Traffic Safety Improvements on Ballinteer Road

Project Report

January 2015
Control sheet

Project Name: Ballinteer Road, Ballinteer
Project Number: 14_102
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Report Title: Project Report

<table>
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<th>Issue No.</th>
<th>Issue Status</th>
<th>Date</th>
<th>Prepared by</th>
<th>Checked by</th>
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1 Introduction

Clifton Scannell Emerson Associates was appointed in May 2014 by Dun Laoghaire Rathdown County Council to investigate options for traffic safety improvements on Ballinteer Road.

The project sets out to address local residents concerns regarding traffic speeds and the lack of provision of safe access and egress into and out of residential estates along the section of Ballinteer Road covered by the study area.

The section of Ballinteer Road in question extends south from its junction with Ballinteer Avenue to its junction with Brehon Field Road and forms a major feeder route between the M50 Motorway and the Dundrum Shopping Centre / Dundrum Village.

1.1 Project Brief
The main tasks involved in conducting the project are as follows:

1. The procurement of a contractor to conduct traffic surveys at key intersections along this section of Ballinteer Road, to include data on vehicular, pedestrian and cycle movements.
2. The procurement of a contractor to conduct a topographical survey of key sections of the study area.
3. The development of options, in consultation with DLRCC, to address the concerns of local residents and items listed above.
4. Preparation of a Preliminary Layout drawing, to "Public Consultation" standard, for use in discussions with local Elected Members and residents.
5. Preparation of Construction Tender Documents, incorporating all comments and changes arising following feedback on the Preliminary Layout.

1.2 Scheme objectives
The objectives of the project are to improve safety for pedestrians, cyclists and vehicles (in particular, for vehicles entering and existing residential estates), reduce speeds on Ballinteer Road and to provide logical crossing points for cyclists and pedestrians.
2 Data Collection

2.1 Topographical Surveys
Topographical surveys were conducted in July 2014, with mapping information obtained from the surveys used to inform the study.

2.2 Traffic Surveys
Full junction turning counts and cyclist/pedestrian crossing counts were conducted on Thursday 18th September and Saturday 20th September 2014 in accordance with NTA specifications at the following locations:

1. Junction of Ballinteer Road, Ballinteer Avenue, Wyckham Road and Wesley College Access Road;
2. Junction of Ballinteer Road and Clonlea Park;
3. Junction of Ballinteer Road and Clonlea;
4. Junction of Ballinteer Road and Delbrook Park;
5. Junction of Ballinteer Road and College Park;
6. Junction of Ballinteer Road and The Heights; and
7. Pedestrian crossing on Ballinteer Road, just south of The Heights.

3 Design

3.1 Preliminary Design Options
A number of preliminary design options were considered along Ballinteer Road to improve safety for residents (Phase 1) and to alleviate congestion at the Wesley College Roundabout (Phase 2). The options considered for each phase are discussed below.

Phase 1
The purpose of Phase 1 of the project is to address local residents concerns regarding traffic speeds and to improve safety for residents entering and exiting their estates. This phase does not particularly focus on alleviating traffic congestion through the study area, but rather on providing fast tracked safety benefits to residents. Measures to reduce congestion will be provided as part of Phase 2. A number of preliminary design options were looked at. Three meter traffic lanes were proposed as part of each option through the use of hatching and right turning lanes to reduce speeds in accordance with the Design Manual for Urban Roads and Streets, 2013. In addition, options were investigated to implement one of the following:

1. Signalise the junction of Ballinteer Road and The Heights.
2. Maintain the College Park Avenue junction as a priority junction and provide a signalised toucan crossing on the southern arm of the intersection.
3. Signalise the intersection of Ballinteer Road and College Park Avenue and provide signalised toucan crossings on the north and east arms of the junction.
Option 1 would facilitate safer and more convenient access for residents of The Heights to and from Ballinteer Road. It would also provide a break in traffic flow to facilitate safer and more convenient access from surrounding residential estates. However, it was concluded that the provision of junction modifications at the College Park Avenue junction would be a more suitable solution for the following reasons:

- There is currently a toucan crossing south of the junction which assists residents to get in and out of The Heights estate.
- The Heights is currently used as a rat run during peak times to travel between Ballinteer Road and Ballinteer Avenue and signalisation of the junction may encourage this further.
- The Heights estate is located within relatively close proximity of The M50 and there is a risk that its signalisation would induce queuing back onto the M50 during peak times, which should be avoided.
- While The Heights and College Park Avenue provide access to a high proportion of the total residential housing in the study area, College Park Avenue is located more centrally on the link and will best assist access and egress to the surrounding residential estates.

Option 2 would facilitate safer and more convenient access for residents of College Park Avenue to and from Ballinteer Road when the toucan crossing is called. In particular, vehicles turning right from College Park Avenue onto Ballinteer Road would be able to do so more safely and conveniently during the toucan cycle. It would also provide a break in traffic flow to facilitate safer and more convenient access from surrounding residential estates when the crossing is called. However, this option was discounted during the preliminary design phase for the following reasons:

- While the crossing would facilitate safe and convenient right turning movements from College Park Road onto Ballinteer Road when it is called, it does not assist vehicles turning right from Ballinteer Road into the estate.
- The crossing will not necessarily be called at regular intervals or during peak periods of congestion when it is required the most.
- The knock on benefits of providing the crossing to residents of nearby estates in terms of safety and convenience, would be less than those achieved through the signalisation of the junction.

Option 3 would facilitate safer and more convenient access for residents of College Park Avenue to and from Ballinteer Road and would provide a break in traffic flow to facilitate safer and more convenient access to and from the surrounding residential estates. For this reason and the reasons discussed above, Option 3 was noted as the preferred option. A number of lane configurations were then investigated and modelled for Option 3 to derive the preferred lane configuration to be advanced to detailed design.
Phase 2
Phase 2 relates to the provision of measures to improve safety and reduce congestion at the Wesley College Roundabout. A number of options were considered involving the conversion of the existing roundabout into a signalised intersection, including the following lane configurations:

1. One through and one right turning lane on the Ballinteer Road and Wyckham Way approaches and one lane on the Wesley College access approach. This option could be facilitated within the existing road reserve allocated for the roundabout.

2. One through and one right turning lane on the Ballinteer Road approach, two through and one right turning lane on the Wyckham Way approach and two lanes on the Wesley College access approach. This option would require land take on the east side of Wyckham Way, north of the roundabout (a section off the garden of one residential property) and widening of the Wesley College access road at the intersection, requiring relocation or removal of the exiting pillars and approval from the school to widen the road.

3. Two through and one right turning lane on the Ballinteer Road approach, one through and one right turning lane on the Wyckham Way approach and two lanes on the Wesley College access approach. This option would require land take on the west side of Ballinteer Road, south of the roundabout (a cut off the front of a section of land currently being developed) and widening of the Wesley College access road at the intersection, requiring relocation or removal of the exiting pillars and approval from the school to widen the road.

4. Two through and one right turning lane on the Ballinteer Road approach, two through lanes on the Wyckham Way approach and one lane on the Wesley College access approach. This option would require land take on the east side of Wyckham Way, north of the roundabout (a section off the garden of one residential property) and land take on the west side of Ballinteer Road, south of the roundabout (a cut off the front of a section of land currently being developed).

5. Two through lanes on the Ballinteer Road approach, two through lanes on the Wyckham Way approach and two lanes on the Wesley College access approach. This option would require land take on the east side of Wyckham Way, north of the roundabout (a section off the garden of one residential property), land take on the west side of Ballinteer Road, south of the roundabout (a cut off the front of a section of land currently being developed) and widening of the Wesley College access road at the intersection, requiring relocation or removal of the exiting pillars and approval from the school to widen the road.

The five options outlined above were modelled using Oscady to inform the decision process in terms of which option should be progressed to detailed design stage.

4 Traffic Modelling

The Oscady modelling package was used to evaluate the preferred preliminary design options for Phases 1 and 2.
4.1 Phase 1
Table 4.1 shows the Oscady Modelling results corresponding to two options to signalise the junction of Ballinteer Road and College Park Avenue for AM, PM and Saturday peak hour traffic flows.

The two options are as follows:

1. One straight and one right turning pocket on the south approach, one combined straight and left turning lane on the north approach and *one approach lane on the east approach* (College Park Avenue approach)
2. One straight and one right turning pocket on the south approach, one combined straight and left turning lane on the north approach and *separate right and left turning approach lanes on the east approach* (College Park Avenue approach)

The results show that the junction operates above capacity for Option 1 during the PM peak but within capacity for Option 2 during all peak periods. Therefore, the implementation of Option 2 is recommended. This option will require the widening of the entrance to the estate on the southern side, which will require the relocation of the southern pillar and will impact on existing trees, as shown in Figure 14_102_201.

**Table 4.1: Oscady Modelling Results for Phase 1**

<table>
<thead>
<tr>
<th>Junction</th>
<th>Configuration</th>
<th>Time Period</th>
<th>Max DoS</th>
<th>Max Queue (vehicle lengths)</th>
<th>Max Queue Approach</th>
<th>Max Queue College Pk Ave</th>
<th>RFC</th>
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<tbody>
<tr>
<td>Ballinteer Rd/ College Park Ave</td>
<td>1 approach lane College Park Ave</td>
<td>AM</td>
<td>81.4</td>
<td>14.8</td>
<td>Ballinteer Rd Sth</td>
<td>5.6</td>
<td>0.896</td>
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<tr>
<td>Ballinteer Rd/ College Park Ave</td>
<td>1 approach lane College Park Ave</td>
<td>PM</td>
<td>96.6</td>
<td>61.0</td>
<td>Ballinteer Rd Nth</td>
<td>3.8</td>
<td>1.063</td>
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<tr>
<td>Ballinteer Rd/ College Park Ave</td>
<td>1 approach lane College Park Ave</td>
<td>Sat</td>
<td>88.8</td>
<td>25.3</td>
<td>Ballinteer Rd Nth</td>
<td>2.1</td>
<td>0.978</td>
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<tr>
<td>Ballinteer Rd/ College Park Ave</td>
<td>2 approach lanes College Park Ave</td>
<td>AM</td>
<td>77.7</td>
<td>12.0</td>
<td>Ballinteer Rd Sth</td>
<td>2.5</td>
<td>0.856</td>
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<td>Ballinteer Rd/ College Park Ave</td>
<td>2 approach lanes College Park Ave</td>
<td>PM</td>
<td>86.3</td>
<td>18.2</td>
<td>Ballinteer Rd Nth</td>
<td>1.4</td>
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<tr>
<td>Ballinteer Rd/ College Park Ave</td>
<td>2 approach lanes College Park Ave</td>
<td>Sat</td>
<td>79.4</td>
<td>12.4</td>
<td>Ballinteer Rd Nth</td>
<td>1.0</td>
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4.2 Phase 2

Table 4.2 shows the Oscady Modelling results corresponding to two options to signalise the junction of Ballinteer Road and College Park Avenue for AM, PM and Saturday peak hour traffic flows. The results for Option 1, which would provide a signalised junction within the existing land envelope covered by the roundabout, showed that the intersection would operate above capacity, with a maximum degree of saturation of 124.5 percent, maximum queue length of 219.6 vehicles and a ratio of flow to capacity value of 1.371 during the AM peak.

While there was an improvement in the results for Options 2 and 3, the intersection for these case scenarios still operates above capacity during peak periods. Oscady results for Option 4 show that the intersection is approaching capacity during the AM peak with a degree of saturation of 87.5 percent, and has very little spare capacity to cater for additional traffic flows.

The results show an improvement in the operation of the intersection for Option 5, with a maximum degree of saturation of 83.6 percent during the AM peak (worst case scenario). Therefore, the intersection layout associated with Option 5 is recommended for implementation as part of Phase 2 of the scheme.

Table 4.2: Oscady Modelling Results for Phase 2

<table>
<thead>
<tr>
<th>Option</th>
<th>Intersection</th>
<th>Configuration</th>
<th>Time Period</th>
<th>Max DoS (%)</th>
<th>Max Queue (vehicle lengths)</th>
<th>RFC</th>
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<tr>
<td>1</td>
<td>Ballinteer Rd/Ave/Wyckham Way/ Wesley</td>
<td>1 through Ballinteer Rd/ Wyckham Way, 1 lane Wesley</td>
<td>AM</td>
<td>124.5</td>
<td>219.6</td>
<td>1.371</td>
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<tr>
<td>1</td>
<td>Ballinteer Rd/Ave/Wyckham Way/ Wesley</td>
<td>1 through Ballinteer Rd/ Wyckham Way, 1 lane Wesley</td>
<td>PM</td>
<td>105.4</td>
<td>104.5</td>
<td>1.160</td>
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<tr>
<td>1</td>
<td>Ballinteer Rd/Ave/Wyckham Way/ Wesley</td>
<td>1 through Ballinteer Rd/ Wyckham Way, 1 lane Wesley</td>
<td>SAT</td>
<td>120.4</td>
<td>204.6</td>
<td>1.325</td>
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<td>2</td>
<td>Ballinteer Rd/Ave/Wyckham Way/ Wesley</td>
<td>1 through Ballinteer Rd/ 2 through Wyckham Way (SB), 2 lane Wesley</td>
<td>AM</td>
<td>116.6</td>
<td>167.5</td>
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<td>2</td>
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<td>1 through Ballinteer Rd/ 2 through Wyckham Way (SB), 2 lane Wesley</td>
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<td>107.1</td>
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<td>2</td>
<td>Ballinteer Rd/Ave/Wyckham Way/ Wesley</td>
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<td>122.1</td>
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<td>Ballinteer Rd/Ave/Wyckham Way/ Wesley</td>
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<td>88.0</td>
<td>24.2</td>
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<td>3</td>
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<td>3</td>
<td>Ballinteer Rd/Ave/Wyckham Way/ Wesley</td>
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<td>Sat</td>
<td>91.6</td>
<td>34.3</td>
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<td>4</td>
<td>Ballinteer Rd/Ave/Wyckham Way/ Wesley</td>
<td>2 through Ballinteer Rd(NB) / 2 through Wyckham Way, 1 lane Wesley</td>
<td>AM</td>
<td>87.5</td>
<td>17.1</td>
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<td>4</td>
<td>Ballinteer Rd/Ave/Wyckham Way/ Wesley</td>
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<td>PM</td>
<td>77.2</td>
<td>11.5</td>
<td>0.847</td>
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<td>4</td>
<td>Ballinteer Rd/Ave/Wyckham Way/ Wesley</td>
<td>2 through Ballinteer Rd(NB) / 2 through Wyckham Way, 1 lane Wesley</td>
<td>Sat</td>
<td>79.2</td>
<td>14.2</td>
<td>0.872</td>
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<td>5</td>
<td>Ballinteer Rd/Ave/Wyckham Way/ Wesley</td>
<td>2 through Ballinteer Rd(NB) / 2 through Wyckham Way, 2 lane Wesley</td>
<td>AM</td>
<td>83.6</td>
<td>13.7</td>
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<td>5</td>
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<td>74.9</td>
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<td>5</td>
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<td>Sat</td>
<td>79.2</td>
<td>14.2</td>
<td>0.872</td>
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5 Proposed Scheme
The preferred options for the proposed scheme were brought up to detailed design standard, with Phases 1 and 2 provided on separate drawings.

5.1 Detailed Design Summary
In accordance with the outcome of the Phase 1 Oscady models, the measures proposed as part of Phase 1 of the scheme are shown in Figure 14_102_200 and Figure 14_102_201.

Similarly, in accordance with the Phase 2 Oscady models, the measures proposed for Phase 2 of the scheme are shown in Figure 14_102_202.

Approval and construction of Phase 1 will likely occur in the short term. Phase 2 requires land take and therefore approval and construction will likely occur in the medium term.

6 Appendices
- 14_102_200 Phase 1 Detailed Design (1 of 2)
- 14_102_201 Phase 1 Detailed Design (2 of 2)
- 14_102_202 Phase Detailed Design
This drawing is produced using the Irish Transverse Mercator (ITM) / Irish Grid Geographics Coordinate System.

**EXISTING ROAD ARRANGEMENT**

**EXISTING CROSSING TO BE RETAINED**

**NOTE:** LANE MARKINGS AND MEDIAN REVISED AS FOLLOWS-
- 3.0m CARRIAGEWAY
- 4.2M CHEVRON ISLAND
- 3.0m CARRIAGEWAY

**PROPOSED ROAD ARRANGEMENT**

ROAD MARKINGS TO BE REVISED TO PROVIDE RIGHT TURN FILTER

ROAD MARKINGS TO BE REVISED TO PROVIDE RIGHT TURN FILTER

NOTES AND HATCH ADDED

**LEGEND:**
- CARRIAGEWAY
- FOOTPATH
- CYCLEPATH/CLAINKEEN
- VERGE/LANDSCAPING
- CONCRETE ISLAND

**DUN LAOGHAIRE RATHDOWN COUNTY COUNCIL**

**BALLINTEER ROAD SAFETY IMPROVEMENTS**

**PHASE 1 LAYOUT**

**SHEET 1 OF 2**

**PW**

**EC/GE**

**12/08/14**

**1:1000**

**PUBLIC CONSULTATION**

**PUBLIC CONSULTATION**

**14_102_200-A**
PROPOSED NEW SIGNALISED JUNCTION TO PROVIDE RIGHT TURN FILTER.

PROPOSED NEW SIGNALISED TOUCON CROSSING ON BALLINTEER ROAD AND ZEBRA CROSSING OVER CLONLEA.

NOTE: LANE MARKINGS AND MEDIAN REVISED AS FOLLOWS:
- 3.0m CARRIAGEWAY
- 3.0m CARRIAGEWAY
- 1.7M CHEVRON ISLAND
- 3.0m CARRIAGEWAY

EXISTING CROSSING TO BE RETAINED.

S.A.M. VEHICLE ACTIVATED SPEED DETECTOR - ACTUAL SPEED.