Assisting Decisions

Windmillhill Resource Recovery Project Transport Assessment Audit

Report for South Dublin County Council

July 2008

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Document Control

Project Title:	SDCC Resource Recovery Project Transport Assessment Audit
MVA Project Number:	C81171800
Document Type:	Transport Audit Report
Directory & File Name:	G:\Contracts\Live\C8117800 SDCC Transport Assessment Audit \Reports\Transport Report1.Doc

Document Approval

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Distribution

Issue	Date	Distribution	Comments
1	29/06/2008	South Dublin County Council	Draft Report
2	30/06/2008	South Dublin County Council	Draft Final Report
3	03/07/2008	South Dublin County Council	Final Report

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1 Introduction

1.1 Background

1.1.1 Energy Answers International is proposing to develop a Resource Recovery Thermal Facility at the existing Quarry site at Windmillhill, adjacent to the N7 in South Dublin. A planning application for this was submitted to An Bord Pleanála under the Planning and Development (Strategic Infrastructure) Act 2006. A Transport Assessment was prepared by TOBIN Consulting Engineers Ltd in relation of the planning application. South Dublin County Council, the local authority within which the proposed development is located, has been notified by An Bord Pleanála of the development proposal.

1.1.2 MVA Consultancy was commissioned by South Dublin County Council to conduct an audit of the submitted Transport Assessment and to determine the suitability of the analysis undertaken in relation to the proposed Windmillhill development.

1.1.3 This Report details the tasks included in this audit as well as outlining our conclusions on the suitability and appropriateness of the Transport Assessment, and the likely impact of the development proposal.

1.1.4 This Audit Report will be used as the basis for a submission to An Bord Pleanála by South Dublin County Council, in relation to the development proposal.

1.2 Study Methodology

1.2.1 The methodology for undertaking this transport audit includes three main stages:

- Stage 1: Assessment of trip generation and distribution characteristics for the proposed development;
- Stage 2: Highway Operational Assessment; and
- Stage 3: Summary of Conclusions and Recommendations.

Stage 1: Assessment of Trip Generation/ Distribution Patterns, and Background Traffic Flows

1.2.2 Stage one of the study involved an audit of the traffic data used within the Transport Assessment to determine present and future traffic conditions in the vicinity of the proposed development. This data was derived from a variety of sources including NRA automatic counter data and bespoke traffic surveys. This traffic survey data was reviewed to determine the suitability of the data for use in relation to undertaking the Transport Assessment.

1.2.3 A vital part of the assessment is the calculation of trip generation rates associated with the development. The trip generation for the site is considered in two parts:

- Trip generation during the construction of the thermal facility; and
- Trip generation of the facility once it is operational.

1.2.4 As part of this Transport Assessment Audit, the trip generation calculations used have been reviewed to determine whether a full account of traffic generated by the development has been considered. Particular focus was placed on the AM and PM peak trip generation, given that background traffic volumes are usually at their highest during these time periods, and are therefore critical in terms of highway network capacity and performance. The peak hour trip generation rates used in the Transport Assessment were, therefore, assessed to determine their appropriateness.

1.2.5 The next step of this process will be to assess trip distribution patterns associated with the development proposal, i.e. the roads to which vehicles accessing/ egressing the development are anticipated to use. This process should influence the spatial scope of the Transport Assessment, i.e. determine the roads and junctions that are examined as part of the Transport Assessment to ensure that the zone of influence[1] of the development proposal corresponds to the assessment area.

Stage 2: Highway Operational Assessment

1.2.6 As part of the Transport Assessment, a junction analysis was carried out on the site access junction located on the N7. The validity of the formulae and their applicability for use in analysing the junction was investigated as part of this Transport Assessment Audit. A series of assessment years and peak hour scenarios were tested using the Ratio of Flow to Capacity (or RFC) formula. Each scenario was audited to ensure the calculations underpinning them were correct and that appropriate and reasonable input parameters were used. These parameters include:

- Modelling parameters contained within the RFC formula;
- Traffic demand data such as future year calculated traffic flow data and facility trip generation rates; and
- Geometric parameters of the junction which determine capacities such as turning capacity and queuing capacity.

1.2.7 A key element of this stage of the audit was a review of the future year forecast traffic flows and queuing on the N7, and adjoining interchanges using the SDCC Traffic Model[2]. This would give a more representative view of the wider impact of the development proposal, and will be sufficiently robust to facilitate an indication of the additional development traffic related impact.

Stage 3: Conclusions and Recommendations

1.2.8 The final stage of this process will be to present a summary of the findings from the above tasks. Conclusions and recommendations are made on the suitability and appropriateness of the Transport Assessment chapter of the planning application, and our view on the appropriateness of the development proposal.

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1 This is the area to which traffic generated by the development has a measurable impact on the surrounding road network.

2 The SDCC Traffic Model is a SATURN based traffic model originating from the Dublin Transportation Offices Multi Modal Transport Model. The SDCC model provides a robust basis for estimating future year traffic flow and queuing on all main roads within the SDCC area.

1.3 Report Structure

1.3.1 This section of the Report has outlined the Study Methodology followed to complete the Transportation Assessment Audit. It provides a brief review of each stage of the audit and the interrelationship between each of the Transport Assessment Audit tasks.

1.3.2 The remainder of the Report is structured as follows:

- **Section 2, Trip Generation/ Distribution and Background Traffic Flow Assessment**: This section contains a review of all traffic data and calculations used in the trip generation process and determined whether they take full account of development generated traffic. Furthermore, the trip distribution patterns associated with the proposed development are assessed to understand the loading pattern of trips related to the development proposal on the local road network;
- **Section 3, Highway Operational Assessment**: This section provides a review of the junction analysis carried out in the Transport Assessment and an outline of future forecast traffic flows and queuing on the N7, and the adjoining Rathcoole interchange using the SDCC Traffic Model. This analysis gives a more representative view of the wider impact of the proposed development and provides a robust indication of the impact of the proposed development; and
- **Section 4, Conclusions and Recommendations**: This section contains a summary of the conclusions and key findings of the Transport Assessment Audit.

2 Trip Generation/ Distribution and Background Traffic Flow Assessment

2.1 Introduction

2.1.1 This section of the Report provides an overview and assessment of the trip generation assumptions used in the development Transport Assessment. Subsequent to this, a review of the trip distribution patterns used in the Transport Assessment is described, in addition to a review of how adequately it covers the zone of influence of the proposed development. Assumptions and calculations used in the derivation of forecast traffic flows on the surrounding road network were also audited, and a commentary on this process is included.

2.1.2 Finally, an outline of the likely zone of influence is detailed, and how the development trips will impact on the adjoining road network within this zone.

2.2 Trip Generation Assessment

2.2.1 Tables 2.1 to 2.3 below illustrate the trip generation figures included in the Transport Assessment. These trip generation tables are underpinned by the following assumptions:

- Existing quarry traffic is based on traffic counts carried out on the 13th of September 2006;
- The construction phase of the project will require a maximum of 150 people at any one time;
- The construction will require the importation of approximately 34,000 tonnes of material. It has been assumed that all HGV traffic associated with materials for construction will be delivered during the first year of construction and that all construction-generated HGV traffic is evenly distributed throughout the day. This equates to 12 HGV trips per day;
- It is assumed that all employees for the construction of the Resource Recovery Thermal Plant (N7RRP) will arrive during the AM peak hour and depart during the PM peak hour;
- Energy answers proposed to import a maximum of 365,000 tonnes per annum of non-hazardous waste to the facility during the operational phase. It is anticipated that 85% of the waste will be delivered by 20 tonne trucks and the remainder by 10 tonne trucks. This equates to a total on 73 inbound and 73 outbound HGV trips per day due to waste delivery activities;
- A further 27 inbound and 27 outbound HGV trips are expected per day due to shipping delivery;
- It is assumed that HGV traffic will arrive and depart constantly throughout the day. Therefore it is assumed there will be 10 HGV arrivals and 10 HGV departures during both the AM and PM peak hours;
- It is estimated that there will be a total of 114 inbound and 114 outbound trips generated by employees, vendors and visitors to the facility daily;

- It is assumed that all day shift employees will arrive during the AM peak hour and all night shift employees will depart during the AM peak hour. It is also assumed that all swing shift employees will arrive during the PM peak hour and all day shift employees will depart during the PM peak hour; and
- The existing quarry will begin a 6 month "winding down" process once the N7RRP becomes operational in 2011. The owners of the existing quarry do not expect to generate more than 40 vehicle arrivals and 40 departures per day during this 6 month period, and expect a total of 4 inbound trips and 4 outbound trips for both the AM and PM peak hours.

2.2.2 Based on the above assumptions, the AM and PM peak trip generation rates are as per the following two tables.

Table 2.1 AM Trip Generation Rates (Inbound and Outbound)

	Inbound Cars	Inbound HGV	Outbound Cars	Outbound HGV	TOTAL
2006 AM (Existing)	3	13	3	18	**37**
Construction Phase AM	153	15	3	19	**190**
Operational Phase 2011 AM	60	13	11	12	**96**
Operational Phase 2026 AM	59	10	9	10	**88**

2.2.3 As can be seen from Table 2.1 above, AM peak hour trip generation rates for the site increase from 37 in 2006 to 190 during the construction phase (representing an increase of 153 vehicles).

2.2.4 The equivalent AM peak hour trip generation for the proposed development site in 2011 is 96 vehicles during 2011 when the quarry is winding down, and 88 in the 2026 horizon year.

Table 2.2 PM Trip Generation Rates (Inbound and Outbound)

	Inbound Cars	Inbound HGV	Outbound Cars	Outbound HGV	TOTAL
2006 PM (Existing)	1	9	11	14	**35**
Construction Phase PM	1	10	161	15	**187**
Operational Phase 2011 PM	24	13	61	12	**110**
Operational Phase 2026 PM	23	10	59	10	**102**

2.2.5 Table 2.2 above shows that PM peak hour trip generation rises from a total of 35 trips during 2006 to 187 during the construction phase (representing an increase of 152 vehicles).

2.2.6 The equivalent PM peak hour trip generation for the proposed development in 2011 is 110, and in the 2026 horizon year, 102 vehicles.

Table 2.3 Daily Trip Generation (Inbound and Outbound)

	Inbound Cars	Inbound HGV	Outbound Cars	Outbound HGV	TOTAL
2006 (Existing)	49	166	51	199	**465**
Construction Phase	199	172	201	205	**777**
Operational Phase 2011	124	130	124	130	**508**
Operational Phase 2026	114	100	114	100	**428**

2.2.7 Table 2.3 above, outlines the daily trip generation rates for the four scenarios. The total trip generation in 2006 is 465 trips, this figure increases to 777 trips during the construction phase. The total amount of trips during the 2011 operational year is 508 which then decrease to 428 trips during the 2026 design year.

2.2.8 The assumptions underpinning the trip generation calculations in the Transport Assessment are deemed reasonable, and represent a sound basis for determining the impact of the proposed development on the road network.

2.2.9 The calculations do, however indicate that peak hour trips generation rates will increase substantially as a result of the development proposal. This increase will be most pronounced during the construction phase. Peak hour trip rates during the operational phase of the proposed development will, however, still be significantly higher than trips rates associated with the current use of the site as a quarry.

2.3 Trip Distribution and Zone of Influence

2.3.1 The trip distribution determination used in this Transport Assessment was very limited in that it focused only on the site entrance itself and the southbound carriageway of the N7. As the site entrance works on a "left in, left out" basis the distribution in the report shows 100% of trips to the development coming from the north and travelling in a southbound direction, similarly 100% of trips from the development travel in a southbound direction on the N7.

2.3.2 The development site is located between two interchanges, the Steelstown Interchange to the south and the Rathcoole Interchange to the north. These two interchanges are of vital importance to the Transport Assessment as any traffic from the south wishing to enter the development must use the Rathcoole interchange and similarly any traffic leaving the development and wishing to travel north must use the Steelstown Interchange. Because of this any Transport Assessment should examine the distribution patterns associated with the development and the impact of these flows on the N7 and all directly affected interchanges.

2.4 Audit of N7 Traffic Data

2.4.1 In undertaking the Transport Assessment, background traffic data for the N7 was obtained from a manual classified traffic survey undertaken by Abacus Transportation Surveys on Wednesday the 13th of September 2006 at the entrance to the existing quarry. This data was then factored up to 2008, 2009, 2011 and 2026 levels using growth factors provided by the NRA for the national primary road network (Published August 2003 for years 2002-2040).

2.4.2 Figures 12.17 to 12.24 of the Transport Assessment show the base flow plus generated traffic from the development for 2009, 2011, and 2026. These figures have all been audited to ensure that the calculations and traffic flows used are correct, which is the case.

2.4.3 The report however fails to give details of northbound [3] traffic in any of the scenarios. As a result of this there is no indication of the impact of northbound development traffic on the N7. Given that the proposed development is likely to serve a wide catchment area, to the north as well as the south, this represents a significant weakness in the robustness of the Transport Assessment undertaken.

2.5 Traffic Flows Associated with Proposed Development

2.5.1 Figures 2.1 and 2.2 below show the distribution of development traffic on the N7 and Rathcoole and Steelstown interchanges in the 2009 (worst case) AM and PM peaks

[3] The northbound carriageway of the N7 is also referred to as the inbound carriageway.
The southbound carriageway of the N7 is also referred to as the outbound carriageway.

respectively. The distribution used assumes a 50-50 split in direction of origin and destination.

Figure 2.1 2009 (Construction Phase) AM Development Traffic Distributions[4]

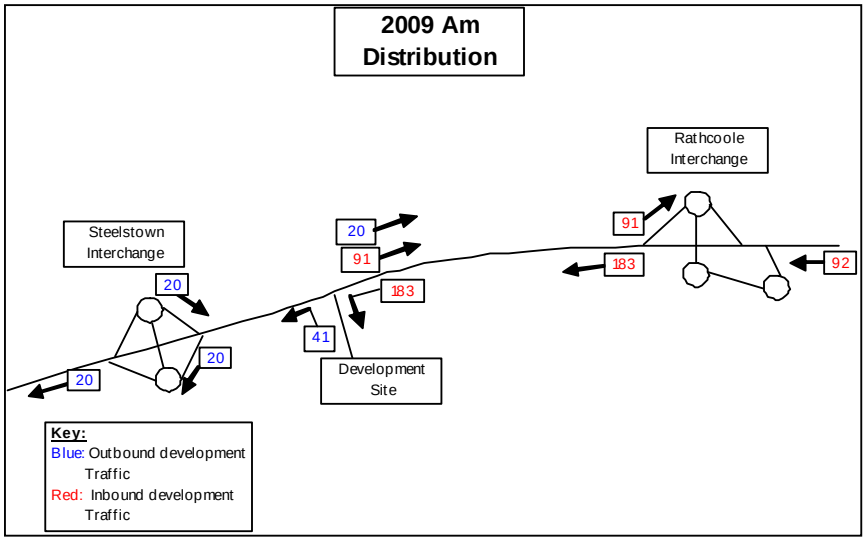
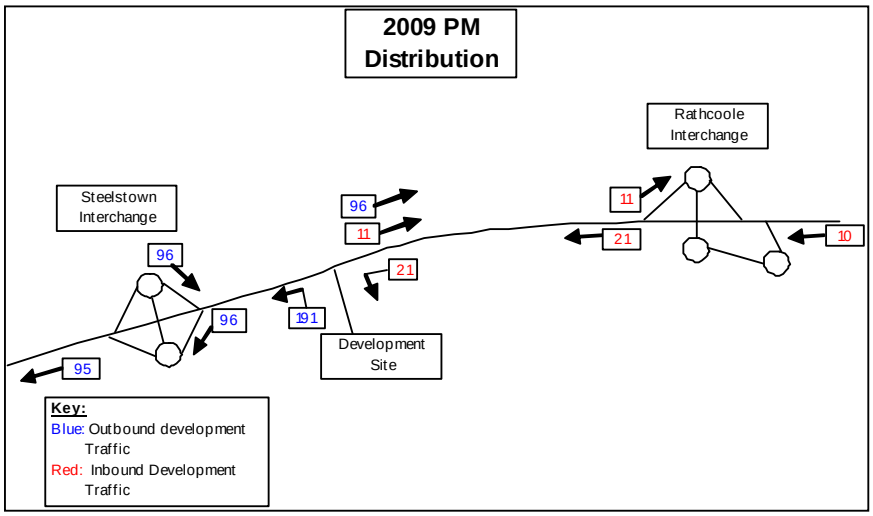


Figure 2.2 2009 (Construction Phase) PM Development Traffic Distributions[1]



2.5.2 As can be seen from the figures above an extra 91 trips pass through the Rathcoole Interchange and an extra 20 trips pass through the Steelstown interchange in the 2009 AM peak. When this distribution is applied to the horizon year (2026) of the N7RRP the amount of additional trips passing through the Rathcoole interchange in the AM peak will be 43 and the amount of trips passing through the Steelstown interchange will be 18. The Rathcoole Interchange will therefore experience a greater traffic loading in the AM Peak than the Steelstown Interchange, as the predominant direction of movement is to the site. In the PM

[4] A PCU factor of 2 for HGV's as per the Transport Assessment is assumed

peak, the reverse is true, with Steelstown Interchange experiencing the greatest increase in traffic volumes, arising from traffic egressing the development, and using the Steelstown Interchange to turn northbound on the N7.

2.5.3 The above assessment assumed a 50:50 split for north-south access traffic, however it is likely that different distribution patterns would emerge in practice. This would require further catchment area analysis to determine whether the facility will have a local, county, regional or national catchment, and what are the implications for this in terms of the trip distribution patterns.

2.5.4 An alternative approach would be to analyse the impact of development related traffic, by applying varying distribution patterns (e.g. 67%:33%, 33%:67% for north-south trips) and analysing the impact of these different distribution patterns on the road network.

2.6 Conclusions

Trip Generation Assessment

2.6.1 The assumptions underpinning trip generation rate calculations, and the ensuing calculations used in the Transport Assessment are considered robust, and appear to represent the likely worst case scenario for development generated traffic, in each of the impact years considered.

2.6.2 The trip generation figures show an increase in the amount of daily traffic to the site during the two construction years, when the total amount of daily trips increases from 465 trips to 777 trips. The amount of daily trips during the first six months of operation is 508 when the quarry is in its winding down phase. Thereafter the trips daily once the operation of the quarry has ceased will be 428 trips.

2.6.3 The key impact of the development proposal is, however during peak hours, when there would be a very substantial increase in trips to and from the development in all impact years assessed. This is illustrated in the table below.

Table 2.4 AM and PM Peak 2-Way Trip Generation Rates

	AM Peak	PM Peak
2006 (Existing)	37	35
Construction Phase	190	187
Operational Phase 2011	96	110
Operational Phase 2026	88	102

Trip Distribution Assessment

2.6.4 The trip distribution used in the Transport Assessment does not take account of the full zone of influence of the development. In particular, the assessment should have been extended

to include the Steelstown and Rathcoole interchanges, given that the left-in, left out junction configuration at the site will load significant numbers of additional trips onto these interchanges.

2.6.5 The assessment approach should also have included an assessment of base year and future year traffic data for the northbound carriageways of the N7, and an examination of the impact of the development on this carriageway.

2.6.6 The net impact of the proposed development during construction (assuming a 50:50 north-south directional split) is likely to be 91 PCUs passing through the Rathcoole interchange (an increase of 77 PCUs) in the AM peak. This decreases to 43 PCUs passing through the Rathcoole Interchange (an increase of 28 PCUs) in the year of opening (2011), and 40 PCUs (an increase of 25 PCUs) in the horizon year (2026) AM peak. The Steelstown Interchange will experience less significant increases in the AM peak.

2.6.7 During the PM Peak, the Steelstown Interchange will be affected to a much greater extent, as it will accommodate significantly higher volumes of traffic egressing the development, thus significantly increasing traffic flow through this interchange (an increase of 76 PCUs in the construction year {2009}, 22 in the year of opening {2011} and 20 in the horizon year {2026} PM peak).

2.6.8 Although not forming part of this audit, sensitivity testing on varying distribution patterns associated with traffic accessing/ egressing the proposed development should be undertaken to establish the maximum possible impact of development related traffic on the road network, and in particular on the Rathcoole and Steelstown Interchanges.

3 Highway Operational Assessment

3.1 Introduction

3.1.1 This section of the Audit Report investigates the validity of the assessment approach undertaken in the Transport Assessment, including the formulae used and their validity for use in junction analysis.

3.1.2 Given the limited scope of the Transport Assessment, in terms of failing to include an examination of the impact at the Steelstown and Rathcoole Interchanges, this section of the Report also provides a review of forecast future traffic flows on the N7, as contained within the Transport Assessment; and the adjoining Rathcoole Interchange using the South Dublin Traffic Model.

3.1.3 This section also includes a review of the road safety impact of the development proposal included in the Transport Assessment.

3.2 Junction Analysis / Mainline Carriageway Assessment Audit

3.2.1 The existing site access junction to the proposed N7RRP has been analysed for the construction and operational phases as part of the Transport Assessment. This was undertaken using the capacity formulae from SR 582 (Kimber and Coombe; the traffic capacity of major/ minor junctions; DOE TRRL report SR 582, 1980) for T-junctions. The key parameters examined in the results of this analysis are RFC (ratio of flow to capacity) and maximum queue length.

3.2.2 The results of this junction analysis showed that the RFC value for the site access junction is well within the critical limits of 0.85 in all scenarios and that queue lengths are no greater than 5 for vehicles trying to exit the site.

3.2.3 In auditing these results it was found that all calculations were carried out correctly. However the figure used for Wb-c (width of road flow from B to C) in the calculations was 6.5m. In PICADY if a value is over 5 it is taken as 5. To use a value of 6.5 implies that the road is 13.5m wide.

3.2.4 The Transport Assessment has forecast that 2026 traffic flows on the N7 are 5,133 vehicle including development related traffic. Calculations used for link capacity in the report find that the road will operate with 1.0% spare capacity in the peak hour and that because of this the national road network can accommodate the proposed development. To arrive at this conclusion on the basis of forecast traffic flows and assumed capacity is based on the assumption that the N7, or any road can operate close to 100% capacity. This is not true as when traffic volumes exceed 85% of capacity, the performance of the link in terms of free flow speeds, reliable journey time and safety performance begins to deteriorate. At close to 100% capacity a road link will experience very serious deterioration in performance and the level of service would decrease substantially. Given the strategic nature of the N7, i.e. its National Primary Road status, the implications of this erosion in performance would be significant.

3.2.5 As mentioned previously in this report, no reference is made to the impact of the proposed development on the northbound carriageway of the N7. Given the left-in, left-out junction configuration at the site, this represents a deficiency in the analysis undertaken.

3.3 Rathcoole Interchange Junction Performance

3.3.1 The analysis used in the Transport Assessment is limited as it only takes account of the site entrance and southbound carriageway of the N7, i.e. it does not cover the full zone of influence of the development proposal. Furthermore, the Transport Assessment does not include the impact of development proposals which would also impact on the sphere of influence for the development. Such developments include the Western Distributor Road, which is included in the current South Dublin Development Plan as a long term road objective [5]. The completion of this road is likely to result in a significant increase in traffic volumes through the increase through the Rathcoole and/ or Steelstown Interchange.

3.3.2 As highlighted earlier in this report the extent of the analysis undertaken in the Transport Assessment is limited and fails to take account of the impact on interchanges to the north and south of the development. In this section of the report, the do-minimum traffic conditions (i.e. traffic conditions in the absence of the proposed development) on the Rathcoole Interchange are detailed to give an insight into how this junction will be functioning before the additional development traffic is added to it.

3.3.3 For this study the Northern and Southern roundabouts of the Rathcoole interchange were analysed. This was undertaken for the AM Peak hour (08:00-09:00hrs) in the assumed construction year (2009), assumed opening year (2011) and assumed horizon year (2026) using the SDCC SATURN model.

3.3.4 The relevant junction analysis statistics are presented below in Table 3.1 and Table 3.2, overleaf.

[5] The South Dublin Development Plan states "The Council will give priority to, and will fast-track the building of the North – South Road (Western Distributor Road) west of Adamstown/ Lucan."

Table 3.1 Rathcoole Interchange Northern Roundabout Statistics

Flow/ Performance Characteristic	2009	2011	2026
Total Flow [6]	1,400	1,439	2,399
Average Delay (seconds) [7]	116	116	167
Worst Approach Delay (seconds) [8]	328	330	484
Average V/C % [9]	68	69	81
Worst Approach V/C % [10]	118	118	126
Average Queue [11]	23	23	34
Worst Approach Queue [12]	45	45	65

Table 3.2 Rathcoole Interchange Southern Roundabout Statistics

Flow/ Performance Characteristic	2009	2011	2026
Total Flow	2,353	2,376	2,726
Average Delay (seconds)	19	19	20
Worst Approach Delay (seconds)	37	36	38
Average V/C %	72	72	87

6 Total Flow is the total amount of traffic in pcu's that travels through the roundabout during the AM peak hour

7 Average delay is the average time in seconds spent queuing at all arms of the roundabout

8 Worst approach delay is the average time spent queuing at the arm which experiences the longest delays

9 Average V/C is the total volume of traffic at the junction divided by the capacity of that junction expressed as a percentage

10 Worst approach V/C is the value of volume/capacity for the approach arm which experiences the highest value of volume over capacity

11 Average queue is the average queue length on all arms at the roundabout expressed in pcu's

12 Worst approach queue is the average queue length on the approach which experiences the longest queues, expressed in pcu's

Flow/ Performance Characteristic	2009	2011	2026
Worst Approach V/C %	101	101	101
Average Queue	3	3	3
Worst Approach Queue	5	5	5

3.3.5 The above analysis indicates that the Rathcoole Interchange (northern and southern roundabouts) will be operating at capacity on certain arms in the 2009 do-minimum scenario. Traffic flows and delay through the interchange will also increase in future. This increase will be particularly evident after the completion of the Western Distributor Road, assuming that the primary connection between this road and the N7 is via the Rathcoole Interchange. The following is a brief summary of the key performance characteristics for the Rathcoole Interchange:

- Traffic volumes through the northern roundabout will increase from 1,400 in 2009 to 2,399 in 2026;
- Average V/ C at the northern roundabout (over all arms) will increase from 68% in 2009 to 81% in 2026. Average V/ C at the southern roundabout will increase from 72% in 2009 to 87% in 2026;
- Delay on the southern arm approach to the northern roundabout will increase from 328 to 484 seconds;
- V/ C on the southern arm of this roundabout will increase from 118% to 126%, and queues will extend from 45 cars in 2009 to 65 cars in 2026, i.e. extending through the southern roundabout in both scenarios;
- Traffic volumes through the southern roundabout will increase from 2,353 in 2009 to 2,726 in 2026;
- Average V/ C at the southern roundabout (over all arms) will increase from 72% in 2009 to 87% in 2026; and
- The western arm of the southern roundabout will operate above capacity in 2009, and remain at this level in future (V/ C of 101%).

3.3.6 Based on this analysis it can be seen that traffic volumes through the Rathcoole Interchange (northern Roundabout) will increase substantially between 2011 and 2026 in the absence of the development proposal. The southern roundabout will experience a lower increase; however it will still operate close to capacity (V/ C of 87%). The substantial increase through this interchange, in particular the northern roundabout is largely due to the completion of the Western Distributor Road, with the Rathcoole Interchange likely to accommodate the majority of trips accessing the N7 from the North.

3.3.7 Traffic accessing the proposed development is likely to add additional volumes to this interchange during the periods. In the AM peaks these increases amount to an extra 77 PCUs in 2009, 28 PCUs in 2011 and 25 PCUs in 2026. This additional traffic will result in increased delay through the interchange, which could have implications in terms of the delivery and operation of the Western Distributor Road as envisaged by South Dublin Development Plan. Despite the lower volumes of traffic in the horizon year, these flows will be loaded onto an interchange carrying substantially increased background traffic volumes, when compared to the construction phase scenario.

3.4 Road Safety

3.4.1 Section 12.11.1 of the Transport Assessment examines the road safety impact of the proposed development. The assessment states that South Dublin Development Plan standards for sight distances on 100km/h roads are met. The assessment also describes diverge and merge lane characteristics at the sight entrance.

3.4.2 The assessment does not conclude that there will be no negative safety impacts associated with the development proposal. Furthermore, the assessment proposes that "advance warning of the site access junction in the form of warning and regulatory signs" are erected. This would seem to be an acknowledgement on the part of the Transport Assessment authors that the proposed development will represent an increased risk to vehicular traffic movements on the N7.

3.4.3 The N7 is a 3-lane inter-urban dual carriageway with 100kph speed limit applying along the mainline carriageway in the vicinity of the development. On safety grounds, access/ egress to adjoining areas should be confined to high quality interchanges, such as that at Rathcoole. Left in-left out arrangements, with limited acceleration/ deceleration lanes are only suited to low traffic volumes; and should only be provided to accommodate existing developments where no alternative is available.

3.4.4 The development proposal will result in a considerable increase in vehicles accessing/ egressing the development during peak hours (153/ hour in 2009, 59/ hour in 2011, and 51/ hour in 2026). This increase in traffic accessing/ egressing the site will present an increased risk to road safety on the N7. Furthermore, development related traffic heading in a northbound direction will result in increased traffic volumes through the Steelstown Interchange, which is also of left-in left-out configuration.

3.5 Conclusions

Mainline Carriageway Assessment Audit

3.5.1 The Transport Assessment has forecast that the N7 southbound in 2026 will operate with 1.0% spare capacity in the peak hour and that because of this the national road network can accommodate the proposed development. Based on the forecast flows within the Transport Assessment (5,133 vehicles southbound), this conclusion is invalid, as when traffic volumes exceed 85% of capacity, the performance of the link in terms of free flow speeds, reliable journey time and safety performance begins to deteriorate. At close to 100% capacity a road link will experience very serious deterioration in performance and the level of service

would decrease substantially. Given the strategic nature of the N7, i.e. its National Primary Road status, the implications of this erosion in performance would be significant.

3.5.2 No reference is made to the impact of the proposed development on the northbound carriageway of the N7. Given the left-in, left-out junction configuration at the site, this represents a deficiency in the analysis undertaken.

Rathcoole Interchange Junction Performance

3.5.3 There is no correlation between the Transport Assessment and the zone of influence of the development proposal. Specifically, the impact at the Rathcoole and Steelstown Interchanges has not been assessed. This is a significant weakness in the assessment undertaken. Furthermore the assessment does not consider committed developments in the South Dublin Area, for example the Western Distributor Road, a long term objective within the South Dublin Development Plan. Although the alignment for this road has not been determined, it is likely that its connection with the N7 will result in increased traffic flows through the Rathcoole and/ or Steelstown Interchanges.

3.5.4 The South Dublin Traffic Model was used as a basis for assessing background traffic flows and conditions through the Rathcoole Interchange. Data extracted from the model has indicated that the interchange is operating at capacity in 2009, with significant delay experienced through the interchange, in particular the northern roundabout.

Assessment Approach

3.5.5 The impact of the development proposal on the wider road network should have been undertaken as part of the Transport Assessment, rather than an assessment of the performance of the priority junction on the N7. This assessment should have included the N7 interchanges at both Steelstown and Rathcoole. The most appropriate means of undertaking this assessment would be to use the South Dublin Traffic Model as a basis.

3.5.6 To ensure the model is sufficiently representative of local traffic conditions at present, it would be necessary to expand the network representation to include the Steelstown Interchange, and to revalidate the model within the zone of influence of the development proposal, to 2008 traffic conditions, via local traffic survey data.

Road safety

3.5.7 Site access/ egress arrangements are via a left-in, left-out junction arrangement on the N7, a 3-lane National Primary Road with 100km/h speed limit. The development proposal would result in increased traffic volumes accessing/ egressing the site, with the most pronounced daily increases coinciding with peak hour traffic volumes on the N7. The junction configuration at the proposed development site location is only suited to low traffic volumes. As a result, any increase in traffic volumes will have a negative impact on road safety performance of the N7.

3.5.8 The recommended advance warning signs, recommended in the Transport Assessment, are an implicit acknowledgement of the increased risk to vehicular traffic on the N7 arising from the development proposal.

4 Conclusions and Recommendations

4.1 Conclusions

4.1.1 This Transport Assessment Audit undertaken in relation to the proposed Resource Recovery Project at Windmillhill, adjacent to the N7 in South Dublin has found the assessment to lack in the following key areas:

- The zone of influence of the development does not correlate with the Transport Assessment spatial scope. The Transport Assessment related to an examination of the performance of the left-in, left-out junction on the N7 southbound carriageway. While the trip generation rates used within the Transport Assessment are considered robust, an examination of trip distribution patterns was not submitted. As a result the impact of the development on the wider road network was not considered. In particular, the impact of the development proposal on the following elements of the road network should have been considered as part of the transport assessment:
  - Rathcoole and Steelstown Interchanges, and
  - Northbound carriageway on the N7;
- Committed developments are not considered, including the proposed Western Distributor Road, which is included as a long term road objective within the current South Dublin Development Plan;
- The Transport Assessment has forecast that the N7 southbound in 2026 will operate with 1.0% spare capacity in the peak hour and because of this the national road network can accommodate the proposed development. Based on the forecast flows within the Transport Assessment (5,133 vehicles southbound), this conclusion is invalid, as when traffic volumes exceed 85% of capacity, the performance of the link in terms of free flow speeds, reliable journey time and safety performance begins to deteriorate. At close to 100% capacity a road link will experience very serious deterioration in performance and the level of service would decrease substantially. Given the strategic nature of the N7, i.e. its National Primary Road status, the implications of this erosion in performance would be significant; and
- The assessment does not adequately consider the impact of the proposed development on road safety performance on the N7 National Primary Road. The development represents an intensification of use at the site as regards trip generation, and site access is via a single access/ egress point on the N7, with limited merge/ diverge lanes. Any change of land use at the site location leading to an intensification of trip generation rates, in particular during peak hours represents an increased risk to traffic safety on the N7.

4.2 Recommendations

4.2.1 The following recommendations are made on foot of the Transport Assessment Audit, undertaken by MVA Consultancy in relation to the proposed development at Windmillhill:

- The proposed development is located adjacent to the N7 National Primary Road, with access/ egress via a left-in, left-out arrangement. The development proposal would lead to an intensification of trips to the site (in particular during peak hours), which

would have a negative impact on the N7 traffic safety in its vicinity. The warning signs recommended in the Transport Assessment for erection on the N7, in advance of the site, are an implicit acknowledgement of the increased risk this development proposal presents to N7 traffic.

- The development proposal will result in increased traffic flows on the N7 mainline carriageway, and through both the Steelstown and Rathcoole Interchanges, the latter of which is forecast to experience substantial increases in background traffic volumes and delays in future. This could have implications in terms of the delivery and/ or operation of the proposed Western Distributor Road, as detailed earlier in this Report.
- On the above grounds, it is considered that the site location at Windmillhill represents an unsuitable location for any development which results in intensification of trip generation rates, such as the proposed Resource Recovery Project.

MVA Consultancy provides advice on transport and other policy areas, to central, regional and local government, agencies, developers, operators and financiers.

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