APPENDIX A

Consultation Responses

Bord Iascaigh Réigiúnach an Iardheiscirt
South Western Regional Fisheries Board

Fisheries Ireland
Our Natural Heritage

Swe100-poc-pplEIS- recycling CS08-2360

Mr Bill Quirke.
Conservation Services Limited.
Tullaha
Glenflesk,
Killarney,
Co. Kerry

4 April 2008

RE: EIS for Proposed Waste Recycling Facility at Caherdean, Killarney.

Dear Mr Quirke,

Further to your letter concerning the above proposal. This site is located within the catchment of the Gweestin River which is a highly productive salmonid river and designated water under the Habitats Directive. The requirement of the Board is that the development would not impact on the aquatic habitat or water quality of this system, i.e. tributaries of the Gweestin River and the Gweestin itself, during the construction or operational phases.

To insure protection of the Gweestin, the Board recommends that all site waters (site surface/ storm water/ contaminated/ treated effluent be disposed using sustainable drainage methods utilising techniques such as permeable paving, soil infiltration, percolation, wetlands etc. There should be no culvertion, interference or modification of any fish bearing watercourses. All liquid waste generated on site should be controlled and contained in adequately sized effluent storage facilities with effective bunding.

The fishery status of the adjoining tributaries is unknown, this should be determined.

When further information is available the Board would be pleased to discuss this with you again.

Yours sincerely,

Patricia O'Connor.
For Chief Executive Officer.

The South Western
Regional Fisheries Board
Sunnyside House
Macroom,
Co. Cork

Conservation Services

From: Jim Ryan [jim_ryan@environ.ie]
Sent: 29 February 2008 17:59
To: conserv@eircom.net
Subject: Re: Fwd: Waste recycling centre near Gweestin River in cSAC343


TW_83b9.jpg (152 KB)

TW_83b2.jpg (163 KB)

TW_83b3.jpg (116 KB)

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TW_83b7.jpg (125 KB)

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TW_83b1.jpg (129 KB)

ATT00009.txt (935 B)

>>> Neil Lockhart 29/02/2008 14:44 >>>
Jim,

Attached are some scanned documents that support the selection of cSAC Casltemaine Harbour (343) for salmon, otter and lampreys. The information may be of (limited) use to Bill Quirke, but the Central Fisheries Board will have better data on salmon. Ferdia might wish to add his comments.

Neil

>>> Jim Ryan 29/02/2008 10:36 >>>
Is it possible to provide location info for the lampreys and otter or salmon (less important as they can get that from CFB) for the Laune and Gweestin rivers which form part of the Castlemaine Harbour SAC?

>>> "Conservation Services" <conserv@eircom.net> 28/02/2008 16:41 >>>
Jim/Aine,

I attach map and letter re. the above.

All the best,

Bill Quirke

Conservation Services
Tullaha, Glenflesk
Killarney, Co. Kerry
Ireland

Tel/Fax: +353-64-30130
e-mail: conserv@eircom.net

NATURA 2000

Additional Explanatory Notes to Accompany Form

Site Name: Castlemaine Harbour

Site Code: S00000343

3. Ecological Information

3.2.f Fishes Listed on Annex II of Council Directive 92/43/EEC

Note.
From the available maps, it appears that the present boundary of this site extends to just beyond Killorglin. The River Laune and its tributaries are outside of the pSAC site (though the upper parts of the southern tributaries, which flow from the Reeks, are within site 365). Lough Leane and the River Flesk system are within site 0365.

For the purpose of the assessments, it is assumed that the main channel of the Laune and its main tributaries will be added in with suitable boundaries in the course.

1106 Salmo salar

(i) Population data on species

Castlemaine Harbour is a very large estuarine/bay site, with a range of coastal habitats which are generally of good quality. It includes the estuaries of two main rivers, the Maine and the Laune, and also the estuary of the Caragh River. The River Laune extends for about 14 km form Killorglin to Lough Leane (part of site 365). The principal tributaries of the Laune are the Gweestin River (confluence grid ref V833 948) which flows for about 18 km and which has a tributary the Glanooragh (confluence grid ref V904 980, length c. 8 km); Cottoner's River (confluence grid ref V967 957) which rises high in the Macgillycuddy Reeks at Coomloughra and flows for about 12 km; the Finglas River (confluence grid ref V805 942, length 8 km); Gaddagh River (confluence grid ref V841 937) which rises on the east slope of Carrauntoohil (Lough Caffee) and which has a tributary the Owenacullin River (total length c 15 km). Total length of river and main tributaries in this system is in excess of 75 km.

The River Laune flows from Lough Leane into Dingle Bay via Castlemaine Harbour. Its lower reaches have long pools and glides dominated by weeds and the riverbed here is of stones and gravel. The river receives good runs of salmon and sea trout (Irish Fisheries 2001). According to O'Reilly (1991) the River Laune is an exceptional river and fishery and gets an excellent run of spring salmon and grilse, but that the sea-trout run has declined. There is a constant fishery on the system although this has reduced due to a low recruitment and no restocking is carried out (Paddy O'Sullivan, pers comm.). However, effort is being made to improve the recruitment through the reduction of fishing pressure by drift netting in Castlemaine Harbour (approx. 3000 salmon were left in the river) and through a reduction in the drift net fishery in Dingle Bay through capping.

The Laune flows from Lough Leane, which is the largest of the Killarney lakes and was once famous in Europe as a haunt for anglers, particularly for salmon (Went 1947), although numbers have been reduced over time. It has been noted that significant numbers of juvenile salmon do not occur in Lough Leane although this is apparently common in Irish lakes (Bracken 1998). According to Irish Fisheries (2001) Lough Leane is noted for its great brown trout and salmon fishing.

The May 2000 Fishery Report (Irish Fisheries, 2001) noted that all draft nets had been removed from the Laune as part of the catchment management programme and that the effect had been positive with over 120 salmon caught in the Killarney Flesk River (tributary of the Laune) during one week in May.

Population size in the river system is not known but the species is certainly not rare. On the form the population is given as Common (as opposed to Rare or Very Rare or merely Present).

(iii) Site assessment criteria

Population
Salmon are native to almost all Irish rivers, although each catchment essentially contains a closed breeding population with sea going migrating individuals showing a high fidelity to their home streams. It is unlikely that any pSAC holds more than 2% of the national total.

Class Interval C 2% > p > 0%

Conservation
Salmon (*Salmo salar* L.) have a complex and unusual life-cycle. They hatch in freshwater from nests in gravel (redds), migrate downstream to the sea when they become smolts (after 2 years) and finally return to the upper reaches of their native river to spawn after at least a year at sea. Fish returning from the sea after one year are called grilse whilst fish spending more than one winter at sea are called salmon.

Salmon are a very important commercial species which are netted from Atlantic coasts and estuaries. In recent times the efficiency of drift netting at sea accounts for 72% of all fish captured (Central Fisheries Board, 2001). Angling now accounts for only 4-5% of the catch with many anglers calling for drift netting to be banned. Salmon are also a very important aquaculture species in Ireland. There is concern that interactions between wild stocks and escaped farm salmon are deleterious to the wild population (Hansen and Youngson 1997). Other threats to salmon and their habitats include water pollution, siltation, destruction of spawning beds, commercial fishing and obstruction of their passage upstream (Crisp 1996, Bracken and O'Grady, 1992).

EPA water quality sampling at a number of sites on the Laune River during the period 1986 - 1996 allocated Q-values of 4 (unpolluted conditions) and 3-4 (slightly polluted). Prior to 1986 the Q ratings were given as 5 (pristine) or 4-5 (unpolluted), so there has been a deterioration in water quality in recent years. Most of the tributaries of the Laune were unpolluted (Q values 4, 4-5, 5), although the Gweestin River has suffered from some water quality problems with Q-values as low as 2-3 (moderately polluted) given at one site (Gweestin Bridge) on the river in 1996 and 1998.

The EPA classified Lough Leane as highly eutrophic in period 1995-97. They note that this is a recent significant deterioration from an unpolluted mesotrophic condition maintained over many years, and follows many years of improving quality in the lake due to the introduction of phosphorus removal at the Killarney Sewage Works in the early 1980s (Lucey et al 1999). The lake was strongly eutrophic in 1998 and moderately eutrophic in 1999 (information from 'A catchment based approach for reducing nutrient inputs from all sources to the Lakes of Killarney - Lough Leane Catchment Plan, 2nd Interim report December 2000'). While the catchment plan should improve the quality of Leane in the long-term, it is still very vulnerable to pollution.

Fahey et al. (1997) sampled the intertidal biotopes at a site in Castlemaine harbour below Rosculleh Pt and the Laune river channel. Evidence of sewage discharge was noted.

Direct threats to fish exist from netting in Dingle Bay and Castlemaine harbour although these are being addressed in the catchment management plan. Other problems include over grazing and forestry in the catchment causing reduction in water quality through increased sediment loads during flash flooding.

Ranking: B - good conservation

Isolation

Salmon are anadromous fish, spending part of their life at sea, but return to their home rivers to spawn. Each stock of salmon will have evolved local adaptations to their home rivers and restocking of rivers in the past has had limited success (Niall O'Maoileidigh in litt, also see Maitland 1996), so therefore each salmon stock could be considered to be isolated to a certain extent. Sub-species, races or local varieties are, however, not recognised.

In Europe the salmon has a continuous distribution from the River Mino in Portugal to the Petschora region of Russia. It occurs in Iceland and is common in the Baltic Sea. It occurs throughout Ireland and much of Britain.

While acknowledging that each salmon stock in Irish rivers (and presumably all European rivers) could be considered to be isolated to a certain extent, in geographical terms none of the Irish populations are isolated within the extended European range of the species nor are they at the edge of the European range (as would the populations be in Portugal). The salmon stock in the Castlemaine pSAC are not isolated.

Ranking: C - population not isolated within extended range

Global

Overall, the Laune is an important salmon river with suitable spawning and nursery habitats. All returning fish entering the Laune/Flesk system and the Caragh system pass through the extensive estuarine bay. Part of Castlemaine Harbour is a designated SPA and a Nature Reserve. Threats exist from netting in Dingle Bay and Castlemaine harbour although these are being addressed in the catchment management plan. Eutrophication of the river and lake habitats within the system is a problem and continued threat.

Ranking: B - good value

Biosphere Environmental Services
January 2001

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NATURA 2000

ADDITIONAL EXPLANATORY NOTES TO ACCOMPANY FORM

Site Name: Castlemaine Harbour

Site Code: 80000343

3.2 Species

3.2.c. Mammals listed on Annex II of Council Directive 92/43/EEC

1355 *Lutra lutra*

(i) Population data on species

Conservation Ranger Mr Pat Foley reports that otters are seen at times within the site and it is considered that they may breed on the River Laune upstream of Killorglin. They are known to breed on the River Maine upstream of Castlemaine which is outside of the site. In the past this stretch of river was visited by the Limerick Otter Hunt group and Pat Foley considers that there may be 2-3 breeding pairs along 10-12 miles of good otter habitat.

(ii) Site assessment criteria

Population

The otter is a widespread animal in Ireland. In a distribution study in the early 1990s approximately 90% of coastal and freshwater sites examined contained otter signs (see Lennon 1996). A similar widespread distribution had been detected in an earlier survey in 1980-81 (Chapman & Chapman 1982). An estimate of total national population is not available but it can be assumed that no one SAC site would contain more than 1% of the national total.

Class Interval C 0-2%

Conservation

The otter is associated with a range of habitat types, which often occur as large complexes. Of particular importance are low-lying coasts, especially with islands; lakes or lake complexes with marginal terrestrial habitats, and river corridors. The highest densities occur along low-lying coasts with islands and a large freshwater input.

Otters are highly mobile and have large home ranges and territories. For this reason large areas are required to ensure their protection – NPW consider 5,000 ha as the minimum size for coastal and lacustrine sites and 2.5 km corridors for riverine sites.

Otters feed mainly on fish, especially salmonids, eels, various game fish and sticklebacks. They also take frogs, crayfish, birds, and even invertebrates such as molluscs and beetles. They breed and rest in holts, which may be any type of dry hollow above the high water mark. Hollows within large trees are frequently used, as are holes in clay banks etc.

The well documented decline throughout much of Europe is attributed mostly to habitat destruction, water pollution, illegal killings and disturbance due to recreational activities. There has been little research on threats to otters in Ireland. Studies in Cork city and environs, however, have identified elevated levels of organochlorine and PCB contaminants in otter tissue and several deaths are known to have occurred from these pollutants.

Castlemaine Harbour is a very large estuarine/bay site, with a range of coastal habitats which are generally of good quality. It includes the estuaries of two main rivers, the Maine and the Laune as well as all of the Laune up to Lough Leane. It is an important aquaculture area. The estuarine shoreline of the site is predominantly either sandy or muddy and is not considered suitable for breeding otter. They do, however, utilise the estuary for feeding etc. The River Laune provides good breeding habitat.

Ranking D: good conservation.

Isolation
Otters are widespread and have a contaneous distribution throughout Ireland. At this site they are not isolated within their range.

Ranking C

Global
Regular visitors to the site and probably breeding in the Laune River. Good quality estuarine and coastal habitats which support good fish stocks for otter. No known significant threats.

Ranking B: good value

3.2.e Fishes Listed on Annex II of Council Directive 92/43/EEC

1095 Petromyzon marinus
1099 Lampetra fluviatilis

(i) Population data on species
This site includes all of Castlemaine Harbour, the estuarine section of the River Maine and the River Laune as far as Lough Leane. The current extension involves the incorporation of the estuary element for lamprey populations. The River Laune flows from Lough Leane into Dingle Bay via Castlemaine Harbour. The riverbed here is composed of stones and gravel, ideally suited to lamprey spawning requirements. There is a healthy salmonid fishery on the system, although this has been degraded in recent years because of poor recruitment (Paddy O'Sullivan, pers comm.).

Overall, it is considered that the harbour is described as an estuarine system. Unspecified lampreys have been found in the lower reaches of the River Laune, the lower reaches of the Maine and unspecified ammocoetes have been found in the Flesk (Kurz and Costello, 1999).

(ii) Site assessment criteria

Population
The sea lamprey (*Petromyzon marinus*) and river lamprey (*Lampetra fluviatilis*) are migratory species that are thought to breed within this site. As little quantitative information is presently available on national population size, it is difficult to allocate a relative percentage of the national total. Further research into population size and ecology is required nationally. Lamprey species are likely to be more common in Ireland than any available records suggest. No one site is likely to hold more than 1% of the national population.

Class Interval: C (0-2%)

Conservation
Three species of lamprey occur in Irish freshwaters. All three species (*Petromyzon marinus*, *Lampetra fluviatilis* and *Lampetra planeri*) occur in freshwater although L. planeri is the only species that has

an exclusively freshwater lifecycle. Habitat overlap occurs between all species and it is common to find all three species resident (at some point in their lifecycles) in the same freshwater location. Despite the fact that all three species of lamprey are listed under Annex II of the EU Habitats Directive, there are very few published studies regarding lampreys in the Republic of Ireland. Lampreys are not commercially exploited in Ireland.

The **sea and river lampreys** are migratory species that inhabit deep offshore waters, shallow inshore waters, estuaries and easily accessible rivers. They breed in the unpolluted lower reaches of larger rivers in late May and June where the gradient of the river bed is shallow, and where low water flows allow deposition of sand and silt. However, lampreys can migrate 50 miles or more upstream before spawning. A general decline in population numbers across Europe has been attributed to increasing pollution of rivers and estuaries and the building of weirs and dams which prevent successful migration of populations to preferred spawning grounds.

Potential negative impacts to system conservation include the eutrophication of Lough Leane, mostly from Killarney town, although this has been addressed (Paddy O'Sullivan, pers comm.) and the lake is now classified as mesotrophic by the EPA (see McGarrigle et al. 2002). Much of the input into the lake causing problems is via the River Flesk (80%). Other problems include sewage, over grazing, land erosion and forestry causing reduction in water quality through increased sediment loads during flash flooding. Commercial netting for other species would not be perceived as a problem as lamprey are not caught in conventional fishing gears.

The Laune system is regarded as an excellent habitat for salmonid species and as such would also be regarded as excellent for all three lamprey species. The main threats to lamprey species in this system are pollution from local settlements and aquaculture developments. EPA water quality sampling at a number of sites on the Laune River during the period 1980 – 2000 allocated Q-values of 4 (unpolluted conditions) to the majority of sites, with a value of 3-4 (slightly polluted) at a site 1.5 km d/s of the Gweestin River confluence. Prior to 1986 the Q ratings were given as 5 (pristine) or 4-5 (unpolluted) so there has been a slight deterioration in water quality in recent years (most likely caused by the growth in Killorglin Town). Most of the tributaries of the Laune were unpolluted, although the Gweestin River has suffered from some water quality problems with Q-values as low as 2-3 (moderately polluted) given at one site on the river in 1996 and 1998.

Ranking: B – good conservation value

Isolation

The sea lamprey (*Petromyzon marinus*) and river lamprey (*Lampetra fluviatilis*) are migratory species (spend part of their life at sea, but return to their home rivers to spawn) and as such would not be considered as isolated within their range.

Ranking: C – population not isolated within range

Global

Overall, this site is potentially an excellent river lamprey system and good sea lamprey system with extensive spawning habitats and good water quality. It is difficult to assess the importance of this population as detailed information is absent. It is probable that all sites recorded as sustaining populations of lamprey species at this early stage in our discovery of the full extent of their distribution can be ranked as of good conservation value.

Ranking: B – good value

APPENDIX B

SAC Site Synopsis

SITE SYNOPSIS

SITE NAME: CASTLEMAINE HARBOUR

SITE CODE: 000343

This is a large site located on the south-east corner of the Dingle Peninsula, County Kerry. It consists of the whole inner section of Dingle Bay, i.e. Castlemaine Harbour, the spits of Inch and White Strand/Rosbehy and a little of the coastline to the west. The River Maine, almost to Castlemaine and much of the River Laune catchment, including the Gaddagh, Gweestion, Glanooragh, Cottoner's River and the River Loe, are also included within the site.

The site is a candidate SAC selected for fixed grey dunes and alluvial wet woodlands, both priority habitats on Annex I of the E.U. Habitats Directive. The site is also selected as a candidate SAC for estuaries, tidal mudflats, Atlantic salt meadows, *Salicornia* mudflats, Mediterranean salt meadows, drift line vegetation, perennial vegetation of stony banks, dunes with creeping willow, dune slacks, embryonic shifting dunes and Marram dunes, all habitats listed on Annex I of the E.U. Habitats Directive. The site is also selected for the following species listed on Annex II of the same directive – Sea Lamprey, River Lamprey, Atlantic Salmon, Otter and the liverwort, Petalwort.

Inch Spit holds a fine sand dune system. It is the largest and arguably one of the best remaining 'intact' dune systems in the country. In the younger, more mobile dunes, Marram (*Ammophila arenaria*) is common, with Groundsel (*Senecio vulgaris*), Sea Rocket (*Cakile maritima*) and Dandelion (*Taraxacum* sp.) also present. The fixed, more stable dunes support Lady's Bedstraw (*Galium verum*), Common Bird's-foot-trefoil (*Lotus corniculatus*), Wild Thyme (*Thymus praecox*), Kidney Vetch (*Anthyllis vulneraria*), Wild Pansy (*Viola tricolor*) and Biting Stonecrop (*Sedum acre*), among others. The slightly damper conditions which prevail in dune slacks support Creeping Bent (*Agrostis stolonifera*), Crested Dog's-Tail (*Cynosurus cristatus*), Glaucous Sedge (*Carex flacca*), Creeping Willow (*Salix repens*) and Jointed Rush (*Juncus articulatus*). The rare bryophyte Petalwort (*Petalophyllum ralfsii*), which is listed on Annex II of the E.U. Habitats Directive, has been recorded in this system. A smaller spit, with a similar diversity of dune types, occurs at Rosbehy on the southern shore, from where Yellow Centaury (*Cicendia filiformis*) and Knotted Pearlwort (*Sagina nodosa*) have been recorded from a dune slack along with other, more common species.

The sand spits, and also the Coomore peninsula, are underlain by shingle and in places the shingle is exposed and supports a characteristic flora. Species present include Lyme-grass (*Leymus arenarius*), Sandwort (*Honkenya peploides*) and two Red Data Book plants, Sea Pea (*Lathyrus japonicus*) and Sea-kale (*Crambe maritima*).

The coastline is fringed in many places by saltmarsh. The vegetation here includes Thrift (*Armeria maritima*), Common Saltmarsh-grass (*Puccinellia maritima*), Sea Aster (*Aster tripolium*), Sea Rush (*Juncus maritimus*) and Sea Plantain (*Plantago maritima*). Upper saltmarsh communities extend inland, along estuarine channels, where they are mixed with freshwater communities. Sea Club-rush (*Scirpus maritimus*) and Common Reed (*Phragmites australis*) occur at these locations. Cord-grass (*Spartina anglica*) has colonised the lower part of the saltmarsh at Inch and extends out onto the open mudflat.

West of Inch, cliffs of glacial drift occur, which support such plants as Ivy (*Hedera helix*), Red Fescue (*Festuca rubra*), Ling Heather (*Calluna vulgaris*) and Honeysuckle (*Lonicera periclymenum).* Along the cliff-tops there is coastal grassland with species such as Sweet Vernal-grass (*Anthoxanthum odoratum*), Cock's-foot (*Dactylis glomerata*) and Wood Sage (*Teucrium scorodonia*).

Much of the site consists of intertidal sand and mudflats, supporting beds of Eelgrass (*Zostera marina*) in some places.

The rivers and their associated habitats also make up a considerable portion of the site. These associated habitats include wet grassland, woodland, scrub and bog/heath. In the valley up-river of Killorglin, is an interesting area of alluvial wet woodland, dominated by Alder (*Alnus glutinosa*) and Willow (*Salix* spp.).

Five plants listed in the Irish Red Data Book have been recorded at this site: Sea-kale, Sea Pea, Corn Cockle (*Agrostemma githago*), Pennyroyal (*Mentha pulegium*) and Irish Lady's-tresses (*Spiranthes romanzoffiana*). The two last-named are legally protected under the Flora (Protection) Order, 1999 as is the rare bryophyte, Petalwort. Other scarce species which occur here are Yellow Bartsia (*Parentucellia viscosa*), Lax-flowered Sea-lavender (*Limonium humile*) and Blue-eyed-grass (*Sisyrinchium bermudiana*).

Castlemaine Harbour is a very important site for passage and wintering waterfowl. The following figures are derived from counts between 1994/5 and 1996/7. One species occurs here in internationally important numbers - Brent Goose (734) - with 16 species having populations of national importance: Cormorant (215), Shelduck (129), Pintail (167), Scaup (138), Wigeon (3,513), Red-breasted Merganser (51), Oystercatcher (1,539), Ringed Plover (330), Golden Plover (1940), Grey Plover (122), Knot (347), Sanderling (207), Dunlin (1360), Redshank (299), Greenshank (26) and Turnstone (296).

The vicinity of Castlemaine Harbour is also important as one of few areas in Ireland - all in Kerry - where the Natterjack Toad naturally occurs. This amphibian is listed in the Irish Red Data Book and on Annex IV of the E.U. Habitats Directive.

The site also supports a small colony of Common Seal, while two Lamprey species have been recorded in the Laune river catchment. The Laune catchment is used by Otter and is an important salmon system with nurseries, riffles pools and glides.

Castlemaine Harbour is of major ecological importance. It contains a range of coastal habitats of excellent quality, including many that are listed on Annex I of the EU Habitats Directive. It also includes long stretches of river and stream which are excellent habitats for Salmon, Lamprey and Otter. Inch dunes are recognised as among the finest in the country, with particularly well-developed dune slacks. The site supports internationally important waterfowl populations, rare plant species, the rare Natterjack Toad and populations of several animal species that are listed on Annex II of the E.U. Habitats Directive. Part of the site is designated a Special Protection Area and is listed as a site under the Ramsar Convention. Part of Castlemaine Harbour is a Statutory Nature Reserve, while Inch and Rosbehy are Wildfowl Sanctuaries.

18.10.2005

APPENDIX C

Ecology Species List

Species List

Common Name	Scientific Name
Horsetail	*Equisetum arvense*
Polypody	*Polypodium australe*
Bracken	*Pteridium aquilinum*
Hart's Tongue Fern	*Asplenium scolopendrium*
Creeping Buttercup	*Ranunculus repens*
Nettle	*Urtica dioica*
Downy Birch	*Betula pubescens*
Alder	*Alnus glutinosa*
Chickweed	*Stellaria media*
Common Mouse-ear	*Cerastium fontanum*
Sorrel	*Rumex acetosa*
Broad-leaved Dock	*Rumex obtusifolius*
Osier Willow	*Salix viminalis*
Primrose	*Primula vulgaris*
Bramble	*Rubus fruticosus agg.*
Blackthorn	*Prunus spinosa*
Hawthorn	*Crataegus monogyna*
Bush Vetch	*Vicia sepium*
White Clover	*Trifolium repens*
Holly	*Ilex aquifolium*
Herb Robert	*Geranium robertianum*
Ivy	*Hedera helix*
Hedge Parsley	*Torilis japonica*
Marestail	*Hippuris vulgaris*
Ribwort Plantain	*Plantago lanceolata*
Ash	*Fraxinus excelsior*
Cleavers	*Galium aparine*
Honeysuckle	*Lonicera periclymenum*
Creeping Thistle	*Cirsium arvense*
Dandelion	*Taraxacum officinale agg.*
Ragwort	*Senecio jacobea*
Annual Meadow-grass	*Poa annua*
Perennial Rye-grass	*Lolium perenne*
Smooth Meadow-grass	*Poa pratensis*
Cock's-foot	*Dactylis glomerata*
Yorkshire Fog	*Holcus lanatus*
Creeping Bent Grass	*Agrostis stolonifera*
Timothy-grass	*Phleum pratense*
Sitka Spruce	*Picea sitchensis*
Larch	*Larix decidua*

APPENDIX D

Criteria for Assessing Surface Water Quality

Appendix D Criteria for assessing surface water bodies

Biotic Index	Water Quality	Quality Status
Q5	Good	Unpolluted Waters
Q4-5	Fair - Good	
Q4	Fair	
Q3-4	Doubtful - Fair	Slightly Polluted Waters
Q3	Doubtful	Moderately Polluted Waters
Q2-3	Poor - Doubtful	
Q2	Poor	Seriously Polluted Waters
Q1-2	Bad - Poor	
Q1	Bad	

GUIDELINES USED FOR CLASSIFICATION OF IMPORTANCE OF FRESHWATERS

Rating

A **Internationally Important**

Habitats designated as SACs for Annex II species under the EU Habitats Directive. Major Salmon river fisheries. Major salmonid lake fisheries.

B **Nationally or Regionally Important**

Other major salmonid waters and waters with major amenity fishery value. Commercially important coarse fisheries. Waters with important populations of species protected under the Wildlife Act and/or important populations of Annex II species under the EU Habitats Directive. Waters designated or proposed as Natural Heritage Areas by Dúchas.

C **High Local Value**

Small water bodies with known salmonid populations or with good potential salmonid habitat, or any population of species protected under the Wildlife Act and/or listed Annex II species under the EU Habitats Directive. Large water bodies with some fisheries value.

D **Moderate Local Value**

Small water bodies with some coarse fisheries value or some potential salmonid habitat. Any stream with an unpolluted Q-value rating.

E **Low value**

Water bodies with no current fisheries value and no significant potential fisheries value. Habitat diversity low and degraded.

NRA (2004)

A Sites

	Temporary	Short-term	Medium-term	Long-term
Extensive	MAJOR	SEVERE	SEVERE	SEVERE
Localised	MAJOR	MAJOR	SEVERE	SEVERE

B Sites

	Temporary	Short-term	Medium-term	Long-term
Extensive	MAJOR	MAJOR	SEVERE	SEVERE
Localised	MODERATE	MODERATE	MAJOR	MAJOR

C Sites

	Temporary	Short-term	Medium-term	Long-term
Extensive	MODERATE	MODERATE	MAJOR	MAJOR
Localised	MINOR	MODERATE	MODERATE	MODERATE

D Sites

	Temporary	Short-term	Medium-term	Long-term
Extensive	MINOR	MINOR	MODERATE	MODERATE
Localised	NOT SIGNIFICANT	MINOR	MINOR	MINOR

E Sites

	Temporary	Short-term	Medium-term	Long-term
Extensive	NOT SIGNIFICANT	NOT SIGNIFICANT	MINOR	MINOR
Localised	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT

NRA (2004)

In line with the EPA guidelines (EPA 2002) the following terms are defined when quantifying duration:

Temporary: Up to 1 year
Short-term: From 1 to 7 years
Medium-term: 7 to 15 years
Long-term: 15 – 60 years
Permanent: over 60 years.

For the purposes of this report 'localised' impacts on rivers are loosely defined as impacts measurable no more than 250 metres from the impact source. 'Extensive' impacts on rivers are defined as impacts measurable more than 250m from the impact source. Any impact on salmonid spawning habitat or nursery habitat where it is in short supply, would be regarded as an extensive impact as it is likely to have an impact on the salmonid population beyond the immediate vicinity of the impact source.

Limitations Encountered

No significant limitations were encountered.

APPENDIX E

Surface Water Monitoring Data

River and Code: **GWEESTIN** **22/G/06**
Tributary of : Laune OS Catchment No: 207
OS Grid Ref : V 833 948

Sampling Stations		Biological Quality Ratings (Q Values)					
No.	Location	**1990**	**1994**	**1996**	**1998**	**2001**	**2004**
0300	Dooneen Br	-	4	4	4-5	4	4
0400	Br E of Ballydeenlea	4	-	-	-	-	-
0600	Gweestin Bridge	3	4	3-4	3-4	4	4
0800	Rockfield Bridge	4	-	-	-	-	-
0900	Br u/s Listry Br	-	4	4	4	4	4
1000	Listry Bridge	4	-	-	-	-	-
1200	Gweestin Bridge	2-3	3	2-3	3	3	3

Station No: 1200
River Code: 22G06
Situated On: GWEESTIN
Location: Gweestin Bridge
Hydrometric Area: Laune-Maine-Dingle Bay

Station No: 1200	**Location:** Gweestin Bridge	**Date From:** 2001	**To:** 2003	

Parameter	Parameter Units	Minimum	Median	Maximum	No of Samples	Source	Source Type
B.O.D	mg O21-1	**1**	**1.6**	**26**	27	Kerry Co Co	LA
Colour	Hazen	**15**	**68**	**175**	24	Kerry Co Co	LA
Conductivity	µS cm-1	98	193	255	39	Kerry Co Co	LA
Ortho-Phosphate	mg P 1-1	**<0.00**	**0.03**	**0.08**	39	Kerry Co Co	LA
Oxidised Nitrogen	mg N 1-1	**0.5**	**1.3**	**2.4**	39	Kerry Co Co	LA
pH		**6.8**	**7.5**	**8.3**	39	Kerry Co Co	LA
Temperature	oC	**6**	**10.7**	**18.3**	39	Kerry Co Co	LA
Total Ammonia	mg N 1-1	**<0.04**	**<0.02**	**0.32**	30	Kerry Co Co	LA

Station No: 1200	**Location:** Gweestin Bridge	**Date From:** 1998	**To:** 2000	

Parameter	Parameter Units	Minimum	Median	Maximum	No of Samples	Source	Source Type
B.O.D	mg O21-1	**0.6**	**2.4**	**6.2**	21	Kerry Co Co	LA
Colour	Hazen	**50**	**75**	**500**	19	Kerry Co Co	LA
Conductivity	µS cm-1	115	176	214	24	Kerry Co Co	LA
Ortho-Phosphate	mg P 1-1	**0.02**	**0.04**	**0.1**	13	Kerry Co Co	LA
pH		**6.9**	**7.3**	**7.8**	24	Kerry Co Co	LA
Temperature	oC	**7.7**	**11**	**18**	19	Kerry Co Co	LA
Total Ammonia	mg N 1-1	**<0.02**	**0.07**	**0.52**	23	Kerry Co Co	LA

A value displayed in **BOLD** indicates the value falls outside either an upper or lower threshold and highlights stations where there may be water quality problems.

Chemical Surface Water Monitoring Results (14th April 2008 by Southern Scientific Services Ltd)					
Parameter	**Results (mg/l unless otherwise stated)**				**Standard (see Notes)**
	G2	**G4**	**TA2**	**TB2**	
Temperature, ºC*	9.4	9.4	8.7	11.5	**25 (SW)**
pH	7.4	7.7	7.6	7.2	**≥ 6 and ≤ 9 (S)**
Dissolved Oxygen*	12.2	11.4	13.3	9.5	**50% ≥ 9 mg/l (S)**
Conductivity*, µS/cm @ 20ºC	140	140	130	140	**1,000 (SW)**
COD	7.7	5.3	<5.0	43.8	**40 mg/l (SW)**
BOD	<1.0	<1.0	<1.0	<1.0	**≤ 5 mg/l (S)**
Suspended Solids	2.0	1.0	1.0	12	**≤ 25 mg/l (S)**
MRP	<0.010	0.013	0.011	0.013	**0.015 mg/l (P)**
Ammonia (NH_4^+- N)	<0.023	<0.023	0.035	0.040	**≤ 0.02 mg/l (S)**
Total Phosphorus (P)	0.04	<0.04	0.04	0.05	**0.062 mg/l (FW)**
Iron	0.33	0.29	0.14	0.77	**0.2 mg/l (SW)**
Chloride	24.3	25.1	27.3	29.3	**250 mg/l (SW)**
Chromium	<0.05	<0.05	<0.05	<0.05	**0.05 mg/l (SW)**
Manganese	0.06	0.05	0.03	0.04	**0.05 mg/l (SW)**
Sulphate	11.4	11.8	6.20	9.96	**200 mg/l (SW)**
Sodium	15.25	15.48	16.40	18.70	**200 mg/l (SW)**
Total Organic Nitrogen (N)	0.93	0.87	1.16	0.84	**1mg/l (SW)**

Notes: SW – Surface Water Regulations [1989]
S – Salmonid Waters Regulations [1988]
P – Phosphorus Regulations [1998]
FW – Freshwater Fish Directive

***Taken in the field**

Chemical Surface Water Monitoring Results (14th April 2008 by Southern Scientific Services Ltd.)					
Parameter	**Results (mg/l unless otherwise stated)**				**Standard**
	G2	**G4**	**TA2**	**TB2**	
Tin	<0.10	<0.10	<0.10	<0.10	**N/A**
Cadmium	<0.02	<0.02	<0.02	<0.02	**0.005 mg/l (SW)**
Copper	<0.02	<0.02	<0.02	<0.02	**<0.005 mg/l (S)**
Lead	<0.1	<0.1	<0.1	<0.1	**0.05 mg/l (SW)**
Total Phenols	<0.05	<0.05	<0.05	<0.05	**0.0005 mg/l (SW)**
Nickel	<0.05	<0.05	<0.05	<0.05	**8 µg/l (DS)**
Zinc	0.02	0.02	0.02	0.02	**≤0.03 mg/l (S)**
Mercury	<0.05	<0.05	<0.05	<0.05	**0.001 mg/l (SW)**
Total Antimony	<0.05	<0.05	<0.05	<0.05	**5 µg/l (DW)**
Tellurium (µg/l)	<1	<1	<1	<1	**N/A**
Thallium (µg/l)	<1	<1	<1	<1	**N/A**
Arsenic	<0.05	<0.05	<0.05	<0.05	**0.05 mg/l (SW)**
Selenium	<0.05	<0.05	<0.05	<0.05	**0.01 mg/l (SW)**

Notes: SW – Surface Water Regulations [1989]
S – Salmonid Waters Regulations [1988]
DW – Drinking Water Directive [98/83/EC]

APPENDIX F

Riverine Habitat Assessment

Site Code	TA2	TB2	G2	G4
Grid Reference	V9361 9939	V9340 9980	V9343 9862	V9238 9821
Photograph Number	21	6	34	38
Width (m)	1-2	0.74	6	15
Depth (cm)	8	5	25	10 – 20
Substrate	Gravel, Cobble, Mud	Mud, Gravel, Cobble	Cobble, Gravel, Sand	Cobble, Gravel, Sand
Flow Type	Riffle 50% Glide 50%	Riffle 40% Glide 60%	Riffle 20% Glide 80%	Riffle 25% Glide 75%
Instream Vegetation	None	None	Filamentous algae <1%	None
Dominant Bankside Vegetation	Hawthorn	Gorse	Willow	Ash
Summer Shade of Stream by Bankside Vegetation	30%	40%	35%	35%
Salmonid Adult Habitat	Poor	None	Good	Fair
Salmonid Nursery Habitat	Fair	Fair	Very Good	Good – Very Good
Salmonid Spawning Habitat	Poor - Fair	Poor - Fair	Good	Good

APPENDIX G

Surface Water Site Photographs


Photo 01.JPG


Photo 02.JPG


Photo 03.JPG


Photo 04.JPG


Photo 05.JPG


Photo 06.JPG


Photo 07.JPG


Photo 08.JPG


Photo 09.JPG


Photo 10.JPG


Photo 11.JPG


Photo 12.JPG


Photo 13.JPG


Photo 14.JPG


Photo 15.JPG


Photo 16.JPG


Photo 17.JPG


Photo 18.JPG


Photo 19.JPG


Photo 20.JPG


Photo 21.JPG


Photo 22.JPG


Photo 23.JPG


Photo 24.JPG


Photo 25.JPG


Photo 26.JPG


Photo 27.JPG


Photo 28.JPG


Photo 29.JPG


Photo 30.JPG


Photo 31.JPG


Photo 32.JPG


Photo 33.JPG


Photo 34.JPG


Photo 35.JPG

Photo 36.JPG

Photo 37.JPG

Photo 38.JPG

APPENDIX H

Electro-fishing Results

SITE E-A

Site Code	E-A
Grid Reference	V9362 9939
Photograph Number	21 - 23
Width (m)	0.3 – 0.75
Depth (cm)	3 - 10
Substrate	Bedrock, Mud, Cobble, Gravel
Flow Type	Riffle 35% Glide 65%
Instream Vegetation	None
Dominant Bankside Vegetation	Willow Hawthorn
Summer Shade of Stream by Bankside Vegetation	60%
Salmonid Adult Habitat	Poor
Salmonid Nursery Habitat	Fair - Good
Salmonid Spawning Habitat	Poor - Fair

Area Fished (m^2)	c.27
Duration of electrofishing (mins)	10
Fish Species Recorded	Brown Trout
Number of Brown Trout Recorded	11
Minimum brown trout density	0.407 m^2
C.P.U.E (trout per hour fishing equivalent)	66

Details of salmonids captured

Brown Trout Fork Length (cm)	Age
4.0	0+
4.1	
4.2	
4.2	
4.4	
4.5	
4.5	
4.6	
4.8	
4.8	
4.9	

SITE E-B

Site Code	E-B
Grid Reference	V9335 9914
Photograph Number	24 & 25
Width (m)	0.5 - 2
Depth (cm)	5 - 10
Substrate	Cobble, Gravel, Mud
Flow Type	Riffle 40% Glide 60%
Instream Vegetation	None
Dominant Bankside Vegetation	Willow, Hawthorn, Ash
Summer Shade of Stream by Bankside Vegetation	70%
Salmonid Adult Habitat	Poor
Salmonid Nursery Habitat	Fair – Good
Salmonid Spawning Habitat	Fair

Area Fished (m^2)	c.37
Duration of electrofishing (mins)	10
Fish Species Recorded	Brown Trout
Number of Brown Trout Recorded	11
Minimum brown trout density	0.297 m^2
C.P.U.E (trout per hour fishing equivalent)	66

Details of salmonids captured

Brown Trout Fork Length (cm)	Age
4.0	0+
4.3	
4.3	
4.4	
4.5	
4.5	
4.6	
5.1	
5.3	
5.6	
13.0	1+

SITE E-C

Site Code	E-C
Grid Reference	V9336 9882
Photograph Number	26 & 27
Width (m)	0.5 - 1
Depth (cm)	5 - 12
Substrate	Cobble, Gravel, Mud
Flow Type	Riffle 50% Glide 50%
Instream Vegetation	None
Dominant Bankside Vegetation	Sycamore, Oak, Hawthorn
Summer Shade of Stream by Bankside Vegetation	75%
Salmonid Adult Habitat	Poor
Salmonid Nursery Habitat	Fair - Good
Salmonid Spawning Habitat	Fair

Area Fished (m^2)	c.22
Duration of electrofishing (mins)	7
Fish Species Recorded	Brown Trout
Number of Brown Trout Recorded	15
Minimum brown trout density	0.682m^2
C.P.U.E (trout per hour fishing equivalent)	128

Details of salmonids captured

Brown Trout Fork Length (cm)	Age
3.8	0+
4.0	
4.1	
4.1	
4.2	
4.2	
4.3	
4.3	
4.3	
4.3	
4.4	
4.4	
4.8	
4.9	
5.0	

Lamprey Assessment

Location	V9336 9878
Photograph	28
Area Fished	2m²
Lamprey Recorded	0

SITE E-D

Site Code	E-D
Grid Reference	V9342 9863
Photograph Number	29
Width (m)	0.5 - 1
Depth (cm)	4 - 8
Substrate	Gravel, Cobble, Mud
Flow Type	Riffle 50% Glide 50%
Instream Vegetation	None
Dominant Bankside Vegetation	Willow, Gorse, Ash, Hawthorn
Summer Shade of Stream by Bankside Vegetation	85%
Salmonid Adult Habitat	None - Poor
Salmonid Nursery Habitat	Fair - Good
Salmonid Spawning Habitat	Fair

Area Fished (m^2)	c.22
Duration of electrofishing (mins)	5
Fish Species Recorded	Brown Trout
Number of Brown Trout Recorded	16
Minimum brown trout density	0.727m^2
C.P.U.E (trout per hour fishing equivalent)	264

Details of salmonids captured

Brown Trout Fork Length (cm)	Age
2.9	0+
3.2	
3.3	
3.4	
3.4	
3.7	
3.9	
3.9	
3.9	
4.2	
4.3	
4.3	
4.4	
4.5	
4.7	

Lamprey Assessment

Location	V9339 9868
Photograph	30
Area Fished	2m²
Lamprey Recorded	0

SITE W-A

Site Code	W-A
Grid Reference	V9293 9967
Photograph Number	23
Width (m)	1
Depth (cm)	7
Substrate	Gravel, Cobble, Mud
Flow Type	Riffle 75% Glide 25%
Instream Vegetation	None
Dominant Bankside Vegetation	Willow, Hawthorn
Summer Shade of Stream by Bankside Vegetation	65%
Salmonid Adult Habitat	Poor
Salmonid Nursery Habitat	Fair – Good
Salmonid Spawning Habitat	Poor

Area Fished (m^2)	c.30
Duration of electrofishing (mins)	5
Fish Species Recorded	None

SITE W-B

Site Code	W-B
Grid Reference	V9271 9921
Photograph Number	7 & 8
Width (m)	1.5
Depth (cm)	8
Substrate	Gravel, Cobble, Mud
Flow Type	Riffle 25% Glide 75%
Instream Vegetation	Slime growth 90%
Dominant Bankside Vegetation	Willow, Alder
Summer Shade of Stream by Bankside Vegetation	65%
Salmonid Adult Habitat	Poor
Salmonid Nursery Habitat	Fair
Salmonid Spawning Habitat	Poor

Area Fished (m^2)	c.67
Duration of electrofishing (mins)	7
Fish Species Recorded	None

SITE W-C

Site Code	W-C
Grid Reference	V9250 9881
Photograph Number	11
Width (m)	1
Depth (cm)	5 - 10
Substrate	Cobble, Mud, Gravel, Sand
Flow Type	Riffle 10% Glide 90%
Instream Vegetation	None
Dominant Bankside Vegetation	Willow, Gorse, Hawthorn, Alder
Summer Shade of Stream by Bankside Vegetation	80%
Salmonid Adult Habitat	Poor
Salmonid Nursery Habitat	Fair
Salmonid Spawning Habitat	Poor - Fair

Area Fished (m^2)	c.35
Duration of electrofishing (mins)	8
Fish Species Recorded	None

SITE W-D

Site Code	W-D
Grid Reference	V9237 9829
Photograph Number	18
Width (m)	1.5
Depth (cm)	5 - 20
Substrate	Cobble, Mud, Gravel, Sand
Flow Type	Riffle 5% Glide 95%
Instream Vegetation	None
Dominant Bankside Vegetation	Ash, Bramble
Summer Shade of Stream by Bankside Vegetation	50%
Salmonid Adult Habitat	Poor
Salmonid Nursery Habitat	Fair
Salmonid Spawning Habitat	Fair

Area Fished (m^2)	c.90
Duration of electrofishing (mins)	10
Fish Species Recorded	Brown Trout, Three-spined Stickleback
Number of Brown Trout Recorded	1
Minimum brown trout density	0.011m^2
C.P.U.E (trout per hour fishing equivalent)	6

Details of salmonids captured

Brown Trout Fork Length (cm)	Age
4.8	0+

Appendix I

Trial Pit Data

paudie o'mahoney
and associates
consulting engineers and architects

Grosvenor Court,
High St.,
Killarney.
Co. Kerry

Tel:- (064) 33412
Fax:- (064) 35387
Email:- info@paudieomahoney.com

Trial Pit	Soil Types & Depths	
1	approx @ 900mm approx @ 3000mm	Grey Mud Shaley Pencil
2	0 - 900mm 900 - 1800mm approx @ 1800mm **approx @ 1500mm**	Grey Mud Loose Grey Shale Pencil **Water**
3	0 - 450mm 450 - 1250mm 1250 - 4000mm **approx @ 5000m**	Bog Blue Clay c/w Pebbles Loose Pencil/Shale **Water**
4	0 - 400mm 400 - 1200mm 1200 - 4000mm **approx @ 4000mm**	Bog Green Clay c/w pebbles/boulders Loose Pencil/Shale **Water**
7	0 - 600mm 600 - 2000mm 2000 - 4500mm **approx @ 4500mm**	Bog Blue Grey Clay c/w Silt Loose Pencil **Water**
8	0 - 600mm 600 - 2500mm 2500 - 4000mm **approx @ 3500mm**	Bog Grey Mud c/w Silt & Pebbles Clay changing to Brown Gravel **Water**
9	0 - 250mm approx @ 600mm approx > 600mm	Bog Grey Clay Blue Grey Shaley Clay
13	0 - 600mm 600 - 2000mm	Boggy Clay Loose Shaley Pencil
14	0 - 600mm 600 - 1200mm 1200 - 3500mm approx @ 3500mm **approx @ 3200mm**	Clay/Bog Grey Clay c/w Silt Blue Pencil/Clay Pencil **Water**

paudie o'mahoney and associates
consulting engineers and architects

Grosvenor Court,
High St.,
Killarney.
Co. Kerry

Tel:- (064) 33412
Fax:- (064) 35387
Email:- info@paudieomahoney.com

Trial Pit	Depth Sample Taken	
	Sample A	**Sample B**
1	1.5m	3.0m
2	1.4m	2.7m
3	1.4m	2.8m
4	1.5m	3.0m
5	1.4m	2.7m
6	1.3m	2.6m
7	1.5m	3.0m
8	1.5m	3.0m
9	1.3m	2.6m
10	1.5m	3.0m
11	1.2m	2.4m
12	1.5m	3.0m
13	1.5m	3.0m
14	1.2m	2.4m

Appendix J

Particle Size Analysis (PSA) Results

southern scientific services ltd.

Received 2nd Jan 2008

Our Ref: 07 Let 302

John Blennerhassett,
Paudie O' Mahony & Associates,
Grossvenor Court,
Upper High Street,
Killarney,
County Kerry

21 December 2007,

RE: Soil Samples – Work No. 18927 C {Sample Id's C07-Nov 437 – 464}

Dear John,

Enclosed, please find particle size analysis results from the KWD site for 28 samples of soil / subsoil. Samples are identified as 1A, 1B....14A, 14B in the accompanying sheets. Analysis was carried out on a single fraction only, due to insufficient sample.

Sample preparation was carried out for the plastic limit and liquid limit tests but no results could be obtained due to insufficiency of the fraction less than 0.425 mm. Insufficient sample remained for moisture content. The large proportion of stone {>10mm} in all of the samples make the plastic limit and liquid limits tests impossible to carry out unless the sample size is increased accordingly.

I would recommend that the samples be re-taken with a larger sample mass up to 5kg at least.
If you have any queries on any of the above or the attached sheet, please do not hesitate to contact our office.

Kindest Regards,

Michael Murphy
Southern Scientific Services Ltd.

dunrine | killarney | county kerry | ireland | telephone +353 (0)64 33922 | fax +353 (0)64 39022
web site www.southernscientificireland.com | e-mail info@southernscientificireland.com

registered in ireland no 323196 | vat reg no IE 6343196 M

Particle Size, mm	Sample Id 1A, g	Fraction % 1A	% Passed 1A
40	0	0.00	100.00
25-40	26	26.31	73.69
10.0-25	54	54.64	19.05
5.0-10.0	5	5.06	13.99
2.0-5.0	2.3	2.33	11.66
1.0-2.0	1.37	1.39	10.27
0.50-1.0	0.874	0.88	9.39
0.25-0.50	0.553	0.56	8.83
0.125-0.250	0.554	0.56	8.27
0.063-0.125	0.472	0.48	7.79
0.02-0.063	4.5	4.55	3.24
0.002-0.02	1.9	1.92	1.32
<0.002	1.3	1.32	0.00
Sample Size, g	**98.823**		

Particle Size, mm	Sample Id 1B, g	Fraction % 1B	% Passed 1B
40	0	0.00	100.00
25-40	24	27.93	72.07
10.0-25	45	52.36	19.71
5.0-10.0	8	9.31	10.40
2.0-5.0	2	2.33	8.07
1.0-2.0	1.553	1.81	6.26
0.50-1.0	0.693	0.81	5.46
0.25-0.50	0.519	0.60	4.85
0.125-0.250	0.433	0.50	4.35
0.063-0.125	0.338	0.39	3.96
0.02-0.063	1.7	1.98	1.98
0.002-0.02	1	1.16	0.81
<0.002	0.7	0.81	0.00
Sample Size, g	**85.936**		

Particle Size, mm	Sample Id 2A, g	Fraction % 2A	% Passed 2A
40	0	0.00	100.00
25-40	34	25.96	74.04
10.0-25	68	51.92	22.11
5.0-10.0	16	12.22	9.90
2.0-5.0	5.4	4.12	5.77
1.0-2.0	0.0149	0.01	5.76
0.50-1.0	0.861	0.66	5.10
0.25-0.50	0.133	0.10	5.00
0.125-0.250	0.007	0.01	5.00
0.063-0.125	0.244	0.19	4.81
0.02-0.063	2	1.53	3.28
0.002-0.02	2.4	1.83	1.45
<0.002	1.9	1.45	0.00
Sample Size, g	**130.9599**		

Particle Size, mm	Sample Id 2B, g	Fraction % 2B	% Passed 2B
40	0	0.00	100.00
25-40	42	33.73	66.27
10.0-25	52	41.76	24.51
5.0-10.0	7.8	6.26	18.24
2.0-5.0	3.9	3.13	15.11
1.0-2.0	0.891	0.72	14.39
0.50-1.0	0.418	0.34	14.06
0.25-0.50	0.246	0.20	13.86
0.125-0.250	0.216	0.17	13.69
0.063-0.125	0.241	0.19	13.49
0.02-0.063	3.5	2.81	10.68
0.002-0.02	3.3	2.65	8.03
<0.002	10	8.03	0.00
Sample Size, g	**124.512**		

Particle Size, mm	Sample Id 3A, g	Fraction % 3A	%passing 3A
40	0	0.00	100.00
25-40	0	0.00	100.00
10.0-25	92	66.13	33.87
5.0-10.0	18	12.94	20.93
2.0-5.0	12	8.63	12.31
1.0-2.0	1.961	1.41	10.90
0.50-1.0	1.009	0.73	10.17
0.25-0.50	0.845	0.61	9.56
0.125-0.250	0.527	0.38	9.19
0.063-0.125	0.479	0.34	8.84
0.02-0.063	5.4	3.88	4.96
0.002-0.02	4.1	2.95	2.01
<0.002	2.8	2.01	0.00
Sample Size, g	139.121		

Particle Size, mm	Sample Id 3B, g	Fraction % 3B	% Passed 3B
40	0	0.00	100.00
25-40	0	0.00	100.00
10.0-25	82	55.32	44.68
5.0-10.0	18	12.14	32.54
2.0-5.0	12	8.10	24.44
1.0-2.0	2.246	1.52	22.93
0.50-1.0	0.971	0.66	22.27
0.25-0.50	0.714	0.48	21.79
0.125-0.250	0.543	0.37	21.43
0.063-0.125	0.56	0.38	21.05
0.02-0.063	23.1	15.58	5.46
0.002-0.02	4.3	2.90	2.56
<0.002	3.8	2.56	0.00
Sample Size, g	148.234		

Particle Size, mm	Sample Id 4A, g	Fraction % 4A	% Passed 4A
40	0	0.00	100.00
25-40	24	27.66	72.34
10.0-25	32	36.88	35.46
5.0-10.0	8	9.22	26.24
2.0-5.0	4	4.61	21.63
1.0-2.0	1.052	1.21	20.41
0.50-1.0	2.729	3.15	17.27
0.25-0.50	1.954	2.25	15.02
0.125-0.250	1.822	2.10	12.92
0.063-0.125	2.406	2.77	10.14
0.02-0.063	2.9	3.34	6.80
0.002-0.02	2.2	2.54	4.26
<0.002	3.7	4.26	0.00
Sample Size, g	86.763		

Particle Size, mm	Sample Id 4B, g	Fraction % 4B	% Passed 4B
40	0	0.00	100.00
25-40	70	49.44	50.56
10.0-25	30	21.19	29.37
5.0-10.0	10	7.06	22.31
2.0-5.0	4	2.83	19.48
1.0-2.0	3.836	2.71	16.77
0.50-1.0	2.872	2.03	14.74
0.25-0.50	2.591	1.83	12.91
0.125-0.250	2.656	1.88	11.04
0.063-0.125	4.125	2.91	8.12
0.02-0.063	4	2.83	5.30
0.002-0.02	4.3	3.04	2.26
<0.002	3.2	2.26	0.00
Sample Size, g	141.58		

Particle Size, mm	Sample Id 5A, g	Fraction % 5A	% Passed 5A
40	0	0.00	100.00
25-40	90	22.71	77.29
10.0-25	10	2.52	74.76
5.0-10.0	6.1	1.54	73.22
2.0-5.0	8.7	2.20	71.03
1.0-2.0	3.749	0.95	70.08
0.50-1.0	3.664	0.92	69.16
0.25-0.50	3.769	0.95	68.20
0.125-0.250	2.413	0.61	67.60
0.063-0.125	3.829	0.97	66.63
0.02-0.063	91.6	23.12	43.51
0.002-0.02	88.3	22.29	21.23
<0.002	84.1	21.23	0.00
Sample Size, g	**396.224**		

Particle Size, mm	Sample Id 5B, g	Fraction % 5B	% Passed 5B
40	0	0.00	100.00
25-40	0	0.00	100.00
10.0-25	78	61.93	38.07
5.0-10.0	12	9.53	28.55
2.0-5.0	6	4.76	23.78
1.0-2.0	0.91	0.72	23.06
0.50-1.0	1.159	0.92	22.14
0.25-0.50	0.803	0.64	21.50
0.125-0.250	1.579	1.25	20.25
0.063-0.125	1.906	1.51	18.74
0.02-0.063	9.9	7.86	10.88
0.002-0.02	8.5	6.75	4.13
<0.002	5.2	4.13	0
Sample Size, g	**125.957**		

Particle Size, mm	Sample Id 6A, g	Fraction % 6A	% Passed 6A
40	22	18.55	81.45
25-40	30	25.29	56.16
10.0-25	35	29.50	26.66
5.0-10.0	4.3	3.62	23.03
2.0-5.0	1.5	1.26	21.77
1.0-2.0	0.624	0.53	21.24
0.50-1.0	0.835	0.70	20.54
0.25-0.50	0.746	0.63	19.91
0.125-0.250	0.788	0.66	19.25
0.063-0.125	2.531	2.13	17.11
0.02-0.063	8.3	7.00	10.12
0.002-0.02	7.3	6.15	3.96
<0.002	4.7	3.96	0.00
Sample Size, g	**118.624**		

Particle Size, mm	Sample Id 6B, g	Fraction % 6B	% Passed 6B
40	0	0.00	100.00
25-40	0	0.00	100.00
10.0-25	26	37.03	62.97
5.0-10.0	7.2	10.26	52.71
2.0-5.0	6.9	9.83	42.88
1.0-2.0	0.9999	1.42	41.46
0.50-1.0	0.821	1.17	40.29
0.25-0.50	0.938	1.34	38.96
0.125-0.250	1.172	1.67	37.29
0.063-0.125	2.078	2.96	34.33
0.02-0.063	10.2	14.53	19.80
0.002-0.02	9.3	13.25	6.55
<0.002	4.6	6.55	0.00
Sample Size, g	**70.2089**		

Particle Size, mm	Sample Id 7A, g	Fraction % 7A	% Passed 7A
40	0	0.00	100.00
25-40	0	0.00	100.00
10.0-25	78	52.74	47.26
5.0-10.0	16	10.82	36.44
2.0-5.0	10.7	7.23	29.21
1.0-2.0	3.717	2.51	26.70
0.50-1.0	1.804	1.22	25.48
0.25-0.50	1.52	1.03	24.45
0.125-0.250	1.692	1.14	23.31
0.063-0.125	1.869	1.26	22.04
0.02-0.063	12.2	8.25	13.79
0.002-0.02	11.8	7.98	5.81
<0.002	8.6	5.81	0.00
Sample Size, g	**147.902**		

Particle Size, mm	Sample Id 7B, g	Fraction % 7B	% Passed 7B
40	0	0.00	100.00
25-40	60	35.66	64.34
10.0-25	42	24.96	39.39
5.0-10.0	8.7	5.17	34.22
2.0-5.0	9.9	5.88	28.33
1.0-2.0	5.041	3.00	25.34
0.50-1.0	3.322	1.97	23.36
0.25-0.50	3.082	1.83	21.53
0.125-0.250	2.445	1.45	20.08
0.063-0.125	2.689	1.60	18.48
0.02-0.063	14.4	8.56	9.92
0.002-0.02	9.6	5.70	4.22
<0.002	7.1	4.22	0.00
Sample Size, g	**168.279**		

Particle Size, mm	Sample Id 8A, g	Fraction % 8A	% Passed 8A
40	0	0.00	100.00
25-40	0	0.00	100.00
10.0-25	36	13.15	86.85
5.0-10.0	16	5.84	81.01
2.0-5.0	40	14.61	66.40
1.0-2.0	86.144	31.46	34.93
0.50-1.0	43.209	15.78	19.15
0.25-0.50	7.832	2.86	16.29
0.125-0.250	3.109	1.14	15.16
0.063-0.125	3.393	1.24	13.92
0.02-0.063	16.9	6.17	7.74
0.002-0.02	11.8	4.31	3.43
<0.002	9.4	3.43	0.00
Sample Size, g	**273.787**		

Particle Size, mm	Sample Id 8B, g	Fraction % 8B	% Passed 8B
40	0	0.00	100.00
25-40	88	34.05	65.95
10.0-25	38	14.70	51.24
5.0-10.0	14	5.42	45.83
2.0-5.0	26	10.06	35.77
1.0-2.0	42.635	16.50	19.27
0.50-1.0	21.204	8.20	11.06
0.25-0.50	4.66	1.80	9.26
0.125-0.250	2.504	0.97	8.29
0.063-0.125	2.426	0.94	7.35
0.02-0.063	10.6	4.10	3.25
0.002-0.02	5	1.93	1.32
<0.002	3.4	1.32	0.00
Sample Size, g	**258.429**		

Particle Size, mm	Sample Id 9A, g	Fraction % 9A	% Passed 9A
40	0	0.00	100.00
25-40	42	28.84	71.16
10.0-25	61	41.89	29.27
5.0-10.0	7	4.81	24.46
2.0-5.0	6.4	4.40	20.06
1.0-2.0	3.013	2.07	18.00
0.50-1.0	3.197	2.20	15.80
0.25-0.50	2.019	1.39	14.41
0.125-0.250	2.428	1.67	12.75
0.063-0.125	3.661	2.51	10.23
0.02-0.063	6.5	4.46	5.77
0.002-0.02	5.1	3.50	2.27
<0.002	3.3	2.27	0.00
Sample Size, g	**145.618**		

Particle Size, mm	Sample Id 9B, g	Fraction % 9B	% Passed 9B
40	187	63.78	36.22
25-40	82	27.97	8.26
10.0-25	15	5.12	3.14
5.0-10.0	3	1.02	2.12
2.0-5.0	2	0.68	1.44
1.0-2.0	0.531	0.18	1.26
0.50-1.0	0.434	0.15	1.11
0.25-0.50	0.288	0.10	1.01
0.125-0.250	0.293	0.10	0.91
0.063-0.125	0.367	0.13	0.78
0.02-0.063	0.5	0.17	0.61
0.002-0.02	1.2	0.41	0.20
<0.002	0.6	0.20	0.00
Sample Size, g	**293.213**		

Particle Size, mm	Sample Id 10A, g	Fraction % 10A	% Passed 10A
40	0	0.00	100.00
25-40	0	0.00	100.00
10.0-25	118	62.20	37.80
5.0-10.0	40	21.08	16.72
2.0-5.0	20	10.54	6.18
1.0-2.0	3.156	1.66	4.51
0.50-1.0	0.595	0.31	4.20
0.25-0.50	0.471	0.25	3.95
0.125-0.250	0.142	0.07	3.88
0.063-0.125	0.354	0.19	3.69
0.02-0.063	3.8	2.00	1.69
0.002-0.02	1.8	0.95	0.74
<0.002	1.4	0.74	0.00
Sample Size, g	**189.718**		

Particle Size, mm	Sample Id 10B, g	Fraction % 10B	% Passed 10B
40	0	0.00	100.00
25-40	74	48.45	51.55
10.0-25	58	37.97	13.58
5.0-10.0	6.7	4.39	9.19
2.0-5.0	5.6	3.67	5.52
1.0-2.0	2.083	1.36	4.16
0.50-1.0	1.126	0.74	3.42
0.25-0.50	0.714	0.47	2.95
0.125-0.250	0.471	0.31	2.65
0.063-0.125	0.54	0.35	2.29
0.02-0.063	2.2	1.44	0.85
0.002-0.02	0.8	0.52	0.33
<0.002	0.5	0.33	0.00
Sample Size, g	**152.734**		

Particle Size, mm	Sample Id 11A, g	Fraction % 11A	% Passed 11A
40	0	0.00	100.00
25-40	76	37.19	62.81
10.0-25	102	49.91	12.91
5.0-10.0	16.7	8.17	4.74
2.0-5.0	3.7	1.81	2.92
1.0-2.0	0.925	0.45	2.47
0.50-1.0	0.537	0.26	2.21
0.25-0.50	0.383	0.19	2.02
0.125-0.250	0.419	0.21	1.82
0.063-0.125	0.614	0.30	1.52
0.02-0.063	1.4	0.69	0.83
0.002-0.02	1.1	0.54	0.29
<0.002	0.6	0.29	0.00
Sample Size, g	**204.378**		

Particle Size, mm	Sample Id 11B, g	Fraction % 11B	% Passed 11B
40	0	0.00	100.00
25-40	208	81.83	18.17
10.0-25	26	10.23	7.94
5.0-10.0	2.2	0.87	7.07
2.0-5.0	0.68	0.27	6.81
1.0-2.0	0.995	0.39	6.41
0.50-1.0	0.655	0.26	6.16
0.25-0.50	1.231	0.48	5.67
0.125-0.250	0.888	0.35	5.32
0.063-0.125	1.129	0.44	4.88
0.02-0.063	7.5	2.95	1.93
0.002-0.02	3.4	1.34	0.59
<0.002	1.5	0.59	0.00
Sample Size, g	**254.178**		

Particle Size, mm	Sample Id 12A, g	Fraction % 12A	% Passed 12A
40	0	0.00	100.00
25-40	106	50.14	49.86
10.0-25	50	23.65	26.20
5.0-10.0	2.2	1.04	25.16
2.0-5.0	1.1	0.52	24.64
1.0-2.0	6.617	3.13	21.51
0.50-1.0	3.734	1.77	19.75
0.25-0.50	4.268	2.02	17.73
0.125-0.250	4.969	2.35	15.38
0.063-0.125	5.106	2.42	12.96
0.02-0.063	15.8	7.47	5.49
0.002-0.02	7.1	3.36	2.13
<0.002	4.5	2.13	0.00
Sample Size, g	**211.394**		

Particle Size, mm	Sample Id 12B, g	Fraction % 12B	% Passed 12B
40	190	63.97	36.03
25-40	64	21.55	14.48
10.0-25	20	6.73	7.75
5.0-10.0	1.5	0.51	7.24
2.0-5.0	1.2	0.40	6.84
1.0-2.0	2.492	0.84	6.00
0.50-1.0	1.912	0.64	5.36
0.25-0.50	2.209	0.74	4.61
0.125-0.250	1.971	0.66	3.95
0.063-0.125	2.934	0.99	2.96
0.02-0.063	5.2	1.75	1.21
0.002-0.02	2.3	0.77	0.44
<0.002	1.3	0.44	0.00
Sample Size, g	**297.018**		

Particle Size, mm	Sample Id 13A, g	Fraction % 13A	% Passed 13A
40	162	69.06	30.94
25-40	60	25.58	5.37
10.0-25	3.5	1.49	3.87
5.0-10.0	2.1	0.90	2.98
2.0-5.0	1.6	0.68	2.30
1.0-2.0	0.261	0.11	2.19
0.50-1.0	0.334	0.14	2.04
0.25-0.50	0.39	0.17	1.88
0.125-0.250	0.674	0.29	1.59
0.063-0.125	0.931	0.40	1.19
0.02-0.063	1.3	0.55	0.64
0.002-0.02	0.9	0.38	0.26
<0.002	0.6	0.26	0.00
Sample Size, g	**234.59**		

Particle Size, mm	Sample Id 13B, g	Fraction % 13B	% Passed 13B
40	0	0.00	100.00
25-40	36	24.52	75.48
10.0-25	102	69.48	5.99
5.0-10.0	2.7	1.84	4.15
2.0-5.0	1.5	1.02	3.13
1.0-2.0	0.368	0.25	2.88
0.50-1.0	0.273	0.19	2.70
0.25-0.50	0.271	0.18	2.51
0.125-0.250	0.527	0.36	2.15
0.063-0.125	0.96	0.65	1.50
0.02-0.063	1.3	0.89	0.61
0.002-0.02	0.5	0.34	0.27
<0.002	0.4	0.27	0.00
Sample Size, g	**146.799**		

Particle Size, mm	Sample Id 14A, g	Fraction % 14A	% Passed 14A
40	5	1.85	98.15
25-40	165	61.17	36.98
10.0-25	70	25.95	11.03
5.0-10.0	2.8	1.04	9.99
2.0-5.0	1.3	0.48	9.51
1.0-2.0	1.619	0.60	8.91
0.50-1.0	2.576	0.95	7.95
0.25-0.50	2.194	0.81	7.14
0.125-0.250	2.71	1.00	6.13
0.063-0.125	3.648	1.35	4.78
0.02-0.063	7.9	2.93	1.85
0.002-0.02	3.4	1.26	0.59
<0.002	1.6	0.59	0.00
Sample Size, g	**269.747**		

Particle Size, mm	Sample Id 14B, g	Fraction % 14B	% Passed 14B
40	10	2.86	97.14
25-40	148	42.29	54.86
10.0-25	108	30.86	24.00
5.0-10.0	8	2.29	21.72
2.0-5.0	3	0.86	20.86
1.0-2.0	4.816	1.38	19.48
0.50-1.0	3.722	1.06	18.42
0.25-0.50	9.441	2.70	15.72
0.125-0.250	3.9	1.11	14.61
0.063-0.125	0.125	0.04	14.57
0.02-0.063	31.1	8.89	5.69
0.002-0.02	14.8	4.23	1.46
<0.002	5.1	1.46	0.00
Sample Size, g	**350.004**		

Appendix K

Site Characterisation Form

SITE CHARACTERISATION FORM

1.0 GENERAL DETAILS (From planning application)

NAME & ADDRESS OF APPLICANT:	Kerry Central Recycling Facility Ltd. Scart/Caherdean, Killarney, Co. Kerry.				
SITE LOCATION AND TOWNLAND:	Scart/Caherdean, Killarney, Co. Kerry.				
TELEPHONE NO:	064 32458	**FAX NO:**	064 38661	**E-MAIL:**	brian.bruton@kwd.ie
MAXIMUM NO. OF RESIDENTS:	65 staff @ 60L/p/d 32 visitors @ 5L/p/d	**NO. OF DOUBLE BEDROOMS:**	-	**NO. OF SINGLE BEDROOMS:**	-

PROPOSED WATER SUPPLY: (tick as appropriate)	**mains** √	**private well/borehole**	**group well/borehole**

2.0 DESK STUDY

SOIL TYPE	Till derived chiefly from Namurin Rocks	**Other (specify)**	**AQUIFER CATEGORY**	**Regionally Important**	**Locally Important** √	**Poor**	
VULNERABILITY Interim GSI Guidelines and site information	**Extreme**	**High**	**Moderate**	**Low**	**High to Low** √	**Unknown**	
BEDROCK	Namurian Undiffer-entiated	**Name of Public/Group Scheme Water Supply within 1 km**			**None**		
Is there a GSI Groundwater Protection Scheme? (Y/N):	Y	**Groundwater Protection Response:**	RI	**Source Protection Area**	**SI** None	**SO** None	
Presence of significant sites (archaeological, natural & historical):			N/A				
Past experience in the area:		N/A					

Comments:
(Integrate the information above in order to comment on: the potential suitability of the site, potential targets at risk, and/or any potential site restrictions).
From the above we can infer that percolation in the area would be acceptable. However, caution would have to be taken due to the under lying aquifer quality and usage and extreme vulnerability of the area.

NOTE: Only existing information available at the desk study stage should be used in this section

3.0 ON-SITE ASSESSMENT

3.1 Visual Assessment

LANDSCAPE POSITION:	N22 runs adjacent the eastern boundary of the site.	**SLOPE:**	STEEP (>1:5)	SHALLOW (1:5-1:20) √	RELATIVELY FLAT (<1:20)

SURFACE FEATURES (Distance to features should be noted in metres)	
HOUSES:	None on proposed site
SITE BOUNDARIES:	North – Factory & Agricultural Land East –N22 and Drainage Ditch South – Agricultural Land West – Drainage Ditch
ROADS:	N22 to East of site
EXISTING LAND USE:	Greenfield site with conifer plantation
OUTCROPS (ROCK AND/OR SUBSOIL):	None on site
SURFACE WATER PONDING:	None on site
LAKES:	None on site
BEACHES/SHELLFISH AREAS/WETLANDS:	None on site
KARST FEATURES:	None on site
WATERCOURSE/STREAM*:	None on site
DRAINAGE DITCHES*:	Running along the western and eastern boundary of the site. Internal drainage ditches will be captured in the internal drainage system.
WELLS*:	None on site
SPRINGS*:	None on site
VEGETATION INDICATORS:	Grass and rushes in area of proposed percolation area
GROUND CONDITION:	Soft and boggy

COMMENTS:
(Integrate the information above in order to comment on: the potential suitability of the site, potential targets at risk, the suitability of the site to treat the wastewater and the location of the proposed system within the site).

Water table possibly high on site. Foul water treatment on-site could cause risk to groundwater and surface water.

*** note** water level

3.2 Trial Hole No.1

Trial Hole should be a minimum of 2.1 m deep (3m where have regionally important aquifers)

Depth of trial hole (m):	**1.8m**	**Date and time of excavation:**	**05/05/08**	**Date and time of examination:**	**06/05/08**
Depth from ground surface to bedrock (m) (if present):		**Not encountered**			
Depth from ground surface to water table (m) (if present):		**1.4m**			

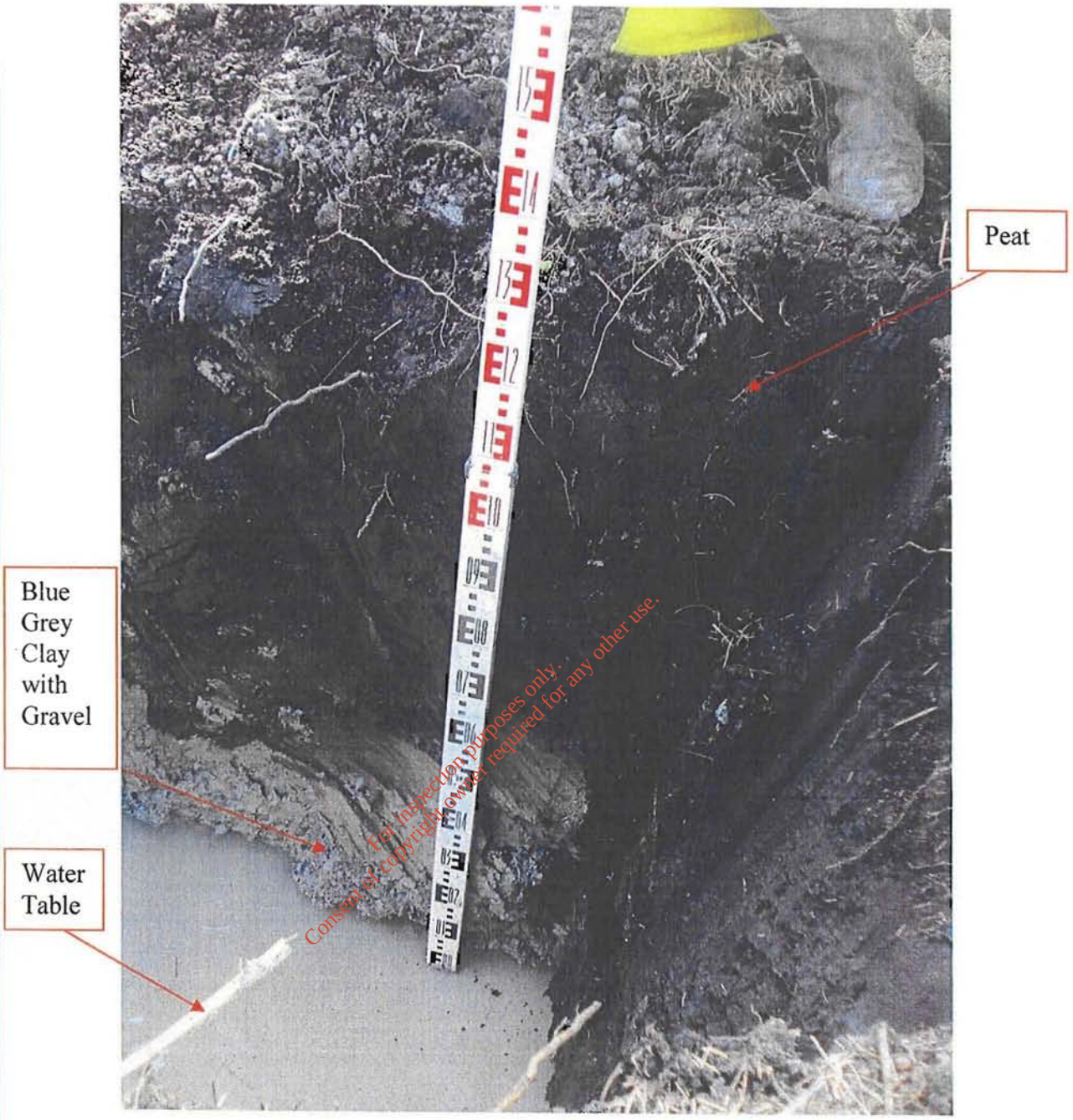
	Soil/Subsoil Texture & Classification**	Soil Structure	Density/ Compactness	Colour ***	Preferential flowpaths
0.1 m 0.2 m 0.3 m 0.4 m 0.5 m 0.6 m	Peat	Blocky	Compact	Dark Brown	Grass Rootlets
0.7 m 0.8 m 0.9 m 1.0 m 1.1 m 1.2 m 1.3 m 1.4 m	Blue Grey Clay with Gravel	Structureless Massive	Soft	Blue	None Water Table
1.5 m 1.6 m 1.7 m 1.8 m					End of Dig
1.9 m 2.0 m 2.1 m 2.2 m 2.3 m 2.4 m 2.5 m	See next page for cross section of trial hole				

Other information

Depth of water ingress:	1.4	**Rock type (if present):**	N/A	**Plasticity and dilatancy results:**	**3 samples to be tested for each horizon and results should be entered above for each horizon**	**Likely T value:**	>20

EVALUATION: Ground suitable for discharge subject to P Test results.

** See Appendix E for BS 5930 classification
*** All signs of mottling should be recorded
Note: Depth of percolation test holes should be indicated on diagram above.



Trial Hole No.1 - Cross Section

(a) Percolation ("T") Test @ Invert of Percolation Pipe or relevant subsoil layer

Percolation Test Hole	1	2
Depth from ground surface to top of hole (mm) (A)	900mm	900mm
Depth from ground surface to base of hole (mm) (B)	1.3m	1.3m
Depth of hole (mm) [B - A]	400mm	400mm
Dimensions of hole [length x breadth (mm)]	300 x 300	300 x 300
Each hole must be pre-soaked twice before the test is carried out (from 10.00 am to 5.00 pm and from 5.00 pm to next morning)		
Date of test	06/05/08	06/05/08
Date pre-soaking started	05/05/08	05/05/08
Time filled to 400 mm		
Time water level at 300 mm		

Percolation Test Hole No.	1			2		
Fill no.	Start Time (at 300 mm)	Finish Time (at 200 mm)	Δt (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	Δt (min)
1						
2						
3						
Average Δt				Average Δt		

Not carried out

Average$\Delta t/4$ = [Hole No.1] _____(t_1)

Average $\Delta t/4$ = [Hole No.2] _____(t_2)

T value* = $(t_1 + t_2)/2$ = _____(min/25 mm)

Result of Test : T =

COMMENTS:

- If two very different T test results are obtained and where one of these values fails then a third test should be carried out to determine the representivity of each of the results.

3.3 (b) Percolation ("P") Test @ Ground Level, Trial Hole No. 1

Percolation Test Hole	1	2
Depth of hole from ground surface (mm)	400	400
Dimensions of hole [length x breadth (mm)]	300x300	300x300
Each hole must be pre-soaked twice before the test is carried out (from 10.00 am to 5.00 pm and from 5.00 pm to next morning)		
Date of test	06/05/08	06/05/08
Date pre-soaking started	05/05/08	05/05/08
Time filled to 400 mm	10:27	10:32
Time water level at 300 mm	11:01	11:10

Percolation Test Hole No.	1			2		
Fill no.	Start Time (at 300 mm)	Finish Time (at 200 mm)	Δp (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	Δp (min)
1	11:01	11:39	38	11:10	11:55	45
2	11:43	12:36	53	11:57	12:50	53
3	12:38	14:42	124	12:50	14:58	128
Average Δp			72	Average Δp		75
Average Δp/4 = [Hole No.1] 18 (p_1)				Average Δp/4 = [Hole No.2] 19 (p_2)		

P value* = (p_1 + p_2)/2 = **18.5** (min/25 mm)

Result of Test : P = 18.5

COMMENTS: The P value is 18.5, giving an infiltration rate of 20 L/m²/day as the P value is between 5 and 20. This was lower than expected.

- **If two very different P test results are obtained and where one of these values fails then a third test should be carried out to determine the representivity of each of the results**

3.2 Trial Hole No. 2

Trial Hole should be a minimum of 2.1 m deep (3m where have regionally important aquifers)

Depth of trial hole (m):	**2m**	**Date and time of excavation:**	**05/05/08**	**Date and time of examination:**	**06/05/08**
Depth from ground surface to bedrock (m) (if present):		**Not encountered**			
Depth from ground surface to water table (m) (if present):		**1.1m**			

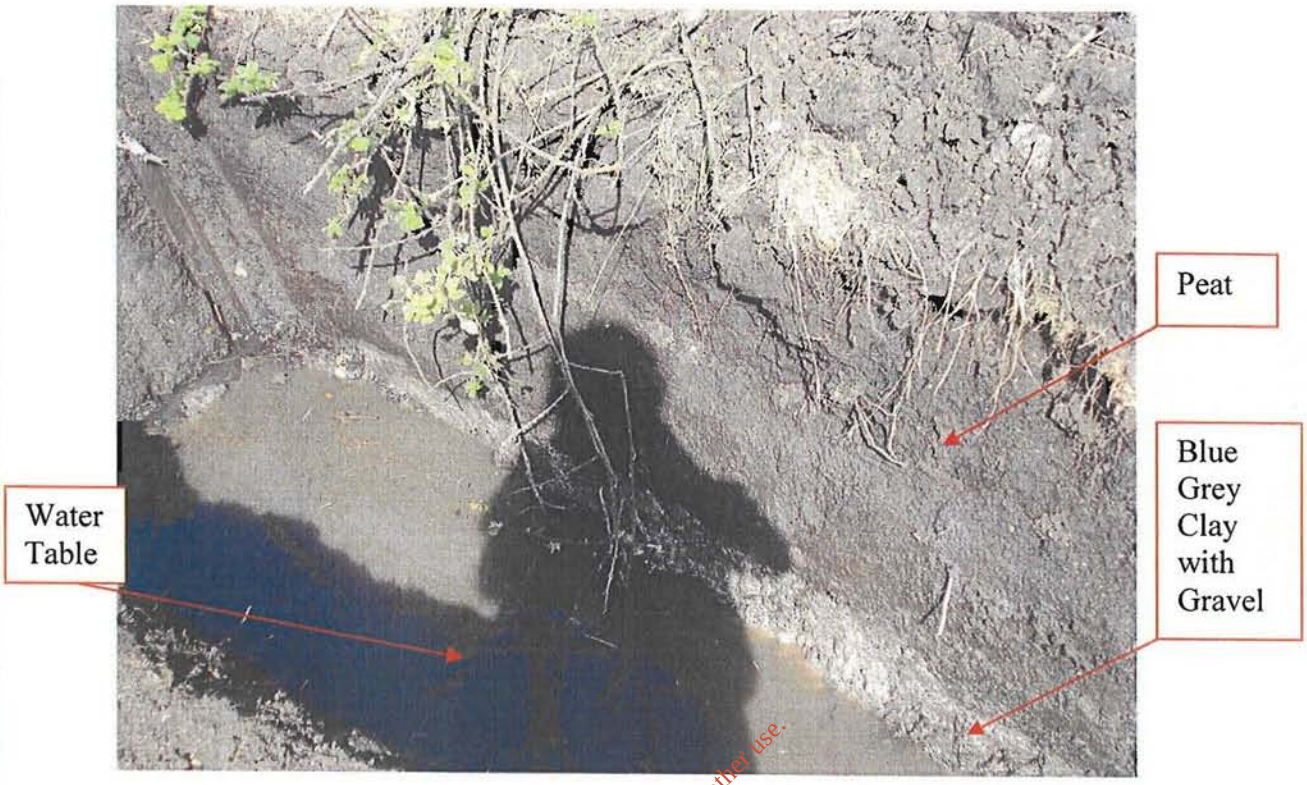
	Soil/Subsoil Texture & Classification**	Soil Structure	Density/ Compactness	Colour ***	Preferential flowpaths
0.1 m 0.2 m 0.3 m 0.4 m 0.5 m 0.6 m	Peat	Blocky	Compact	Dark Brown	Grass Rootlets
0.7 m 0.8 m 0.9 m 1.0 m 1.1 m	Blue Grey Clay	Structureless Massive	Soft	Blue	None Water Table
1.2 m 1.3 m 1.4 m 1.5 m					End of Dig
1.6 m 1.7 m 1.8 m 1.9 m 2.0 m 2.1 m 2.2 m 2.3 m 2.4 m 2.5 m	See next page for cross section of trial hole				

Other information

Depth of water ingress:	N/A	**Rock type (if present):**	N/A	**Plasticity and dilatancy results:**		**Likely T value:**	>20

EVALUATION: Ground will provide adequate treatment subject to P test results.

** See Appendix E for BS 5930 classification
*** All signs of mottling should be recorded
Note: Depth of percolation test holes should be indicated on diagram above.



Trial Hole 2 - Cross Section

(a) Percolation ("T") Test @ Invert of Percolation Pipe or relevant subsoil layer

Percolation Test Hole	1	2
Depth from ground surface to top of hole (mm) (A)	900mm	900mm
Depth from ground surface to base of hole (mm) (B)	1.3m	1.3m
Depth of hole (mm) [B - A]	400mm	400mm
Dimensions of hole [length x breadth (mm)]	300 x 300	300 x 300
Each hole must be pre-soaked twice before the test is carried out (from 10.00 am to 5.00 pm and from 5.00 pm to next morning)		
Date of test	06/05/08	06/05/08
Date pre-soaking started	05/05/08	05/05/08
Time filled to 400 mm		
Time water level at 300 mm		

Percolation Test Hole No.	1			2		
Fill no.	Start Time (at 300 mm)	Finish Time (at 200 mm)	Δt (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	Δt (min)
1						
2						
3						
Average Δt				Average Δt		

Not carried out

Average Δt/4 = [Hole No.1] _____(t_1)

Average Δt/4 = [Hole No.2] _____(t_2)

T value* = $(t_1 + t_2)/2$ = _____(min/25 mm)

Result of Test : T =

COMMENTS:

- If two very different T test results are obtained and where one of these values fails then a third test should be carried out to determine the representivity of each of the results.

3.3 (b) Percolation ("P") Test @ Ground Level , Trial Hole No. 2

Percolation Test Hole	1	2
Depth of hole from ground surface (mm)	400	400
Dimensions of hole [length x breadth (mm)]	300x300	300x300
Each hole must be pre-soaked twice before the test is carried out (from 10.00 am to 5.00 pm and from 5.00 pm to next morning)		
Date of test	06/05/08	06/05/08
Date pre-soaking started	05/05/08	05/05/08
Time filled to 400 mm	10:01	10:03
Time water level at 300 mm	10:43	10:46

Percolation Test Hole No.	1			2		
Fill no.	Start Time (at 300 mm)	Finish Time (at 200 mm)	Δp (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	Δp (min)
1	10:43	11:51	68	11:26	12:14	48
2	11:51	13:06	75	12:15	13:41	86
3	13:08	15:10	122	13:44	16:04	140
Average Δp			88	Average Δp		91
Average Δp/4 = [Hole No.1] 22 (p_1)				Average Δp/4 = [Hole No.2] 23 (p_2)		

P value* = (p_1 + p_2)/2 = 22.5 (min/25 mm)

Result of Test : P = 22.5

COMMENTS: The P value is 22.5, giving an infiltration rate of 10 L/m^2/day as the P value is between 20 and 40. This was lower than expected but is more conservative than the P value obtained at TH-01 and will be used in the sizing of the percolation area.

- If two very different P test results are obtained and where one of these values fails then a third test should be carried out to determine the representivity of each of the results

Sketch of site showing measurement to Trial Hole location and Percolation Test Hole locations, wells and direction of groundwater flow (if known), proposed house (incl. distances from boundaries) adjacent houses, watercourses, significant sites and other relevant features. North point should always be included.

[A copy of the site layout drawing should be used if available]

Please see Drawing No. DR0001/01.

4.0 CONCLUSION of SITE CHARACTERISATION:

(Integrate the information from the desk study and on-site assessment (i.e. visual assessment, trial hole and percolation tests) above and conclude the type of system(s) that is (are) appropriate. This information is also used to choose the optimum final disposal route of the treated wastewater).

Suitable for (delete as appropriate)****:

~~(a) septic tank and soil percolation system~~

~~(b) septic tank and intermittent filter system and polishing unit; or septic tank and constructed wetlands and polishing unit~~

(c) mechanical aeration system and polishing unit

****note:** ***more than one option may be suitable for a site and this should be recorded***

and

~~**SUITABLE**~~ / **UNSUITABLE** (delete as appropriate) for discharge to **surface water**[1]

SUITABLE / ~~**UNSUITABLE**~~ (delete as appropriate) for discharge to **groundwater**

5.0 RECOMMENDATION:

Propose to install: EPS Bison Wastewater Treatment Plant followed by a raised bed soil filter and discharge to ~~surface water~~/groundwater (delete as appropriate)

Conditions (if any) e.g. special works, invert level of trench, site improvement works testing etc.....

See attached design

Signed: PJ Griffin, RPS Consulting Engineers

Address: Lyrr Building, IDA Business and Technology Park, Mervue, Galway

Qualifications/Experience: Chartered Engineer Date of Report: 12th Sept.2008

Phone: 091 534100 Fax: 091 534199 e-mail pj.griffin@rpsgroup.com

[1] A discharge of sewage effluent to "waters" (definition includes any or any part of any river, stream, lake, canal, reservoir, aquifer, pond, watercourse or other inland waters, whether natural or artificial) will require a licence under the Water Pollution Acts 1977-90

6.0 TREATMENT SYSTEM DESIGN DETAILS

System Type?	**BAF**	**Proposed Discharge route?**	~~Surface water~~	Groundwater
Size of Proposed Treatment System?	Primary/Septic Tank (m^3) 6.8	Secondary Treatment System Capacity (m^3) 6.8	Percolation Area/Polishing filter (State units - m or m^2)* 345m^2 soil polishing filter	
What Quality Assurance is proposed during the following?	**Installation & Commissioning** Installed and commissioned by EPS	**On-going Maintenance** On-going maintenance by EPS		

*** the calculated percolation area or polishing filter area should be shown on site plan**

7.0 REVIEW (by Local Authority)

Site visit	☐	Date:
Inspection of Trial Hole	☐	Date:
Inspection of Percolation Test Holes	☐	Date:

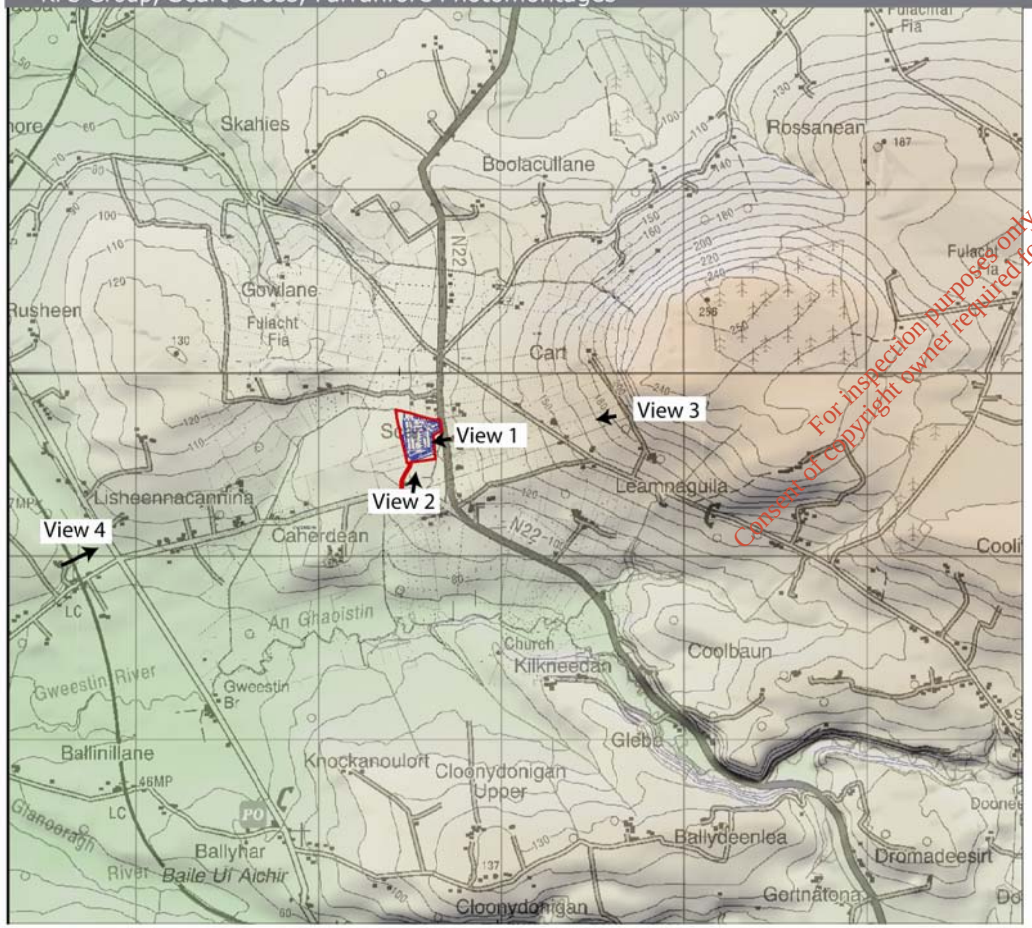
COMMENTS

SIGNED: Date:

Appendix L

Photomontages

RPS Group, Scart Cross, Farranfore Photomontages



Viewpoints Used	
View 1	160 m
View 2	300 m
View 3	1200 m
View 4	976 m

RPS Group

Pixel Lab arch-viz

View 1

Shot 1 - Existing view to the site

Shot 2 - Proposed view to the site after 5 - 10 years

Shot 3 - Proposed view to the site after 20 - 25 years

View 2

Shot 1 - Existing view to the site

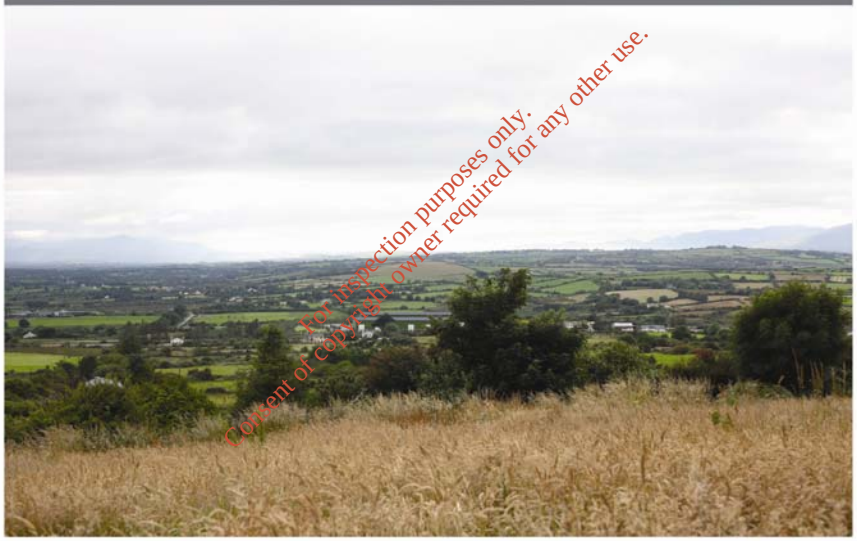
Shot 2 - Proposed view to the site after 5 - 10 years

Shot 3 - Proposed view to the site after 20 - 25 years

View 3

Shot 1 - Existing view to the site

Shot 2 - Proposed view to the site after 5 - 10 years



Shot 3 - Proposed view to the site after 20 - 25 years

View 4

Shot 1 - Existing view to the site

Shot 2 - Proposed view to the site after 5 - 10 years

Shot 3 - Proposed view to the site after 20 - 25 years

Appendix M

Archaeology

Bibliography and References

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Antiquities of Kerry Origin in the National Museum of Ireland. (NMI Topographic files).

1st Edition OS Map 1842 Sheets 48 & 58

2nd Edition OS Map 1894 Sheets 48 & 58

RMP Sheets 48 & 58

OSI Trailmaster; Southwest CD. Ordnance Survey Ireland.

www.excavations.ie

Glossary

Archaeological Monitoring: supervision of any ground disturbance works or other related activity at a development site

Bronze Age: period ranging from 2500BC-500BC

Burnt Spread: a deposit of material usually consisting of burnt stones and black charcoal enriched soil

Fulacht Fiadh: generally regarded as 'cooking places' and date from the Bronze Age. Typically composed of the material described above for a burnt spread, and occasionally contain a trough

Hot-stone technology: the heating of stones in a fire and placing in water in a pit/trough to heat the water for a ranger of purposes such as cooking

***In Situ*:** a Latin term meaning the deposit/artefact etc is in its original location and has not been disturbed

Medieval: *Early* period ranging from 5th century to 12th century A.D.
Late period ranging from late 12th century –mid 16th century A.D.

Neolithic: period ranging from 4000 B.C.-2500 B.C.

Non-invasive assessment: an archaeological assessment which does not involve test excavations & generally based on research and fieldwalking

Post-Medieval: period ranging from the late 16th century A.D. onwards

Preservation by record: the full excavation of an archaeological site

Rath/Ringfort: typically a circular enclosure constructed of earth or earth and stone, and comprised of a ditch and bank

RMP No.: Records of Monuments and Places-a list of known or possible archaeological sites held by the National Monuments section of the DEHLG

Souterrain: a man-made underground passageway or chamber

Test Excavations: a series of narrow trenches excavated across a proposed development site to determine the presence and extent, if any, of potential archaeological deposits

Trough: term given to a pit often found in association with fulachta fiadh and examples found have been of earth-cut or wooden construction

Appendix N

Air Quality Limit Values

Air Quality Standards

Table A.1: Limit Values (S.I 271 of 2002)

Pollutant	Limit Type	Margin of Tolerance	Value
Nitrogen Dioxide	Hourly limit for protection of human health - not to be exceeded more than 18 times/year	50% until 2001 reducing linearly to 0% by 2010	200 ∝g/m^3 NO_2
	Annual limit for protection of human health	50% until 2001 reducing linearly to 0% by 2010	40 ∝g/m^3 NO_2
	Annual limit for protection of vegetation	None	30 ∝g/m^3 NO + NO_2
Lead	Annual limit for protection of human health	-	0.5 ∝g/m^3
Sulphur Dioxide	Hourly limit for protection of human health - not to be exceeded more than 24 times/year	-	350 ∝g/m^3
	Daily limit for protection of human health - not to be exceeded more than 3 times/year	-	125 ∝g/m^3
	Annual & Winter limit for the protection of ecosystems	-	20 ∝g/m^3
Particulate Matter Stage 1	24-hour limit for protection of human health - not to be exceeded more than 35 times/year		50 ∝g/m^3 PM_{10}
	Annual limit for protection of human health		40 ∝g/m^3 PM_{10}
Particulate Matter Stage 2	24-hour limit for protection of human health - not to be exceeded more than 7 times/year	To be derived from data and to be equivalent to Stage 1 limit value	50 ∝g/m^3 PM_{10}
	Annual limit for protection of human health	50% until 2005 reducing linearly to 0% by 2010	20 ∝g/m^3 PM_{10}

Pollutant	Limit Type	Margin of Tolerance	Value
Benzene	Annual limit for protection of human health	100% until 2003 reducing linearly to 0% by 2010	5 ∝g/m^3
Carbon Monoxide	8-hour limit (on a rolling basis) for protection of human health	-	10 mg/m^3

Table A2 – $PM_{2.5}$ Target Value in Directive 2008/50/EC.

Pollutant	Regulation	Target Value	Date by which target should be achieved
$PM_{2.5}$	2008/50/EC	25∝g/m^3	2010

Appendix O

RSA Stage 1/2

RPS

Road Safety Audit Stage 1/2

Kerry Central Recycling Facility at Scart/ Caherdean, Killarney, Co. Kerry.

DOCUMENT CONTROL SHEET

Client	Kerry Central Recycling Facility Ltd.					
Project Title	Road Safety Audit 1/2					
Document Title	Kerry Central Recycling Facility at Scart/ Caherdean, Killarney, Co. Kerry. – Stage 1/2					
Document No.	MGE0109RP0007					
This Document Comprises	DCS	TOC	Text	List of Tables	List of Figures	No. of Appendices
	1	1	8	-	-	2

Rev.	Status	Author(s)	Reviewed By	Approved By	Office of Origin	Issue Date
F01	Approval	JW	EC	JW	Galway	Sept'08

Consulting Engineers

TABLE OF CONTENTS

LIST OF APPENDICES

1 INTRODUCTION

This Stage 1/2 Road Safety Audit report was commissioned by Kerry Central Recycling Facility Ltd. as part of the new planning application for the proposed Kerry Central Recycling Facility at Scart/ Caherdean, Killarney, Co. Kerry.

The information supplied is listed in Appendix A. The audit is based on observations from the site visit and the information provided.

The Road Safety Audit team included Jason Walsh and Eamon Cox who visited the site on 5th March 2008.

This Stage 1/2 Road safety Audit has been carried out in accordance with the requirements of NRA HD 19/04- Road Safety Audits and NRA HA 42/04- Road Safety Audit Guidelines, contained in Volume 5 of the National Roads Authority Design Manual for Roads and Bridges.

The information provided has been reviewed and the site examined. This report summarises the issues which have an adverse effect on road safety. The audit does not verify for compliance with any other standards.

The matters effecting road safety are identified in this report as problems and are considered to require action in order to improve the safety of the project and minimise accident occurrence.

If any of the recommendations in this report are not accepted, a written response is required, stating reasons for non-acceptance. Comments made in the Report under the heading Observations are intended as information only, written response is not required.

2 BACKGROUND TO PROJECT

This audit has been undertaken for a new planning application for a proposed Kerry Central Recycling Facility at Scart/ Caherdean, Killarney, Co. Kerry.

The access to the proposed facility is via a proposed 6m wide access road with a junction off the L-3023 local road approximately 330m west of the revised N22 junction.

3 MAIN REPORT

3.1 PROBLEM

The junction radii at the proposed access road to the proposed development appear inadequate. Inadequate entry radii at the narrow local road (5.5m approximately at the junction) may result in side swipe accidents as large vehicles exiting the development may cross into the path of vehicles in the opposite lane.

Recommendation

Ensure adequate entry radii are provided at the junction. An AutoTrack analysis should be carried to demonstrate that this problem will not occur.

3.2 PROBLEM

No width of the access road has been detailed; inadequate width of the access road may result in collisions between a large vehicle (i.e. HGV) entering the development via the access road while a large vehicle is exiting.

Recommendation

Ensure that the access road has sufficient width to allow for 2 large vehicles to safely pass. Also ensure widening of bends is included where required.

3.3 PROBLEM

The footpath on the access road has no crossing to the footpath within the development servicing the canteen and toilet facilities. A lack of crossing can result in mobility impaired pedestrian having difficulty crossing the road.

Recommendation

Provide a crossing from the access road after the weighbridge office to the canteen building.

3.4 PROBLEM

No visibility splays have been detailed at the access road junction. A lack of adequate visibility at junction may result in vehicles exiting the development pulling out in front of vehicles on the local road resulting in a collision and possible injury.

Recommendation

Ensure adequate visibility is provided at the access road junction.

3.5 PROBLEM

The N22 Tralee to Killarney road is located east 330m of the development; the roads to the west are narrow local roads. The narrow local roads will cause difficulty for large vehicles (i.e. HGV) and could result in side swipe accidents with local traffic on these roads.

Recommendation

The large vehicles should enter the development from the N22 rather that utilising the local road network to reduce the risk of swipe accidents occurring.

3.6 PROBLEM

The drainage on the local road is provided by ditches in the verge or in the fields in the area of the new access road junction. As no levels have been provided for the access road it is uncertain if the access road will drain onto the local road. If this situation occurs it could result in ponding on the road during wet conditions which could force traffic into the centre of the road and could result in vehicle collisions.

Recommendation

Ensure that the access road does not drain onto the local road.

3.7 PROBLEM

The local road narrows (4.5m approximately) on approach to the revised N22 junction, skids marks of large vehicles were observed in this area as was evidence of mounting of the verge present. A large vehicle and car was observed having difficulty negotiating this area of narrow road. Side swipe accidents could occur at this location.

Recommendation

This section of road should be widened to provide sufficient road width for vehicles to safely pass.

3.8 PROBLEM

The approach visibility to the junction is reduced by the road layout and hedge growth. The stop signs are also obscured by the hedge growth. Reduced approach visibility could result in vehicles over shooting the junction into the path of vehicle on the N22.

Recommendation

The verge should be widened in this area to provide adequate approach visibility to the junction.

3.9 PROBLEM

At the immediate approach to the N22 junction a sharp crest and earth mound obscures the layout of the junction; this could result in vehicles crossing into the opposing lane while approaching the junction into the path of vehicle turning into the junction.

Recommendation

The vertical alignment should be revised to remove the crest and the earth mound should be lowered to ensure that the layout of the junction is not obscured.

3.10 PROBLEM

The 80km/h speed limit sign on the local road is obscured by the hedge. Drivers who are unsure of the speed restriction on the local road may travel in excess of the speed resulting in loss of control accidents.

Recommendation

Relocate the speed limit sign or to a more suitable location.

3.11 OBSERVATION

3.11.1 Observation 1

Large vehicles and vehicles with trailers will have difficulty trying to manoeuvre within the width of the road in the event that the facility is closed. A turning area for vehicles should be provided prior to the entrance to the development.

4 AUDIT STATEMENT

We certify that we have examined the site in daylight on the 5th March 2008. The examination has been carried out with the sole purpose of identifying any features of the design that could be removed or modified in order to improve road safety.

The problems identified have been noted in this report together with associated safety improvement suggestions, which we would recommend should be studied for improvement. The Audit has been carried out by the persons named below who have not been involved in any design work on this project as a member of the design team.

Jason Walsh **Signed:** _____

(Audit Team Leader) **Dated:** 10/09/2008

Eamon Cox **Signed:** _____

(Audit Team Member) **Dated:** 10/09/2008

Appendix A1

Documents Provided

1. **Site Layout – Drawing No. 07/106/J1/01-A**

Dated: 05/02/08

Appendix A2

Signed Feed Back Form

Road Safety Audit Feedback Form

Scheme: Kerry Central Recycling Facility at Scart/ Caherdean, Killarney, Co. Kerry

Audit Stage: Stage 1/2

Date Audit Completed: 1st April 2008.

Table 1.1

Paragraph No. in Safety Report	Problem Accepted (Y/N)	Recommended measure accepted (Y/N)	Alternative Measures/ Notes	Alternative Measures accepted by Auditors (Y/N)
3.1	Y	Y	The junction radii were amended during the preliminary design, the auditors reviewed a design layout prior to this design process. Junction geometry and radii are designed in accordance with TD 42 NRA DMRB and they have been auto tracked. The proposed junction will have easy access and exit from the site junction. See also notes 3.2 and 3.7 below.	Y
3.2	Y	Y	The access road has been auto tracked and adequate width is available for HGV's.	Y
3.3	Y	Y	Details of pedestrian crossings will be provided at detailed design stage.	Y
3.4	Y	Y	The junction visibility has been checked and the visibility envelope provided is in accordance with TD 42 NRA DMRB. Obstructions within the envelope will be removed or reinstated outside the visibility envelope.	Y
3.5	Y	Y	Deliveries will enter from the east, off the N22, and will not utilise the local road network to the west of the site.	Y
3.6	Y	Y	The drainage will be contained within the site and will not impact the local road.	Y
3.7	Y	Y	Auto track analysis has been carried out and the sections of road that require widening have been identified.	Y
3.8	Y	Y	Forward visibility on the approach has been analysed and the sections of road/verge that required widening to maintain forward visibility have been identified.	Y
3.9	Y	Y	The N22 junction was recently realigned and a ghost island provided. The mound obstructing visibility appears to be fill/spoil from the works. This will be brought to the attention of the local authority.	Y
3.10	Y	Y	This will be brought to the attention of the local authority.	Y

Signed: _____ Design Team Leader

Date: 10/09/08

Signed: _____ Audit Team Leader

Date: 10/09/08

Appendix P

New Junction Access Road Design

RPS

Kerry Central Recycling Facility

New Access Junction to proposed Materials Recovery Facility

DOCUMENT CONTROL SHEET

Client	Kerry Central Recycling Facility Ltd.					
Project Title	Kerry Central Recycling Facility					
Document Title	New Access Junction to proposed Materials Recovery Facility					
Document No.	MGE0109RP0008					
This Document Comprises	DCS	TOC	Text	List of Tables	List of Figures	No. of Appendices
	1	1	7	0	1	0

Rev.	Status	Author(s)	Reviewed By	Approved By	Office of Origin	Issue Date
F01	Final Issue	Katarzyna Rajska	Sue Mackie	Siobhan Doyle	Galway	September 2008

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1 INTRODUCTION

RPS Consulting Engineers have on behalf Kerry Central Recycling Facility Ltd., prepared an access junction design for a proposed Kerry Central Recycling Facility at Scart/ Caherdean, Killarney, Co. Kerry.

2 SCOPE OF DESIGN

This report includes the following elements:

- Junction plan layout design, junction visibility envelope and forward visibility check,
- Assessment of the access from exiting junction off the N22 National Primary Route and.
- Auto Track analyses.

3 METHODOLOGY

This report has been prepared with regard to the recommendations of the following documents:

- National Roads Authority (NRA) Design Manual for Roads and Bridges(DMRB),
- 'The Traffic Management Guidelines' jointly issued by the Department of Environment and Local Government (DEHLG), the Department of Transport (DoT) and the Dublin Transportation Office (DTO);
- Kerry County Development Plan 2003-2009 and
- Draft Kerry County Development Plan 2009-2015.

A site visit was also conducted on 7th March 2008.

This document should be read in conjunction with the following drawings:

- DG0014-01 Rev.P01 – Access and Road Network Plan
- DG0014-02 Rev.P01 – Development Access Junction
- DG0014-03 Rev.P01 – Local Road Improvement Recommendation.
- DG0015-01 Rev.P01 – Overall Plan of AutoTrack Analysis
- DG0015-02,03,04 Rev.P01 – AutoTrack Analysis

which are also included with this Application.

4 ACCESS FROM NATIONAL ROAD NETWORK

4.1 NATIONAL ROAD

Access to the proposed development from National Primary Route N22, will be via the L-3023 Local Road approximately 300m east of the proposed development access junction. The N22 at the L-3023 Local Road junction is a recently improved section of road that provides a well lined and signed ghost island junction to cater for right turning movement (see Figure 4.1).

Figure 4.1

4.2 LOCAL ROAD

Observations during the site visit dated 07th of March, 2008 noted that the existing L-3023 Local Road width was insufficient to cater for passing vehicles (see Figure 4.2a and Figure 4.2b). The road width varies between 4.6 and 6.2m. The verges along this section of Local Road are narrow and are lined with hedges. Where the road is too narrow to accommodate passing traffic, vehicles must pull into the very narrow grass verge to allow an oncoming vehicle to pass. It is especially difficult for trucks and agricultural vehicles to pass other vehicles. It was also observed that the existing road was not lined.

Figure 4.2a

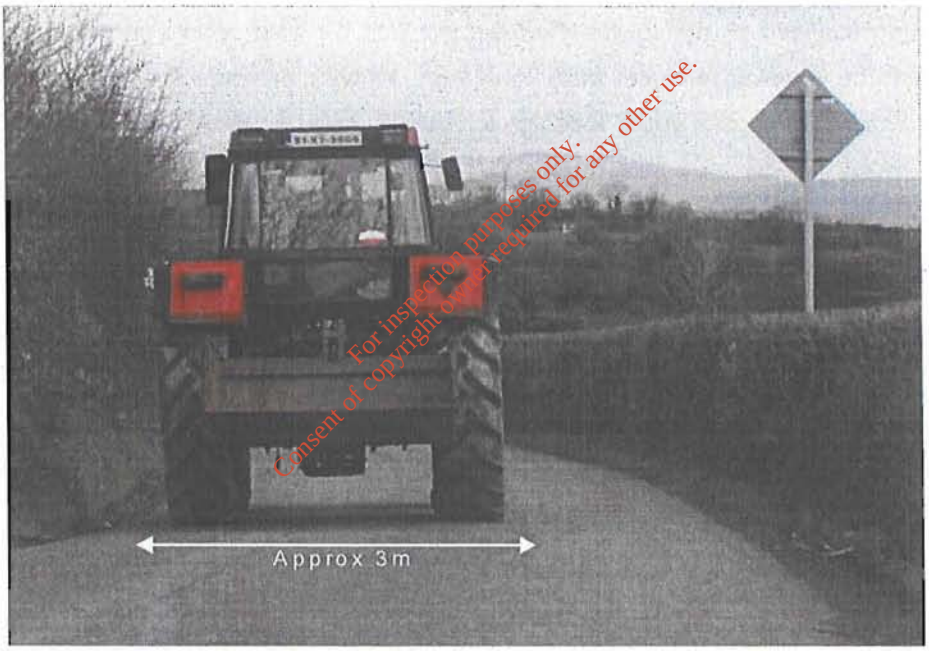

Figure 4.2b

5 JUNCTION DESIGN

The proposed new development access junction is located on the L-3023 Local Road approximately 300m from the Local Road junction at the N22 ghost island junction. The proposed junction is designed as a major/minor priority junction in accordance with the NRA DMRB TD 42/95. For details of proposed junction layout plan see drawing DG0014-02. A simple junction was chosen because the anticipated daily 2-way movements will be 232 per day accounting for staff and deliveries. Using this figure, the junction choice was based on Figure 2/2 TD 42/95 and will allow adequate provision for the new junction traffic flows.

5.1 JUNCTION VISIBILITY

The Local Road has a signed speed limit of 80kph and design speed of 85kph. The visibility envelope splay provided will be 160m in both directions; this is in accordance with NRA DMRB TD 42/95 Table 7/1. The junction is sited on a straight section of the L-3023 Local Road but the narrow road cross section and adjacent bend limits the forward visibility on the approach from the N22. The existing road width east of the junction is not sufficient to provide the 160m required but minor road and verge widening work is proposed on the inside of the adjacent bend, this will be discussed in more detail in Section 6 and 7 of this report. Junction approach visibility envelope for the development access road is set out in accordance with TD 42/95 Figure 7/1 and para 7.6. For details of proposed junction layout plan see drawing DG0014-02.

There is an existing house entrance immediately west, 34m, of the proposed junction. It was observed on site that the there will be a conflict between the new proposed junction and the existing entrance visibility lines (see Figure 5.0) due to the existing garden wall and high dense boundary hedges. This house has been acquired as part of the development and we have recommended that the existing hedge and wall be removed and set back to provide visibility between the existing and proposed junction. For details of proposed verge widening for visibility splay envelopes see drawing DG0014-02.

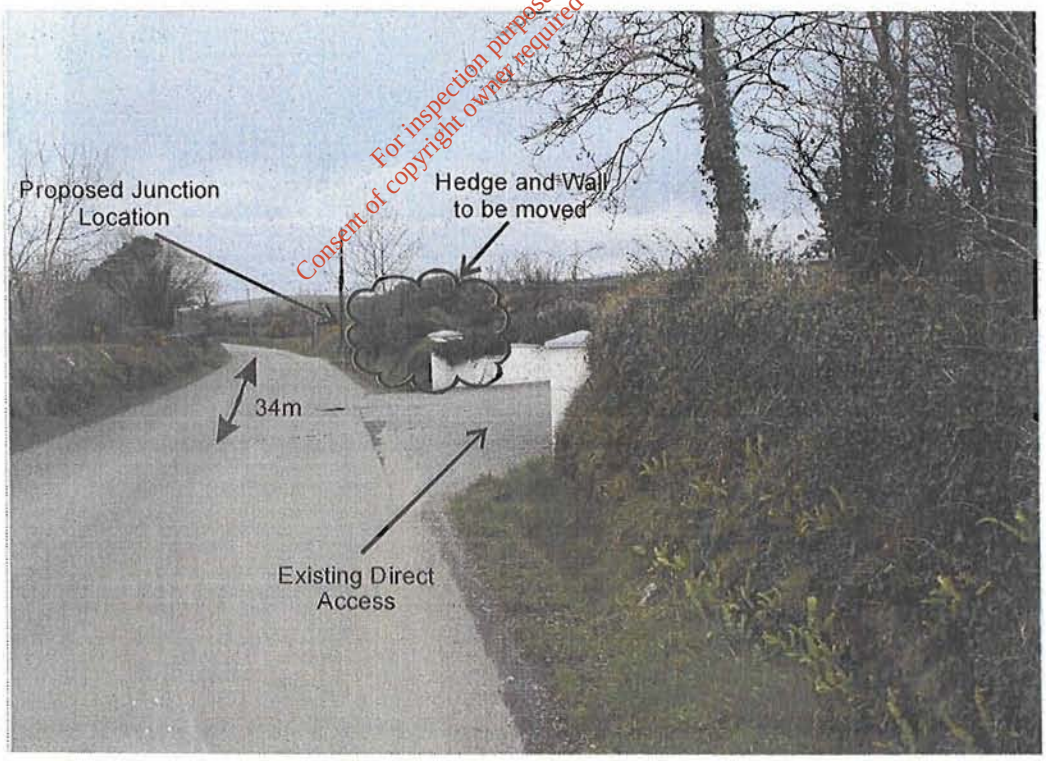

Figure 5.0

5.2 JUNCTION RADII

The junction radii provided are 15m with tapers in accordance with TD 42/95 para 7.17 b for a rural simple junction. This layout allows for easy entry and exit of long vehicles from the proposed development road and the existing L-3023 Local Road.

6 AUTOTRACK ANALYSIS

The Auto Track analysis was assessed at the following locations:

- Existing Junction on N22,
- L-3023 Local Road between N22 junction and Proposed Development Access Junction
- Proposed Development Access Junction
- Development Access Road
- Internal Development Access Road and Proposed Site Layout

The Autotrack analysis results are presented on Drawings DG0015-01, -02, -03 and -04.

6.1 DESIGN VEHICLE

A car with a trailer with overall length of 12.79m was used to model vehicles accessing the public drop-off area located to the north-east of site. Turning movements of a skip collecting truck were represented by a 9m long 3 axle rigid vehicle. The remaining site, junctions and roads were analysed using a 16.5m long max legal articulated truck which represent the design vehicle for AutoTrack analysis. This vehicle represents the largest Heavy Goods Vehicle (HGV) that will be accessing the site and associated roads and junctions.

Turning movements for emergency vehicles have smaller turning swept paths than HGV described above. Therefore this vehicle type is not modelled because it is smaller and required a smaller turning circle than the HGV already assessed.

6.2 ANALYSIS

AutoTrack analysis revealed the following:

- The existing junction on N22 accommodates all turning manoeuvres between the N22 and the L-3023 Local Road. See drawing DG0015-01 and DG0015-02.
- The Local Road section between the existing N22 junction and the proposed development access junction is too narrow to accommodate two HGV's passing at narrow sections. Vehicles need to stop and use full width of the grassed verge to manoeuvre. See drawing DG0015-01 and DG0015-02.

- The proposed development access junction geometry accommodates all turning manoeuvres to and from the site. Manoeuvres are performed without vehicle body migrating into opposite lane traffic when turning. See drawing DG0015-01 and DG0015-02.

- The development access road consists of two 3m wide lanes divided by 750m wide raised kerb with 0.9-1.0m high railing running along the centreline of the road. Widening on the curves is required to accommodate the swept paths of long vehicles using the facility. See drawing DG0015-01and DG0015-02.

- The internal development road, internal road junction and the weighbridge area have sufficient width to accommodate the turning circles of HGV's. See drawing DG0015-01 and DG0015-03 and DG0015-04.

- The public access area to the north-east of the proposed development has sufficient space to accommodate entering/exiting car with a trailers. See drawing DG0015-01 and DG0015-03 and DG0015-04.

- The skip collection area assessed using the 3-axle rigid vehicle is designed as cul de sac. There is no turning area at the end of the cul de sac. Allowance is made for trucks to reverse from open circulation area to collect skips. The skip collecting truck will have to reverse up to 40m maximum to collect the furthest skip. This manoeuvre will not impact on safety because only skip collection trucks will circulate in this area see drawing DG0015-01 and DG0015-03 and DG0015-04.

- All loading bays are HGV's accessible. See drawing DG0015-01 and DG0015-03 and DG0015-04.

- Parking areas are designed to facilitate all vehicle manoeuvres required. See drawing DG0015-01 and DG0015-03 and DG0015-04.

7 VULNERABLE ROAD USERS

There are no pedestrian facilities along existing L-3023 Local Road therefore the proposed footpath will tie-in to existing grass verge at the new proposed junction location.

It is proposed to provide a 1.8m wide footpath running along the Development Access Road, for details see drawing DG0014-01. The footpath is separated from the road edge by 0.3m wide grass verge. It extends from the access junction to the vehicle parking areas within the proposed development (see drawing DG0015-01). High volumes of foot traffic are not expected to use the facility due to the rural location of the facility.

8 CONCLUSIONS AND RECOMMEDATIONS

The new proposed junction is designed in accordance with the requirements of TD 42/95. The new proposed development junction and the N22 junction can cater for all traffic movements and turning manoeuvres. The internal site will cater for the turning manoeuvres and swept paths in the different sections of the site for the expected vehicles using them. The L-3023 Local Road however requires widening to achieve the visibility designed and accommodate passing vehicles expected.

Recommendations for the improvements along the L-3023 Local Road between the existing junction with N22 and proposed development access junction are based on the following:

- The L-3023 Local Road must be a minimum of 6m wide in order to accommodate two passing trucks. Widening of road carriageway needs to be applied over the full stretch of the L-3023 Local Road between existing junction with N22 and the proposed development access junction. As an alternative, inter visible passing bays could be provided.

- In addition to road carriageway widening, verge widening to cater for junction visibility and stopping sight distance visibility must be provided – see drawing DG0014-03 and 02.

Appendix Q

Automatic Traffic Counts on the N22

Traffic Counter Data for "Farranfore N22-01" in year 2008, based on 27 days recorded data

Average Daily Volumes in 2008 (both directions combined)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daily Volume	7286	-	-	-	-	-	-	-	-	-	-	-

Bank Holiday Directional Volumes in 2008

Holiday	Easter				May				June				August				October				Christmas			
Date	Mar 21	Mar 22	Mar 23	Mar 24	May 02	May 03	May 04	May 05	May 30	May 31	Jun 01	Jun 02	Aug 01	Aug 02	Aug 03	Aug 04	Oct 24	Oct 25	Oct 26	Oct 27	Dec 24	Dec 25	Dec 26	Dec 27
Eastbound	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Westbound	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Average Hourly Directional Volumes on Weekdays (Monday - Friday) in 2008

Hour Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Eastbound Total	19	12	11	8	13	25	71	209	277	225	187	211	243	270	284	305	389	426	272	134	111	96	64	37
Eastbound %HCV	6	5	20	12	16	13	13	7	7	14	12	11	9	8	8	6	5	4	3	3	2	1	1	1
Westbound Total	23	14	9	6	6	20	27	138	405	301	228	237	229	250	258	272	279	370	302	186	106	85	58	53
Westbound %HCV	5	11	8	15	29	24	31	10	6	6	8	7	8	7	7	6	6	3	2	2	6	4	5	3

Average Hourly Directional Volumes on Saturdays in 2008

Hour Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Eastbound Total	34	26	24	13	15	23	35	80	119	139	156	198	222	263	271	288	306	262	207	134	110	93	61	37
Eastbound %HCV	2	5	7	11	14	13	12	10	9	10	9	6	5	3	2	2	2	2	1	1	1	2	1	0
Westbound Total	40	34	18	12	8	16	21	57	117	125	159	212	265	280	316	294	281	236	196	154	132	96	65	66
Westbound %HCV	2	5	3	9	7	29	31	8	7	7	6	4	3	3	2	3	1	1	1	2	2	3	3	0

Average Hourly Directional Volumes on Sundays in 2008

Hour Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Eastbound Total	32	32	31	28	12	7	12	27	47	68	102	147	200	266	301	316	307	314	268	164	128	81	57	33
Eastbound %HCV	1	2	1	1	0	0	0	3	5	5	3	3	3	2	1	1	2	2	2	3	2	1	1	0
Westbound Total	42	34	23	21	13	6	10	29	39	54	81	140	194	256	318	299	278	258	252	184	128	93	78	60
Westbound %HCV	1	1	1	0	6	4	17	3	3	3	3	2	2	1	1	1	2	2	2	2	4	1	3	1

Summary Engineering Information based on 27 days recorded data

AADT estimate: 8411	HCV%: 5.6	Growth (2007->2008): 2.6%	30th HH : 736	50th HH: 648	30HH as % of AADT: 8.75	Peak hour ratio: 0.86

Download hourly directional counts | *Download daily directional counts* | *Download summary graphs*

Traffic Counter Data for "Farranfore N22-01" in year 2007, based on 363 days recorded data

Average Daily Volumes in 2007 (both directions combined)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daily Volume	7097	7574	7741	8226	8528	8575	8995	9146	8348	8330	8267	7491

Bank Holiday Directional Volumes in 2007

Holiday	Easter				May				June				August				October				Christmas			
Date	Apr 06	Apr 07	Apr 08	Apr 09	May 04	May 05	May 06	May 07	Jun 01	Jun 02	Jun 03	Jun 04	Aug 03	Aug 04	Aug 05	Aug 06	Oct 26	Oct 27	Oct 28	Oct 29	Dec 24	Dec 25	Dec 26	Dec 27
Eastbound	3498	3639	3602	3771	4843	3989	3680	3759	4754	3846	3562	3922	4946	4047	3727	4237	4828	3799	3349	3738	2356	1033	1893	3152
Westbound	3943	3789	3486	3401	4909	4176	3833	3525	5118	4046	3584	3496	5046	4533	3619	3807	4903	3802	3408	3432	2447	1019	1902	3206

Average Hourly Directional Volumes on Weekdays (Monday - Friday) in 2007

Hour Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Eastbound Total	23	12	10	8	13	30	93	233	284	242	216	241	269	293	299	325	393	452	316	186	145	123	87	45
Eastbound %HCV	9	6	20	15	14	14	14	8	8	16	12	11	10	8	8	7	6	5	4	4	3	2	3	3
Westbound Total	31	15	9	6	6	22	36	163	415	307	253	270	260	275	271	286	292	386	349	246	147	110	79	77
Westbound %HCV	4	13	10	11	27	22	27	12	6	7	9	8	8	7	7	7	6	4	4	4	4	4	5	3

Average Hourly Directional Volumes on Saturdays in 2007

Hour Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Eastbound Total	35	28	20	17	15	22	48	102	139	163	197	239	276	301	296	312	323	308	246	169	140	125	82	50
Eastbound %HCV	4	4	9	10	12	9	15	9	9	13	8	7	6	4	3	3	3	3	3	3	2	1	3	2
Westbound Total	47	36	22	17	11	18	27	76	134	171	207	262	284	320	315	324	288	280	268	201	149	107	82	83
Westbound %HCV	2	5	3	5	7	27	26	14	11	8	7	5	4	3	3	3	3	3	3	3	3	3	4	1

Average Hourly Directional Volumes on Sundays in 2007

Hour Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Eastbound Total	35	30	28	27	12	10	26	44	65	84	143	195	235	305	328	330	338	334	294	199	155	112	63	41
Eastbound %HCV	2	3	3	4	6	4	4	7	7	9	4	3	3	3	2	2	3	3	3	3	2	2	2	2
Westbound Total	46	41	28	27	14	8	14	43	62	70	124	187	248	295	321	304	303	287	282	218	152	112	78	73
Westbound %HCV	2	1	2	2	2	5	18	5	8	7	5	3	3	1	2	2	2	3	3	2	3	3	3	2

Summary Engineering Information based on 363 days recorded data

AADT estimate: 8200	HCV%: 6.3	Growth (2006->2007): 6.8%	30th HH : 913	50th HH: 897	30HH as % of AADT: 11.13	Peak hour ratio: 0.83

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Traffic Counter Data for "Farranfore N22-01" in year 2006, based on 349 days recorded data

Average Daily Volumes in 2006 (both directions combined)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

Daily Volume	5931		7239		7359		7738		7755		7975		8504		8667		8004		7918		7794		7245	
Bank Holiday Directional Volumes in 2006																								
Holiday	Easter				May				June				August				October				Christmas			
Date	Apr 14	Apr 15	Apr 16	Apr 17	Apr 28	Apr 29	Apr 30	May 01	Jun 02	Jun 03	Jun 04	Jun 05	Aug 04	Aug 05	Aug 06	Aug 07	Oct 27	Oct 28	Oct 29	Oct 30	Dec 24	Dec 25	Dec 26	Dec 27
Eastbound	3319	3710	3724	3616	4399	3624	3367	3455	4109	3709	3302	3694	4486	3554	3413	3917	4450	3609	3261	3463	2069	976	1892	3314
Westbound	3699	3801	3594	3391	4453	3777	3626	3264	4455	4023	3357	3073	4759	4048	3334	3399	4579	3686	3247	3162	2147	988	1900	3136
Average Hourly Directional Volumes on Weekdays (Monday - Friday) in 2006																								
Hour Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Eastbound Total	22	11	9	8	11	29	75	218	271	218	203	226	249	274	285	303	358	424	300	176	135	118	86	44
Eastbound %HCV	9	11	23	14	15	15	13	8	8	16	13	11	10	8	9	8	7	5	5	5	3	3	4	5
Westbound Total	32	15	8	5	5	21	35	126	381	285	240	245	242	244	244	255	273	349	339	227	140	100	76	73
Westbound %HCV	5	14	11	12	23	18	28	12	7	7	8	8	8	7	7	7	6	5	4	4	5	5	5	4
Average Hourly Directional Volumes on Saturdays in 2006																								
Hour Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Eastbound Total	32	25	19	17	14	21	38	103	136	155	187	229	260	295	291	295	303	295	248	170	140	115	81	49
Eastbound %HCV	6	5	8	7	10	12	16	9	10	14	9	7	6	4	4	3	3	3	2	2	2	1	3	2
Westbound Total	48	33	21	16	10	20	25	59	125	155	205	250	284	307	325	312	281	247	248	194	158	109	82	70
Westbound %HCV	2	5	2	2	9	21	28	13	11	8	7	5	4	3	3	3	3	4	3	2	3	3	3	2
Average Hourly Directional Volumes on Sundays in 2006																								
Hour Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Eastbound Total	31	28	25	22	14	9	20	39	57	76	133	185	239	304	331	318	315	326	279	180	146	105	61	39
Eastbound %HCV	2	2	3	1	3	4	4	6	6	8	4	3	3	2	2	2	2	2	3	3	2	3	2	3
Westbound Total	47	40	29	24	14	8	13	33	54	65	119	181	229	283	293	279	277	278	285	222	144	109	75	67
Westbound %HCV	2	2	2	2	2	4	13	5	6	7	5	3	2	1	2	1	2	2	2	2	3	3	4	3
Summary Engineering Information based on 349 days recorded data																								
AADT estimate: 7679		HCV%: 6.5			Growth (2005->2006): 5.9%				30th HH : 860				50th HH: 840				30HH as % of AADT: 11.2				Peak hour ratio: 0.84			
Download hourly directional counts							*Download daily directional counts*										*Download summary graphs*							

Traffic Counter Data for "Farranfore N22-01" in year 2005, based on 364 days recorded data

Average Daily Volumes in 2005 (both directions combined)												
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daily Volume	6162	6747	6918	7360	7506	7691	8220	8105	7246	7202	6883	6933
Bank Holiday Directional Volumes in 2005												

Holiday	Easter				May				June				August				October				Christmas			
Date	Mar 25	Mar 26	Mar 27	Mar 28	Apr 29	Apr 30	May 01	May 02	Jun 03	Jun 04	Jun 05	Jun 06	Jul 29	Jul 30	Jul 31	Aug 01	Oct 28	Oct 29	Oct 30	Oct 31	Dec 24	Dec 25	Dec 26	Dec 27
Eastbound	2903	3198	3254	3379	4244	3539	3341	3153	4315	3666	3505	3796	4261	3728	3456	3658	4208	3230	3099	2749	2179	938	1732	3074
Westbound	3162	3343	3226	2971	4377	3723	3457	2922	4555	3897	3460	3117	4519	4159	3396	3123	4174	3253	3123	2687	2311	907	1806	2888
Average Hourly Directional Volumes on Weekdays (Monday - Friday) in 2005																								
Hour Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Eastbound Total	21	11	7	6	11	28	66	198	259	204	191	215	236	260	265	296	344	388	287	164	127	112	82	41
Eastbound %HCV	4	6	12	13	12	11	14	10	8	16	15	13	11	9	10	8	7	5	4	4	3	2	4	2
Westbound Total	31	15	7	4	4	18	32	122	348	261	229	239	240	237	241	245	274	328	307	211	134	97	76	70
Westbound %HCV	3	9	13	13	18	16	26	11	7	9	9	9	8	7	7	7	6	5	4	3	4	4	4	4
Average Hourly Directional Volumes on Saturdays in 2005																								
Hour Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Eastbound Total	30	24	18	15	14	19	35	95	128	145	175	213	242	268	270	284	294	282	232	159	126	113	75	44
Eastbound %HCV	4	4	7	3	4	9	9	10	11	15	10	8	6	5	4	3	3	3	3	2	1	1	4	2
Westbound Total	42	32	20	14	10	15	21	62	115	149	194	240	275	288	296	288	271	239	220	175	146	98	79	68
Westbound %HCV	2	4	2	4	10	16	23	10	9	9	7	5	4	3	3	4	3	4	3	2	3	3	4	2
Average Hourly Directional Volumes on Sundays in 2005																								
Hour Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Eastbound Total	28	31	25	20	14	9	24	41	60	77	126	173	212	269	296	309	315	311	261	181	143	105	60	37
Eastbound %HCV	2	2	1	2	2	3	3	3	5	7	5	4	3	2	2	2	3	3	3	3	2	2	2	2
Westbound Total	45	40	27	22	14	8	10	39	53	70	110	165	221	275	293	270	277	257	262	184	141	107	81	71
Westbound %HCV	1	1	3	2	2	5	12	3	5	7	5	2	3	2	2	2	3	2	3	2	3	3	4	3
Summary Engineering Information based on 364 days recorded data																								
AADT estimate: 7251		HCV%: 6.6			Growth (2004->2005): 5.3%				30th HH : 793				50th HH: 772				30HH as % of AADT: 10.94				Peak hour ratio: 0.85			
Download hourly directional counts									*Download daily directional counts*								*Download summary graphs*							

Traffic Counter Data for "Farranfore N22-01" in year 2004, based on 320 days recorded data

Average Daily Volumes in 2004 (both directions combined)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daily Volume	5836	6378	6490	6864	7048	7230	7837	7874	7124	6907	6643	6373

Bank Holiday Directional Volumes in 2004

Holiday	Easter				May				June				August				October				Christmas			
Date	Apr 09	Apr 10	Apr 11	Apr 12	Apr 30	May 01	May 02	May 03	Jun 04	Jun 05	Jun 06	Jun 07	Jul 30	Jul 31	Aug 01	Aug 02	Oct 22	Oct 23	Oct 24	Oct 25	Dec 24	Dec 25	Dec 26	Dec 27

Eastbound	2901	3349	3202	3456	3899	3449	3202	3249	3805	3225	3335	3505	4167	3493	3269	3583	3772	3286	2989	2968	2179	802	1442	2331
Westbound	3056	3615	3127	3081	3960	3404	3356	2978	4015	3468	3329	2980	4354	3725	3232	3092	3949	3260	3061	2840	2314	835	1570	2305
Average Hourly Directional Volumes on Weekdays (Monday - Friday) in 2004																								
Hour Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Eastbound Total	20	12	7	6	10	24	48	157	240	193	176	199	225	252	246	275	333	377	275	153	121	109	79	39
Eastbound %HCV	3	5	7	10	17	13	19	9	7	14	13	10	9	7	9	7	6	5	4	4	3	2	3	3
Westbound Total	27	12	7	5	3	16	29	110	334	251	218	224	223	228	231	223	242	301	274	200	127	88	70	63
Westbound %HCV	3	6	9	13	16	17	25	11	6	7	7	7	7	6	6	7	5	4	4	3	5	4	4	4
Average Hourly Directional Volumes on Saturdays in 2004																								
Hour Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Eastbound Total	31	23	18	14	11	17	26	78	125	138	162	195	220	253	252	259	285	274	222	150	122	115	76	41
Eastbound %HCV	2	5	5	4	6	10	13	12	11	13	11	7	6	5	4	3	3	3	3	3	1	1	4	1
Westbound Total	40	29	19	13	9	13	19	52	108	153	187	227	255	269	277	274	244	230	216	166	133	88	66	63
Westbound %HCV	2	3	2	4	11	12	27	12	10	8	7	4	5	3	3	3	3	3	3	2	3	3	4	1
Average Hourly Directional Volumes on Sundays in 2004																								
Hour Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Eastbound Total	28	28	26	18	12	8	16	34	65	78	123	175	220	270	271	291	299	294	243	159	126	93	54	36
Eastbound %HCV	1	1	2	2	2	3	2	4	5	8	4	4	3	2	2	2	3	3	3	3	2	2	2	1
Westbound Total	42	37	28	25	13	7	7	26	52	66	109	150	200	244	269	256	270	277	258	178	130	96	76	65
Westbound %HCV	1	1	1	2	3	3	8	2	5	8	5	3	3	2	2	2	2	3	2	2	3	3	3	3

Summary Engineering Information based on 320 days recorded data

AADT estimate: 6888	HCV%: 6	Growth (2003->2004): 4.4%	30th HH : 750	50th HH: 727	30HH as % of AADT: 10.89	Peak hour ratio: 0.85

Download hourly directional counts | Download daily directional counts | Download summary graphs

Traffic Counter Data for "Farranfore N22-01" in year 2003, based on 331 days recorded data

Average Daily Volumes in 2003 (both directions combined)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daily Volume	-	6077	6178	6552	6624	6905	7373	7717	6865	6607	6425	6076

Bank Holiday Directional Volumes in 2003

Holiday	Easter				May				June				August				October				Christmas			
Date	Apr 18	Apr 19	Apr 20	Apr 21	May 02	May 03	May 04	May 05	May 30	May 31	Jun 01	Jun 02	Aug 01	Aug 02	Aug 03	Aug 04	Oct 24	Oct 25	Oct 26	Oct 27	Dec 24	Dec 25	Dec 26	Dec 27
Eastbound	2654	3137	3313	3245	3640	3304	3043	2914	3714	3131	3331	3505	4075	3574	3411	3307	3708	3329	3223	2864	2067	774	1532	2510
Westbound	2902	3253	3156	2835	3616	3263	3081	2737	3813	3323	3298	2888	4280	3929	3183	2731	3699	3206	3216	2856	2192	793	1564	2343

Average Hourly Directional Volumes on Weekdays (Monday - Friday) in 2003																								
Hour Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Eastbound Total	22	11	6	4	9	25	49	149	236	189	175	205	232	248	248	277	310	358	258	150	116	105	79	39
Eastbound %HCV	3	4	7	13	20	16	18	9	7	14	12	10	9	7	8	7	6	5	4	4	3	2	4	3
Westbound Total	27	12	8	5	3	15	26	96	307	248	213	221	220	229	225	222	242	283	267	189	126	89	69	64
Westbound %HCV	2	6	8	12	15	24	30	10	6	6	7	7	7	5	6	7	5	4	4	4	5	4	4	4
Average Hourly Directional Volumes on Saturdays in 2003																								
Hour Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Eastbound Total	28	22	16	12	11	17	30	74	120	137	161	203	237	259	255	265	274	276	224	151	121	103	72	41
Eastbound %HCV	2	2	3	5	8	12	14	13	12	14	10	7	5	4	4	3	3	3	2	3	2	1	4	3
Westbound Total	40	27	20	16	9	14	19	48	102	142	181	228	252	272	281	270	261	227	217	159	139	96	68	62
Westbound %HCV	2	2	3	4	4	17	31	11	9	7	7	5	4	3	3	3	3	4	3	2	3	3	3	1
Average Hourly Directional Volumes on Sundays in 2003																								
Hour Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Eastbound Total	28	29	26	19	10	9	18	38	64	75	111	168	226	280	285	298	298	315	251	172	134	101	61	35
Eastbound %HCV	2	2	2	3	4	2	2	4	7	9	4	4	3	2	2	2	3	3	4	3	2	2	1	2
Westbound Total	39	37	27	24	15	7	9	26	52	66	110	155	203	257	294	256	266	269	256	178	141	100	74	59
Westbound %HCV	1	1	1	1	1	3	4	4	6	9	6	4	3	2	2	2	2	3	3	2	3	2	4	2

Summary Engineering Information based on 331 days recorded data					
AADT estimate: 6597	HCV%: 5.8	Growth (2002->2003): 8.6%	30th HH : 732	50th HH: 707	30HH as % of AADT: 11.1	Peak hour ratio: 0.85

Download hourly directional counts | Download daily directional counts | Download summary graphs

Traffic Counter Data for "Farranfore N22-01" in year 2002, based on 51 days recorded data

Average Daily Volumes in 2002 (both directions combined)												
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daily Volume	-	-	-	-	-	-	-	-	-	6337	6179	5097

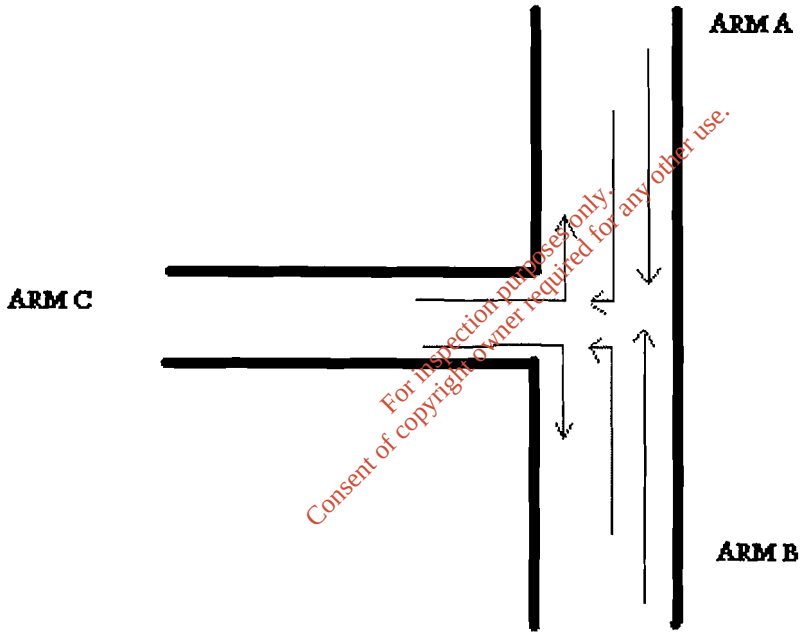
Bank Holiday Directional Volumes in 2002																								
Holiday	Easter				May				June				August				October				Christmas			
Date	Mar 29	Mar 30	Mar 31	Apr 01	May 03	May 04	May 05	May 06	May 31	Jun 01	Jun 02	Jun 03	Aug 02	Aug 03	Aug 04	Aug 05	Oct 25	Oct 26	Oct 27	Oct 28	Dec 24	Dec 25	Dec 26	Dec 27
Eastbound	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3562	2966	3173	2653	-	-	-	-
Westbound	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3575	2878	3183	2529	-	-	-	-

Average Hourly Directional Volumes on Weekdays (Monday - Friday) in 2002																								
Hour Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

Eastbound Total	19	11	6	4	8	24	41	137	230	191	162	185	227	233	220	246	287	328	219	136	101	95	74	40
Eastbound %HCV	3	3	7	14	23	18	21	9	6	13	13	10	9	8	9	7	7	4	5	4	3	2	2	4
Westbound Total	22	11	7	5	4	14	23	91	295	239	202	199	202	219	213	203	215	256	244	161	98	67	57	58
Westbound %HCV	2	3	5	16	11	21	29	12	6	7	8	9	8	6	6	7	5	5	4	4	5	5	6	4
Average Hourly Directional Volumes on Saturdays in 2002																								
Hour Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Eastbound Total	23	26	16	10	10	16	19	66	117	130	143	184	232	240	242	241	257	255	195	120	101	79	46	31
Eastbound %HCV	6	5	2	8	3	12	25	12	9	14	9	8	5	4	4	3	3	2	2	2	1	1	1	1
Westbound Total	28	26	17	11	6	10	15	39	89	123	152	194	217	268	281	255	229	202	184	140	113	72	54	50
Westbound %HCV	3	4	5	3	4	9	35	14	7	6	7	4	5	3	3	4	3	2	2	2	3	3	4	1
Average Hourly Directional Volumes on Sundays in 2002																								
Hour Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Eastbound Total	20	26	22	18	9	7	12	18	41	58	88	146	255	323	241	264	266	263	233	146	104	72	52	31
Eastbound %HCV	0	2	2	3	3	0	4	5	7	6	4	5	2	3	5	9	3	3	3	2	4	4	2	2
Westbound Total	36	34	26	20	12	6	8	20	34	51	84	120	161	228	263	245	288	269	247	156	112	80	58	54
Westbound %HCV	1	1	1	3	2	0	5	2	7	7	5	4	4	2	3	1	3	2	2	4	5	3	5	2
Summary Engineering Information based on 51 days recorded data																								
AADT estimate: 6075		HCV%: 6.1			Growth: Not Available				30th HH : 611			50th HH: 584			30HH as % of AADT: 10.06				Peak hour ratio: 0.9				
Download hourly directional counts					*Download daily directional counts*										*Download summary graphs*									

Appendix R

Manual Traffic Counts



Arm A = To Tralee
Arm B = To Farranfore
Arm C = Local Road

JUNCTION	Evening Peak Flow						
Arm B --> Arm A							
Time	Cars & Vans	HGVs	Buses & Coaches	MCL	PCL	Tractors	Other
17.00 - 17.15	135	2					
17.15 - 17.30	140	5	1				
17.30 - 17.45	145	5					
17.45 - 18.00	125	6					
TOTAL	545	18	1	0	0	0	0

JUNCTION	Morning Peak Flow						
Arm B --> Arm A							
Time	Cars & Vans	HGVs	Buses & Coaches	MCL	PCL	Tractors	Other
08.00 - 08.15	77	8	1				
08.15 - 08.30	116	2	1	1			
08.30 - 08.45	136	5					
08.45 - 09.00	95	4	1				
TOTAL	424	19	3	1	0	0	0

JUNCTION	Evening Peak Flow						
Arm A --> Arm C							
Time	Cars & Vans	HGVs	Buses & Coaches	MCL	PCL	Tractors	Other
17.00 - 17.15	8	1					
17.15 - 17.30	10						
17.30 - 17.45	11						
17.45 - 18.00	9						
TOTAL	38	1	0	0	0	0	0

JUNCTION	Morning Peak Flow						
Arm A --> Arm C							
Time	Cars & Vans	HGVs	Buses & Coaches	MCL	PCL	Tractors	Other
08.00 - 08.15	3						
08.15 - 08.30	9					1	
08.30 - 08.45	3						
08.45 - 09.00	2						
TOTAL	17	0	0	0	0	1	0

JUNCTION	Evening Peak Flow						
Arm C --> Arm B							
Time	Cars & Vans	HGVs	Buses & Coaches	MCL	PCL	Tractors	Other
17.00 - 17.15	5						
17.15 - 17.30							
17.30 - 17.45	3						
17.45 - 18.00	2						
TOTAL	10	0	0	0	0	0	0

JUNCTION	Morning Peak Flow						
Arm C --> Arm B							
Time	Cars & Vans	HGVs	Buses & Coaches	MCL	PCL	Tractors	Other
08.00 - 08.15	2						
08.15 - 08.30	8						
08.30 - 08.45	10						
08.45 - 09.00	8	1					
TOTAL	28	1	0	0	0	0	0

JUNCTION	Evening Peak Flow						
Arm A --> Arm B							
Time	Cars & Vans	HGVs	Buses & Coaches	MCL	PCL	Tractors	Other
17.00 - 17.15	70	4	1				
17.15 - 17.30	141	7	1				
17.30 - 17.45	150	3	1				
17.45 - 18.00	93	3					
TOTAL	454	17	3	0	0	0	0

JUNCTION	Morning Peak Flow						
Arm A --> Arm B							
Time	Cars & Vans	HGVs	Buses & Coaches	MCL	PCL	Tractors	Other
08.00 - 08.15	70	7	1				
08.15 - 08.30	107	7					
08.30 - 08.45	140	7					
08.45 - 09.00	114	11					
TOTAL	431	32	1	0	0	0	0

JUNCTION	Evening Peak Flow						
Arm B --> Arm C							
Time	Cars & Vans	HGVs	Buses & Coaches	MCL	PCL	Tractors	Other
17.00 - 17.15	1						
17.15 - 17.30	4	1					
17.30 - 17.45	4						
17.45 - 18.00	2						
TOTAL	11	1	0	0	0	0	0

JUNCTION	Morning Peak Flow						
Arm B --> Arm C							
Time	Cars & Vans	HGVs	Buses & Coaches	MCL	PCL	Tractors	Other
08.00 - 08.15							
08.15 - 08.30	4						
08.30 - 08.45	6		1				
08.45 - 09.00	2						
TOTAL	12	0	1	0	0	0	0

JUNCTION	Evening Peak Flow						
Arm C --> Arm A							
Time	Cars & Vans	HGVs	Buses & Coaches	MCL	PCL	Tractors	Other
17.00 - 17.15	4						
17.15 - 17.30	9	1					
17.30 - 17.45	2						
17.45 - 18.00	2						
TOTAL	17	1	0	0	0	0	0

JUNCTION	Morning Peak Flow						
Arm C --> Arm A							
Time	Cars & Vans	HGVs	Buses & Coaches	MCL	PCL	Tractors	Other
08.00 - 08.15	6						
08.15 - 08.30	10						
08.30 - 08.45	18						
08.45 - 09.00	5						
TOTAL	39	0	0	0	0	0	0

Appendix S

TRICS Output

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 12 - CIVIC AMENITY SITES
Category : A - RECYCLING CENTRES

VEHICLES

Selected regions and areas:

12 NORTHERN IRELAND
DO DOWN 1 days
13 REPUBLIC OF IRELAND
DL DUBLIN 1 days

Main parameter selection:

Parameter: Site area
Range: 0.10 to 0.80 (units: hect)

Date Range: 01/01/99 to 14/05/05

Selected survey days:

Thursday	1 days
Friday	1 days

Selected survey types:

Manual count	2 days
Directional ATC Count	0 days

Selected Locations:

Edge of Town	1
Free Standing (PPS6 Out of Town)	1

Selected Location Sub Categories:

Residential Zone	1
Out of Town	1

TRIP RATE for Land Use 12 - CIVIC AMENITY SITES/A - RECYCLING CENTRES

VEHICLES

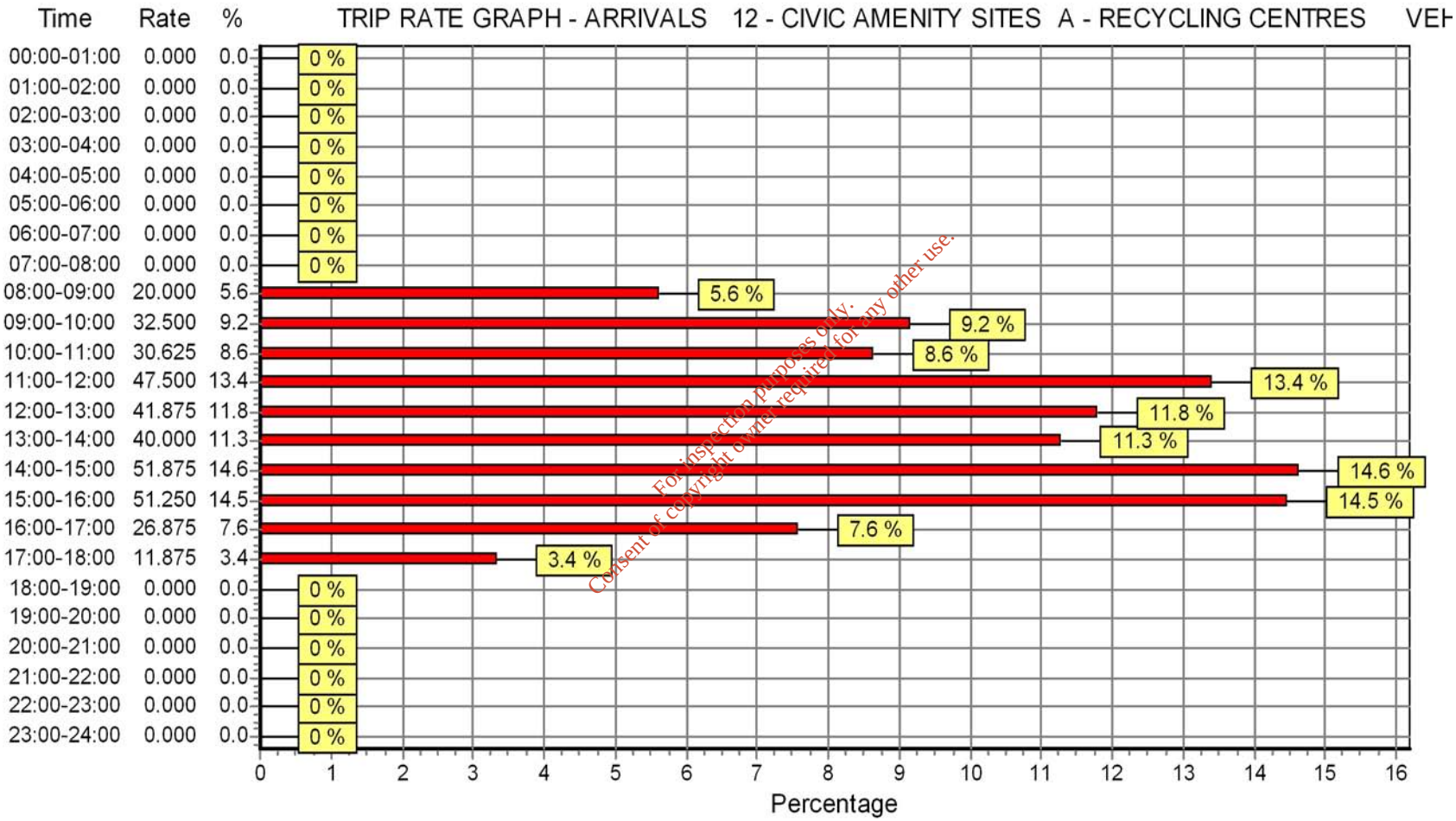
Calculation factor: 1 hect

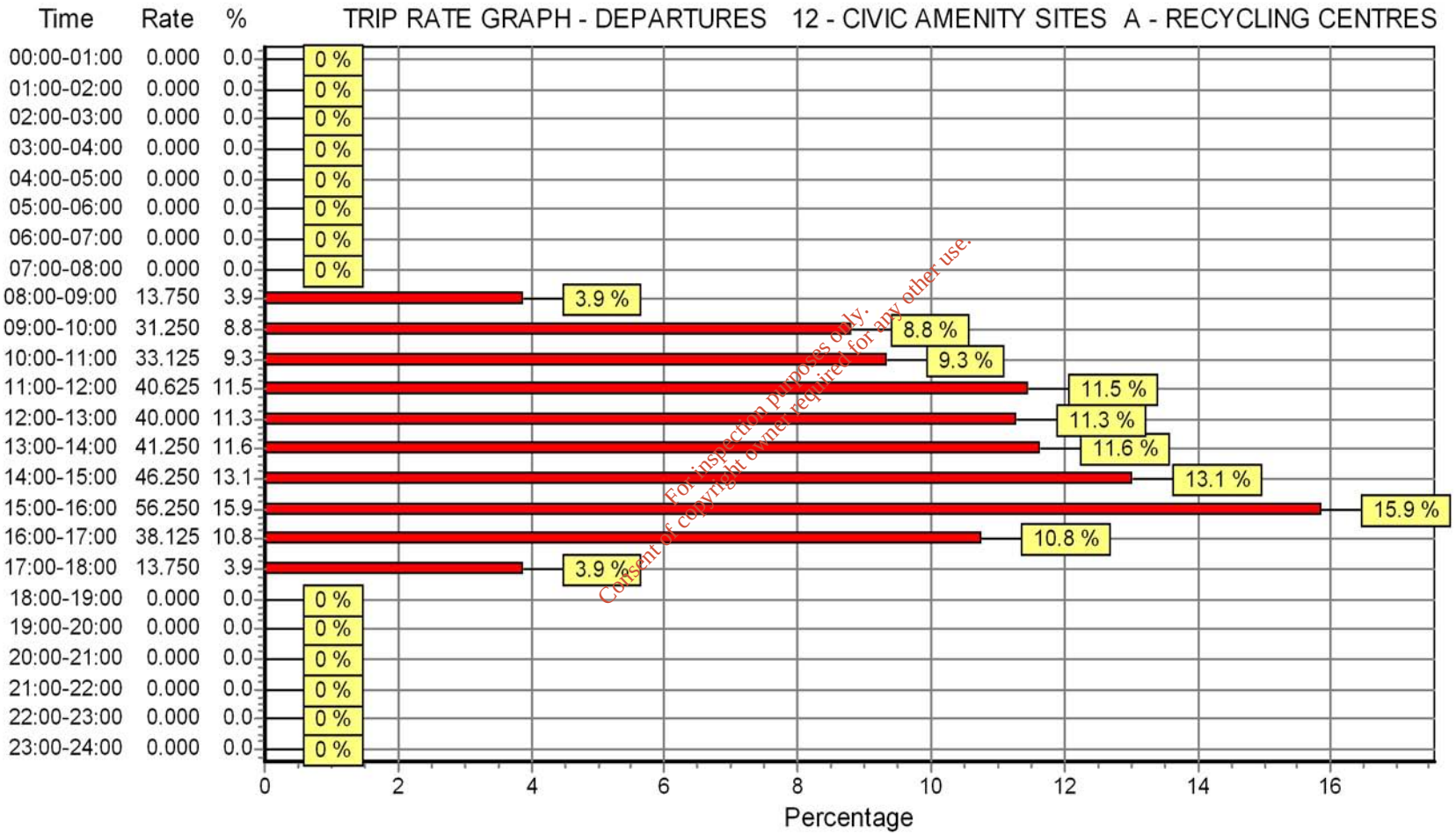
Estimated TRIP rate value per 0.20 HECT shown in shaded columns
BOLD print indicates peak (busiest) period

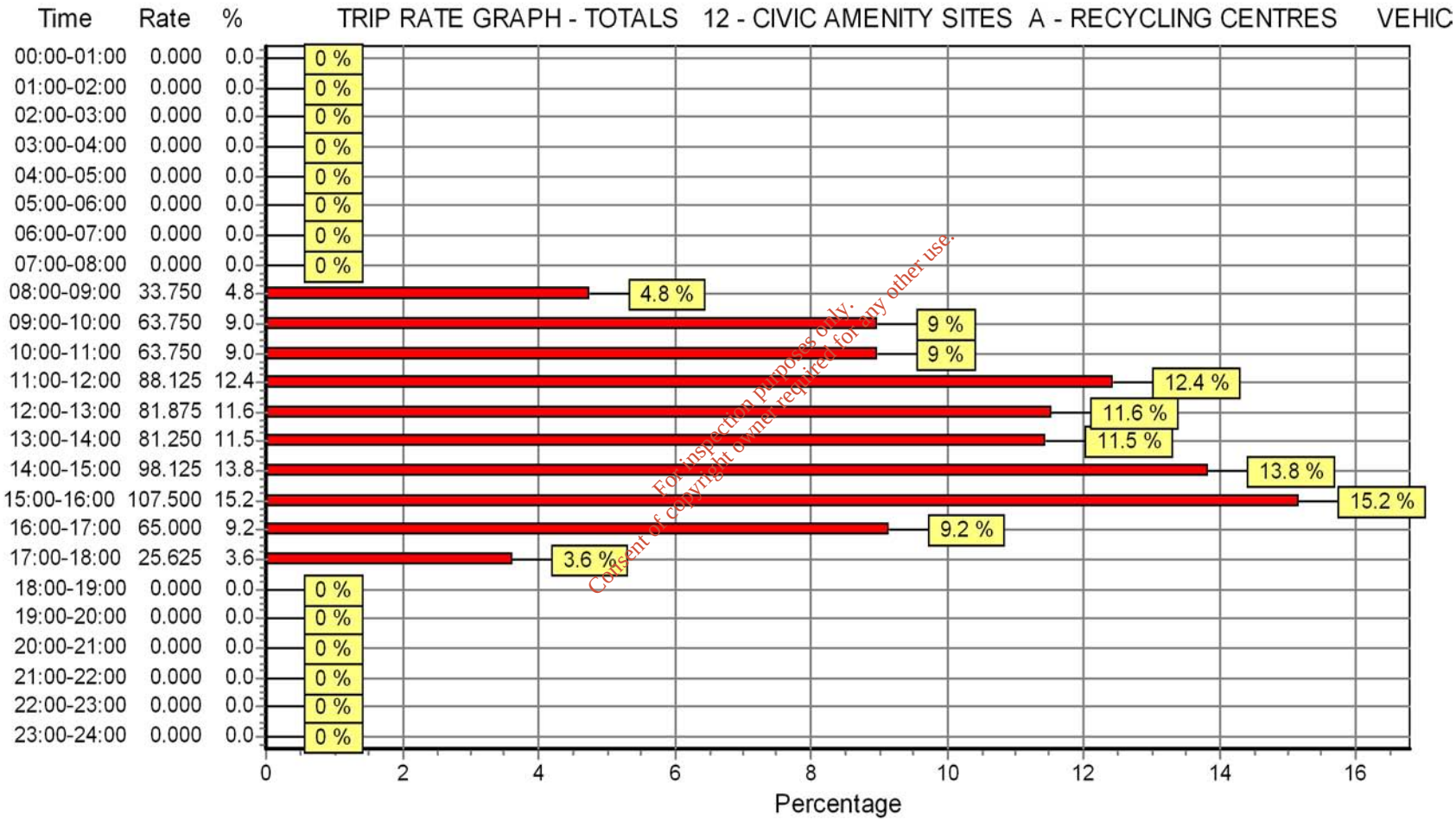
	ARRIVALS				DEPARTURES				TOTALS			
Time Range	No. Days	Ave. AREA	Trip Rate	Estimated Trip Rate	No. Days	Ave. AREA	Trip Rate	Estimated Trip Rate	No. Days	Ave. AREA	Trip Rate	Estimated Trip Rate
00:00 - 01:00	0	0.00	0.000	0.000	0	0.00	0.000	0.000	0	0.00	0.000	0.000
01:00 - 02:00	0	0.00	0.000	0.000	0	0.00	0.000	0.000	0	0.00	0.000	0.000
02:00 - 03:00	0	0.00	0.000	0.000	0	0.00	0.000	0.000	0	0.00	0.000	0.000
03:00 - 04:00	0	0.00	0.000	0.000	0	0.00	0.000	0.000	0	0.00	0.000	0.000
04:00 - 05:00	0	0.00	0.000	0.000	0	0.00	0.000	0.000	0	0.00	0.000	0.000
05:00 - 06:00	0	0.00	0.000	0.000	0	0.00	0.000	0.000	0	0.00	0.000	0.000
06:00 - 07:00	0	0.00	0.000	0.000	0	0.00	0.000	0.000	0	0.00	0.000	0.000
07:00 - 08:00	1	0.80	0.000	0.000	1	0.80	0.000	0.000	1	0.80	0.000	0.000
08:00 - 09:00	2	0.80	20.000	4.076	2	0.80	13.750	2.802	2	0.80	33.750	6.878
09:00 - 10:00	2	0.80	32.500	6.623	2	0.80	31.250	6.369	2	0.80	63.750	12.992
10:00 - 11:00	2	0.80	30.625	6.241	2	0.80	33.125	6.751	2	0.80	63.750	12.992
11:00 - 12:00	2	0.80	47.500	9.681	2	0.80	40.625	8.279	2	0.80	88.125	17.960
12:00 - 13:00	2	0.80	41.875	8.534	2	0.80	40.000	8.152	2	0.80	81.875	16.686
13:00 - 14:00	2	0.80	40.000	8.152	2	0.80	41.250	8.407	2	0.80	81.250	16.559
14:00 - 15:00	**2**	**0.80**	**51.875**	**10.572**	2	0.80	46.250	9.426	2	0.80	98.125	19.998
15:00 - 16:00	2	0.80	51.250	10.445	**2**	**0.80**	**56.250**	**11.464**	**2**	**0.80**	**107.500**	**21.909**
16:00 - 17:00	2	0.80	26.875	5.477	2	0.80	38.125	7.770	2	0.80	65.000	13.247
17:00 - 18:00	2	0.80	11.875	2.420	2	0.80	13.750	2.802	2	0.80	25.625	5.222
18:00 - 19:00	0	0.00	0.000	0.000	0	0.00	0.000	0.000	0	0.00	0.000	0.000
19:00 - 20:00	0	0.00	0.000	0.000	0	0.00	0.000	0.000	0	0.00	0.000	0.000
20:00 - 21:00	0	0.00	0.000	0.000	0	0.00	0.000	0.000	0	0.00	0.000	0.000
21:00 - 22:00	0	0.00	0.000	0.000	0	0.00	0.000	0.000	0	0.00	0.000	0.000
22:00 - 23:00	0	0.00	0.000	0.000	0	0.00	0.000	0.000	0	0.00	0.000	0.000
23:00 - 24:00	0	0.00	0.000	0.000	0	0.00	0.000	0.000	0	0.00	0.000	0.000
Total Rates:			354.375	72.221			354.375	72.222			708.750	144.443

Parameter summary

Trip rate parameter range selected:	0.10 to 0.80 (units: hect)
Survey date date range:	01/01/99 - 14/05/05
Number of weekdays (Monday-Friday):	2
Number of Saturdays:	0
Number of Sundays:	0
Optional parameters used in selection:	NO
Surveys manually removed from selection:	0







Appendix T

PICADY Junction Assessments

TRL LIMITED

CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

PICADY 5.0 ANALYSIS PROGRAM
RELEASE 3.0 (JUNE 2006)

FOR SALES AND DISTRIBUTION INFORMATION,
PROGRAM ADVICE AND MAINTENANCE CONTACT:
TRL SOFTWARE BUREAU
TEL: CROWTHORNE (01344) 770758, FAX: 770864
EMAIL: SoftwareBureau@trl.co.uk

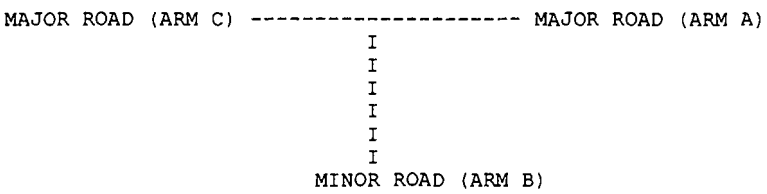
Run with file:- "R:\MGE0109\DF\TIA\PICADY\Access Junction\2010 AM peak.vpi" (drive-on-the-left) at 11:41:13 on Tuesday, 22 July 2008

RUN INFORMATION
****

RUN TITLE: KWD (MRF) Access Junction 2010 AM
LOCATION: Farranfore
DATE: 22/07/08
CLIENT:
ENUMERATOR: kenneth.waldron [GAL-ENG-08]
JOB NUMBER:
STATUS:
DESCRIPTION:

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY
****

INPUT DATA



ARM A IS Arm A
ARM B IS Arm B
ARM C IS Arm C

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

STREAM B-AC CONTAINS TRAFFIC GOING FROM ARM B TO ARM A AND TO ARM C

ETC.

GEOMETRIC DATA

DATA ITEM		MINOR ROAD B
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W)	6.00 M.
CENTRAL RESERVE WIDTH	(WCR)	0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B)	2.20 M.
- VISIBILITY	(VC-B)	90.0 M.
- BLOCKS TRAFFIC		YES
MINOR ROAD - VISIBILITY TO LEFT	(VB-C)	60.0 M.
- VISIBILITY TO RIGHT	(VB-A)	60.0 M.
- LANE 1 WIDTH	(WB-C)	3.40 M.
- LANE 2 WIDTH	(WB-A)	0.00 M.

.SLOPES AND INTERCEPT

(NB:Streams may be combined, in which case capacity

will be adjusted)

Intercept For Stream B-C	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B
688.21	0.27	0.11

Intercept For Stream B-A	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B
547.93	0.25	0.10	0.16	0.36

Intercept For Stream C-B	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B
626.08	0.24	0.24

NB These values do not allow for any site specific corrections

TRAFFIC DEMAND DATA

ARM	FLOW SCALE(%)
A	100
B	100
C	100

Demand set: KWD (MRF) Access Junction 2010 AM

TIME PERIOD BEGINS 08.00 AND ENDS 09.30

LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	NUMBER OF MINUTES FROM START WHEN TOP OF PEAK IS REACHED	NUMBER OF MINUTES FROM START WHEN FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	RATE OF FLOW (VEH/MIN) AT TOP OF PEAK	RATE OF FLOW (VEH/MIN) AFTER PEAK
ARM A	15.00	45.00	75.00	0.88	1.31	0.88
ARM B	15.00	45.00	75.00	0.40	0.60	0.40
ARM C	15.00	45.00	75.00	1.40	2.10	1.40

TIME	FROM/TO	ARM A	ARM B	ARM C
08.00 - 09.30				
	ARM A	0.000	0.000	1.000
		0.0	0.0	70.0
		(0.0)	(10.0)	(10.0)
	ARM B	0.000	0.000	1.000
		0.0	0.0	32.0
		(10.0)	(0.0)	(10.0)
	ARM C	0.286	0.714	0.000
		32.0	80.0	0.0
		(10.0)	(10.0)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

DEFAULT PROPORTIONS OF HEAVY VEHICLES ARE USED

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR COMBINED DEMAND SETS
AND FOR TIME PERIOD 1

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
B-AC	0.40	10.19	0.039		0.00	0.04	0.6		0.10
C-AB	1.05	9.54	0.110		0.00	0.13	1.9		0.12
C-A	0.36								
A-B	0.00								
A-C	0.88								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.15-08.30									
B-AC	0.48	10.15	0.047		0.04	0.05	0.7		0.10
C-AB	1.26	9.55	0.132		0.13	0.16	2.4		0.12
C-A	0.42								
A-B	0.00								
A-C	1.05								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
B-AC	0.59	10.08	0.058		0.05	0.06	0.9		0.11
C-AB	1.56	9.56	0.164		0.16	0.20	3.1		0.13
C-A	0.49								
A-B	0.00								
A-C	1.28								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
B-AC	0.59	10.08	0.058		0.06	0.06	0.9		0.11
C-AB	1.56	9.56	0.164		0.20	0.21	3.1		0.13
C-A	0.49								
A-B	0.00								
A-C	1.28								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.00-09.15									
B-AC	0.48	10.15	0.047		0.06	0.05	0.8		0.10
C-AB	1.26	9.55	0.132		0.21	0.16	2.4		0.12
C-A	0.42								
A-B	0.00								
A-C	1.05								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.15-09.30									
B-AC	0.40	10.19	0.039		0.05	0.04	0.6		0.10
C-AB	1.05	9.54	0.110		0.16	0.13	1.9		0.12
C-A	0.36								
A-B	0.00								
A-C	0.88								

WARNING NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR

QUEUE FOR STREAM B-AC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.0
08.30	0.0
08.45	0.1
09.00	0.1
09.15	0.0
09.30	0.0

QUEUE FOR STREAM C-AB

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.1
08.30	0.2
08.45	0.2
09.00	0.2
09.15	0.2
09.30	0.1

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
B-AC	44.0	29.4	4.5	0.10	4.5	0.10
C-AB	116.2	77.5	14.9	0.13	14.9	0.13
C-A	37.9	25.3				
A-B	0.0	0.0				
A-C	96.3	64.2				
ALL	294.6	196.4	19.4	0.07	19.4	0.07

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

========== end of file ==========

[Printed at 15:09:17 on 22/07/2008]

TRL LIMITED

CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

PICADY 5.0 ANALYSIS PROGRAM
RELEASE 3.0 (JUNE 2006)

FOR SALES AND DISTRIBUTION INFORMATION,
PROGRAM ADVICE AND MAINTENANCE CONTACT:
TRL SOFTWARE BUREAU
TEL: CROWTHORNE (01344) 770758, FAX: 770864
EMAIL: SoftwareBureau@trl.co.uk

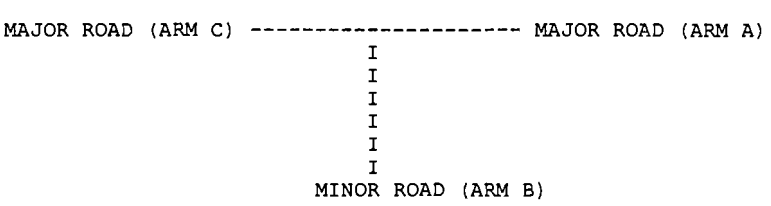
Run with file:- "R:\MGE0109\DF\TIA\PICADY\Access Junction\2015 AM peak.vpi" (drive-on-the-left) at 11:39:21 on Tuesday, 22 July 2008

RUN INFORMATION
****

RUN TITLE: KWD (MRF) Access Junction 2015 AM
LOCATION: Farranfore
DATE: 22/07/08
CLIENT:
ENUMERATOR: kenneth.waldron [GAL-ENG-08]
JOB NUMBER:
STATUS:
DESCRIPTION:

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY
****

INPUT DATA



ARM A IS Arm A
ARM B IS Arm B
ARM C IS Arm C

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

STREAM B-AC CONTAINS TRAFFIC GOING FROM ARM B TO ARM A AND TO ARM C

ETC.

GEOMETRIC DATA

DATA ITEM		MINOR ROAD B
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W)	6.00 M.
CENTRAL RESERVE WIDTH	(WCR)	0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B)	2.20 M.
- VISIBILITY	(VC-B)	90.0 M.
- BLOCKS TRAFFIC		YES
MINOR ROAD - VISIBILITY TO LEFT	(VB-C)	60.0 M.
- VISIBILITY TO RIGHT	(VB-A)	60.0 M.
- LANE 1 WIDTH	(WB-C)	3.40 M.
- LANE 2 WIDTH	(WB-A)	0.00 M.

.SLOPES AND INTERCEPT

(NB:Streams may be combined, in which case capacity

will be adjusted)

Intercept For Stream B-C	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B
688.21	0.27	0.11

Intercept For Stream B-A	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B
547.93	0.25	0.10	0.16	0.36

Intercept For Stream C-B	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B
626.08	0.24	0.24

NB These values do not allow for any site specific corrections

TRAFFIC DEMAND DATA

ARM	FLOW SCALE(%)
A	100
B	100
C	100

Demand set: KWD (MRF) Access Junction 2010 AM

TIME PERIOD BEGINS 08.00 AND ENDS 09.30

LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	NUMBER OF MINUTES FROM START WHEN TOP OF PEAK IS REACHED	NUMBER OF MINUTES FROM START WHEN FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	RATE OF FLOW (VEH/MIN) AT TOP OF PEAK	RATE OF FLOW (VEH/MIN) AFTER PEAK
ARM A	15.00	45.00	75.00	0.94	1.41	0.94
ARM B	15.00	45.00	75.00	0.40	0.60	0.40
ARM C	15.00	45.00	75.00	1.42	2.14	1.42

TIME	FROM/TO	ARM A	ARM B	ARM C
08.00 - 09.30				
	ARM A	0.000	0.000	1.000
		0.0	0.0	75.0
		(0.0)	(10.0)	(10.0)
	ARM B	0.000	0.000	1.000
		0.0	0.0	32.0
		(10.0)	(0.0)	(10.0)
	ARM C	0.298	0.702	0.000
		34.0	80.0	0.0
		(10.0)	(10.0)	(0.0)

TURNING PROPORTIONS
TURNING COUNTS (VEH/HR)
(PERCENTAGE OF H.V.S)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

DEFAULT PROPORTIONS OF HEAVY VEHICLES ARE USED

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR COMBINED DEMAND SETS
AND FOR TIME PERIOD 1

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
B-AC	0.40	10.18	0.039		0.00	0.04	0.6		0.10
C-AB	1.05	9.54	0.110		0.00	0.13	1.9		0.12
C-A	0.38								
A-B	0.00								
A-C	0.94								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.15-08.30									
B-AC	0.48	10.13	0.047		0.04	0.05	0.7		0.10
C-AB	1.27	9.55	0.133		0.13	0.16	2.4		0.12
C-A	0.44								
A-B	0.00								
A-C	1.12								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
B-AC	0.59	10.06	0.058		0.05	0.06	0.9		0.11
C-AB	1.57	9.57	0.164		0.16	0.21	3.1		0.12
C-A	0.52								
A-B	0.00								
A-C	1.38								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
B-AC	0.59	10.06	0.058		0.06	0.06	0.9		0.11
C-AB	1.57	9.57	0.164		0.21	0.21	3.1		0.13
C-A	0.52								
A-B	0.00								
A-C	1.38								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.00-09.15									
B-AC	0.48	10.13	0.047		0.06	0.05	0.8		0.10
C-AB	1.27	9.55	0.133		0.21	0.16	2.4		0.12
C-A	0.44								
A-B	0.00								
A-C	1.12								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.15-09.30									
B-AC	0.40	10.18	0.039		0.05	0.04	0.6		0.10
C-AB	1.05	9.54	0.110		0.16	0.13	2.0		0.12
C-A	0.38								
A-B	0.00								
A-C	0.94								

WARNING NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR

QUEUE FOR STREAM B-AC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.0
08.30	0.0
08.45	0.1
09.00	0.1
09.15	0.1
09.30	0.0

QUEUE FOR STREAM C-AB

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.1
08.30	0.2
08.45	0.2
09.00	0.2
09.15	0.2
09.30	0.1

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
B-AC	44.0	29.4	4.5	0.10	4.5	0.10
C-AB	116.6	77.7	15.0	0.13	15.0	0.13
C-A	40.3	26.9				
A-B	0.0	0.0				
A-C	103.2	68.8				
ALL	304.2	202.8	19.5	0.06	19.5	0.06

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

========== end of file ==========

[Printed at 15:09:37 on 22/07/2008]

TRL LIMITED

CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

PICADY 5.0 ANALYSIS PROGRAM
RELEASE 3.0 (JUNE 2006)

FOR SALES AND DISTRIBUTION INFORMATION,
PROGRAM ADVICE AND MAINTENANCE CONTACT:
TRL SOFTWARE BUREAU
TEL: CROWTHORNE (01344) 770758, FAX: 770864
EMAIL: SoftwareBureau@trl.co.uk

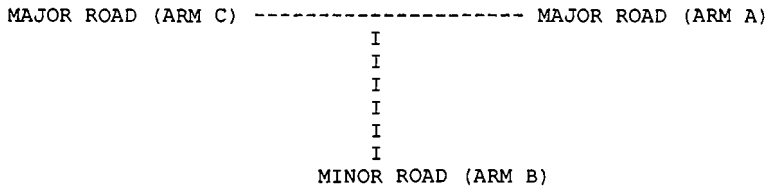
Run with file:- "R:\MGE0109\DF\TIA\PICADY\Access Junction\2025 AM peak.vpi" (drive-on-the-left) at 11:56:38 on Tuesday, 22 July 2008

RUN INFORMATION
****

RUN TITLE: KWD (MRF) Access Junction 2025 AM
LOCATION: Farranfore
DATE: 22/07/08
CLIENT:
ENUMERATOR: kenneth.waldron [GAL-ENG-08]
JOB NUMBER:
STATUS:
DESCRIPTION:

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY
****

INPUT DATA



ARM A IS Arm A
ARM B IS Arm B
ARM C IS Arm C

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

STREAM B-AC CONTAINS TRAFFIC GOING FROM ARM B TO ARM A AND TO ARM C

ETC.

GEOMETRIC DATA

DATA ITEM		MINOR ROAD B	
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W)	6.00 M.	
CENTRAL RESERVE WIDTH	(WCR)	0.00 M.	
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B)	2.20 M.	
- VISIBILITY	(VC-B)	90.0 M.	
- BLOCKS TRAFFIC		YES	
MINOR ROAD - VISIBILITY TO LEFT	(VB-C)	60.0 M.	
- VISIBILITY TO RIGHT	(VB-A)	60.0 M.	
- LANE 1 WIDTH	(WB-C)	3.40 M.	
- LANE 2 WIDTH	(WB-A)	0.00 M.	

.SLOPES AND INTERCEPT

(NB:Streams may be combined, in which case capacity

will be adjusted)

Intercept For Stream B-C	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B
688.21	0.27	0.11

Intercept For Stream B-A	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B
547.93	0.25	0.10	0.16	0.36

Intercept For Stream C-B	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B
626.08	0.24	0.24

NB These values do not allow for any site specific corrections

TRAFFIC DEMAND DATA

ARM	FLOW SCALE(%)
A	100
B	100
C	100

Demand set: KWD (MRF) Access Junction 2010 AM

TIME PERIOD BEGINS 08.00 AND ENDS 09.30

LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	NUMBER OF MINUTES FROM START WHEN TOP OF PEAK IS REACHED	NUMBER OF MINUTES FROM START WHEN FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	RATE OF FLOW (VEH/MIN) AT TOP OF PEAK	RATE OF FLOW (VEH/MIN) AFTER PEAK
ARM A	15.00	45.00	75.00	1.01	1.52	1.01
ARM B	15.00	45.00	75.00	0.40	0.60	0.40
ARM C	15.00	45.00	75.00	1.46	2.19	1.46

TIME	FROM/TO	ARM A	ARM B	ARM C
08.00 - 09.30				
	ARM A	0.000	0.000	1.000
		0.0	0.0	81.0
		(0.0)	(10.0)	(10.0)
	ARM B	0.000	0.000	1.000
		0.0	0.0	32.0
		(10.0)	(0.0)	(10.0)
	ARM C	0.316	0.684	0.000
		37.0	80.0	0.0
		(10.0)	(10.0)	(0.0)

TURNING PROPORTIONS
TURNING COUNTS (VEH/HR)
(PERCENTAGE OF H.V.S)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

DEFAULT PROPORTIONS OF HEAVY VEHICLES ARE USED

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR COMBINED DEMAND SETS
AND FOR TIME PERIOD 1

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
B-AC	0.40	10.16	0.040		0.00	0.04	0.6		0.10
C-AB	1.05	9.55	0.110		0.00	0.13	1.9		0.12
C-A	0.41								
A-B	0.00								
A-C	1.02								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.15-08.30									
B-AC	0.48	10.10	0.047		0.04	0.05	0.7		0.10
C-AB	1.27	9.56	0.133		0.13	0.16	2.4		0.12
C-A	0.48								
A-B	0.00								
A-C	1.21								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
B-AC	0.59	10.03	0.059		0.05	0.06	0.9		0.11
C-AB	1.58	9.58	0.165		0.16	0.21	3.2		0.12
C-A	0.57								
A-B	0.00								
A-C	1.49								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
B-AC	0.59	10.03	0.059		0.06	0.06	0.9		0.11
C-AB	1.58	9.58	0.165		0.21	0.21	3.2		0.13
C-A	0.57								
A-B	0.00								
A-C	1.49								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.00-09.15									
B-AC	0.48	10.10	0.047		0.06	0.05	0.8		0.10
C-AB	1.27	9.56	0.133		0.21	0.16	2.5		0.12
C-A	0.48								
A-B	0.00								
A-C	1.21								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.15-09.30									
B-AC	0.40	10.16	0.040		0.05	0.04	0.6		0.10
C-AB	1.06	9.55	0.111		0.16	0.13	2.0		0.12
C-A	0.41								
A-B	0.00								
A-C	1.02								

WARNING NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR

QUEUE FOR STREAM B-AC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.0
08.30	0.0
08.45	0.1
09.00	0.1
09.15	0.1
09.30	0.0

QUEUE FOR STREAM C-AB

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.1
08.30	0.2
08.45	0.2
09.00	0.2
09.15	0.2
09.30	0.1

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
B-AC	44.0	29.4	4.6	0.10	4.6	0.10
C-AB	117.2	78.1	15.1	0.13	15.1	0.13
C-A	43.8	29.2				
A-B	0.0	0.0				
A-C	111.5	74.3				
ALL	316.6	211.1	19.7	0.06	19.7	0.06

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

========== end of file ==========

[Printed at 15:10:20 on 22/07/2008]

TRL LIMITED

CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

PICADY 5.0 ANALYSIS PROGRAM
RELEASE 3.0 (JUNE 2006)

FOR SALES AND DISTRIBUTION INFORMATION,
PROGRAM ADVICE AND MAINTENANCE CONTACT:
TRL SOFTWARE BUREAU
TEL: CROWTHORNE (01344) 770758, FAX: 770864
EMAIL: SoftwareBureau@trl.co.uk

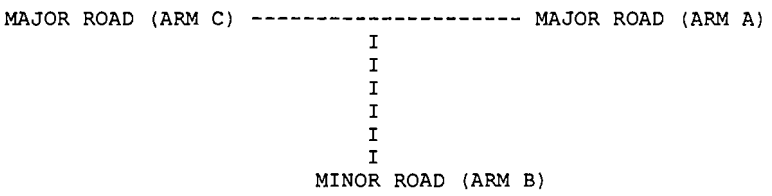
Run with file:- "R:\MGE0109\DF\TIA\PICADY\Access Junction\2010 PM peak.vpi" (drive-on-the-left) at 11:42:39 on Tuesday, 22 July 2008

RUN INFORMATION
****

RUN TITLE: KWD (MRF) Access Junction 2010 PM
LOCATION: Farranfore
DATE: 22/07/08
CLIENT:
ENUMERATOR: kenneth.waldron [GAL-ENG-08]
JOB NUMBER:
STATUS:
DESCRIPTION:

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY
****

INPUT DATA



ARM A IS Arm A
ARM B IS Arm B
ARM C IS Arm C

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

STREAM B-AC CONTAINS TRAFFIC GOING FROM ARM B TO ARM A AND TO ARM C

ETC.

GEOMETRIC DATA

DATA ITEM		MINOR ROAD B
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W)	6.00 M.
CENTRAL RESERVE WIDTH	(WCR)	0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B)	2.20 M.
- VISIBILITY	(VC-B)	90.0 M.
- BLOCKS TRAFFIC		YES
MINOR ROAD - VISIBILITY TO LEFT	(VB-C)	60.0 M.
- VISIBILITY TO RIGHT	(VB-A)	60.0 M.
- LANE 1 WIDTH	(WB-C)	3.40 M.
- LANE 2 WIDTH	(WB-A)	0.00 M.

.SLOPES AND INTERCEPT

(NB:Streams may be combined, in which case capacity

will be adjusted)

Intercept For Stream B-C	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B
688.21	0.27	0.11

Intercept For Stream B-A	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B
547.93	0.25	0.10	0.16	0.36

Intercept For Stream C-B	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B
626.08	0.24	0.24

NB These values do not allow for any site specific corrections

TRAFFIC DEMAND DATA

ARM	FLOW SCALE(%)
A	100
B	100
C	100

Demand set: KWD (MRF) Access Junction 2010 AM

TIME PERIOD BEGINS 08.00 AND ENDS 09.30

LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	NUMBER OF MINUTES FROM START WHEN TOP OF PEAK IS REACHED	NUMBER OF MINUTES FROM START WHEN FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	RATE OF FLOW (VEH/MIN) AT TOP OF PEAK	RATE OF FLOW (VEH/MIN) AFTER PEAK
ARM A	15.00	45.00	75.00	0.36	0.54	0.36
ARM B	15.00	45.00	75.00	0.99	1.48	0.99
ARM C	15.00	45.00	75.00	1.05	1.57	1.05

TIME	FROM/TO	ARM A	ARM B	ARM C
08.00 - 09.30				
	ARM A	0.000	0.000	1.000
		0.0	0.0	29.0
		(0.0)	(10.0)	(10.0)
	ARM B	0.000	0.000	1.000
		0.0	0.0	79.0
		(10.0)	(0.0)	(10.0)
	ARM C	0.631	0.369	0.000
		53.0	31.0	0.0
		(10.0)	(10.0)	(0.0)

TURNING PROPORTIONS
TURNING COUNTS (VEH/HR)
(PERCENTAGE OF H.V.S)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

DEFAULT PROPORTIONS OF HEAVY VEHICLES ARE USED

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR COMBINED DEMAND SETS
AND FOR TIME PERIOD 1

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
B-AC	0.99	10.33	0.096		0.00	0.11	1.5		0.11
C-AB	0.42	9.83	0.042		0.00	0.05	0.7		0.11
C-A	0.64								
A-B	0.00								
A-C	0.36								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.15-08.30									
B-AC	1.18	10.31	0.115		0.11	0.13	1.9		0.11
C-AB	0.50	9.90	0.051		0.05	0.06	0.9		0.11
C-A	0.75								
A-B	0.00								
A-C	0.43								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
B-AC	1.45	10.29	0.141		0.13	0.16	2.4		0.11
C-AB	0.63	10.00	0.063		0.06	0.08	1.2		0.11
C-A	0.91								
A-B	0.00								
A-C	0.53								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
B-AC	1.45	10.29	0.141		0.16	0.16	2.4		0.11
C-AB	0.63	10.00	0.063		0.08	0.08	1.2		0.11
C-A	0.91								
A-B	0.00								
A-C	0.53								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.00-09.15									
B-AC	1.18	10.31	0.115		0.16	0.13	2.0		0.11
C-AB	0.50	9.90	0.051		0.08	0.06	0.9		0.11
C-A	0.75								
A-B	0.00								
A-C	0.43								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.15-09.30									
B-AC	0.99	10.33	0.096		0.13	0.11	1.6		0.11
C-AB	0.42	9.83	0.042		0.06	0.05	0.7		0.11
C-A	0.64								
A-B	0.00								
A-C	0.36								

WARNING NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR

QUEUE FOR STREAM B-AC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.1
08.30	0.1
08.45	0.2
09.00	0.2
09.15	0.1
09.30	0.1

QUEUE FOR STREAM C-AB

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.0
08.30	0.1
08.45	0.1
09.00	0.1
09.15	0.1
09.30	0.0

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
B-AC	108.7	72.5	11.9	0.11	11.9	0.11
C-AB	46.6	31.0	5.6	0.12	5.6	0.12
C-A	69.1	46.0				
A-B	0.0	0.0				
A-C	39.9	26.6				
ALL	264.3	176.2	17.5	0.07	17.5	0.07

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

========== end of file ==========

[Printed at 15:15:55 on 22/07/2008]

TRL LIMITED

CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

PICADY 5.0 ANALYSIS PROGRAM
RELEASE 3.0 (JUNE 2006)

FOR SALES AND DISTRIBUTION INFORMATION,
PROGRAM ADVICE AND MAINTENANCE CONTACT:
TRL SOFTWARE BUREAU
TEL: CROWTHORNE (01344) 770758, FAX: 770864
EMAIL: SoftwareBureau@trl.co.uk

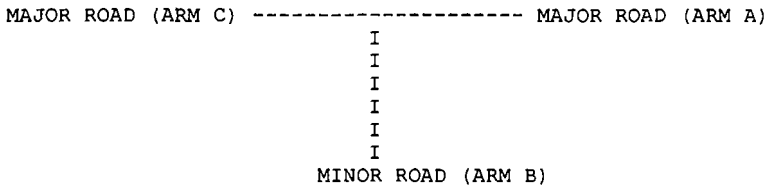
Run with file:- "R:\MGE0109\DF\TIA\PICADY\Access Junction\2015 PM peak.vpi" (drive-on-the-left) at 11:52:46 on Tuesday, 22 July 2008

RUN INFORMATION
****

RUN TITLE: KWD (MRF) Access Junction 2015 PM
LOCATION: Farranfore
DATE: 22/07/08
CLIENT:
ENUMERATOR: kenneth.waldron [GAL-ENG-08]
JOB NUMBER:
STATUS:
DESCRIPTION:

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY
****

INPUT DATA



ARM A IS Arm A
ARM B IS Arm B
ARM C IS Arm C

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

STREAM B-AC CONTAINS TRAFFIC GOING FROM ARM B TO ARM A AND TO ARM C

ETC.

GEOMETRIC DATA

DATA ITEM		MINOR ROAD B
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W)	6.00 M.
CENTRAL RESERVE WIDTH	(WCR)	0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B)	2.20 M.
- VISIBILITY	(VC-B)	90.0 M.
- BLOCKS TRAFFIC		YES
MINOR ROAD - VISIBILITY TO LEFT	(VB-C)	60.0 M.
- VISIBILITY TO RIGHT	(VB-A)	60.0 M.
- LANE 1 WIDTH	(WB-C)	3.40 M.
- LANE 2 WIDTH	(WB-A)	0.00 M.

.SLOPES AND INTERCEPT

(NB:Streams may be combined, in which case capacity

will be adjusted)

Intercept For Stream B-C	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B
688.21	0.27	0.11

Intercept For Stream B-A	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B
547.93	0.25	0.10	0.16	0.36

Intercept For Stream C-B	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B
626.08	0.24	0.24

NB These values do not allow for any site specific corrections

TRAFFIC DEMAND DATA

ARM	FLOW SCALE(%)
A	100
B	100
C	100

Demand set: KWD (MRF) Access Junction 2010 AM

TIME PERIOD BEGINS 08.00 AND ENDS 09.30

LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	NUMBER OF MINUTES FROM START WHEN TOP OF PEAK IS REACHED	NUMBER OF MINUTES FROM START WHEN FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	RATE OF FLOW (VEH/MIN) AT TOP OF PEAK	RATE OF FLOW (VEH/MIN) AFTER PEAK
ARM A	15.00	45.00	75.00	0.39	0.58	0.39
ARM B	15.00	45.00	75.00	0.99	1.48	0.99
ARM C	15.00	45.00	75.00	1.09	1.63	1.09

TIME	FROM/TO	ARM A	ARM B	ARM C
08.00 - 09.30				
	ARM A	0.000 0.0 (0.0)	0.000 0.0 (10.0)	1.000 31.0 (10.0)
	ARM B	0.000 0.0 (10.0)	0.000 0.0 (0.0)	1.000 79.0 (10.0)
	ARM C	0.644 56.0 (10.0)	0.356 31.0 (10.0)	0.000 0.0 (0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

DEFAULT PROPORTIONS OF HEAVY VEHICLES ARE USED

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR COMBINED DEMAND SETS
AND FOR TIME PERIOD 1

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
B-AC	0.99	10.32	0.096		0.00	0.11	1.5		0.11
C-AB	0.42	9.85	0.042		0.00	0.05	0.7		0.11
C-A	0.67								
A-B	0.00								
A-C	0.39								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.15-08.30									
B-AC	1.18	10.30	0.115		0.11	0.13	1.9		0.11
C-AB	0.51	9.92	0.051		0.05	0.06	0.9		0.11
C-A	0.80								
A-B	0.00								
A-C	0.46								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
B-AC	1.45	10.28	0.141		0.13	0.16	2.4		0.11
C-AB	0.63	10.02	0.063		0.06	0.08	1.2		0.11
C-A	0.96								
A-B	0.00								
A-C	0.57								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
B-AC	1.45	10.28	0.141		0.16	0.16	2.4		0.11
C-AB	0.63	10.02	0.063		0.08	0.08	1.2		0.11
C-A	0.96								
A-B	0.00								
A-C	0.57								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.00-09.15									
B-AC	1.18	10.30	0.115		0.16	0.13	2.0		0.11
C-AB	0.51	9.92	0.051		0.08	0.06	0.9		0.11
C-A	0.80								
A-B	0.00								
A-C	0.46								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.15-09.30									
B-AC	0.99	10.32	0.096		0.13	0.11	1.6		0.11
C-AB	0.42	9.85	0.043		0.06	0.05	0.8		0.11
C-A	0.67								
A-B	0.00								
A-C	0.39								

WARNING NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR

QUEUE FOR STREAM B-AC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.1
08.30	0.1
08.45	0.2
09.00	0.2
09.15	0.1
09.30	0.1

QUEUE FOR STREAM C-AB

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.0
08.30	0.1
08.45	0.1
09.00	0.1
09.15	0.1
09.30	0.1

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND		* QUEUEING * DELAY *		* INCLUSIVE QUEUEING * DELAY *	
	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)
B-AC	108.7	72.5	11.9	0.11	11.9	0.11
C-AB	46.8	31.2	5.7	0.12	5.7	0.12
C-A	73.0	48.6				
A-B	0.0	0.0				
A-C	42.7	28.4				
ALL	271.2	180.8	17.6	0.06	17.6	0.06

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

========== end of file ==========

[Printed at 15:16:10 on 22/07/2008]

TRL LIMITED

CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

PICADY 5.0 ANALYSIS PROGRAM
RELEASE 3.0 (JUNE 2006)

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FOR SALES AND DISTRIBUTION INFORMATION,
PROGRAM ADVICE AND MAINTENANCE CONTACT:
TRL SOFTWARE BUREAU
TEL: CROWTHORNE (01344) 770758, FAX: 770864
EMAIL: SoftwareBureau@trl.co.uk

Run with file:- "R:\MGE0109\DF\TIA\PICADY\Access Junction\2025 PM peak.vpi" (drive-on-the-left) at 12:02:21 on Tuesday, 22 July 2008

RUN INFORMATION
****

RUN TITLE: KWD (MRF) Access Junction 2025 AM
LOCATION: Farranfore
DATE: 22/07/08
CLIENT:
ENUMERATOR: kenneth.waldron [GAL-ENG-08]
JOB NUMBER:
STATUS:
DESCRIPTION:

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY
****

INPUT DATA

```
                    MAJOR ROAD (ARM C) ---------------------- MAJOR ROAD (ARM A)
                                                I
                                                I
                                                I
                                                I
                                                I
                                                I
                                             MINOR ROAD (ARM B)
```

ARM A IS Arm A
ARM B IS Arm B
ARM C IS Arm C

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

STREAM B-AC CONTAINS TRAFFIC GOING FROM ARM B TO ARM A AND TO ARM C

ETC.

GEOMETRIC DATA

DATA ITEM		MINOR ROAD B
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W)	6.00 M.
CENTRAL RESERVE WIDTH	(WCR)	0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B)	2.20 M.
- VISIBILITY	(VC-B)	90.0 M.
- BLOCKS TRAFFIC		YES
MINOR ROAD - VISIBILITY TO LEFT	(VB-C)	60.0 M.
- VISIBILITY TO RIGHT	(VB-A)	60.0 M.
- LANE 1 WIDTH	(WB-C)	3.40 M.
- LANE 2 WIDTH	(WB-A)	0.00 M.

.SLOPES AND INTERCEPT

(NB:Streams may be combined, in which case capacity

will be adjusted)

Intercept For Stream B-C	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B
688.21	0.27	0.11

Intercept For Stream B-A	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B
547.93	0.25	0.10	0.16	0.36

Intercept For Stream C-B	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B
626.08	0.24	0.24

NB These values do not allow for any site specific corrections

TRAFFIC DEMAND DATA

ARM	FLOW SCALE(%)
A	100
B	100
C	100

Demand set: KWD (MRF) Access Junction 2010 AM

TIME PERIOD BEGINS 08.00 AND ENDS 09.30

LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	NUMBER OF MINUTES FROM START WHEN TOP OF PEAK IS REACHED	NUMBER OF MINUTES FROM START WHEN FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	RATE OF FLOW (VEH/MIN) AT TOP OF PEAK	RATE OF FLOW (VEH/MIN) AFTER PEAK
ARM A	15.00	45.00	75.00	0.41	0.62	0.41
ARM B	15.00	45.00	75.00	0.99	1.48	0.99
ARM C	15.00	45.00	75.00	1.15	1.72	1.15

TIME	FROM/TO	ARM A	ARM B	ARM C
08.00 - 09.30				
	ARM A	0.000	0.000	1.000
		0.0	0.0	33.0
		(0.0)	(10.0)	(10.0)
	ARM B	0.000	0.000	1.000
		0.0	0.0	79.0
		(10.0)	(0.0)	(10.0)
	ARM C	0.663	0.337	0.000
		61.0	31.0	0.0
		(10.0)	(10.0)	(0.0)

TURNING PROPORTIONS
TURNING COUNTS (VEH/HR)
(PERCENTAGE OF H.V.S)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

DEFAULT PROPORTIONS OF HEAVY VEHICLES ARE USED

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR COMBINED DEMAND SETS
AND FOR TIME PERIOD 1

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
B-AC	0.99	10.32	0.096		0.00	0.11	1.5		0.11
C-AB	0.42	9.89	0.043		0.00	0.05	0.7		0.11
C-A	0.73								
A-B	0.00								
A-C	0.41								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.15-08.30									
B-AC	1.18	10.30	0.115		0.11	0.13	1.9		0.11
C-AB	0.51	9.97	0.051		0.05	0.06	0.9		0.11
C-A	0.87								
A-B	0.00								
A-C	0.49								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
B-AC	1.45	10.27	0.141		0.13	0.16	2.4		0.11
C-AB	0.64	10.07	0.063		0.06	0.08	1.2		0.11
C-A	1.05								
A-B	0.00								
A-C	0.61								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
B-AC	1.45	10.27	0.141		0.16	0.16	2.5		0.11
C-AB	0.64	10.07	0.063		0.08	0.08	1.2		0.11
C-A	1.05								
A-B	0.00								
A-C	0.61								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.00-09.15									
B-AC	1.18	10.30	0.115		0.16	0.13	2.0		0.11
C-AB	0.51	9.97	0.051		0.08	0.06	0.9		0.11
C-A	0.87								
A-B	0.00								
A-C	0.49								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.15-09.30									
B-AC	0.99	10.32	0.096		0.13	0.11	1.6		0.11
C-AB	0.42	9.89	0.043		0.06	0.05	0.8		0.11
C-A	0.73								
A-B	0.00								
A-C	0.41								

WARNING NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR

QUEUE FOR STREAM B-AC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.1
08.30	0.1
08.45	0.2
09.00	0.2
09.15	0.1
09.30	0.1

QUEUE FOR STREAM C-AB

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.1
08.30	0.1
08.45	0.1
09.00	0.1
09.15	0.1
09.30	0.1

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
B-AC	108.7	72.5	11.9	0.11	11.9	0.11
C-AB	47.2	31.4	5.7	0.12	5.7	0.12
C-A	79.5	53.0				
A-B	0.0	0.0				
A-C	45.4	30.3				
ALL	280.8	187.2	17.7	0.06	17.7	0.06

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

========== end of file ==========

[Printed at 15:16:31 on 22/07/2008]

TRL LIMITED

CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

PICADY 5.0 ANALYSIS PROGRAM
RELEASE 3.0 (JUNE 2006)

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TRL SOFTWARE BUREAU
TEL: CROWTHORNE (01344) 770758, FAX: 770864
EMAIL: SoftwareBureau@trl.co.uk

Run with file:- "R:\MGE0109\DF\TIA\PICADY\2010 AM Peak.vpi" (drive-on-the-left) at 15:46:10 on Wednesday, 25 June 2008

RUN INFORMATION
****

RUN TITLE: KWD (MRF) 2010 AM Peak
LOCATION:
DATE: 28/04/08
CLIENT:
ENUMERATOR: kenneth.waldron [GAL-ENG-08]
JOB NUMBER:
STATUS:
DESCRIPTION:

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY
****

INPUT DATA

MAJOR ROAD (ARM C) ---------- MAJOR ROAD (ARM A)
I
I
I
I
I
I
MINOR ROAD (ARM B)

ARM A IS To Farranfore
ARM B IS Local Rd
ARM C IS To Killarney

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

ETC.

GEOMETRIC DATA

DATA ITEM		MINOR ROAD B
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W)	7.00 M.
CENTRAL RESERVE WIDTH	(WCR)	0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B)	3.50 M.
- VISIBILITY	(VC-B)	150.0 M.
- BLOCKS TRAFFIC		NO
MINOR ROAD - VISIBILITY TO LEFT	(VB-C)	90.0 M.
- VISIBILITY TO RIGHT	(VB-A)	90.0 M.
- LANE 1 WIDTH	(WB-C)	3.00 M.
- LANE 2 WIDTH	(WB-A)	3.00 M.

.SLOPES AND INTERCEPT

(NB:Streams may be combined, in which case capacity

will be adjusted)

Intercept For Stream B-C	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B
680.59	0.25	0.10

Intercept For Stream B-A	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B
552.17	0.24	0.10	0.15	0.35

Intercept For Stream C-B	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B
754.33	0.28	0.28

NB These values do not allow for any site specific corrections

TRAFFIC DEMAND DATA

ARM	FLOW SCALE(%)
A	100
B	100
C	100

Demand set: KWD (MRF)

TIME PERIOD BEGINS 08.00 AND ENDS 09.30

LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	NUMBER OF MINUTES FROM START WHEN TOP OF PEAK IS REACHED	NUMBER OF MINUTES FROM START WHEN FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	RATE OF FLOW (VEH/MIN) AT TOP OF PEAK	RATE OF FLOW (VEH/MIN) AFTER PEAK
ARM A	15.00	45.00	75.00	6.57	9.86	6.57
ARM B	15.00	45.00	75.00	1.27	1.91	1.27
ARM C	15.00	45.00	75.00	7.03	10.54	7.03

TIME	FROM/TO	ARM A	ARM B	ARM C
08.00 - 09.30		TURNING PROPORTIONS		
		TURNING COUNTS (VEH/HR)		
		(PERCENTAGE OF H.V.S)		
	ARM A	0.000	0.089	0.911
		0.0	47.0	479.0
		(0.0)	(10.0)	(10.0)
	ARM B	0.431	0.000	0.569
		44.0	0.0	58.0
		(10.0)	(0.0)	(10.0)
	ARM C	0.884	0.116	0.000
		497.0	65.0	0.0
		(10.0)	(10.0)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

DEFAULT PROPORTIONS OF HEAVY VEHICLES ARE USED

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR COMBINED DEMAND SETS
AND FOR TIME PERIOD 1

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
B-C	0.73	8.52	0.085		0.00	0.09	1.3		0.13
B-A	0.55	5.61	0.098		0.00	0.11	1.5		0.20
C-A	6.24								
C-B	0.82	9.58	0.085		0.00	0.09	1.3		0.11
A-B	0.59								
A-C	6.01								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.15-08.30									
B-C	0.87	8.15	0.107		0.09	0.12	1.7		0.14
B-A	0.66	5.07	0.130		0.11	0.15	2.1		0.23
C-A	7.45								
C-B	0.97	9.23	0.106		0.09	0.12	1.7		0.12
A-B	0.70								
A-C	7.18								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
B-C	1.06	7.63	0.139		0.12	0.16	2.3		0.15
B-A	0.81	4.33	0.186		0.15	0.22	3.2		0.28
C-A	9.12								
C-B	1.19	8.73	0.137		0.12	0.16	2.3		0.13
A-B	0.86								
A-C	8.79								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
B-C	1.06	7.63	0.140		0.16	0.16	2.4		0.15
B-A	0.81	4.33	0.186		0.22	0.23	3.4		0.28
C-A	9.12								
C-B	1.19	8.73	0.137		0.16	0.16	2.4		0.13
A-B	0.86								
A-C	8.79								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.00-09.15									
B-C	0.87	8.15	0.107		0.16	0.12	1.9		0.14
B-A	0.66	5.07	0.130		0.23	0.15	2.4		0.23
C-A	7.45								
C-B	0.97	9.23	0.106		0.16	0.12	1.8		0.12
A-B	0.70								
A-C	7.18								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.15-09.30									
B-C	0.73	8.52	0.085		0.12	0.09	1.4		0.13
B-A	0.55	5.61	0.098		0.15	0.11	1.7		0.20
C-A	6.24								
C-B	0.82	9.58	0.085		0.12	0.09	1.4		0.11
A-B	0.59								
A-C	6.01								

QUEUE FOR STREAM B-C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.1
08.30	0.1
08.45	0.2
09.00	0.2
09.15	0.1
09.30	0.1

QUEUE FOR STREAM B-A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.1
08.30	0.1
08.45	0.2
09.00	0.2
09.15	0.2
09.30	0.1

QUEUE FOR STREAM C-B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.1
08.30	0.1
08.45	0.2
09.00	0.2
09.15	0.1
09.30	0.1

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
B-C	79.8	53.2	11.1	0.14	11.1	0.14
B-A	60.6	40.4	14.4	0.24	14.4	0.24
C-A	684.1	456.1				
C-B	89.5	59.6	11.0	0.12	11.0	0.12
A-B	64.7	43.1				
A-C	659.3	439.5				
ALL	1637.9	1092.0	36.5	0.02	36.5	0.02

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

========== end of file ==========

[Printed at 09:28:15 on 15/07/2008]

RUN INFORMATION
****

RUN TITLE: KWD (MRF) 2015 AM Peak
LOCATION:
DATE: 28/04/08
CLIENT:
ENUMERATOR: kenneth.waldron [GAL-ENG-08]
JOB NUMBER:
STATUS:
DESCRIPTION:

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY
****

INPUT DATA

MAJOR ROAD (ARM C) ---------- MAJOR ROAD (ARM A)
I
I
I
I
I
I
MINOR ROAD (ARM B)

ARM A IS To Farranfore
ARM B IS Local Rd
ARM C IS To Killarney

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

ETC.

TRL LIMITED

CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

PICADY 5.0 ANALYSIS PROGRAM
RELEASE 3.0 (JUNE 2006)

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TRL SOFTWARE BUREAU
TEL: CROWTHORNE (01344) 770758, FAX: 770864
EMAIL: SoftwareBureau@trl.co.uk

Run with file:- "R:\MGE0109\DF\TIA\PICADY\2015 AM Peak.vpi" (drive-on-the-left) at 15:57:52 on Wednesday, 25 June 2008

GEOMETRIC DATA

DATA ITEM		MINOR ROAD B
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W)	7.00 M.
CENTRAL RESERVE WIDTH	(WCR)	0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B)	3.50 M.
- VISIBILITY	(VC-B)	150.0 M.
- BLOCKS TRAFFIC		NO
MINOR ROAD - VISIBILITY TO LEFT	(VB-C)	90.0 M.
- VISIBILITY TO RIGHT	(VB-A)	90.0 M.
- LANE 1 WIDTH	(WB-C)	3.00 M.
- LANE 2 WIDTH	(WB-A)	3.00 M.

.SLOPES AND INTERCEPT

(NB:Streams may be combined, in which case capacity

will be adjusted)

Intercept For Stream B-C	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B
680.59	0.25	0.10

Intercept For Stream B-A	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B
552.17	0.24	0.10	0.15	0.35

Intercept For Stream C-B	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B
754.33	0.28	0.28

NB These values do not allow for any site specific corrections

TRAFFIC DEMAND DATA

ARM	FLOW SCALE(%)
A	100
B	100
C	100

Demand set: KWD (MRF)

TIME PERIOD BEGINS 08.00 AND ENDS 09.30

LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	NUMBER OF MINUTES FROM START WHEN TOP OF PEAK IS REACHED	NUMBER OF MINUTES FROM START WHEN FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	RATE OF FLOW (VEH/MIN) AT TOP OF PEAK	RATE OF FLOW (VEH/MIN) AFTER PEAK
ARM A	15.00	45.00	75.00	7.20	10.80	7.20
ARM B	15.00	45.00	75.00	1.34	2.01	1.34
ARM C	15.00	45.00	75.00	7.68	11.51	7.68

TIME	FROM/TO	ARM A	ARM B	ARM C
08.00 ~ 09.30				
	ARM A	0.000	0.083	0.917
		0.0	48.0	528.0
		(0.0)	(10.0)	(10.0)
	ARM B	0.430	0.000	0.570
		46.0	0.0	61.0
		(10.0)	(0.0)	(10.0)
	ARM C	0.893	0.107	0.000
		548.0	66.0	0.0
		(10.0)	(10.0)	(0.0)

TURNING PROPORTIONS
TURNING COUNTS (VEH/HR)
(PERCENTAGE OF H.V.S)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

DEFAULT PROPORTIONS OF HEAVY VEHICLES ARE USED

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR COMBINED DEMAND SETS
AND FOR TIME PERIOD 1

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
B-C	0.77	8.35	0.092		0.00	0.10	1.4		0.13
B-A	0.58	5.36	0.108		0.00	0.12	1.7		0.21
C-A	6.88								
C-B	0.83	9.41	0.088		0.00	0.10	1.4		0.12
A-B	0.60								
A-C	6.63								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.15-08.30									
B-C	0.91	7.94	0.115		0.10	0.13	1.9		0.14
B-A	0.69	4.77	0.144		0.12	0.17	2.4		0.24
C-A	8.21								
C-B	0.99	9.02	0.110		0.10	0.12	1.8		0.12
A-B	0.72								
A-C	7.91								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
B-C	1.12	7.36	0.152		0.13	0.18	2.6		0.16
B-A	0.84	3.96	0.213		0.17	0.26	3.8		0.32
C-A	10.06								
C-B	1.21	8.47	0.143		0.12	0.17	2.4		0.14
A-B	0.88								
A-C	9.69								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
B-C	1.12	7.36	0.152		0.18	0.18	2.7		0.16
B-A	0.84	3.96	0.213		0.26	0.27	4.0		0.32
C-A	10.06								
C-B	1.21	8.47	0.143		0.17	0.17	2.5		0.14
A-B	0.88								
A-C	9.69								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.00-09.15									
B-C	0.91	7.94	0.115		0.18	0.13	2.0		0.14
B-A	0.69	4.77	0.144		0.27	0.17	2.7		0.25
C-A	8.21								
C-B	0.99	9.02	0.110		0.17	0.12	1.9		0.12
A-B	0.72								
A-C	7.91								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.15-09.30									
B-C	0.77	8.35	0.092		0.13	0.10	1.6		0.13
B-A	0.58	5.36	0.108		0.17	0.12	1.9		0.21
C-A	6.88								
C-B	0.83	9.41	0.088		0.12	0.10	1.5		0.12
A-B	0.60								
A-C	6.63								

QUEUE FOR STREAM B-C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.1
08.30	0.1
08.45	0.2
09.00	0.2
09.15	0.1
09.30	0.1

QUEUE FOR STREAM B-A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.1
08.30	0.2
08.45	0.3
09.00	0.3
09.15	0.2
09.30	0.1

QUEUE FOR STREAM C-B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.1
08.30	0.1
08.45	0.2
09.00	0.2
09.15	0.1
09.30	0.1

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
B-C	84.0	56.0	12.2	0.15	12.2	0.15
B-A	63.3	42.2	16.4	0.26	16.4	0.26
C-A	754.3	502.9				
C-B	90.8	60.6	11.5	0.13	11.5	0.13
A-B	66.1	44.0				
A-C	726.8	484.5				
ALL	1785.2	1190.1	40.1	0.02	40.1	0.02

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

========== end of file ==========

[Printed at 09:28:37 on 15/07/2008]

TRL LIMITED

CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

PICADY 5.0 ANALYSIS PROGRAM
RELEASE 3.0 (JUNE 2006)

FOR SALES AND DISTRIBUTION INFORMATION,
PROGRAM ADVICE AND MAINTENANCE CONTACT:
TRL SOFTWARE BUREAU
TEL: CROWTHORNE (01344) 770758, FAX: 770864
EMAIL: SoftwareBureau@trl.co.uk

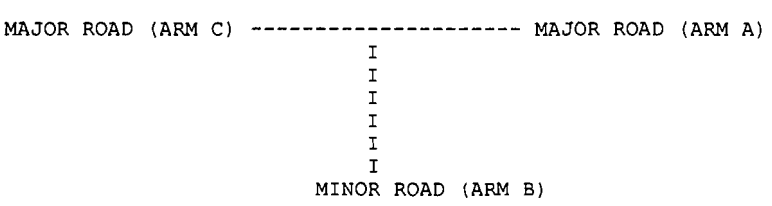
Run with file:- "R:\MGE0109\DF\TIA\PICADY\2025 AM Peak.vpi" (drive-on-the-left) at 16:00:58 on Wednesday, 25 June 2008

RUN INFORMATION
****

RUN TITLE: KWD (MRF) 2025 AM Peak
LOCATION:
DATE: 28/04/08
CLIENT:
ENUMERATOR: kenneth.waldron [GAL-ENG-08]
JOB NUMBER:
STATUS:
DESCRIPTION:

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY
****

INPUT DATA



ARM A IS To Farranfore
ARM B IS Local Rd
ARM C IS To Killarney

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

ETC.

GEOMETRIC DATA

DATA ITEM	MINOR ROAD B
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W) 7.00 M.
CENTRAL RESERVE WIDTH	(WCR) 0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B) 3.50 M.
- VISIBILITY	(VC-B) 150.0 M.
- BLOCKS TRAFFIC	NO
MINOR ROAD - VISIBILITY TO LEFT	(VB-C) 90.0 M.
- VISIBILITY TO RIGHT	(VB-A) 90.0 M.
- LANE 1 WIDTH	(WB-C) 3.00 M.
- LANE 2 WIDTH	(WB-A) 3.00 M.

.SLOPES AND INTERCEPT

(NB:Streams may be combined, in which case capacity

will be adjusted)

Intercept For Stream B-C	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B
680.59	0.25	0.10

Intercept For Stream B-A	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B
552.17	0.24	0.10	0.15	0.35

Intercept For Stream C-B	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B
754.33	0.28	0.28

NB These values do not allow for any site specific corrections

TRAFFIC DEMAND DATA

ARM	FLOW SCALE(%)
A	100
B	100
C	100

Demand set: KWD (MRF)

TIME PERIOD BEGINS 08.00 AND ENDS 09.30

LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	NUMBER OF MINUTES FROM START WHEN TOP OF PEAK IS REACHED	NUMBER OF MINUTES FROM START WHEN FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	RATE OF FLOW (VEH/MIN) AT TOP OF PEAK	RATE OF FLOW (VEH/MIN) AFTER PEAK
ARM A	15.00	45.00	75.00	8.31	12.47	8.31
ARM B	15.00	45.00	75.00	1.41	2.12	1.41
ARM C	15.00	45.00	75.00	8.84	13.26	8.84

TIME	FROM/TO	ARM A	ARM B	ARM C
08.00 - 09.30		TURNING PROPORTIONS		
		TURNING COUNTS (VEH/HR)		
		(PERCENTAGE OF H.V.S)		
	ARM A	0.000	0.074	0.926
		0.0	49.0	616.0
		(0.0)	(10.0)	(10.0)
	ARM B	0.434	0.000	0.566
		49.0	0.0	64.0
		(10.0)	(0.0)	(10.0)
	ARM C	0.904	0.096	0.000
		639.0	68.0	0.0
		(10.0)	(10.0)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

DEFAULT PROPORTIONS OF HEAVY VEHICLES ARE USED

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR COMBINED DEMAND SETS
AND FOR TIME PERIOD 1

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
B-C	0.80	8.04	0.100		0.00	0.11	1.6		0.14
B-A	0.61	4.90	0.125		0.00	0.14	2.0		0.23
C-A	8.02								
C-B	0.85	9.10	0.094		0.00	0.10	1.5		0.12
A-B	0.61								
A-C	7.73								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.15-08.30									
B-C	0.96	7.56	0.127		0.11	0.14	2.1		0.15
B-A	0.73	4.23	0.174		0.14	0.21	3.0		0.29
C-A	9.57								
C-B	1.02	8.64	0.118		0.10	0.13	1.9		0.13
A-B	0.73								
A-C	9.23								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
B-C	1.17	6.86	0.171		0.14	0.20	3.0		0.18
B-A	0.90	3.30	0.272		0.21	0.36	5.1		0.41
C-A	11.73								
C-B	1.25	8.02	0.156		0.13	0.18	2.7		0.15
A-B	0.90								
A-C	11.30								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
B-C	1.17	6.86	0.171		0.20	0.21	3.1		0.18
B-A	0.90	3.30	0.272		0.36	0.37	5.5		0.42
C-A	11.73								
C-B	1.25	8.02	0.156		0.18	0.18	2.7		0.15
A-B	0.90								
A-C	11.30								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.00-09.15									
B-C	0.96	7.56	0.127		0.21	0.15	2.3		0.15
B-A	0.73	4.23	0.174		0.37	0.21	3.4		0.29
C-A	9.57								
C-B	1.02	8.64	0.118		0.18	0.13	2.1		0.13
A-B	0.73								
A-C	9.23								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.15-09.30									
B-C	0.80	8.03	0.100		0.15	0.11	1.7		0.14
B-A	0.61	4.90	0.125		0.21	0.15	2.3		0.23
C-A	8.02								
C-B	0.85	9.10	0.094		0.13	0.10	1.6		0.12
A-B	0.61								
A-C	7.73								

QUEUE FOR STREAM B-C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.1
08.30	0.1
08.45	0.2
09.00	0.2
09.15	0.1
09.30	0.1

QUEUE FOR STREAM B-A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.1
08.30	0.2
08.45	0.4
09.00	0.4
09.15	0.2
09.30	0.1

QUEUE FOR STREAM C-B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.1
08.30	0.1
08.45	0.2
09.00	0.2
09.15	0.1
09.30	0.1

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
B-C	88.1	58.7	13.7	0.16	13.7	0.16
B-A	67.4	45.0	21.2	0.31	21.2	0.31
C-A	879.5	586.4				
C-B	93.6	62.4	12.5	0.13	12.5	0.13
A-B	67.4	45.0				
A-C	847.9	565.3				
ALL	2044.0	1362.7	47.4	0.02	47.4	0.02

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

========== end of file ==========

[Printed at 09:28:58 on 15/07/2008]

TRL LIMITED

CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

PICADY 5.0 ANALYSIS PROGRAM
RELEASE 3.0 (JUNE 2006)

FOR SALES AND DISTRIBUTION INFORMATION,
PROGRAM ADVICE AND MAINTENANCE CONTACT:
TRL SOFTWARE BUREAU
TEL: CROWTHORNE (01344) 770758, FAX: 770864
EMAIL: SoftwareBureau@trl.co.uk

Run with file:- "R:\MGE0109\DF\TIA\PICADY\2010 PM Peak.vpi" (drive-on-the-left) at 16:10:11 on Wednesday, 25 June 2008

RUN INFORMATION
****

RUN TITLE: KWD (MRF) 2010 PM Peak
LOCATION:
DATE: 28/04/08
CLIENT:
ENUMERATOR: kenneth.waldron [GAL-ENG-08]
JOB NUMBER:
STATUS:
DESCRIPTION:

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY
****

INPUT DATA

MAJOR ROAD (ARM C) ---------- MAJOR ROAD (ARM A)
I
I
I
I
I
I
MINOR ROAD (ARM B)

ARM A IS To Farranfore
ARM B IS Local Rd
ARM C IS To Killarney

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

ETC.

GEOMETRIC DATA

DATA ITEM		MINOR ROAD B
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W)	7.00 M.
CENTRAL RESERVE WIDTH	(WCR)	0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B)	3.50 M.
- VISIBILITY	(VC-B)	150.0 M.
- BLOCKS TRAFFIC		NO
MINOR ROAD - VISIBILITY TO LEFT	(VB-C)	90.0 M.
- VISIBILITY TO RIGHT	(VB-A)	90.0 M.
- LANE 1 WIDTH	(WB-C)	3.00 M.
- LANE 2 WIDTH	(WB-A)	3.00 M.

.SLOPES AND INTERCEPT

(NB:Streams may be combined, in which case capacity

will be adjusted)

Intercept For Stream B-C	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B
680.59	0.25	0.10

Intercept For Stream B-A	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B
552.17	0.24	0.10	0.15	0.35

Intercept For Stream C-B	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B
754.33	0.28	0.28

NB These values do not allow for any site specific corrections

TRAFFIC DEMAND DATA

ARM	FLOW SCALE(%)
A	100
B	100
C	100

Demand set: KWD (MRF)

TIME PERIOD BEGINS 08.00 AND ENDS 09.30

LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	NUMBER OF MINUTES FROM START WHEN TOP OF PEAK IS REACHED	NUMBER OF MINUTES FROM START WHEN FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	RATE OF FLOW (VEH/MIN) AT TOP OF PEAK	RATE OF FLOW (VEH/MIN) AFTER PEAK
ARM A	15.00	45.00	75.00	7.80	11.70	7.80
ARM B	15.00	45.00	75.00	1.36	2.04	1.36
ARM C	15.00	45.00	75.00	7.15	10.73	7.15

TIME	FROM/TO	ARM A	ARM B	ARM C
08.00 - 09.30				
	ARM A	0.000	0.032	0.968
		0.0	20.0	604.0
		(0.0)	(10.0)	(10.0)
	ARM B	0.358	0.000	0.642
		39.0	0.0	70.0
		(10.0)	(0.0)	(10.0)
	ARM C	0.888	0.112	0.000
		508.0	64.0	0.0
		(10.0)	(10.0)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

DEFAULT PROPORTIONS OF HEAVY VEHICLES ARE USED

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR COMBINED DEMAND SETS
AND FOR TIME PERIOD 1

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
B-C	0.88	8.18	0.107		0.00	0.12	1.7		0.14
B-A	0.49	5.25	0.093		0.00	0.10	1.4		0.21
C-A	6.37								
C-B	0.80	9.24	0.087		0.00	0.09	1.4		0.12
A-B	0.25								
A-C	7.58								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.15-08.30									
B-C	1.05	7.74	0.135		0.12	0.15	2.3		0.15
B-A	0.58	4.64	0.126		0.10	0.14	2.0		0.25
C-A	7.61								
C-B	0.96	8.82	0.109		0.09	0.12	1.8		0.13
A-B	0.30								
A-C	9.05								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
B-C	1.28	7.12	0.180		0.15	0.22	3.2		0.17
B-A	0.72	3.80	0.188		0.14	0.23	3.2		0.32
C-A	9.32								
C-B	1.17	8.23	0.143		0.12	0.16	2.4		0.14
A-B	0.37								
A-C	11.08								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
B-C	1.28	7.12	0.180		0.22	0.22	3.3		0.17
B-A	0.72	3.80	0.188		0.23	0.23	3.4		0.32
C-A	9.32								
C-B	1.17	8.23	0.143		0.16	0.17	2.5		0.14
A-B	0.37								
A-C	11.08								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.00-09.15									
B-C	1.05	7.74	0.135		0.22	0.16	2.4		0.15
B-A	0.58	4.64	0.126		0.23	0.15	2.3		0.25
C-A	7.61								
C-B	0.96	8.82	0.109		0.17	0.12	1.9		0.13
A-B	0.30								
A-C	9.05								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.15-09.30									
B-C	0.88	8.18	0.107		0.16	0.12	1.9		0.14
B-A	0.49	5.24	0.093		0.15	0.10	1.6		0.21
C-A	6.37								
C-B	0.80	9.24	0.087		0.12	0.10	1.5		0.12
A-B	0.25								
A-C	7.58								

QUEUE FOR STREAM B-C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.1
08.30	0.2
08.45	0.2
09.00	0.2
09.15	0.2
09.30	0.1

QUEUE FOR STREAM B-A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.1
08.30	0.1
08.45	0.2
09.00	0.2
09.15	0.1
09.30	0.1

QUEUE FOR STREAM C-B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.1
08.30	0.1
08.45	0.2
09.00	0.2
09.15	0.1
09.30	0.1

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
B-C	96.3	64.2	14.7	0.15	14.7	0.15
B-A	53.7	35.8	14.1	0.26	14.1	0.26
C-A	699.2	466.1				
C-B	88.1	58.7	11.4	0.13	11.4	0.13
A-B	27.5	18.4				
A-C	831.4	554.2				
ALL	1796.2	1197.5	40.2	0.02	40.2	0.02

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

========== end of file ==========

[Printed at 09:29:15 on 15/07/2008]

TRL LIMITED

CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

PICADY 5.0 ANALYSIS PROGRAM
RELEASE 3.0 (JUNE 2006)

FOR SALES AND DISTRIBUTION INFORMATION,
PROGRAM ADVICE AND MAINTENANCE CONTACT:
TRL SOFTWARE BUREAU
TEL: CROWTHORNE (01344) 770758, FAX: 770864
EMAIL: SoftwareBureau@trl.co.uk

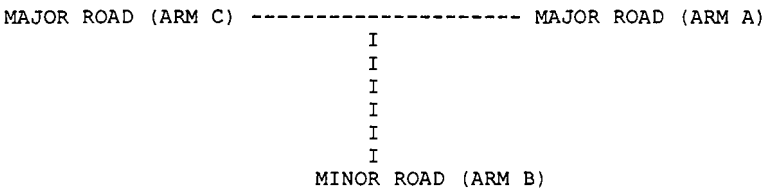
Run with file:- "R:\MGE0109\DF\TIA\PICADY\2015 PM Peak.vpi" (drive-on-the-left) at 18:15:43 on Wednesday, 25 June 2008

RUN INFORMATION
****

RUN TITLE: KWD (MRF) 2015 AM Peak
LOCATION:
DATE: 28/04/08
CLIENT:
ENUMERATOR: kenneth.waldron [GAL-ENG-08]
JOB NUMBER:
STATUS:
DESCRIPTION:

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY
****

INPUT DATA



ARM A IS To Farranfore
ARM B IS Local Rd
ARM C IS To Killarney

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

ETC.

GEOMETRIC DATA

DATA ITEM		MINOR ROAD B
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W)	7.00 M.
CENTRAL RESERVE WIDTH	(WCR)	0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B)	3.50 M.
- VISIBILITY	(VC-B)	150.0 M.
- BLOCKS TRAFFIC		NO
MINOR ROAD - VISIBILITY TO LEFT	(VB-C)	90.0 M.
- VISIBILITY TO RIGHT	(VB-A)	90.0 M.
- LANE 1 WIDTH	(WB-C)	3.00 M.
- LANE 2 WIDTH	(WB-A)	3.00 M.

.SLOPES AND INTERCEPT

(NB:Streams may be combined, in which case capacity

will be adjusted)

Intercept For Stream B-C	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B
680.59	0.25	0.10

Intercept For Stream B-A	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B
552.17	0.24	0.10	0.15	0.35

Intercept For Stream C-B	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B
754.33	0.28	0.28

NB These values do not allow for any site specific corrections

TRAFFIC DEMAND DATA

ARM	FLOW SCALE(%)
A	100
B	100
C	100

Demand set: KWD (MRF)

TIME PERIOD BEGINS 08.00 AND ENDS 09.30

LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	NUMBER OF MINUTES FROM START WHEN TOP OF PEAK IS REACHED	NUMBER OF MINUTES FROM START WHEN FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	RATE OF FLOW (VEH/MIN) AT TOP OF PEAK	RATE OF FLOW (VEH/MIN) AFTER PEAK
ARM A	15.00	45.00	75.00	8.59	12.88	8.59
ARM B	15.00	45.00	75.00	1.39	2.08	1.39
ARM C	15.00	45.00	75.00	7.82	11.74	7.82

TIME	FROM/TO	ARM A	ARM B	ARM C
08.00 - 09.30				
	ARM A	0.000	0.031	0.969
		0.0	21.0	666.0
		(0.0)	(10.0)	(10.0)
	ARM B	0.360	0.000	0.640
		40.0	0.0	71.0
		(10.0)	(0.0)	(10.0)
	ARM C	0.895	0.105	0.000
		560.0	66.0	0.0
		(10.0)	(10.0)	(0.0)

TURNING PROPORTIONS
TURNING COUNTS (VEH/HR)
(PERCENTAGE OF H.V.S)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

DEFAULT PROPORTIONS OF HEAVY VEHICLES ARE USED

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR COMBINED DEMAND SETS
AND FOR TIME PERIOD 1

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
B-C	0.89	7.97	0.112		0.00	0.12	1.8		0.14
B-A	0.50	4.95	0.101		0.00	0.11	1.6		0.22
C-A	7.03								
C-B	0.83	9.02	0.092		0.00	0.10	1.5		0.12
A-B	0.26								
A-C	8.36								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.15-08.30									
B-C	1.06	7.49	0.142		0.12	0.16	2.4		0.16
B-A	0.60	4.28	0.140		0.11	0.16	2.3		0.27
C-A	8.39								
C-B	0.99	8.55	0.116		0.10	0.13	1.9		0.13
A-B	0.31								
A-C	9.98								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
B-C	1.30	6.79	0.192		0.16	0.23	3.4		0.18
B-A	0.73	3.36	0.218		0.16	0.27	3.8		0.38
C-A	10.28								
C-B	1.21	7.90	0.153		0.13	0.18	2.6		0.15
A-B	0.39								
A-C	12.22								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
B-C	1.30	6.79	0.192		0.23	0.24	3.5		0.18
B-A	0.73	3.36	0.218		0.27	0.28	4.1		0.38
C-A	10.28								
C-B	1.21	7.90	0.153		0.18	0.18	2.7		0.15
A-B	0.39								
A-C	12.22								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.00-09.15									
B-C	1.06	7.48	0.142		0.24	0.17	2.6		0.16
B-A	0.60	4.28	0.140		0.28	0.17	2.6		0.27
C-A	8.39								
C-B	0.99	8.55	0.116		0.18	0.13	2.0		0.13
A-B	0.31								
A-C	9.98								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.15-09.30									
B-C	0.89	7.97	0.112		0.17	0.13	2.0		0.14
B-A	0.50	4.94	0.102		0.17	0.11	1.8		0.23
C-A	7.03								
C-B	0.83	9.02	0.092		0.13	0.10	1.6		0.12
A-B	0.26								
A-C	8.36								

QUEUE FOR STREAM B-C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.1
08.30	0.2
08.45	0.2
09.00	0.2
09.15	0.2
09.30	0.1

QUEUE FOR STREAM B-A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.1
08.30	0.2
08.45	0.3
09.00	0.3
09.15	0.2
09.30	0.1

QUEUE FOR STREAM C-B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.1
08.30	0.1
08.45	0.2
09.00	0.2
09.15	0.1
09.30	0.1

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
B-C	97.7	65.2	15.7	0.16	15.7	0.16
B-A	55.1	36.7	16.2	0.29	16.2	0.29
C-A	770.8	513.9				
C-B	90.8	60.6	12.3	0.13	12.3	0.13
A-B	28.9	19.3				
A-C	916.7	611.1				
ALL	1960.0	1306.7	44.1	0.02	44.1	0.02

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

========== end of file ==========

[Printed at 09:29:33 on 15/07/2008]

TRL LIMITED

CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

PICADY 5.0 ANALYSIS PROGRAM
RELEASE 3.0 (JUNE 2006)

FOR SALES AND DISTRIBUTION INFORMATION,
PROGRAM ADVICE AND MAINTENANCE CONTACT:
TRL SOFTWARE BUREAU
TEL: CROWTHORNE (01344) 770758, FAX: 770864
EMAIL: SoftwareBureau@trl.co.uk

Run with file:- "R:\MGE0109\DF\TIA\PICADY\2025 PM Peak.vpi" (drive-on-the-left) at 16:19:36 on Wednesday, 25 June 2008

RUN INFORMATION
****

RUN TITLE: KWD (MRF) 2025 PM Peak
LOCATION:
DATE: 28/04/08
CLIENT:
ENUMERATOR: kenneth.waldron [GAL-ENG-08]
JOB NUMBER:
STATUS:
DESCRIPTION:

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY
****

INPUT DATA

MAJOR ROAD (ARM C) ---------- MAJOR ROAD (ARM A)
I
I
I
I
I
I
MINOR ROAD (ARM B)

ARM A IS To Farranfore
ARM B IS Local Rd
ARM C IS To Killarney

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

ETC.

GEOMETRIC DATA

DATA ITEM		MINOR ROAD B
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W)	7.00 M.
CENTRAL RESERVE WIDTH	(WCR)	0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B)	3.50 M.
- VISIBILITY	(VC-B)	150.0 M.
- BLOCKS TRAFFIC		NO
MINOR ROAD - VISIBILITY TO LEFT	(VB-C)	90.0 M.
- VISIBILITY TO RIGHT	(VB-A)	90.0 M.
- LANE 1 WIDTH	(WB-C)	3.00 M.
- LANE 2 WIDTH	(WB-A)	3.00 M.

.SLOPES AND INTERCEPT

(NB:Streams may be combined, in which case capacity

will be adjusted)

Intercept For Stream B-C	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B
680.59	0.25	0.10

Intercept For Stream B-A	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B
552.17	0.24	0.10	0.15	0.35

Intercept For Stream C-B	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B
754.33	0.28	0.28

NB These values do not allow for any site specific corrections

TRAFFIC DEMAND DATA

ARM	FLOW SCALE(%)
A	100
B	100
C	100

Demand set: KWD (MRF)

TIME PERIOD BEGINS 08.00 AND ENDS 09.30

LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	NUMBER OF MINUTES FROM START WHEN TOP OF PEAK IS REACHED	NUMBER OF MINUTES FROM START WHEN FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	RATE OF FLOW (VEH/MIN) AT TOP OF PEAK	RATE OF FLOW (VEH/MIN) AFTER PEAK
ARM A	15.00	45.00	75.00	9.99	14.98	9.99
ARM B	15.00	45.00	75.00	1.41	2.12	1.41
ARM C	15.00	45.00	75.00	9.04	13.56	9.04

TIME	FROM/TO	ARM A	ARM B	ARM C
08.00 - 09.30		TURNING PROPORTIONS		
		TURNING COUNTS (VEH/HR)		
		(PERCENTAGE OF H.V.S)		
	ARM A	0.000	0.028	0.972
		0.0	22.0	777.0
		(0.0)	(10.0)	(10.0)
	ARM B	0.363	0.000	0.637
		41.0	0.0	72.0
		(10.0)	(0.0)	(10.0)
	ARM C	0.903	0.097	0.000
		653.0	70.0	0.0
		(10.0)	(10.0)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

DEFAULT PROPORTIONS OF HEAVY VEHICLES ARE USED

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR COMBINED DEMAND SETS
AND FOR TIME PERIOD 1

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
B-C	0.90	7.60	0.119		0.00	0.13	1.9		0.15
B-A	0.51	4.41	0.117		0.00	0.13	1.8		0.26
C-A	8.19								
C-B	0.88	8.63	0.102		0.00	0.11	1.6		0.13
A-B	0.28								
A-C	9.75								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.15-08.30									
B-C	1.08	7.03	0.153		0.13	0.18	2.6		0.17
B-A	0.61	3.64	0.169		0.13	0.20	2.8		0.33
C-A	9.78								
C-B	1.05	8.08	0.130		0.11	0.15	2.2		0.14
A-B	0.33								
A-C	11.64								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
B-C	1.32	6.18	0.214		0.18	0.27	3.9		0.21
B-A	0.75	2.58	0.292		0.20	0.39	5.4		0.54
C-A	11.98								
C-B	1.28	7.33	0.175		0.15	0.21	3.1		0.17
A-B	0.40								
A-C	14.26								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
B-C	1.32	6.17	0.214		0.27	0.27	4.0		0.21
B-A	0.75	2.58	0.292		0.39	0.40	6.0		0.55
C-A	11.98								
C-B	1.28	7.33	0.175		0.21	0.21	3.2		0.17
A-B	0.40								
A-C	14.26								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.00-09.15									
B-C	1.08	7.02	0.154		0.27	0.18	2.9		0.17
B-A	0.61	3.64	0.169		0.40	0.21	3.3		0.33
C-A	9.78								
C-B	1.05	8.08	0.130		0.21	0.15	2.3		0.14
A-B	0.33								
A-C	11.64								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.15-09.30									
B-C	0.90	7.59	0.119		0.18	0.14	2.1		0.15
B-A	0.51	4.41	0.117		0.21	0.13	2.1		0.26
C-A	8.19								
C-B	0.88	8.63	0.102		0.15	0.11	1.8		0.13
A-B	0.28								
A-C	9.75								

QUEUE FOR STREAM B-C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.1
08.30	0.2
08.45	0.3
09.00	0.3
09.15	0.2
09.30	0.1

QUEUE FOR STREAM B-A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.1
08.30	0.2
08.45	0.4
09.00	0.4
09.15	0.2
09.30	0.1

QUEUE FOR STREAM C-B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.1
08.30	0.1
08.45	0.2
09.00	0.2
09.15	0.2
09.30	0.1

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND		* QUEUEING * DELAY *		* INCLUSIVE QUEUEING * DELAY *	
	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)
B-C	99.1	66.1	17.4	0.18	17.4	0.18
B-A	56.4	37.6	21.5	0.38	21.5	0.38
C-A	898.8	599.2				
C-B	96.3	64.2	14.1	0.15	14.1	0.15
A-B	30.3	20.2				
A-C	1069.5	713.0				
ALL	2250.5	1500.3	53.0	0.02	53.0	0.02

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

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[Printed at 09:29:49 on 15/07/2008]