Totals	**7067**	**6953**	**14020**						

* light vehicle generation for 1600 to 1700 hrs from Table 3 and 3A swapped with 1700 to 1800 hrs generation to ensure worst case shoulder peak is assessed

Travel Plan car driver target 82.0%

Time Window	Net change in car parking demand	Car parking accumulation (OCC)	Car parking accumulation (Proposed)
		1316	1316
00.00-01.00	20	1336	1336
01.00-02.00	29	1365	1365
02.00-03.00	-82	1283	1283
03.00-04.00	-14	1269	1269
04.00-05.00	81	1350	1350
05.00-06.00	573	1923	1923
06.00-07.00	122	2045	2045
07.00-08.00	405	2450	2450
08.00-09.00	718	3168	3168
09.00-10.00	266	3434	3434
10.00-11.00	117	3551	3551
11.00-12.00	58	3608	3608
12.00-13.00	-38	3570	3570
13.00-14.00	163	3733	3733
14.00-15.00	-341	3392	3392
15.00-16.00	-593	2799	2799
16.00-17.00*	-525	2274	2274
17.00-18.00*	-660	1615	1615
18.00-19.00	4	1619	1619
19.00-20.00	-135	1484	1484
20.00-21.00	-15	1468	1468
21.00-22.00	159	1627	1627
22.00-23.00	-158	1469	1469
23.00-00.00	-39	1430	1430

	OCC (max) 1/300sqm	Proposed (max) 1/200sqm
max nuber of car parking spaces	2348	3522
difference from demand	-1385	**-211**
% difference	-37%	-6%

Calculation of max car parking numbers

GFA (sqm)		Car space ratio/sqm		Car parking spaces	
		OCC	Proposed	OCC	Proposed
Standard	603850	300	200	2013	3019
Mezz	201283	600	400	335	503
Total				**2348**	**3522**

Shift working			
total employees	9631	emoployeed in warehouse	50%
therefore			
warehouse staff are	4816	overnight shift	33%
night shift therefore:	1605		
apply target car modal split	1316	overnight parking demand	

Scenario A (1/3 nighttime shift working) 73% car driver modal share

Time Window	Predicted Traffic Profiles for OxSRFI with Travel Plan								
	Light vehicles			Heavy vehicles			Total vehicles		
	Arrive	Depart	Two-way	Arrive	Depart	Two-way	Arrive	Depart	Two-way
00.00-01.00	60	43	103						
01.00-02.00	39	13	52						
02.00-03.00	26	99	125						
03.00-04.00	43	56	98						
04.00-05.00	137	65	202						
05.00-06.00	974	463	1437						
06.00-07.00	459	351	810						
07.00-08.00	528	167	695						
08.00-09.00	717	77	793						
09.00-10.00	344	107	451						
10.00-11.00	267	163	429						
11.00-12.00	202	150	352						
12.00-13.00	292	326	618						
13.00-14.00	489	344	832						
14.00-15.00	232	536	767						
15.00-16.00	133	661	794						
*16.00-17.00**	172	640	812						
*17.00-18.00**	236	824	1060						
18.00-19.00	528	524	1051						
19.00-20.00	77	198	275						
20.00-21.00	90	103	193						
21.00-22.00	218	77	295						
22.00-23.00	17	158	175						
23.00-00.00	13	48	60						
Totals	**6291**	**6190**	**12481**						

* light vehicle generation for 1600 to 1700 hrs from Table 3 and 3A swapped with 1700 to 1800 hrs generation to ensure worst case shoulder peak is assessed

Travel Plan car driver target 73.0%

Time Window	Net change in car parking demand	Car parking accumulation (OCC)	Car parking accumulation (Proposed)
		1172	1172
00.00-01.00	17	1189	1189
01.00-02.00	26	1216	1216
02.00-03.00	-73	1143	1143
03.00-04.00	-13	1130	1130
04.00-05.00	72	1202	1202
05.00-06.00	510	1712	1712
06.00-07.00	109	1821	1821
07.00-08.00	360	2181	2181
08.00-09.00	640	2821	2821
09.00-10.00	236	3057	3057
10.00-11.00	104	3161	3161
11.00-12.00	52	3213	3213
12.00-13.00	-34	3179	3179
13.00-14.00	145	3324	3324
14.00-15.00	-304	3020	3020
15.00-16.00	-528	2492	2492
16.00-17.00*	-467	2025	2025
17.00-18.00*	-587	1438	1438
18.00-19.00	4	1442	1442
19.00-20.00	-121	1321	1321
20.00-21.00	-13	1308	1308
21.00-22.00	141	1449	1449
22.00-23.00	-140	1308	1308
23.00-00.00	-35	1274	1274

	OCC (max) 1/300sqm	Proposed (max) 1/200sqm
max nuber of car parking spaces	2348	3522
difference from demand	-976	**199**
% difference	-29%	6%

Calculation of max car parking numbers

GFA (sqm)		Car space ratio/sqm		Car parking spaces	
		OCC	Proposed	OCC	Proposed
Standard	603850	300	200	2013	3019
Mezz	201283	600	400	335	503
Total				**2348**	**3522**

Shift working			
total employees	9631	emoployeed in warehouse	50%
therefore			
warehouse staff are	4816	overnight shift	33%
night shift therefore:	1605		
apply target car modal split	1172	overnight parking demand	

Scenario A (1/3 nighttime shift working) 68% car driver modal share

Time Window	Predicted Traffic Profiles for OxSRFI with Travel Plan								
	Light vehicles			Heavy vehicles			Total vehicles		
	Arrive	Depart	Two-way	Arrive	Depart	Two-way	Arrive	Depart	Two-way
00.00-01.00	56	40	96						
01.00-02.00	36	12	48						
02.00-03.00	24	92	117						
03.00-04.00	40	52	92						
04.00-05.00	128	61	188						
05.00-06.00	907	432	1339						
06.00-07.00	428	327	755						
07.00-08.00	492	156	647						
08.00-09.00	667	72	739						
09.00-10.00	320	100	420						
10.00-11.00	248	152	400						
11.00-12.00	188	140	327						
12.00-13.00	272	304	576						
13.00-14.00	455	320	775						
14.00-15.00	216	499	715						
15.00-16.00	124	616	740						
*16.00-17.00**	160	596	756						
*17.00-18.00**	220	767	987						
18.00-19.00	492	488	979						
19.00-20.00	72	184	256						
20.00-21.00	84	96	180						
21.00-22.00	203	72	275						
22.00-23.00	16	147	163						
23.00-00.00	12	44	56						
Totals	**5861**	**5766**	**11627**						

* light vehicle generation for 1600 to 1700 hrs from Table 3 and 3A swapped with 1700 to 1800 hrs generation to ensure worst case shoulder peak is assessed

Travel Plan car driver target 68.0%

Time Window	Net change in car parking demand	Car parking accumulation (OCC)	Car parking accumulation (Proposed)
		1091	1091
00.00-01.00	16	1107	1107
01.00-02.00	24	1132	1132
02.00-03.00	-68	1064	1064
03.00-04.00	-12	1052	1052
04.00-05.00	67	1119	1119
05.00-06.00	475	1594	1594
06.00-07.00	101	1696	1696
07.00-08.00	336	2031	2031
08.00-09.00	596	2627	2627
09.00-10.00	220	2847	2847
10.00-11.00	97	2944	2944
11.00-12.00	48	2992	2992
12.00-13.00	-32	2960	2960
13.00-14.00	135	3096	3096
14.00-15.00	-283	2812	2812
15.00-16.00	-492	2321	2321
16.00-17.00*	-435	1886	1886
17.00-18.00*	-547	1339	1339
18.00-19.00	4	1342	1342
19.00-20.00	-112	1230	1230
20.00-21.00	-13	1217	1217
21.00-22.00	132	1349	1349
22.00-23.00	-131	1218	1218
23.00-00.00	-33	1186	1186

	OCC (max) 1/300sqm	Proposed (max) 1/200sqm
max nuber of car parking spaces	2348	3522
difference from demand	-747	**427**
% difference	-24%	14%

Calculation of max car parking numbers

GFA (sqm)		Car space ratio/sqm		Car parking spaces	
		OCC	Proposed	OCC	Proposed
Standard	603850	300	200	2013	3019
Mezz	201283	600	400	335	503
Total				**2348**	**3522**

Shift working			
total employees	9631	emoployeed in warehouse	50%
therefore			
warehouse staff are	4816	overnight shift	33%
night shift therefore:	1605		
apply target car modal split	1091	overnight parking demand	

APPENDIX B

Car parking accumulation – scenario B

Time Window	Person Trip** (excluding HGV drivers)			Person Trip (HGV driver)			Total Person Trips		
	Arrive	Depart	Two-way	Arrive	Depart	Two-way	Arrive	Depart	Two-way
00.00-01.00	83	59	141	52	80	133	135	139	274
01.00-02.00	53	17	71	76	75	150	129	92	221
02.00-03.00	36	136	172	80	80	160	116	216	331
03.00-04.00	59	76	135	54	83	138	113	159	273
04.00-05.00	188	89	277	76	51	127	264	140	404
05.00-06.00	1334	635	1968	118	75	193	1452	710	2162
06.00-07.00	629	480	1110	128	67	195	758	547	1305
07.00-08.00	723	229	952	124	157	280	847	386	1233
08.00-09.00	982	105	1087	172	159	331	1154	264	1418
09.00-10.00	471	147	617	122	113	235	592	260	852
10.00-11.00	365	223	588	140	151	291	505	373	879
11.00-12.00	276	205	482	127	123	250	403	328	731
12.00-13.00	400	447	847	108	98	207	508	545	1053
13.00-14.00	670	471	1140	89	132	220	758	602	1360
14.00-15.00	317	734	1051	102	149	252	420	883	1303
15.00-16.00	183	905	1088	75	122	197	258	1028	1285
*16.00-17.00**	236	876	1112	132	89	221	368	965	1333
*17.00-18.00**	324	1128	1452	157	143	300	481	1271	1752
18.00-19.00	723	717	1440	120	102	222	843	819	1662
19.00-20.00	105	271	376	101	73	174	206	344	550
20.00-21.00	123	141	264	106	87	193	229	229	457
21.00-22.00	299	105	404	68	96	164	367	201	568
22.00-23.00	24	216	240	63	76	138	86	292	379
23.00-00.00	17	65	83	70	80	150	87	145	233
Totals	**8618**	**8479**	**17098**	**2459**	**2461**	**4920**	**11077**	**10941**	**22018**

* light vehicle generation for 1600 to 1700 hrs from Table 3 and 3A swapped with 1700 to 1800 hrs generation to ensure worst case shoulder peak is assessed

**Based on Swan Valley Single vehicle occupancy of 92%

Table 9: Total OxSRFI person trips

Scenario B (1/4 nighttime shift working) 92% car driver modal share

Time Window	Predicted Traffic Profiles for OxSRFI with Travel Plan								
	Light vehicles			Heavy vehicles			Total vehicles		
	Arrive	Depart	Two-way	Arrive	Depart	Two-way	Arrive	Depart	Two-way
00.00-01.00	76	54	130						
01.00-02.00	49	16	65						
02.00-03.00	33	125	158						
03.00-04.00	54	70	124						
04.00-05.00	173	82	255						
05.00-06.00	1227	584	1811						
06.00-07.00	579	442	1021						
07.00-08.00	665	211	876						
08.00-09.00	903	97	1000						
09.00-10.00	433	135	568						
10.00-11.00	336	205	541						
11.00-12.00	254	189	443						
12.00-13.00	368	411	779						
13.00-14.00	616	433	1049						
14.00-15.00	292	675	967						
15.00-16.00	168	833	1001						
*16.00-17.00**	217	806	1023						
*17.00-18.00**	298	1038	1336						
18.00-19.00	665	660	1325						
19.00-20.00	97	249	346						
20.00-21.00	113	130	243						
21.00-22.00	275	97	372						
22.00-23.00	22	199	221						
23.00-00.00	16	60	76						
Totals	**7929**	**7801**	**15730**						

* light vehicle generation for 1600 to 1700 hrs from Table 3 and 3A swapped with 1700 to 1800 hrs generation to ensure worst case shoulder peak is assessed

Travel Plan car driver target 92.0%

Time Window	Net change in car parking demand	Car parking accumulation (OCC)	Car parking accumulation (Proposed)
		1108	1108
00.00-01.00	22	1130	1130
01.00-02.00	33	1163	1163
02.00-03.00	-92	1071	1071
03.00-04.00	-16	1055	1055
04.00-05.00	91	1146	1146
05.00-06.00	643	1789	1789
06.00-07.00	137	1926	1926
07.00-08.00	454	2380	2380
08.00-09.00	806	3186	3186
09.00-10.00	298	3484	3484
10.00-11.00	131	3615	3615
11.00-12.00	65	3680	3680
12.00-13.00	-43	3637	3637
13.00-14.00	183	3820	3820
14.00-15.00	-383	3437	3437
15.00-16.00	-665	2772	2772
16.00-17.00*	-589	2183	2183
17.00-18.00*	-740	1443	1443
18.00-19.00	5	1448	1448
19.00-20.00	-152	1296	1296
20.00-21.00	-17	1279	1279
21.00-22.00	178	1457	1457
22.00-23.00	-177	1280	1280
23.00-00.00	-44	1236	1236

	OCC (max) 1/300sqm	Proposed (max) 1/200sqm
max nuber of car parking spaces	2348	3522
difference from demand	-1472	**-298**
% difference	-39%	-8%

Calculation of max car parking numbers

GFA (sqm)		Car space ratio/sqm		Car parking spaces	
		OCC	Proposed	OCC	Proposed
Standard	603850	300	200	2013	3019
Mezz	201283	600	400	335	503
Total				**2348**	**3522**

Shift working			
total employees	9631	emoployeed in warehouse	50%
therefore			
warehouse staff are	4816	overnight shift	25%
night shift therefore:	1204		
apply target car modal split	1108	overnight parking demand	

Scenario B (1/4 nighttime shift working) 82% car driver modal share

Time Window	Predicted Traffic Profiles for OxSRFI with Travel Plan								
	Light vehicles			Heavy vehicles			Total vehicles		
	Arrive	Depart	Two-way	Arrive	Depart	Two-way	Arrive	Depart	Two-way
00.00-01.00	68	48	116						
01.00-02.00	44	14	58						
02.00-03.00	29	111	141						
03.00-04.00	48	62	111						
04.00-05.00	154	73	227						
05.00-06.00	1094	521	1614						
06.00-07.00	516	394	910						
07.00-08.00	593	188	781						
08.00-09.00	805	86	891						
09.00-10.00	386	120	506						
10.00-11.00	299	183	482						
11.00-12.00	226	168	395						
12.00-13.00	328	366	694						
13.00-14.00	549	386	935						
14.00-15.00	260	602	862						
15.00-16.00	150	742	892						
*16.00-17.00**	193	718	912						
*17.00-18.00**	266	925	1191						
18.00-19.00	593	588	1181						
19.00-20.00	86	222	308						
20.00-21.00	101	116	217						
21.00-22.00	245	86	332						
22.00-23.00	20	177	197						
23.00-00.00	14	53	68						
Totals	**7067**	**6953**	**14020**						

* light vehicle generation for 1600 to 1700 hrs from Table 3 and 3A swapped with 1700 to 1800 hrs generation to ensure worst case shoulder peak is assessed

Travel Plan car driver target 82.0%

Time Window	Net change in car parking demand	Car parking accumulation (OCC)	Car parking accumulation (Proposed)
		987	987
00.00-01.00	20	1007	1007
01.00-02.00	29	1036	1036
02.00-03.00	-82	954	954
03.00-04.00	-14	940	940
04.00-05.00	81	1021	1021
05.00-06.00	573	1594	1594
06.00-07.00	122	1716	1716
07.00-08.00	405	2121	2121
08.00-09.00	718	2839	2839
09.00-10.00	266	3105	3105
10.00-11.00	117	3222	3222
11.00-12.00	58	3279	3279
12.00-13.00	-38	3241	3241
13.00-14.00	163	3404	3404
14.00-15.00	-341	3063	3063
15.00-16.00	-593	2470	2470
16.00-17.00*	-525	1945	1945
17.00-18.00*	-660	1286	1286
18.00-19.00	4	1290	1290
19.00-20.00	-135	1155	1155
20.00-21.00	-15	1139	1139
21.00-22.00	159	1298	1298
22.00-23.00	-158	1140	1140
23.00-00.00	-39	1101	1101

	OCC (max) 1/300sqm	Proposed (max) 1/200sqm
max nuber of car parking spaces	2348	3522
difference from demand	-1056	118
% difference	-31%	3%

Calculation of max car parking numbers

GFA (sqm)		Car space ratio/sqm		Car parking spaces	
		OCC	Proposed	OCC	Proposed
Standard	603850	300	200	2013	3019
Mezz	201283	600	400	335	503
Total				**2348**	**3522**

Shift working			
total employees	9631	emoployeed in warehouse	50%
therefore			
warehouse staff are	4816	overnight shift	25%
night shift therefore:	1204		
apply target car modal split	987	overnight parking demand	

Scenario B (1/4 nighttime shift working) 73% car driver modal share

Time Window	Predicted Traffic Profiles for OxSRFI with Travel Plan								
	Light vehicles			Heavy vehicles			Total vehicles		
	Arrive	Depart	Two-way	Arrive	Depart	Two-way	Arrive	Depart	Two-way
00.00-01.00	60	43	103						
01.00-02.00	39	13	52						
02.00-03.00	26	99	125						
03.00-04.00	43	56	98						
04.00-05.00	137	65	202						
05.00-06.00	974	463	1437						
06.00-07.00	459	351	810						
07.00-08.00	528	167	695						
08.00-09.00	717	77	793						
09.00-10.00	344	107	451						
10.00-11.00	267	163	429						
11.00-12.00	202	150	352						
12.00-13.00	292	326	618						
13.00-14.00	489	344	832						
14.00-15.00	232	536	767						
15.00-16.00	133	661	794						
*16.00-17.00**	172	640	812						
*17.00-18.00**	236	824	1060						
18.00-19.00	528	524	1051						
19.00-20.00	77	198	275						
20.00-21.00	90	103	193						
21.00-22.00	218	77	295						
22.00-23.00	17	158	175						
23.00-00.00	13	48	60						
Totals	**6291**	**6190**	**12481**						

* light vehicle generation for 1600 to 1700 hrs from Table 3 and 3A swapped with 1700 to 1800 hrs generation to ensure worst case shoulder peak is assessed

Travel Plan car driver target 73.0%

Time Window	Net change in car parking demand	Car parking accumulation (OCC)	Car parking accumulation (Proposed)
		879	879
00.00-01.00	17	896	896
01.00-02.00	26	923	923
02.00-03.00	-73	850	850
03.00-04.00	-13	837	837
04.00-05.00	72	909	909
05.00-06.00	510	1419	1419
06.00-07.00	109	1528	1528
07.00-08.00	360	1888	1888
08.00-09.00	640	2528	2528
09.00-10.00	236	2764	2764
10.00-11.00	104	2868	2868
11.00-12.00	52	2920	2920
12.00-13.00	-34	2886	2886
13.00-14.00	145	3031	3031
14.00-15.00	-304	2727	2727
15.00-16.00	-528	2199	2199
16.00-17.00*	-467	1732	1732
17.00-18.00*	-587	1145	1145
18.00-19.00	4	1149	1149
19.00-20.00	-121	1028	1028
20.00-21.00	-13	1015	1015
21.00-22.00	141	1156	1156
22.00-23.00	-140	1015	1015
23.00-00.00	-35	981	981

	OCC (max) 1/300sqm	Proposed (max) 1/200sqm
max nuber of car parking spaces	2348	3522
difference from demand	-683	**492**
% difference	-23%	16%

Calculation of max car parking numbers

GFA (sqm)		Car space ratio/sqm		Car parking spaces	
		OCC	Proposed	OCC	Proposed
Standard	603850	300	200	2013	3019
Mezz	201283	600	400	335	503
Total				**2348**	**3522**

Shift working			
total employees	9631	emoployeed in warehouse	50%
therefore			
warehouse staff are	4816	overnight shift	25%
night shift therefore:	1204		
apply target car modal split	879	overnight parking demand	

Scenario B (1/4 nighttime shift working) 68% car driver modal share

Time Window	Predicted Traffic Profiles for OxSRFI with Travel Plan								
	Light vehicles			Heavy vehicles			Total vehicles		
	Arrive	Depart	Two-way	Arrive	Depart	Two-way	Arrive	Depart	Two-way
00.00-01.00	56	40	96						
01.00-02.00	36	12	48						
02.00-03.00	24	92	117						
03.00-04.00	40	52	92						
04.00-05.00	128	61	188						
05.00-06.00	907	432	1339						
06.00-07.00	428	327	755						
07.00-08.00	492	156	647						
08.00-09.00	667	72	739						
09.00-10.00	320	100	420						
10.00-11.00	248	152	400						
11.00-12.00	188	140	327						
12.00-13.00	272	304	576						
13.00-14.00	455	320	775						
14.00-15.00	216	499	715						
15.00-16.00	124	616	740						
*16.00-17.00**	160	596	756						
*17.00-18.00**	220	767	987						
18.00-19.00	492	488	979						
19.00-20.00	72	184	256						
20.00-21.00	84	96	180						
21.00-22.00	203	72	275						
22.00-23.00	16	147	163						
23.00-00.00	12	44	56						
Totals	**5861**	**5766**	**11627**						

* light vehicle generation for 1600 to 1700 hrs from Table 3 and 3A swapped with 1700 to 1800 hrs generation to ensure worst case shoulder peak is assessed

Travel Plan car driver target 68.0%

Time Window	Net change in car parking demand	Car parking accumulation (OCC)	Car parking accumulation (Proposed)
		819	819
00.00-01.00	16	835	835
01.00-02.00	24	860	860
02.00-03.00	-68	792	792
03.00-04.00	-12	780	780
04.00-05.00	67	847	847
05.00-06.00	475	1322	1322
06.00-07.00	101	1424	1424
07.00-08.00	336	1759	1759
08.00-09.00	596	2355	2355
09.00-10.00	220	2575	2575
10.00-11.00	97	2672	2672
11.00-12.00	48	2720	2720
12.00-13.00	-32	2688	2688
13.00-14.00	135	2824	2824
14.00-15.00	-283	2540	2540
15.00-16.00	-492	2049	2049
16.00-17.00*	-435	1614	1614
17.00-18.00*	-547	1067	1067
18.00-19.00	4	1070	1070
19.00-20.00	-112	958	958
20.00-21.00	-13	945	945
21.00-22.00	132	1077	1077
22.00-23.00	-131	946	946
23.00-00.00	-33	914	914

	OCC (max) 1/300sqm	Proposed (max) 1/200sqm
max nuber of car parking spaces	2348	3522
difference from demand	-475	**699**
% difference	-17%	25%

Calculation of max car parking numbers

GFA (sqm)		Car space ratio/sqm		Car parking spaces	
		OCC	Proposed	OCC	Proposed
Standard	603850	300	200	2013	3019
Mezz	201283	600	400	335	503
Total				**2348**	**3522**

Shift working			
total employees	9631	emoployeed in warehouse	50%
therefore			
warehouse staff are	4816	overnight shift	25%
night shift therefore:	1204		
apply target car modal split	819	overnight parking demand	