



Inner Moray Firth Local Development Plan - Transport

Working Paper 1

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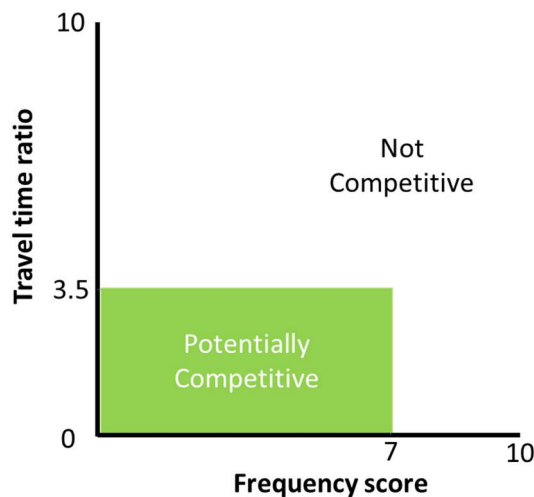
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Summary

This working paper proposes travel time criteria suitable for use in the new Inner Moray Firth Development Plan to define acceptable limits for new development consistent with travel time goals for sustainable development. The new criteria define travel time competitiveness as ratios of non-car to car travel.

Scottish Transport Appraisal Guidance suggests that four perspectives on travel time and accessibility should be included in appraisal: the frequency that a trip is made, the minimum social standard consistent with policy goals, the stated perceptions of people, and the equity of solutions. This paper suggests how these perspectives can be applied within transport assessments for the new development plan.

When considering new development, the completion of the development should contribute to making a location more sustainable: economically, environmentally and socially. The competitiveness of sustainable options can be defined in terms of the journey time competitiveness scores taking account of temporal effects such as public transport service frequencies as shown in the figure.



Applying these criteria to the main settlements in the draft Development Plan identifies that 11 settlements currently offer competitive public transport options for travel to Inverness City, Inshes and Inverness East.

In later stages of the work other work packages should be able to take forward the recommendations to consider how to expand the coverage of competitive locations for public transport, and to design a methodology for applying the journey time competitiveness analysis through travel plans and developer contributions.

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1.0 Introduction

- 1.1 The Inner Moray Firth Local Development Plan 2: Main Issues Report notes that “It is important to distinguish between locations where public transport is provided primarily for people who have little or no choice of mode of travel and locations where public transport can potentially offer a quality of service that can be competitive with car travel”.
- 1.2 Taking forward the Main Issues Report into the Final Plan requires the expectations for each location to be defined in clear terms for:
- Access to local services to ensure walking and cycling are the most competitive modes for an increasing number of trips.
 - Locations where public transport can offer competitive journey times with cars
 - Expanding the range of competitive locations for public transport through transport hubs which enable interchange between locations dependent on car access (using increasingly zero emission vehicles) and core public transport routes where public transport can be competitive.
- 1.3 This working paper proposes travel time criteria suitable for use in the new Development Plan to define acceptable limits for new development consistent with these accessibility and travel time goals.
- 1.4 The approach is designed to ensure that the Local Development plan helps to maintain and improve public transport journey time competitiveness across the Inner Moray Firth, by setting out a clear methodology that can be replicated in each detailed development planning decision.

Methodology

- 1.5 The Main Issues Report suggests that a mix of maximum travel time thresholds to local facilities and ratios of travel time for car and non-car trips could be used to ensure that development locations have transport available consistent with sustainable development.
- 1.6 The approach to the work identifies travel time competitiveness in terms of ratios of non-car to car travel. The work described in this working paper:
- Defines travel time and accessibility criteria consistent with good access to local services by walking, cycling and micro mobility solutions such as e-scooters and e-bikes, including cargo bikes.
 - Identifies settlements where non-car travel by walk/public transport can offer attractive journey times able to compete with the journey times available by car.
- 1.7 In later stages of the work other work packages should then be able to take forward the recommendations of work package 1 with analysis of how to:
- Expand the coverage of competitive locations for public transport
 - Design a methodology for applying the approach through travel plans and developer contributions.

2.0 Competitive Travel Times to Local Services

2.1 People that live close to local services walk far more often than people who live in less accessible neighbourhoods. Improving the proximity of local services to the places people live is recognised in Main Issues Report with the Strategic Environmental Assessment (SEA) assessing access to local services as follows:

“A proposal that is remote from (more than one) services and facilities (e.g. shops, schools, health services and places of work), or remote from its labour force where proposed use is employment could increase the need for travel by car and cannot therefore be considered sustainable. If a site is outwith the distance thresholds here, but is well served by public transport (frequent bus or rail services with at least half-hourly service throughout day at least 7am-10pm) it may not increase the need to travel by car”

2.2 The acceptable thresholds for access to local services are identified as:

- More than 2km, 1-2km, and under 1km
- Walk access with steep slopes, or with exposed positions that could be a deterrent to making an active travel choice

2.3 The specification of shops, schools, health services and places of work is not expanded within the SEA but the definitions of local services in the assessments include:

- The high street/town centre
- Primary school
- Secondary school
- Large employment centres (relevant centres for the development being identified in the assessment)

2.4 For more detailed transport assessments the national guidance suggests that Scottish Transport Appraisal Guidance (STAG) criteria are used. STAG includes four criteria as follows:

- Expressed access – The frequency that the trip for this purpose is made
- Community accessibility – The minimum social standard consistent with policy goals for sustainability, health, education, employment, and inclusion.
- Stated accessibility – How accessible local people consider the location to be. The data for this is often taken from local surveys or the using responses to the Scottish Household Survey on perceptions of access.
- Comparative accessibility – The equity of access for all groups in society, particularly car access compared with non-car access.

2.5 Table 2.1 summarises the local access needs under each of these criteria that could be used in site assessments. In making these assessments the 2km distance threshold above can be complemented with assessments against:

- 3.2km (40 minutes walk) -The distance beyond which few people walk for access to services.
- 1.6km (20minutes walk) - The distance at which walking starts to become attractive for some people

- 800m (10 minutes walk) – The distance at which walking starts to be selected by a majority of people
- 400 metres (5 minutes walk) – The distance at which most people will walk.

Table 2.1 – Criteria for Assessing Travel Times to Local Services

Service	Frequency	Social Standards	Local Perceptions	Fairness
Employment	High frequency		Which employment markets will be affected	Will average travel times to work reduce most for non-car users
Grocery shop	High frequency daily shop	Range and choice of food to enable value and quality	Perceptions of quality and choice	Will travel times reduce most for non-car trips
GP	Low frequency for most people	Highest ranked travel time in index of multiple deprivation	Most important for older age population	Will travel times reduce most for non-car trips
Primary school	Frequent for those in full time education	Ideally less than the 1.6km within which walking becomes more popular		
Secondary school	Frequent for those in full time education	Ideally less than the 1.6km within which walking becomes more popular		
Local comparison goods/ retail centre	Weekly shop		Perceptions of quality and choice	Market segments being served by shops
Post Office Banking/ Cash machine, legal services	Medium frequency		Perceptions of adequacy of local provision	
Leisure, sports, clubs and societies	Medium frequency			
Hospital	Low for most people	Maximum cost of accessibility by public transport £10		
Childcare/day care/ nurseries	Frequent for a small number of people			

3.0 Transport Choice and Competitiveness

- 3.1 The modal shift analysis previously undertaken, identified the main origin and destination trip pairings where public transport was already, or could potentially become competitive with car travel. Public transport can be competitive with car travel where services are of sufficient quality, delivering attractive journey times at regular frequencies, and able to attract use even where a private car is also available for the trip.
- 3.2 When considering new development, the completion of the development should contribute to making a location more sustainable: economically, environmentally and socially. Walkable neighbourhoods and avoiding exclusion resulting from a lack of public transport have been a focus for transport development planning in recent years in Highland Council, but there may also be scope to plan more competitive public transport services to more locations. Public transport tends to be most competitive with car travel on routes where there is some form of restraint on car travel such as congestion or parking restraint, so trips into Inverness, where congestion is growing and parking demand often exceed supply, are a good starting point.
- 3.3 As the city of Inverness grows, new development in the Inner Moray Firth could be associated with opportunities to improve public transport competitiveness, in the same way that public transport competitiveness has developed as other Scottish cities have expanded. A methodology for development plan transport assessments to consider the initial scope for improving public transport competitiveness is defined below.

Components of journey time

- 3.4 Each journey time by walk/public transport is made up of multiple stages which combine to make a total journey time:
- The time to reach the bus stop or rail station at the ends of the journey or as part of interchange within it.
 - The in-vehicle time in buses and trains.
 - The waiting time at bus stops and rail stations.
- 3.5 There are many ways to describe journey times. Car journeys typically assess the fastest journey time regularly achieved and then consider journey times in excess of that journey time as a 'journey delay'. For public transport, some people prefer to walk further to reach faster public transport services whilst others choose longer in-vehicle journeys if they can use a stop location nearer their origin or destination. Unlike car journeys, a failure to achieve the fastest journey time is rarely considered as a 'delay' so representative times are used to describe the journey times that can be expected for any particular journey purpose. The choice of footpath network also leads to substantial travel time discrepancies. Routes using informal footpaths such as across open are space are used in some calculation methods¹, whilst others require distances to be measured along paved footpaths by roads.

¹ For example, the pharmacy access scheme offers grants to pharmacies based on their distance from other pharmacies using footpaths that are recognised in Ordnance Survey Mastermap Topography layer, whilst many public bodies such as NHS Highland measure distances for the purposes of travel claims using Google maps evidence.

- 3.6 In order for consistent journey times to be used in public policy the methodology for calculating journey time need to be explicit. One approach is to use journey times that reflect the experiences and behaviour of travellers. These approaches reflect the reality that travel choices are influenced by imperfect information and use services that have complex and often undefinable quality and reliability characteristics. The provision of information both affects travel behaviour and seeks to reflect travel choices creating sustainable feedback loops through improved service provision. Three main perspectives on these feedback loops are used:
- Policy centric - The policy perspectives of an organisation such as a transport authority define the routing parameters consistent with policy goals, such as only using walking routes with drop kerbs/street lighting, or specified maximum walking distances to bus stops, or specified interchange locations.
 - User-centric information - The most popular method for calculating journey times, representing a travel time which the majority of the population are happy to use. In recent years Google maps has been the most popular journey planning software but Apple maps, Citymapper, FromAtoB.com, Rome2rio and others also attract large market shares. The consumer focus is often reflected in some level of commercialisation with users often able to link to ticket purchase or advertising. There is intense competition between providers to offer user centric journey time information.
 - Personalised - Journey times calculations that reflect the personalised preferences of the traveller or group of travellers. Journeys are planned by individuals and organisations to reflect the capabilities and wishes of particular people. The journey time calculation method reflects these preferences and/or the policies of organisations organising the trips.
- 3.7 The differences between journey times using different calculation methodologies are often substantial². Within development planning the first and second of these methods will be sufficient for most purposes, but particular types of facility relying on special categories of transport, traveller or vehicle, such as hospitals or freight consolidation centres, may wish to adopt a method more tailored to their needs. This can be done as part of travel plans for individual developments if required.

Temporal effects

- 3.8 Journey times vary throughout the day. Each journey time is associated with a time of day when the journey time is achieved. Peak time road journeys are often delayed by road congestion. Bus and rail journey times depend on the timetabled frequency of available services throughout the day.
- 3.9 Perhaps the most robust approach for representing this journey time variation involves calculating journey times at 15 minutes³ or 30 minute intervals⁴ throughout the day and then weighting the journey time in each time period by the importance of that time period by trip purpose⁵. Journey times for travel for work and education can be more highly weighted in the morning and evening peak when commuters are

² A review for DfT in 2014 compared journey times using various methods finding particularly large differences in rural areas

³ E.g. as in the national road congestion monitoring undertaken at a UK level by ORR

⁴ E.g. as in the national travel time statistics up until 2016

⁵ See Appendix A for the travel time weightings used in UK analysis.

more likely to be making these trips, whilst travel for hospital is spread more evenly across the day. For very large developments it may be appropriate for transport assessments to analyse modal competition by trip purpose and time period, but for most transport assessments some simplifications are needed.

3.10 A pragmatic simplification for the purpose of assessing modal competition in development planning can be achieved with a representative journey time and frequency measure to represent the availability of the journey time throughout the day as follows:

- The journey time for arrival for 8:30am and 10:30am by car can be calculated and the average journey time taken. There are very few journeys where the car journey time in peak periods is more than a few minutes higher than for the off-peak journey. Therefore, a single average figure is representative of the car journey time for the purpose of comparisons with public transport journey times.
- For walk/public transport trips, the journey times throughout the day are reviewed to identify the best journey time achieved at 2 hour intervals or more frequently. For the selected journey time a frequency score is made based on the availability of services as shown in Table 3.1.

Table 3.1 – Public Transport Frequency Scores

Score	Frequency Criteria
10	Other services - Regular frequency of service less than every 2 hours
9	Other services - Good network coverage with services every 2 hours or better between 8am and 6pm
8	Good service - No more than 60 minutes between services 8am to 8pm and better coverage at some other times
7	Good service - No more than 30 minutes between services 8am to 6pm
6	Very good service - No more than 30 minutes between services 8am to 8pm
5	Excellent service - No more than 20 minutes between services 8am to 6pm and some coverage outside these periods
4	Excellent service - No more than 20 minutes between services 8am to 8pm
3	High frequency service - 10 minute frequency or better but with lower frequencies at some times of day between 8am and 6pm and some coverage later in the evening
2	High frequency service - 10 minute frequency or better but with lower frequencies at some times of day between 8am and 8pm and some coverage later in the evening
1	Turn up and go services - Better than 10 minute frequency 8am to 6pm and some coverage later in the evening
0	Turn up and go services - Better than 10 minute frequency 7am to 10pm and at least 30 minute frequency throughout the night

3.11 The SEA criteria required minimum half hourly frequencies between 7am and 10pm which would render scores over 7 as representing uncompetitive frequencies.

Journey time competitiveness scores

3.12 The ratio of the non-car to car journey time is a simple description of competitiveness but many simplifications are built in including:

- The car journey times assume that door to door journeys are made without the need to look for parking spaces. In practice, there are many locations where car

parking is not at the door but there is no readily available data to describe this so car journey times will be underestimated for many trips.

- No account has been taken of parking costs or public transport fares. Again, these vary by the journey and category of traveller.
- Some bus passengers have concessionary travel passes so will be comparing a free journey with a car journey where they need to pay for fuel.

3.13 Scores can be given to ratios of non-car to car journey time that reflect these issues and represent competitiveness as shown in Table 3.2.

Table 3.2 – Travel Time Ratios to Describe Competitiveness Criteria

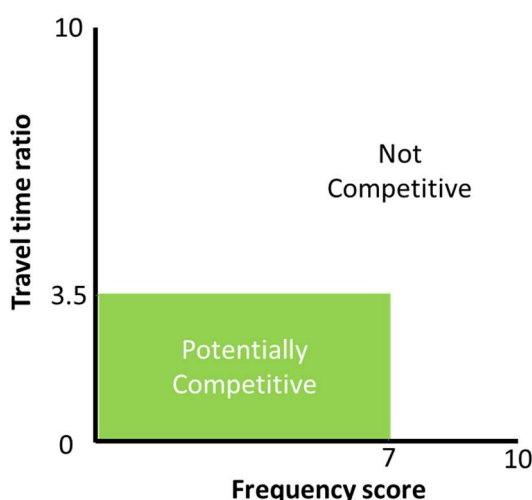
Score	Criteria
1-1.5	Personal choice between equally competitive car and non-car options
1.6-2	Highly competitive public transport
2.1-2.5	Competitive public transport
2.6-3	Competitive for some large market segments - e.g. concessionary travellers
3.1-3.5	Competitive for restricted market segments
3.6-4	Sometimes competitive for niche trips
4-10	Public transport will rarely be chosen by people with a car available
>10	Public transport will rarely be used even by those without a car which will choose other options such as lift from a friend or taxi

3.14 Within individual development plan assessments, the effects of parking charges could be considered by adding travel times equivalent to the charge to represent the deterrence of the charge on travel behaviour. Similarly more detailed consideration could be made of the availability of parking locations and walk times from car parking locations to destinations.

Overall competitiveness

3.15 Figure 3.1 shows the area of the graph that defines broadly the criteria within which overall competitiveness could be achieved.

Figure 3.1 – Overall Competitiveness



3.16 There are other factors that would need to be considered in the detailed travel plans for the sites to ensure that this potential competitiveness is delivered in practice including:

- A suitable quality of experience in comfortable public transport vehicles
- Reliable delivery of the service with appropriate compensation when journey times are not achieved
- Competitive fares
- Information and marketing to ensure that users are able to make good choices.

3.17 All of these criteria are necessary conditions for competitiveness and none of them are sufficient in themselves to enable competitiveness.

4.0 Settlements and Public Transport Competitiveness

4.1 Applying the criteria in Chapter 3 to the data from the modal choice analysis⁶ Table 4.1 shows the ratios and frequency scores for travel to Central Inverness⁷.

Table 4.1 – Travel Time Competitiveness to Inverness City Centre by Settlement

Settlement	Ratio	Frequency Score
Alness	1.6	5.5
Ardersier	2.3	8.4
Auldearn	2.1	7.5
Avoch	1.5	7.1
Beauly	1.6	7.3
Cawdor	6.0	10
Conon Bridge	1.8	7.9
Contin	2.1	9.2
Cromarty	1.6	7.7
Croy	3.4	7.9
Culbokie	2.3	8.9
Dingwall	1.8	6.2
Dores	1.9	9.6
Drumnadrochit	1.4	8
Evanton	1.5	8.9
Fort Augustus	1.4	9.5
Fortrose and Rosemarkie	1.7	7
Inchmore	1.9	8.2
Invergordon	2.4	6.9
West Inverness	1.9	1.3
South Inverness	2.3	1.1
East Inverness	2.0	0.8
Kiltarlity	2.3	9.7
Kirkhill	2.2	7.7
Maryburgh	2.0	8.8
Muir of Ord	1.8	8.5
Munlochy	2.6	6.4
Nairn	1.6	3.9
North Kessock	2.2	4.2
Seaboard Villages	3.2	9.7
Strathpeffer	1.9	7.8
Tain	2.3	8.2
Tomatin	2.9	8.8
Tore	1.9	5.2
Tornagrain	2.1	5.6

⁶ January 2020 - Inner Moray Firth Modal Shift Strategy. Version 1.1

⁷ The location selected in central Inverness for the analysis has latitude/longitude 57.478796,-4.2235382

- 4.2 Although travel time is competitive for most settlements, the frequencies that these times are achieved are only competitive for 13 of the settlements.
- 4.3 Table 4.2 shows a similar analysis for the Inches area of Inverness with 12 settlements currently having potentially competitive public transport options.

Table 4.2 – Travel Time Competitiveness to Inches by Settlement

Settlement	Ratio	Frequency Score
Alness	2.3	5.8
Ardersier	3.2	8.4
Auldearn	2.3	7.5
Avoch	2.9	7.1
Beauly	2.7	7.3
Cawdor	5.7	10
Conon Bridge	2.9	7.9
Contin	2.9	9.2
Cromarty	2.2	7.7
Croy	2.8	7.9
Culbokie	3.2	9.2
Dingwall	2.3	6.2
Dores	3.5	9.6
Drumnadrochit	1.9	8
Evanton	2.2	8.9
Fort Augustus	1.8	9.5
Fortrose and Rosemarkie	2.8	7
Inchmore	2.9	8.2
Invergordon	3.1	6.9
West Inverness	3.5	1.3
South Inverness	4.4	3
East Inverness	4.3	1.2
Kiltarlity	2.8	9.7
Kirkhill	2.7	7.7
Maryburgh	2.6	8.8
Muir of Ord	2.7	8.6
Munlochy	3.9	6.4
Nairn	1.9	4.8
North Kessock	3.5	4.2
Seaboard Villages	3.4	9.7
Strathpeffer	3.1	7.8
Tain	2.5	8.2
Tomatin	3.2	8.8
Tore	3.3	5.2
Tornagrain	3.3	5.6

- 4.4 Table 4.3 shows a similar analysis for the Inverness East area with 11 settlements currently having potentially competitive public transport options.

Table 4.3 – Travel Time Competitiveness to Inverness East by Settlement

Settlement	Ratio	Frequency Score
Alness	2.3	6
Ardersier	2.0	8.4
Auldearn	1.8	7.5
Avoch	2.9	7.1
Beaully	3.1	7.3
Cawdor	6.7	10
Conon Bridge	3.2	7.9
Contin	3.6	9.2
Cromarty	2.7	7.7
Croy	4.1	7.9
Culbokie	5.4	9.2
Dingwall	2.6	6.2
Dores	2.8	9.6
Drumnadrochit	2.0	8
Evanton	2.1	8.9
Fort Augustus	1.4	9.5
Fortrose and Rosemarkie	2.6	7
Inchmore	2.6	8.2
Invergordon	3.1	6.9
West Inverness	2.7	3.4
South Inverness	5.1	1.1
Central Inverness	2.0	1
Kiltarlity	2.6	9.7
Kirkhill	2.8	7.7
Maryburgh	2.4	8.8
Muir of Ord	2.5	8.6
Munlochy	3.4	7.9
Nairn	1.4	5.7
North Kessock	3.1	4.2
Seaboard Villages	3.8	9.7
Strathpeffer	2.5	7.8
Tain	3.1	8.2
Tomatin	2.9	8.8
Tore	3.3	5.2
Tornagrain	1.7	5.6

4.5 More specific and detailed criteria could be applied to all potential developments in the main settlements, growing settlements and economic development areas. These criteria could then be applied within development planning through conditions on development. These aspects are the topics for further working papers to further develop the travel time competitiveness approach.

5.0 Appendix A – Parameters

Table A1 – Weighting of Journey Times by Time and Purpose Segments

Earliest	Latest	Employment	Primary School	Secondary School	Further Education	GP	Hospital	Foodstore	Town Centres	
		<i>Outbound to destination</i>								
07:30	08:00	1	1	1	0.75	0.5	0.5	0.25	0.25	
08:00	08:30	1	1	1	0.75	0.5	0.5	0.25	0.25	
08:30	09:00	1	1	1	1	0.75	0.75	0.5	0.5	
09:00	09:30	1	1	1	1	0.75	0.75	0.75	0.75	
09:30	10:00	1	1	1	1	1	1	1	1	
10:00	10:30	0.75	0	0	1	1	1	1	1	
10:30	11:00	0.5	0	0	1	1	1	1	1	
11:00	11:30	0.25	0	0	0.75	0.75	0.75	0.75	0.75	
11:30	12:00	0.25	0	0	0.5	0.75	0.75	0.75	0.75	
12:00	12:30	0.25	0	0	0.5	0.75	0.75	0.75	0.75	
12:30	13:00	0.25	0	0	0.5	0.75	0.75	0.75	0.75	
13:00	13:30	0.25	0	0	0.5	0.75	0.75	0.75	0.75	
13:30	14:00	0.25	0	0	0.5	0.75	0.75	0.75	0.75	
14:00	14:30	0.25	0	0	0.5	1	1	0.75	0.75	
14:30	15:00	0.25	0	0	0.5	1	1	0.75	0.75	
15:00	15:30	0.25	0	0	0.5	0.75	0.75	0.75	0.75	
15:30	16:00	0.25	0	0	0.5	0.75	0.75	1	1	
16:00	16:30	0.25	0	0	0.5	0.75	0.75	1	1	
16:30	17:00	0.25	0	0	0.5	0.5	0.5	0.75	0.75	
17:00	17:30	0.25	0	0	0.5	0.5	0.5	0.75	0.75	
17:30	18:00	0.25	0	0	0.5	0.5	0.5	0.5	0.5	
18:00	18:30	0.25	0	0	0.75	0.5	0.5	0.5	0.5	
18:30	19:00	0.25	0	0	0.75	0.5	0.5	0.5	0.5	
		<i>Inbound from destination</i>								
07:30	08:00	0.25	0	0	0.5	0.5	0.5	0.25	0.25	
08:00	08:30	0.25	0	0	0.5	0.5	0.5	0.25	0.25	
08:30	09:00	0.25	0	0	0.5	0.5	0.5	0.5	0.5	
09:00	09:30	0.25	0	0	0.5	0.5	0.5	0.75	0.75	
09:30	10:00	0.25	0	0	0.5	0.75	0.75	0.75	0.75	
10:00	10:30	0.25	0	0	0.5	0.75	0.75	0.75	0.75	
10:30	11:00	0.25	0	0	0.5	1	1	1	1	
11:00	11:30	0.25	0	0	0.5	1	1	1	1	
11:30	12:00	0.25	0	0	0.5	1	1	1	1	
12:00	12:30	0.25	0	0	0.5	0.75	0.75	0.75	0.75	
12:30	13:00	0.25	0	0	0.5	0.75	0.75	0.75	0.75	
13:00	13:30	0.25	0	0	0.5	0.75	0.75	0.75	0.75	
13:30	14:00	0.25	0	0	0.5	0.75	0.75	0.75	0.75	
14:00	14:30	0.25	0	0	0.75	0.75	0.75	0.75	0.75	
14:30	15:00	0.25	1	1	0.75	0.75	0.75	0.75	0.75	
15:00	15:30	0.25	1	1	1	1	1	0.75	0.75	
15:30	16:00	0.5	1	1	1	1	1	0.75	0.75	
16:00	16:30	0.75	1	1	1	1	1	0.75	0.75	
16:30	17:00	1	1	1	1	0.75	0.75	1	1	
17:00	17:30	1	0.5	0.5	1	0.75	0.75	0.75	0.75	
17:30	18:00	1	0.25	0.25	1	0.75	0.75	0.75	0.75	

Inner Moray Firth Local Development Plan - Transport

		Employment	Primary School	Secondary School	Further Education	GP	Hospital	Foodstore	Town Centres
Earliest	Latest								
18:00	18:30	1	0	0	0.75	0.75	0.75	0.75	0.75
18:30	19:00	1	0	0	0.75	0.5	0.5	0.5	0.5

