Technical Note 230098-X-X-X-XXX-TN-DBFL-CE-0001

Subject:	M50 Junction 15 Interchange Modelling Assessment Note	**Prepared by:**	LP & DK
Title:	DLR ABTAs (Racecourse South Lands ABTA & Kiltiernan-Glenamuck ABTA)	**Checked by:**	DPM
Job No:	230098	**Date:**	Rev 0: 9th Oct 2024 Rev 1: 13th Feb 2025 Rev 2: 30th April 2025

1 INTRODUCTION

DBFL Consulting Engineers has been commissioned by Dún Laoghaire Rathdown County Council (DLRCC) to conduct modelling assessments of the M50 Junction 15 interchange. To evaluate the impact on the interchange from increased trip rates from Racecourse South Lands Area Based Transport Assessment (ABTA) and Kiltiernan-Glenamuck Area Based Transport Assessment (ABTA) as well as assessment the impact of implementing proposed signalised crossing to safely facilitate active travel movement across the interchange. This Technical Note summaries the modelling results from this assessment.

The M50 Junction 15 serves as the primary north-south crossing point for pedestrians, cyclists, public transport, and private vehicles over the M50 Motorway. The interchange comprises of the Carrickmines Interchange Overbridge and three roundabouts: Glenamuck Road North, Carrickmines North, and Carrickmines South.

The main tool used to extract the traffic flows was NTA's Regional Modelling System (RMS). The RMS is an ideal tool for providing existing and forecast strategic traffic flows, trip rates, public transport flows and the modal splits across five separate regions in Ireland. The study area is located within the Eastern Regional Model (ERM) of the RMS. The ERM is based on latest 2016 Census information (POWSCAR) and 2017 National Household Travel Survey (NTHS) data.

DBFL extracted the traffic flows from the 2024, 2028, and 2042 ERM model runs with the agreed forecast values, and the 2028 and 2042 ERM reference models. Certain flows have also been extracted from the traffic surveys carried out on Thursday 25th April 2024 by Innovation Data Solutions (IDASO).

This Technical Note presents the results of options assessments for Junction 15 in relation to Racecourse South Lands ABTA and Kiltiernan-Glenamuck ABTA. Two primary scenarios are evaluated:

- **Do Nothing Scenarios**, based on the NTA ERM Reference Modelling and no changes in the traffic network

- **Do Something Scenarios**, based on the NTA ERM Reference Modelling + DLRCC Modelling Projection + proposed signalised pedestrian/cyclist crossing points within the interchange

For the Do Something scenarios to improve the pedestrian/cyclist experience at each roundabout, 5 no. fully controlled crossing points are proposed across the M50 Junction 15 Interchange. The signalised roundabout layout is shown in **Figure 1.** The location of each crossing is as follows:

Carrickmines South Roundabout:

- On Glenamuck Road North facilitating access to Carrickmines P&R.

Carrickmines North Roundabout:

- On Glenamuck Road North facilitating access over the M50.

Glenamuck Road North Roundabout:

- On the M50 slip road facilitating a crossing onto Glenamuck Road South.
- On Glenamuck Road South crossing to Ballyogan Road.
- From the south side of Ballyogan Road crossing to the north side of the road

The Technical Note includes modelling results for signalised roundabouts based on the increased trip rates from Racecourse South Lands ABTA and Kiltiernan-Glenamuck ABTA based on DLRCC projections, received on 12th June 2024.

Figure 1: Map illustrating the Signalised M50 Junction 15 (Carrickmines Interchange), the Carrickmines Interchange Overbridge and the junction's three roundabouts

2 METHODOLOGY

The operational assessment of the local road network is to be undertaken using the Transport Research Laboratory (TRL) computer package TRANSYT for a signal-coordinated roundabout layout.

TRANSYT is an off-line computer program for studying everything from isolated road junctions to large signal-coordinated networks. TRANSYT produces optimised signal timings to progress platoons of traffic through a network. It is possible to model priority (non-signal controlled) intersections, including roundabouts within a TRANSYT model, but this is only appropriate where these intersections form part of a larger network comprised of signalised intersections.

DBFL extracted the traffic flows from the 2024, 2028, and 2042 ERM model runs with the agreed forecast values, and the 2028 and 2042 ERM reference models. Certain flows have also been extracted from the traffic surveys carried out on Thursday 25th April 2024 by Innovation Data Solutions (IDASO).

The time periods were chosen to reflect the peak hour periods in the morning and evening:

- AM Peak Period (08:00 – 09:00)
- PM Peak Period (17:00 – 18:00)

The scenarios as part of this assessment were:

Do Nothing

- **A1** - 2024 Traffic Flows based on the NTA ERM Reference Modelling and no changes in the traffic network
- **A2** – 2028 Traffic Flows based on the NTA ERM Reference Modelling and no changes in the traffic network
- **A3** – 2042 Traffic Flows based on the NTA ERM Reference Modelling and no changes in the traffic network

Do Something

- **B1** – 2028 Traffic Flow based on the NTA ERM Reference Modelling + DLRCC Modelling Projection + proposed signalised pedestrian/cyclist crossing points within the interchange
- **B2** – 2042 Traffic Flow based on the NTA ERM Reference Modelling + DLRCC Modelling Projection + proposed signalised pedestrian/cyclist crossing points within the interchange

3 THE M50 JUNCTION 15 – DESCRIPTION IN TRANSYT

The operational performance of the M50 Junction 15 interchange including Glenamuck Road North Roundabout, Carrickmines North and Carrickmines South Roundabouts has been assessed using TRANSYT of Transport Research Laboratory (TRL) computer package. In the "Do Nothing" and "Do Something" scenarios, all arms of these three roundabouts were labelled as follows:

Carrickmines South Roundabout

- **Arm 1:** M50 Link (S)
- **Arm 2:** Glenamuck Road North (W)
- **Arm 3:** Glenamuck Road North (N)
- **Arm 4:** Local Link (E)

Figure 2 shows the existing and proposed layout of Carrickmines North Roundabout.

Figure 2 Existing and proposed Layout of the Carrickmines South Roundabout

Carrickmines North Roundabout

- **Arm 1:** Glenamuck Road North(S)
- **Arm 2:** M50 Link (W)
- **Arm 3:** Local Link (N)
- **Arm 4:** Glenamuck Road North (E)

Figure 3 shows the existing and proposed layout of Carrickmines North Roundabout.

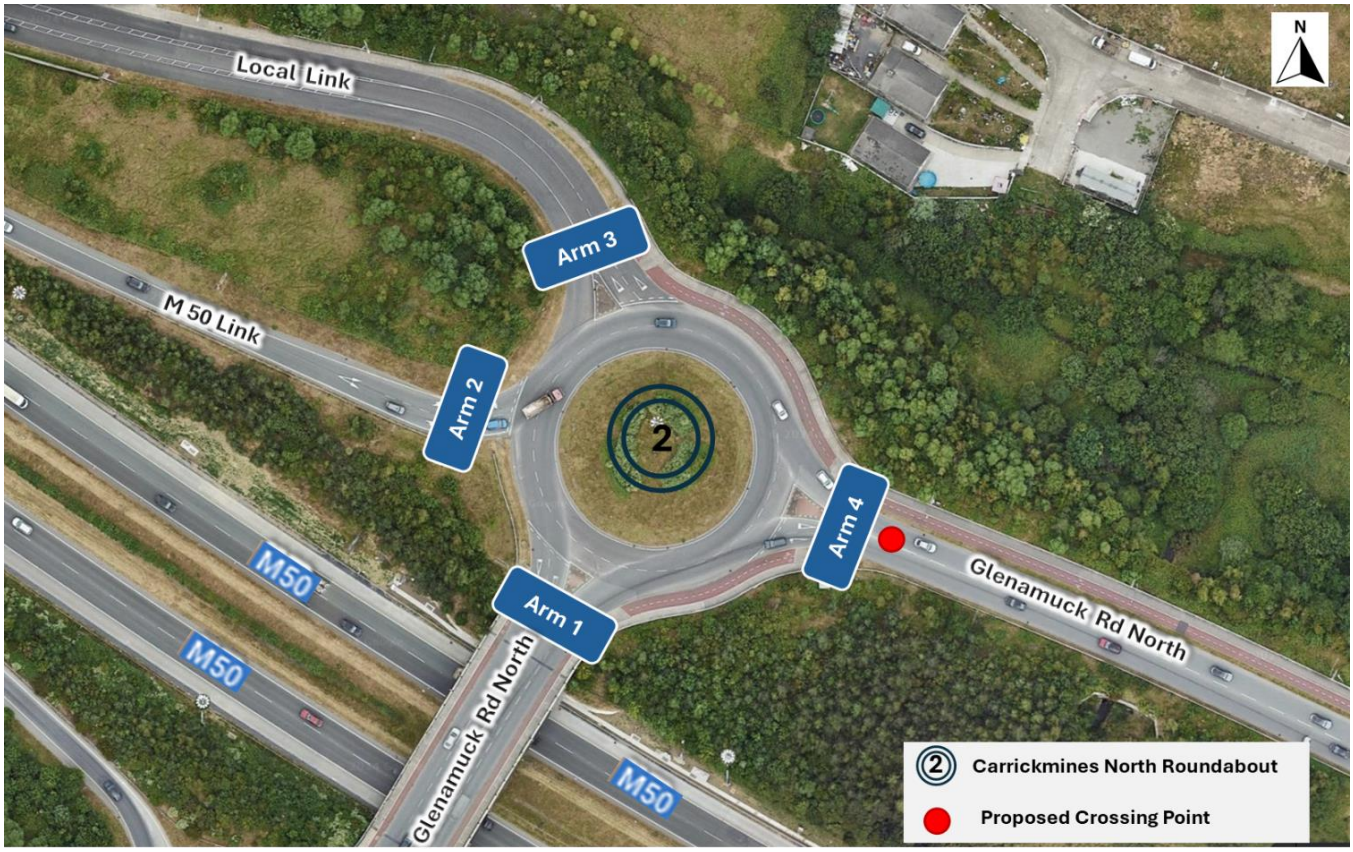


Figure 3 Existing and Proposed Layout of the Carrickmines North Roundabout

Glenamuck Road North Roundabout

- **Arm 1:** Glenamuck Road (S)
- **Arm 2:** Ballyogan Road (W)
- **Arm 3:** M50 Link (NW)
- **Arm 4:** Glenamuck Road North (N)
- **Arm 5:** M50 Link (E)

Figure 4 shows the existing and proposed layout of Carrickmines North Roundabout.

Figure 4 Existing and Proposed Layout of the Glenamuck Road North Roundabout

4 TRANSYT RESULTS

4.1 TRANSYT results for Carrickmines South Roundabout

The TRANSYT results for the capacity analysis at this roundabout found that this roundabout will operate within capacity in all the scenarios during the AM peak hour period.

The highest Degree of Saturation (DoS) during the AM peak was recorded at 73%, with a mean maximum queue of 13.47 Passenger Car Units (Pcus) observed on Arm 3 (Glenamuck Road North) under the 2028 Do Something scenario. Similarly, 2042 Do Something show similar results, with a DoS of 72% and a mean max queue of 12.7 PCUs.

During the PM peak period, the highest DoS reached 77%, again on Arm 3, with 16.48 pcus mean maximum queue based on the 2042 Do Something scenario.

In contrast, Arm 4 (Local Link) consistently exhibited the lowest DoS, with 25% during the PM peak and only 6% during the AM peak. It is noted that Arm 4 is connected to the Carrickmines Luas Park & Ride.

Table 1 summarises the overall TRANSYT results from the analysis undertaken where the highest percentage of Dos with corresponding mean max queue in each scenario during AM and PM peak period.

Period	(Year) Scenario	Arm	Highest DoS (%)	Mean max queue (pcu)
AM	2024	3	66	0.62
	2028 _DN	3	66	0.62
	2028_DS	3	73	13.47
	2042 _DN	3	64	0.58
	2042_DS	3	72	12.7
PM	2024	3	70	0.8
	2028_DN	3	63	0.54
	2028_DS	3	66	9.68
	2042_DN	3	71	0.87
	2042_DS	3	77	16.48

Table 1 TRANSYT Results for Capacity Analysis of Carrickmines South Roundabout

Carrickmines South Roundabout AM Results

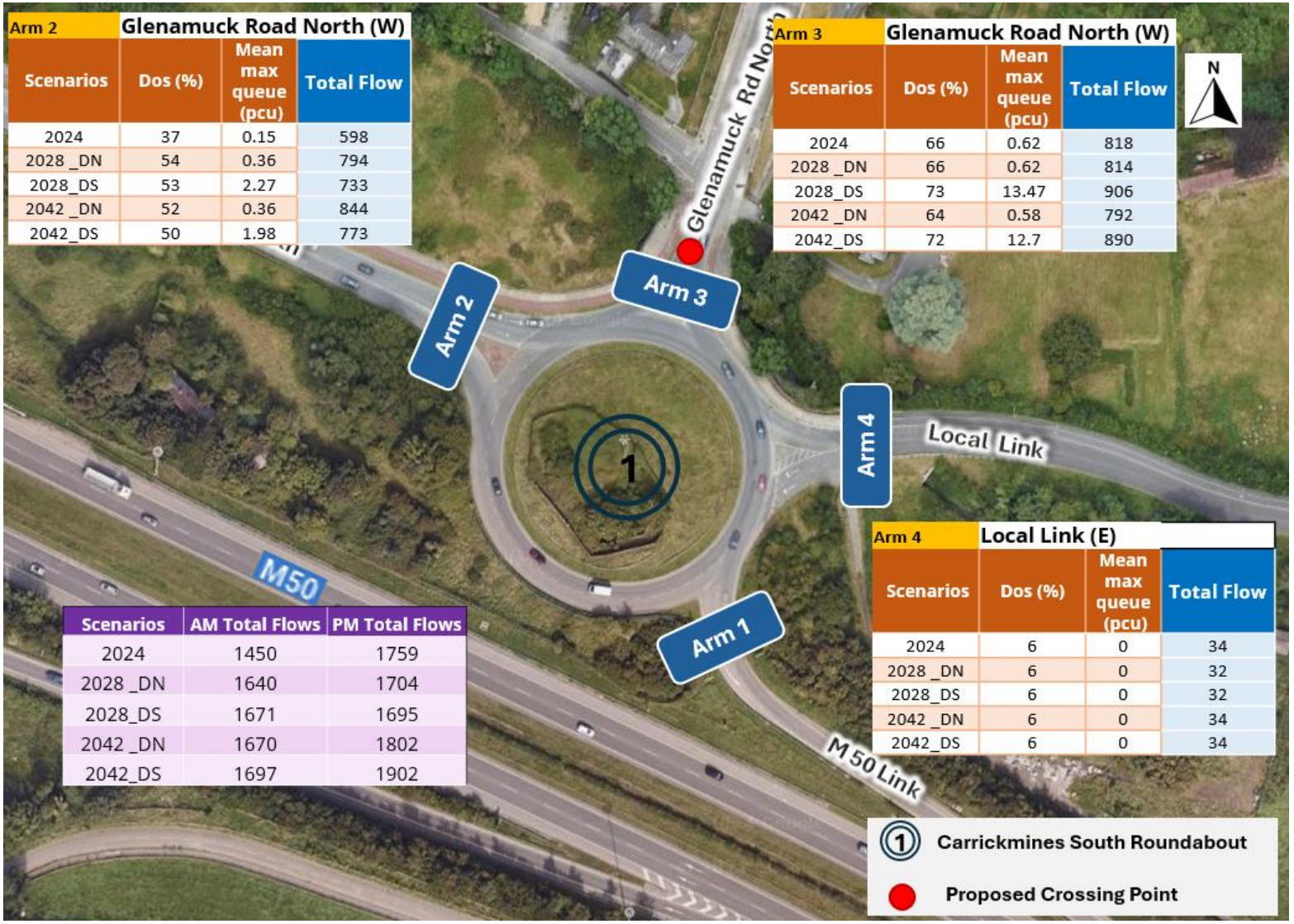


Figure 5 TRANSYT Modelling AM Results on Carrickmines South Roundabout

Carrickmines South Roundabout PM Results

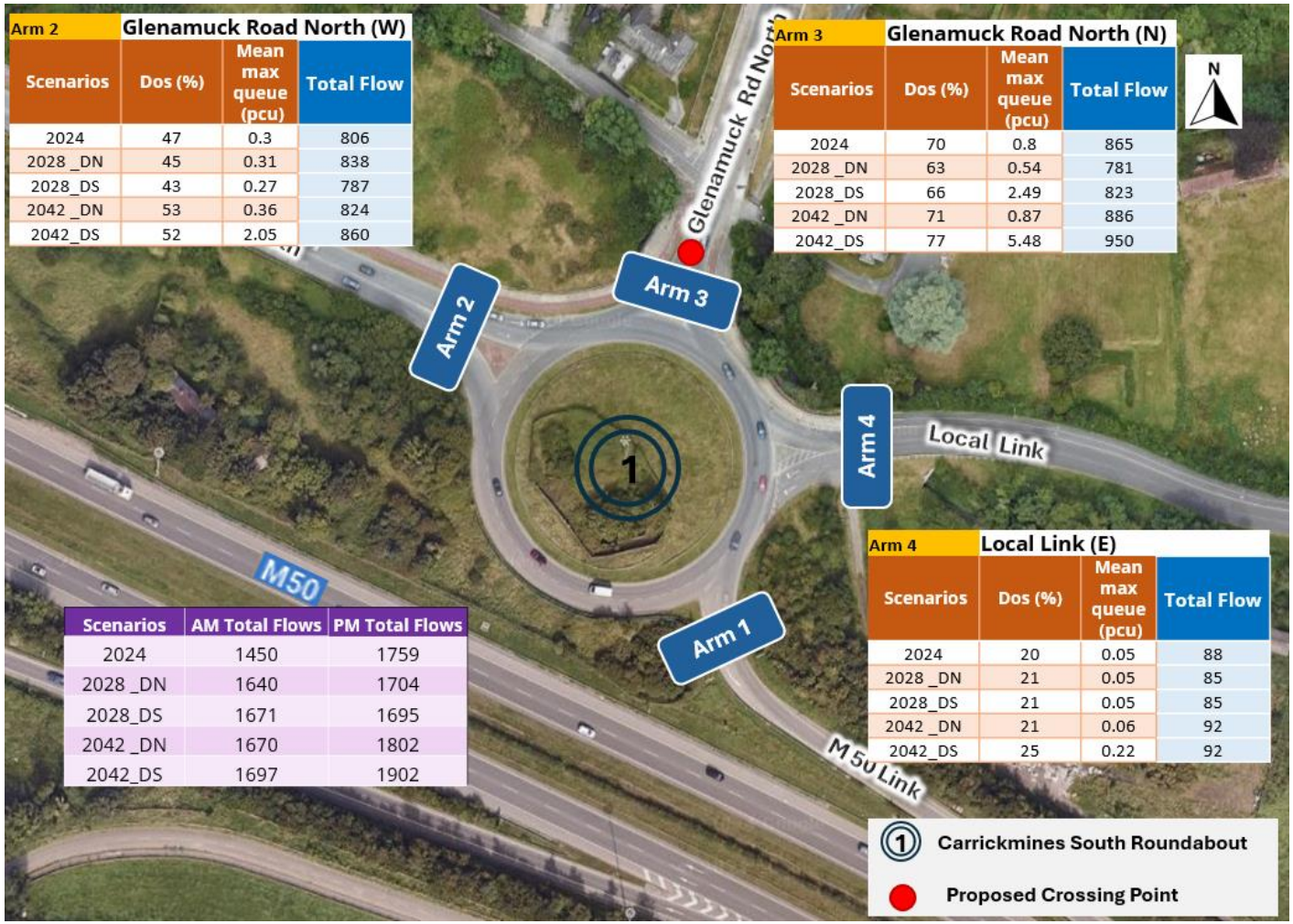


Figure 6 TRANSYT Modelling PM Results on Carrickmines South Roundabout

4.2 TRANSYT results for Carrickmines North Roundabout

The TRANSYT results for the capacity analysis at this roundabout are within capacity based on all the scenarios during the AM and PM peak periods.

During the AM Peak Arm 3 (Local Link) has the lowest Dos under 10% with zero mean max queue. While the Dos of Arm 1 (Glenamuck Road North) is the highest with up to 88% corresponding to 4.78 pcus mean max queue during the AM peak based on the 2042 2DS.

During the PM peak period, the highest DoS is 63%, with a mean maximum queue of 1.06 Pcus observed on Arm 2 (M50 Link) in the 2024 scenario. Traffic demand is expected to decrease from 2024 to 2042. While traffic flow remains stable between the 2028 DN and 2028 DS scenarios with similar DoS with a slight increase in Queue between the scenarios.

A reduction is observed between the 2028 DN/DS scenarios and the 2042 DN/DS scenarios, with approximately 150 fewer pcus and a 30% decrease in DoS. This could be attributed to traffic redistribution due to the construction of the Glenamuck distributor road, causing traffic going to Carrickmines to exit on Junction 14 as opposed to Junction 15.

Table 2 summarises the overall TRANSYT results from the analysis undertaken where the highest percentage of Dos with corresponding mean max queue in each scenario during AM and PM peak period.

Period	(Year) Scenario	Arm	Highest DoS (%)	Mean max queue (pcu)
AM	2024	1	61	0.96
	2028 DN	1	81	3.4
	2028 DS	1	79	4.9
	2042 DN	1	85	4.78
	2042 DS	1	88	6.19
PM	2024	2	63	1.06
	2028 DN	2	58	0.82
	2028 DS	2	60	2.09
	2042 DN	2	51	0.52
	2042 DS	2	51	2.53

Table 2: TRANSYT Results for Capacity Analysis of Carrickmines North Roundabout

Carrickmines North Roundabout AM Results

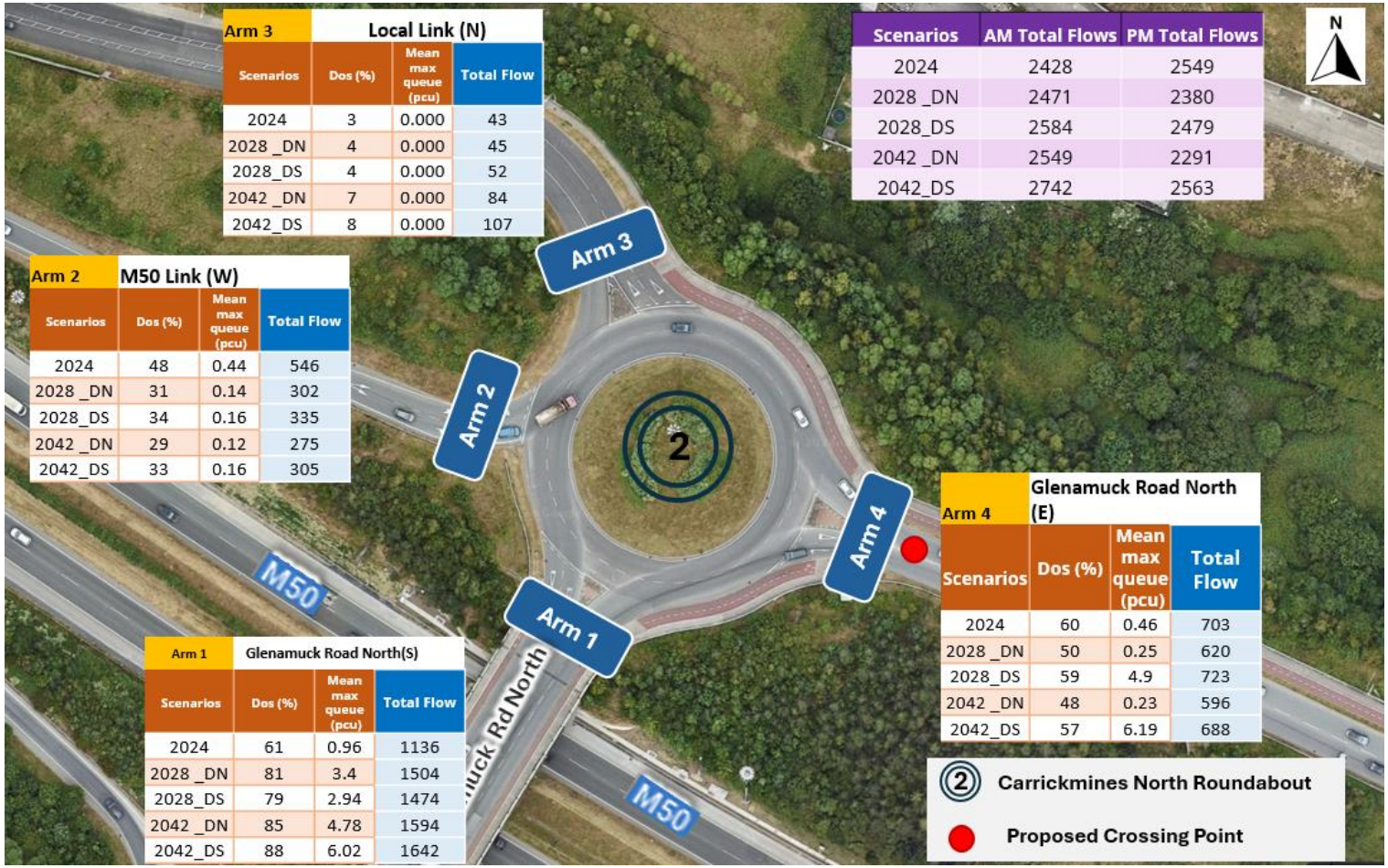


Figure 7 TRANSYT Modelling AM Results on Carrickmines North Roundabout

Carrickmines North Roundabout PM Results

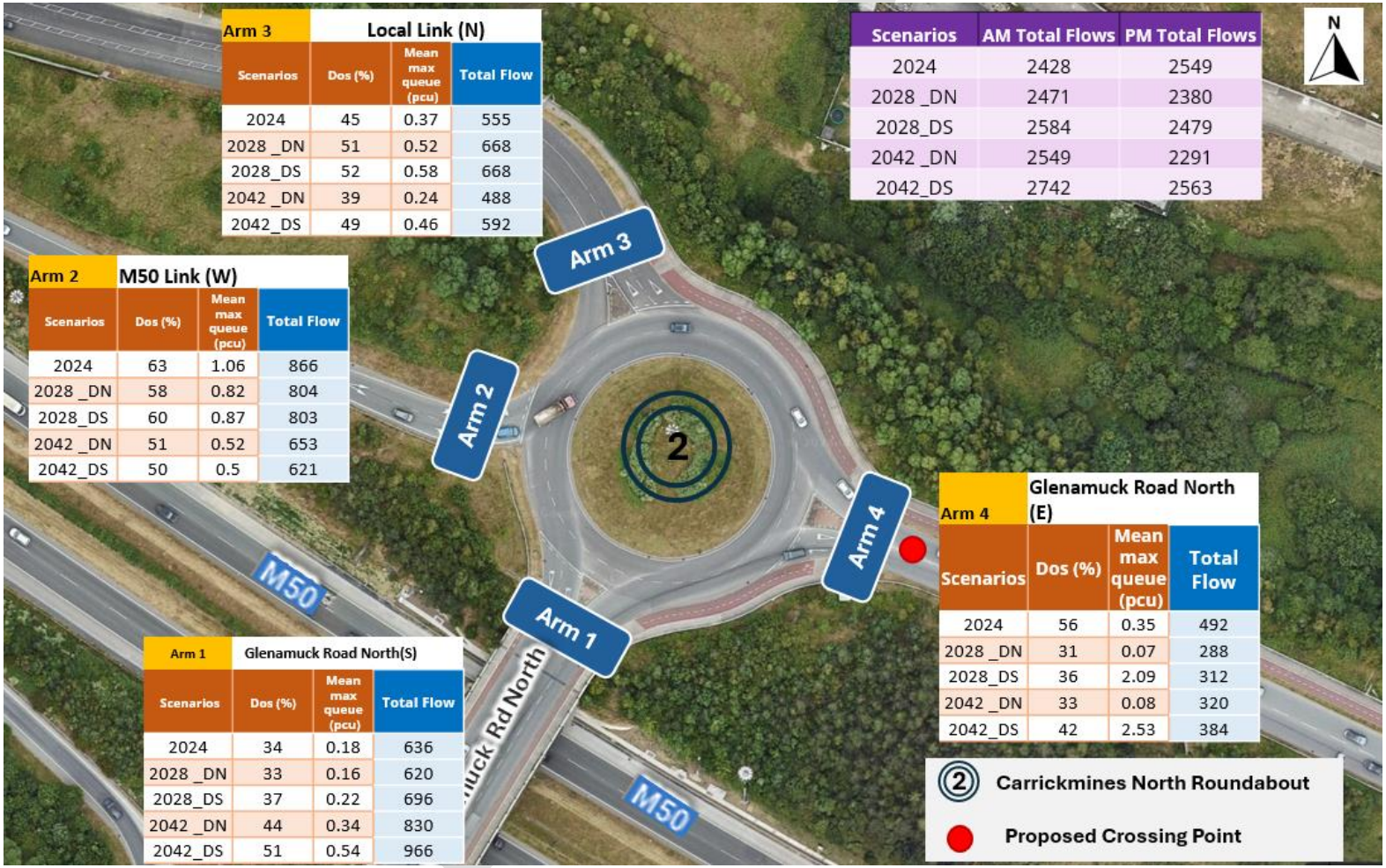


Figure 8 TRANSYT Modelling PM Results on Carrickmines North Roundabout

4.3 TRANSYT results for Glenamuck Road North Roundabout

The TRANSYT results for the capacity analysis at the Glenamuck North Roundabout indicate that it operates within capacity across all scenarios during both the AM and PM peak periods.

During the AM peak, the highest DoS is 68%, recorded on Arm 5 (M50 Link) in the 2028 DN scenario and the highest mean maximum queue is 21.23 Pcus is on the Arm 5 in the 2042 DS scenario. It is observed that Arm 5 (M50 Link East) experiences the highest total flow at 1088 pcus in 2024 but is expected to see a decrease of approximately 250 pcus in the 2042 DN and 100 Pcus in the 2042 DS. Meanwhile, traffic demand on Arm 1, Arm 2, and Arm 5 is projected to increase between 2024 and 2042.

In the PM peak, the highest DoS 73% is recorded on Arm 4 (Glenamuck Road North), with the highest mean maximum queue of being on Arm 5, during the 2042 DS Scenario of 12.51 Pcus in the 2024 base scenario.

Table 3 summarises the overall TRANSYT results from the analysis undertaken where the highest percentage of Dos with corresponding mean max queue in each scenario during AM and PM peak period.

Period	(Year) Scenario	Arm	Highest DoS (%)	Mean max queue (pcu)
AM	2024	4	49	0.46
	2028 DN	5	68	1.4
	2028 DS	5	46	14.32
	2042 DN	5	59	0.83
	2042 DS	1	54	21.23
PM	2024	4	73	1.98
	2028 DN	4	60	0.9
	2028 DS	4	67	1.34
	2042 DN	4	55	0.82
	2042 DS	4	64	0.68

Table 3 TRANSYT Results for Capacity Analysis of Glenamuck Road North Roundabout

Glenamuck Road North Roundabout AM Results

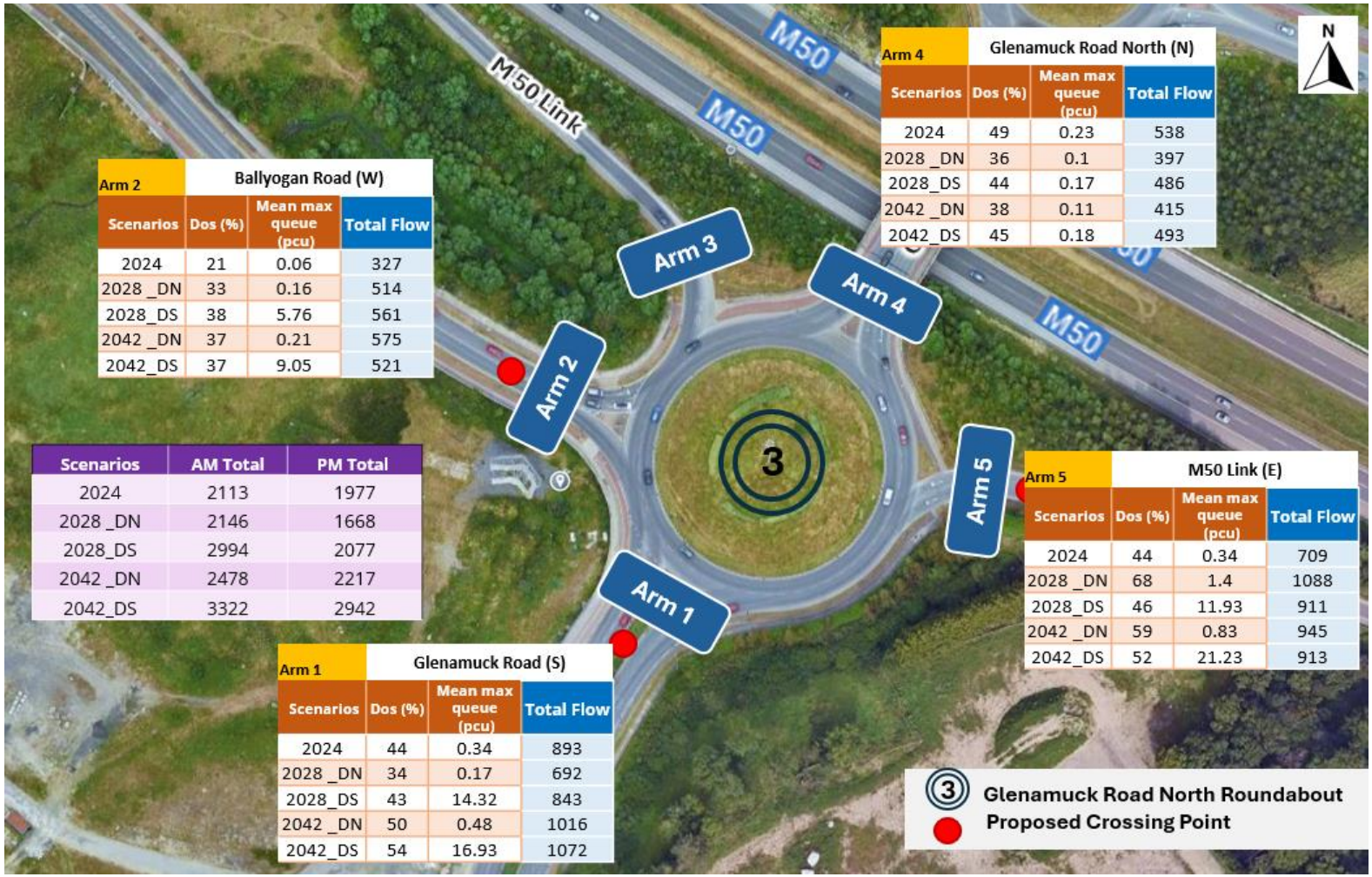


Figure 9 TRANSYT Modelling AM Results on Glenamuck North Roundabout

Glenamuck Road North Roundabout PM Results

Arm 2	Ballyogan Road (W)		
Scenarios	Dos (%)	Mean max queue (pcu)	Total Flow
2024	12	0.02	190
2028 _DN	12	0.02	191
2028_DS	19	1.65	230
2042 _DN	24	0.08	381
2042_DS	35	4.74	421

Arm 4	Glenamuck Road North (N)		
Scenarios	Dos (%)	Mean max queue (pcu)	Total Flow
2024	73	0.99	805
2028 _DN	60	0.45	661
2028_DS	67	0.67	735
2042 _DN	55	0.34	608
2042_DS	64	0.57	704

Scenarios	AM Total	PM Total
2024	2113	1977
2028 _DN	2146	1668
2028_DS	2994	2077
2042 _DN	2478	2217
2042_DS	3322	2942

Arm 5	M50 Link (E)		
Scenarios	Dos (%)	Mean max queue (pcu)	Total Flow
2024	30	0.13	484
2028 _DN	45	0.38	729
2028_DS	43	4.72	742
2042 _DN	42	0.35	712
2042_DS	47	12.51	608

Arm 1	Glenamuck Road (S)		
Scenarios	Dos (%)	Mean max queue (pcu)	Total Flow
2024	36	0.2	738
2028 _DN	22	0.06	453
2028_DS	29	10.31	566
2042 _DN	42	0.3	855
2042_DS	49	12.8	970

Figure 1 TRANSYT Modelling AM Results on Glenamuck North Roundaboutt

5 SENSITIVITY ANALYSIS

DBFL conducted a sensitivity analysis over the M50 Junction 15 Interchange TRANSYT Model. In this analysis, DBFL has assumed that the future car share in the Racecourse South Lands increases to 50% from 30%. This implies a growth of 67% over the generation and attraction vehicular trips to/from the Racecourse South Lands for all the future years from the ERM results.

The results of this sensitivity analysis are outlined below.

5.1 TRANSYT sensitivity results for Carrickmines South Roundabout

The TRANSYT results for the capacity analysis at this roundabout found that this roundabout will operate within capacity in all the scenarios during the AM peak hour period.

The highest Degree of Saturation (DoS) during the AM peak was recorded at 72%, with a mean maximum queue of 13.33 Passenger Car Units (Pcus) observed on Arm 3 (Glenamuck Road North) under the 2042 Do Something Sensitivity scenario. The results between the Sensitivity and non-sensitivity are similar enough to not consider any statistical difference between the two.

During the PM peak period, the highest DoS reached 77%, again on Arm 3, with 17.11 pcus mean maximum queue based on the 2042 DS Sensitivity scenario. The results between the Sensitivity and non-sensitivity are similar enough to not consider any statistical difference between the two.

These results show that with the sensitivity analysis there is little impact from the applied growth due to the racecourse.

Table 4 summarises the overall TRANSYT results from the analysis undertaken where the highest percentage of Dos with corresponding mean max queue in each scenario during AM and PM peak period.

Period	(Year) Scenario	Arm	Highest DoS (%)	Mean max queue (pcu)
AM	2042 _DN	3	64	0.58
	2042_DS	3	72	12.7
	2042_DN_ST	3	72	0.94
	2042_DS_ST	3	72	13.33
PM	2042 _DN	3	71	0.87
	2042_DS	3	77	16.48
	2042_DN_ST	3	77	1.27
	2042_DS_ST	3	77	17.11

Table 4 TRANSYT Results for Capacity Analysis of Carrickmines South Roundabout

Carrickmines South Roundabout AM Sensitivity (ST) Results

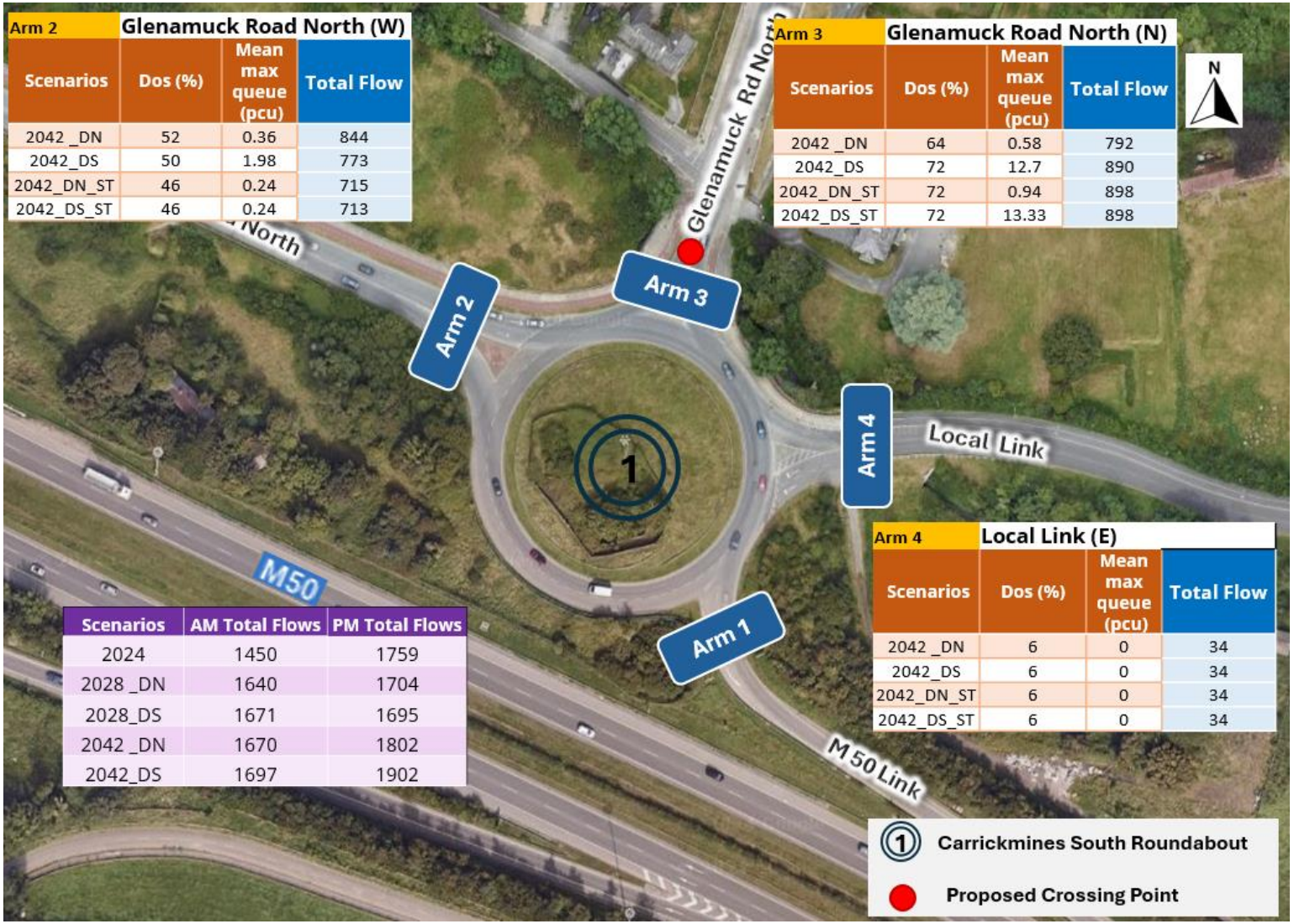


Figure 5 TRANSYT Modelling AM Results on Carrickmines South Roundabout

Carrickmines South Roundabout PM Sensitivity (ST) Results

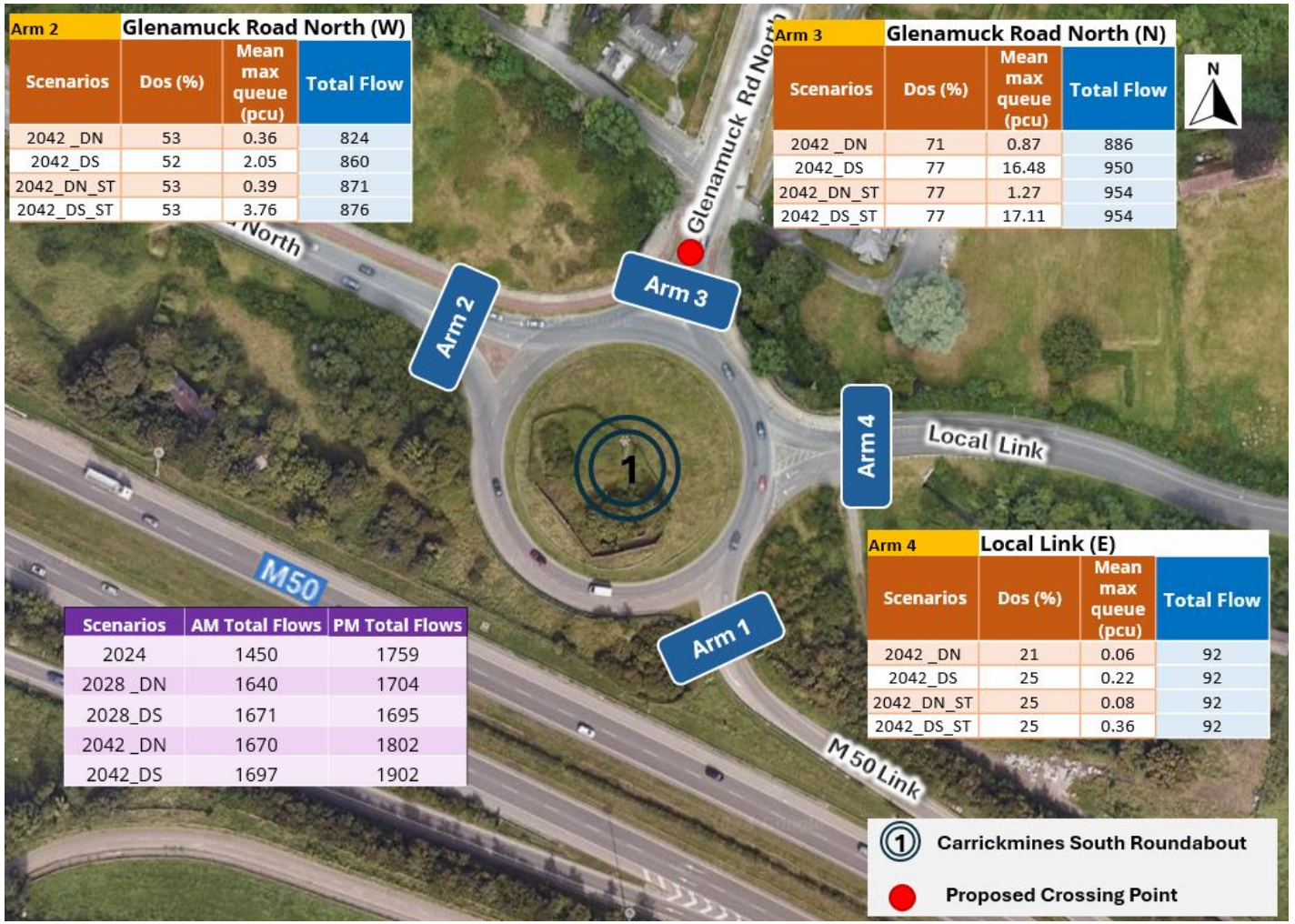


Figure 6 TRANSYT Modelling PM Results on Carrickmines South Roundabout

5.2 TRANSYT sensitivity results for Carrickmines North Roundabout

Overall, the Sensitivity analysis of Carrickmines North Roundabout found that the roundabout would operate within capacity, with one arm approaching capacity during the AM peak.

The TRANSYT capacity analysis found that Arm 1 (Glenamuck Road North) of the roundabout will approach capacity during the AM scenarios. The highest Degree of Saturation (DoS) was recorded on Arm 1 of during the 2042 Do-Nothing Sensitivity scenario, at 94% with a mean maximum queue of 12.28 Passenger Car Units (PCUs). These results show that the junction is approaching capacity without the additional growth from the Racecourse South lands. The DoS slightly decreases to 93% during the 2042 Do-Something Sensitivity scenario, which is based on a car mode split which is significantly higher than the standard case.

During the PM peak period, the highest DoS reached is 57%, on Arm 3, with 1.94 pcus mean maximum queue based on the 2042 DS Sensitivity scenario. The results between the Sensitivity and non-sensitivity scenarios show a slight increase after the growth is applied but are similar enough to not consider any statistical difference between the two.

The results of the Sensitivity Analysis demonstrate that there is little impact as a result of the applied growth from the Racecourse South lands.

Table 5 summarises the overall TRANSYT results from the analysis undertaken where the highest percentage of DoS with corresponding mean max queue in each scenario during AM and PM peak period.

Period	(Year) Scenario	Arm	Highest DoS (%)	Mean max queue (pcu)
AM	2042 _DN	1	85	4.78
	2042_DS	1	88	6.19
	2042_DN_ST	1	94	12.28
	2042_DS_ST	1	93	10.5
PM	2042 _DN	2	51	0.52
	2042_DS	1	51	2.53
	2042_DN_ST	3	57	0.74
	2042_DS_ST	3	57	1.94

Table 5: TRANSYT Results for Capacity Analysis of Carrickmines North Roundabout

Carrickmines North Roundabout AM Sensitivity (ST) Results

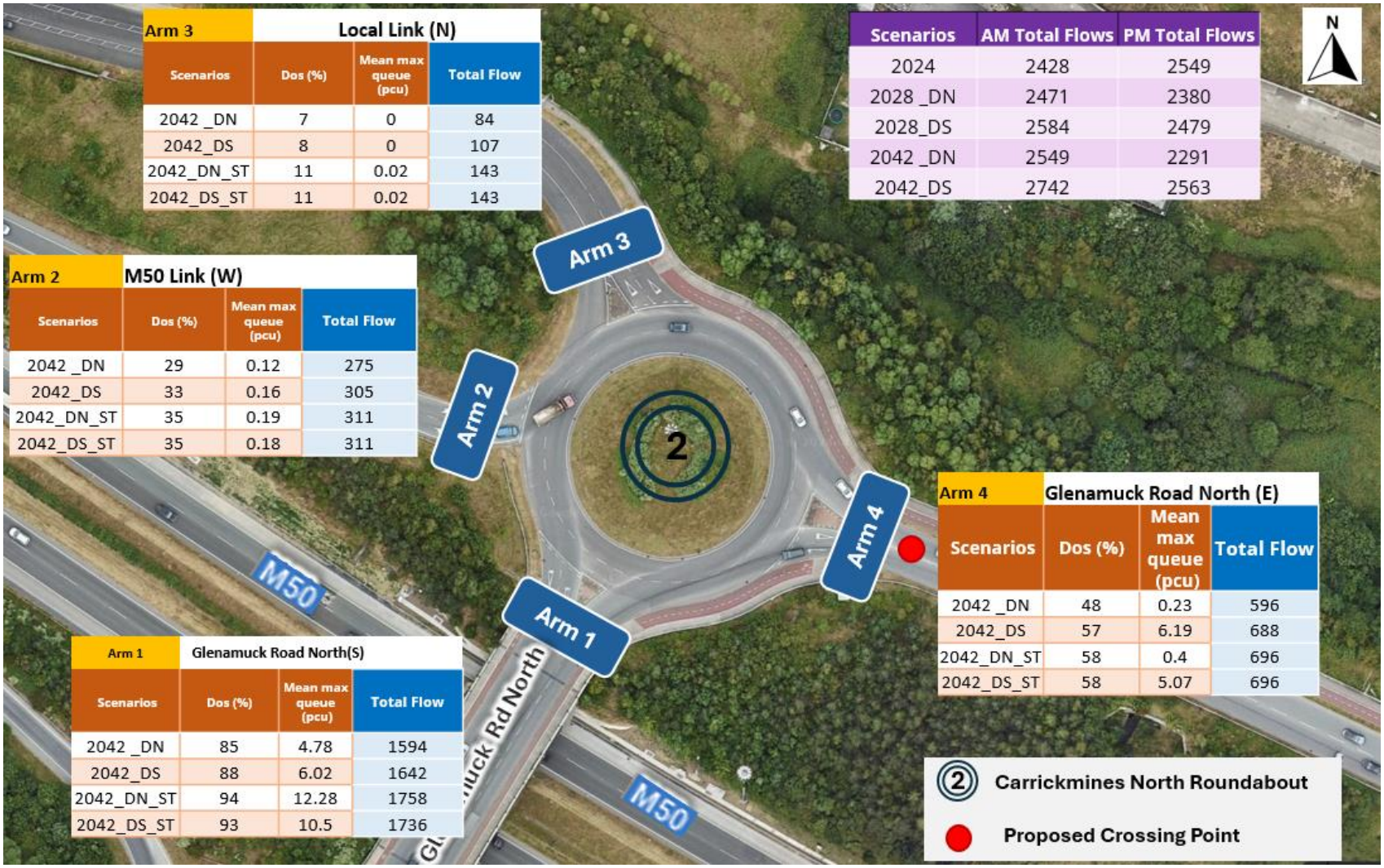


Figure 7 TRANSYT Modelling AM Results on Carrickmines North Roundabout

Carrickmines North Roundabout PM Sensitivity (ST) Results

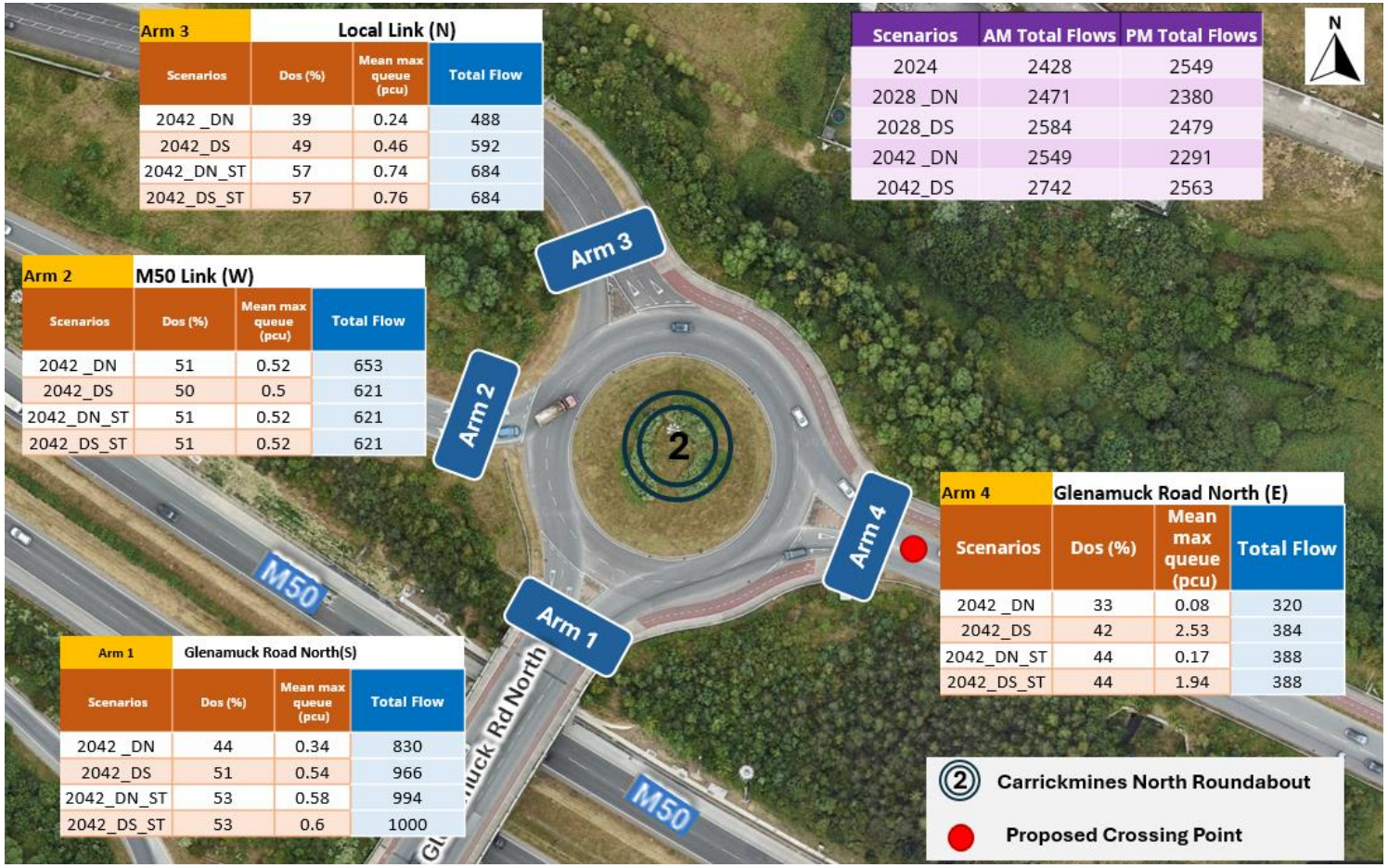


Figure 8 TRANSYT Modelling PM Results on Carrickmines North Roundabout

5.3 TRANSYT sensitivity results for Glenamuck Road North Roundabout

The TRANSYT results for the capacity analysis at the Glenamuck North Roundabout indicate that it operates within capacity across all scenarios during both the AM and PM peak periods.

During the AM peak, the highest DoS is 65% and the highest mean maximum queue is 22.91 Pcus, recorded on Arm 5 (M50 Link) in the 2042 DS Sensitivity scenario. It is observed that Arm 5 (M50 Link East) experiences the highest total flow at 961 pcus in the same scenario.

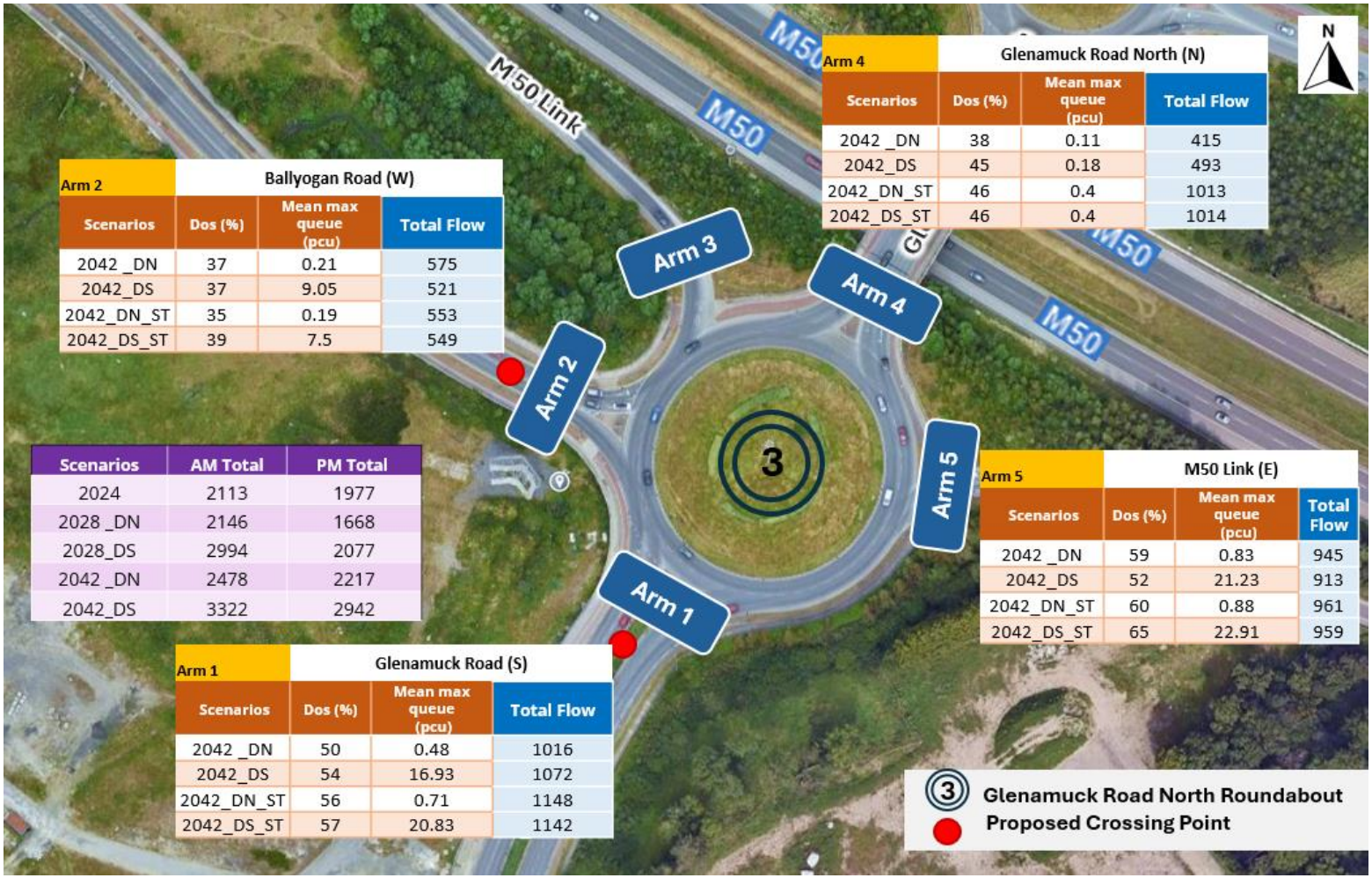
In the PM peak, the highest DoS 68% is recorded on Arm 4 (Glenamuck Road North), with the highest mean maximum queue of being on Arm 5, during the 2042 DS Scenario of 13.12 Pcus in the 2042 DS Sensitivity scenario.

Table 3 summarises the overall TRANSYT results from the analysis undertaken where the highest percentage of Dos with corresponding mean max queue in each scenario during AM and PM peak period.

Period	(Year) Scenario	Arm	Highest DoS (%)	Mean max queue (pcu)
AM	2042 _DN	5	59	0.83
	2042_DS	1	54	21.23
	2042_DN_ST	5	60	0.88
	2042_DS_ST	5	65	22.91
PM	2042 _DN	4	55	0.35
	2042_DS	4	64	12.8
	2042_DN_ST	4	68	1.4
	2042_DS_ST	4	68	13.12

Table 6 TRANSYT Results for Capacity Analysis of Glenamuck Road North Roundabout

Glenamuck Road North Roundabout AM Sensitivity (ST) Results



Arm 4	Glenamuck Road North (N)		
Scenarios	Dos (%)	Mean max queue (pcu)	Total Flow
2042 _DN	38	0.11	415
2042_DS	45	0.18	493
2042_DN_ST	46	0.4	1013
2042_DS_ST	46	0.4	1014

Arm 2	Ballyogan Road (W)		
Scenarios	Dos (%)	Mean max queue (pcu)	Total Flow
2042 _DN	37	0.21	575
2042_DS	37	9.05	521
2042_DN_ST	35	0.19	553
2042_DS_ST	39	7.5	549

Scenarios	AM Total	PM Total
2024	2113	1977
2028 _DN	2146	1668
2028_DS	2994	2077
2042 _DN	2478	2217
2042_DS	3322	2942

Arm 5	M50 Link (E)		
Scenarios	Dos (%)	Mean max queue (pcu)	Total Flow
2042 _DN	59	0.83	945
2042_DS	52	21.23	913
2042_DN_ST	60	0.88	961
2042_DS_ST	65	22.91	959

Arm 1	Glenamuck Road (S)		
Scenarios	Dos (%)	Mean max queue (pcu)	Total Flow
2042 _DN	50	0.48	1016
2042_DS	54	16.93	1072
2042_DN_ST	56	0.71	1148
2042_DS_ST	57	20.83	1142

Figure 9 TRANSYT Modelling AM Results on Glenamuck North Roundabout

Glenamuck Road North Roundabout PM Sensitivity (ST) Results

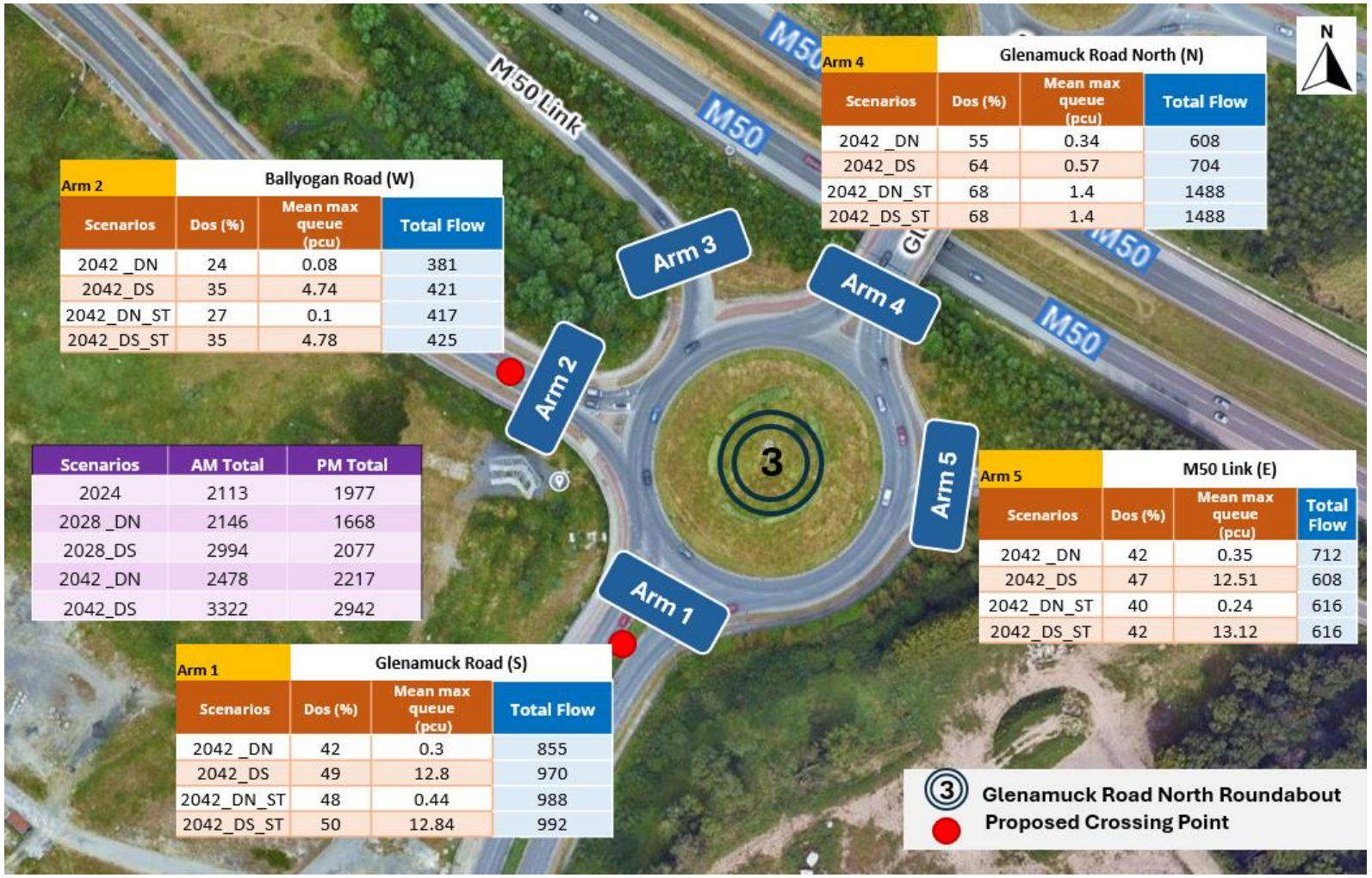


Figure 2 TRANSYT Modelling AM Results on Glenamuck North Roundabout

6 CONCLUSION

This technical note has presented the signalised roundabout modelling results from TRANSYT for the M50 Junction 15, as part of the Dun Laoghaire Rathdown County Council (DLRCC) Area Based Transport Assessments (ABTAs) for Racecourse South Lands and Kiltiernan-Glenamuck. The assessment covered multiple scenarios: 2024 base year, 2028 Do Nothing, 2028 Do Something, 2042 Do Nothing, and 2042 Do Something. Key findings for each roundabout are as follows:

1. Carrickmines North Roundabout:
    - Operates within capacity across all scenarios
    - Arm 3 (Glenamuck Road North) reaches 73% DoS with a mean maximum queue of 13.47 pcus in 2028 DS during AM peak and 77% DoS with a mean maximum queue of 5.48 pcus in 2042 DS during the PM peak.
    - In the 2042 Do Something scenario, compared to the 2024 Base Year, Arm 3 (Glenamuck Road North) with the signalised crossing sees an increase of 72 pcus in traffic flow during the AM peak, with an increase of 6% in DoS and mean max queue of 12.08 pcus. In the PM peak, traffic flow rises by 85 pcus, with a 7% increase in DoS and mean max queue of 4.68 pcus.
    - Through the Sensitivity analysis, it was found that in the AM Peak, the Flows for Arm 3 increased in between the Do-Nothing and Do-Nothing Sensitivity scenarios by 8% DoS and 0.36 PCUs MMQ. The DoS on Arm 1 shows that it is approaching capacity in both the 2042 DN and DN Sensitivity analyses during the AM Peak. There was a minor increase in the PM peak, but the junction will still operate well within capacity.
2. Carrickmines South Roundabout:
    - Operates within capacity across all scenarios.
    - Arm 1 (Glenamuck Road North) has the highest with up to 88% corresponding to 6.02 pcus mean max queue during the AM peak based on the 2042 DS during the AM peak.
    - Arm 2 (M50 Link) has the highest DoS at 63%, with a mean max queue of 1.06 Pcus in the 2024 scenario during the PM peak.
    - In the 2042 Do Something scenario, compared to the 2024 Base Year, Arm 4 (Glenamuck Road North) with the signalised crossing sees a reduction of 15 pcus in traffic flow during the AM peak, with a 3% decrease in DoS and mean max queue of 0.32 pcus. In the PM peak, traffic flow declines by 108 pcus, with a 14% decrease in DoS and a mean max queue of 1.64 pcus.
    - Through the sensitivity analysis it was found that in the AM Peak, Arm 1, which was experiencing the most capacity issues reduces in DoS and Queueing for both the Do Something and Do Nothing scenarios. This shows that the additional growth of the traffic gives more opportunities for vehicles

to enter the junction from the most active arm. In the PM peak, it is expected that Arm 1 and Arm 2 will have a slight increase in DoS and queuing as a result of the sensitive analysis.

3. Glenamuck Road North Roundabout:
    - Operates within capacity across all scenarios.
    - Highest DoS recorded: 74% with 15.47 PCU mean maximum queue on Arm 5 (M50 Link) in the 2028 Do Nothing scenario.
    - Arm 5 (M50 Link) has the highest DoS at 74%, with a mean maximum queue of 15.67 Pcus in 2028 DN during the AM peak
    - Arm 4 (Glenamuck Road North) has the highest DoS 73% is with a mean maximum queue of 1.98 Pcus in the 2024 scenario during the PM peak
    - In the 2042 Do Something scenario, compared to the 2024 Base Year, Arm 1 (Glenamuck Road) with the signalised crossing sees an increase of 179 pcus in traffic flow during the AM peak, with a 9% increase in DoS and mean max queue of 5.65pcus. In the PM peak, traffic flow rises by 238 pcus, with a 12% increase in DoS and a mean max queue of 5.38 pcus.
    - In the 2042 Do Something scenario, compared to the 2024 Base Year, Arm 2 (Ballyogan Road) with the signalised crossing sees an increase of 194 pcus in traffic flow during the AM peak, with a 15% increase in DoS and mean max queue of 8.15pcus. In the PM peak, traffic flow rises by 122 pcus, with an 8% increase in DoS and a mean max queue of 1.08pcus.
    - In the 2042 Do Something scenario, compared to the 2024 Base Year, Arm 5 (M50 Link) with the signalised crossing sees an increase of 208 pcus in traffic flow during the AM peak, with a 14% increase in DoS and mean max queue of 1.14pcus. In the PM peak, traffic flow rises by 233 pcus, with 23% increase in DoS and a mean max queue of 2.33pcus.
    - Through the sensitivity analysis it was found that in the AM Peak, Arm 5, which was experiencing the most capacity issues reduces in DoS and Queueing for the Do Nothing scenario and increases for the Do Something Scenarios. In the PM peak, it is expected that Arm 4, which was experiencing the highest DoS will increase slightly but will still remain within capacity. This shows that wit the additional flows from the growth factor this junction will still operate within capacity.

Overall, the M50 Junction 15 interchange operates within capacity across almost all scenarios in this assessment, and is reaching capacity at Junction 2, Arm 1 (Glenamuck Road North), where is reaches its expected highest DoS and Queue in the 2042 Do nothing Sensitivity Scenario, but this same value is lower in the Do Something scenario which further encourages the need for this project, as introducing slight signal control would give this arm more time for a full clearance. The roundabouts continue to function effectively, even with increased trip rates from the

Racecourse South Lands and Kiltiernan-Glenamuck Area Based Transport Assessments (ABTAs) and the proposed signalised crossings.

Table 7, **Table 8** and **Table 9** below summarise the overall TRANSYT results from the analysis undertaken where the highest percentage of DoS with corresponding mean max queue was recorded in each peak period of these three roundabouts.

Carrickmines South Roundabout				
Period	**(Year) Scenario**	**Arm**	**Highest DoS (%)**	**Mean max queue (pcu)**
AM	2024	3	66	0.62
	2028 _DN	3	66	0.62
	2028_DS	3	73	13.47
	2042 _DN	3	64	0.58
	2042_DS	3	72	12.7
PM	2024	3	70	0.8
	2028_DN	3	63	0.54
	2028_DS	3	66	9.68
	2035	3	71	0.87
	2042_DN	3	77	16.48

Table 7 TRANSYT Results for Capacity Analysis of Carrickmines South Roundabout

Carrickmines North Roundabout				
Period	**(Year) Scenario**	**Arm**	**Highest DoS (%)**	**Mean max queue (pcu)**
AM	2024	1	61	0.96
	2028 DN	1	81	3.4
	2028 DS	1	79	4.9
	2042 DN	1	85	4.78
	2042 DS	1	88	6.19
PM	2024	2	63	1.06
	2028 DN	2	58	0.82
	2028 DS	2	60	2.09
	2042 DN	2	51	0.52
	2042 DS	2	51	2.53

Table 8 TRANSYT Results for Capacity Analysis of Carrickmines North Roundabout

Glenamuck Road North Roundabout				
Period	**(Year) Scenario**	**Arm**	**Highest DoS (%)**	**Mean max queue (pcu)**
AM	2024	4	49	0.46
	2028_DN	5	68	1.4
	2028_DS	5	46	14.32
	2042_DN	5	59	0.83
	2042_DS	1	54	21.23
PM	2024	4	73	1.98
	2028_DN	4	60	0.9
	2028_DS	4	67	1.34
	2042_DN	4	55	0.82
	2042_DS	4	64	0.68

Table 9 TRANSYT Results for Capacity Analysis of Glenamuck Road North Roundabout

Table 10, **Table 11** and **Table 12** below summarise the TRANSYT results from the Sensitivity Analysis undertaken where the highest percentage of DoS with corresponding mean max queue was recorded in each peak period of these three roundabouts.

Period	**(Year) Scenario**	**Arm**	**Highest DoS (%)**	**Mean max queue (pcu)**
AM	2042 _DN	3	64	0.58
	2042_DS	3	72	12.7
	2042_DN_ST	3	72	0.94
	2042_DS_ST	3	72	13.33
PM	2042 _DN	3	71	0.87
	2042_DS	3	77	16.48
	2042_DN_ST	3	77	1.27
	2042_DS_ST	3	77	17.11

Table 10 TRANSYT Results for Capacity Analysis of Carrickmines South Roundabout

Period	(Year) Scenario	Arm	Highest DoS (%)	Mean max queue (pcu)
AM	2042 _DN	1	85	4.78
	2042_DS	1	88	6.19
	2042_DN_ST	1	94	12.28
	2042_DS_ST	1	93	10.5
PM	2042 _DN	2	51	0.52
	2042_DS	1	51	2.53
	2042_DN_ST	3	57	0.74
	2042_DS_ST	3	57	1.94

Table 11 TRANSYT Results for Capacity Analysis of Carrickmines North Roundabout

Period	(Year) Scenario	Arm	Highest DoS (%)	Mean max queue (pcu)
AM	2042 _DN	5	59	0.83
	2042_DS	1	54	21.23
	2042_DN_ST	5	60	0.88
	2042_DS_ST	5	65	22.91
PM	2042 _DN	4	55	0.35
	2042_DS	4	64	12.8
	2042_DN_ST	4	68	1.4
	2042_DS_ST	4	68	13.12

Table 12 TRANSYT Results for Capacity Analysis of Glenamuck Road North Roundabout

- The longest queues are observed on the M50 off ramp on the Glenamuck Road North Roundabout, it is not clear to what extent will that queue extend with different modal shares e.g. the prevailing modal share in the area. The 2042_DS_ST has a lower DoS than the 2042_DN_ST, despite being based on a car mode split which is significantly higher than the standard case.
- In some cases, there is a noted reduction in traffic levels between 2028 and 2042, an explanation and rationale are required for this reduction and sensitivity tests if no reduction transpires.
- Additional sensitivity scenarios need also be provided, for instance in the case that the active travel bridge is not provided.
- Having regard to local road measures in the draft ABTA, the M50 Parallel link road will remain a primary access to the actual Racecourse and therefore consideration of how will events at the Racecourse and along the link be managed in the case of full development of the lands (dual purpose) etc. will be required.
- From a vehicular perspective, the development is very dependent on accessibility off Junction 15; with little resilience or accessibility to road networks to the north or west of the site. In the case of incidents / closures along the M50 corridor, consideration to how would access be managed is recommended.

Appendix A: TRANSYT Report

Appendix B: Traffic Network Diagrams