12 Traffic and Transport

EIA Addendum Update

The proposed reduction of 22 accommodation units at Woodbank and deletion of Area 10 does not change the outcome of the original assessment which raised no significant traffic or transport issues. No changes have been made to this chapter.

12.1 Introduction

12.1.1 This EIAR chapter provides an assessment of the likely significant effects on the traffic, transport and access, arising from the Lomond Banks Planning Permission in Principle (PPiP) development proposal. It incorporates the findings of the Transport Assessment (TA).

12.1.2 The aims of this chapter are to:

- Identify the relevant context in which the TA has been undertaken;
- Describe the methods used to undertake the assessment;
- Outline the relevant baseline conditions currently existing at the site and surroundings;
- Identify the potential direct and indirect traffic and transport effects of the proposed development;
- Identify mitigation and enhancement measures where required to address identified effects;
- Assess residual predicted effects; and,
- Assess cumulative effects on the local and trunk road network from the proposed development in combination with other relevant cumulative developments.

12.2 Legislation, Policy Context and Guidance

Legislation

12.2.1 The overarching legislative framework applicable to this EIA for the proposed development is outlined in **Chapter 4 – Legislative and Planning Policy Context**.

Policy

12.2.2 The planning policy framework applicable to this EIA for the proposed development is outlined in **Chapter 4 – Legislative and Planning Policy Context**. Planning policy considerations of specific relevance to this assessment are:

- Scottish Planning Policy (SPP);
- A Catalyst for Change - The Regional Transport Strategy for the West of Scotland 2008-2021, Strathclyde Partnership for Transport (SPT);
- Loch Lomond & the Trossachs National Park (LLTNP) – Local Development Plan, 2017-2021; and,
- West Dunbartonshire Local Transport Strategy, 2013 – 2018.

12.2.3 Other policy considerations of relevance to this assessment are:

- Designing Streets, Scottish Government, 2010; and,
- Cycling by Design, Transport Scotland, 2021.

Guidance and Relevant Technical Standards

12.2.4 The following guidance and technical standards have informed this assessment:

- Transport Assessment Guidance 2012 – produced by Transport Scotland to guide the preparation of Transport Assessments for development proposals in Scotland, for which the planning and transport policy are contained within Scottish Planning Policy (SPP). The guidance provides an outline of the framework for delivering integration of transport and land use planning, including the requirements for a Transport Assessment, of development involved with significant travel generating uses; and,
- SCOTS National Roads Development Guide (NRDG) 2015 – produced by the Society for Chief Officers of Transport in Scotland, supported by Transport Scotland and Scottish Government Planning and Architecture Division. This document supports Designing Streets and expands on its principles to clarify the circumstances in which it can be used.

12.3 Study Methodology

Scope of Assessment

12.3.1 This chapter presents an assessment of likely significant effects on the local and trunk road network from the proposed development. The assessment presented has been prepared in accordance with the 2017 EIA Regulations.

12.3.2 The principal aspects considered within this assessment include:

- Changes in vehicle flows and usage patterns within the road network;
- Associated amenity and environmental effects, including:
  - Severance;
  - Driver delay;
  - Pedestrian and Cyclist Delay;
  - Pedestrian and Cyclist Amenity;
  - Fear and intimidation;
  - Driver delay; and,
  - Accidents and safety.

Overall Approach

12.3.3 In undertaking the assessment presented, the following activities have been carried out:

- EIA screening and scoping (see below);
- Scoping discussions and correspondence with West Dunbartonshire Council (WDC Roads Officers and Transport Scotland (TS);
- Desk-based review of available information including previous studies;
- A site-visit, walkover and cycle of the site and surrounding pedestrian, cycle and local road network;

- Traffic data collection;
- Evaluation of the baseline and baseline + development scenario traffic conditions;
- Production of a Transport Assessment (TA) for the proposed development; and,
- Identification and assessment of likely significant effects, taking into account proposed mitigation and enhancement measures and including consideration of likely cumulative effects.

12.3.4 The assessment has been informed by the EIA Screening and Scoping Report by Peter Brett Associates (now Stantec) in April 2017) and subsequent EIA Screening and Scoping Opinion issued by LLTNPA (May 2017) in respect of the EIA for the previously proposed development at Lomond Banks (application ref: 2018/0133/PPP).

12.3.5 The EIA Scoping Opinion indicated that WDC had requested that "*Parking for the development should conform to the appropriate standards set out in WDC Parking Standards*". Later scoping discussions in October 2017 requested a revision to this to accord with SCOTS NRDG parking standards. WDC have since updated their Parking Standards in October 2019. The proposed development has therefore been assessed against WDC's updated parking standards, with NRDG standards used where no standard for a certain use (hotels) is not provided in the Council's standards.

12.3.6 Consultation was also undertaken with ScotRail Abellio to agree in principle the mutual benefits of promoting access to the development site by rail. Whilst any interventions are still in early developmental stages, options for shared-ticketing, marketing and the need for future studies is being explored further.

12.3.7 Consultation was undertaken with respect to the Balloch Village Parking Proposals and, more specifically, the streetscape improvements proposed as part of the Station Square Proposals for Balloch Road. WDC has indicated that any future refinement of the streetscape proposals will be informed through collaborative working with the proposed developer, to develop a scheme which will meet the needs of WDC and the design requirements of the Zone A Station Square area of the development proposals. It is expected that this scheme will progress collaboratively between WDC, SUSTRANS and the developer.

Study Area

12.3.8 The study area in the TA is consistent with that set out in 'the EIA Screening and Scoping Report' and 'the EIA Scoping Opinion', with key junctions between the Drymen Road/A811 Stirling Road Priority junction to the east and the A82/A811 Stoneymollan Roundabout to the west, being identified and agreed for assessment with WDC and TS. These junctions, as listed below under "Extent of Assessment", are those junctions expected to experience an uplift in through traffic volumes as a result of the development.

Information Sources

Desk Top Study

12.3.9 The following sources were used within the Transport Assessment:

- Scottish Planning Policy (SPP);
- A Catalyst for Change - The Regional Transport Strategy for the West of Scotland 2008-2021, Strathclyde Partnership for Transport (SPT);
- Loch Lomond & the Trossachs National Park (LLTNP) – Local Development Plan, 2017-2021;
- West Dunbartonshire Local Transport Strategy, 2013 – 2018;
- Designing Streets, Scottish Government, 2010;
- Cycling by Design, Transport Scotland, 2021;

- Transport Assessment Guidance 2012;
- SCOTS National Roads Development Guide 2015 – produced by the Society for Chief Officers of Transport in Scotland, supported by Transport Scotland and Scottish Government Planning and Architecture Division. This document supports Designing Streets and expands on its principles to clarify the circumstances in which it can be used;
- www.crashmap.co.uk;
- TRICS V7.9.1 trip generation database;
- ARCADY Roundabout junction analysis software;
- PICADY Priority junction analysis software; and,
- STEP Scottish Trip End User Programme software application.

12.3.10 A desk top study was undertaken to inform the policy review of the TA, as well as gathering supporting information on existing public transport services and timetables for bus and rail services adjacent to the development site.

Fieldwork

12.3.11 Fieldwork was undertaken in the form of site visits by walking, cycling and private vehicles of the development site and surrounding local area. Traffic data was also collected to inform baseline traffic flows.

12.3.12 To determine the existing traffic conditions on the study network a series of Junction Turning Counts (JTCs) were undertaken over Thursday 7th September 2017 and Saturday 9th September 2017 at all junctions noted above. Traffic surveys were undertaken in accordance with an agreed survey specification.

12.3.13 To inform the TA and the noise and air quality assessment to support the Environmental Assessment, a seven-day Automatic Traffic Count (ATC) survey was also undertaken from Thursday 7th September 2017 to Wednesday 12th September 2017, inclusive to record existing traffic link flows, vehicle composition and traffic speeds.

12.3.14 Subsequently, traffic surveys of the following junctions within the study area were carried out again on Thursday 18th November and Saturday 20th November 2021 to assess the validity of the 2017 traffic survey results.

- A82 / A811 – Stoneymollan Roundabout; and,
- A811, Ben Lomond Way Roundabout.

12.3.15 The results of the 2021 surveys demonstrated that traffic flows were higher during 2017. It was therefore agreed with WDC to base the traffic, noise and air quality assessments on the 2017 traffic surveys to provide a robust assessment.

Approach to Assessment

Identification of Relevant Receptors

12.3.16 Scoping was undertaken with West Dunbartonshire Council (WDC) Road Officers and Transport Scotland (TS). Preliminary scoping was undertaken with WDC and TS during the preparatory stages of the Planning Application Notice (PAN) for the previous planning application, submitted in October 2017 for the previous proposals. As the development proposals have evolved to reflect land use constraints, more detailed Scoping was undertaken with both TS and WDC to confirm the assessment parameters of the TA.

12.3.17 The TA was prepared in accordance with the Scoping agreed with WDC Road Officers in October 2017 and again in October 2021 for the current development proposals and with TS in March 2018. As such, the following assessment parameters were established:

Extent of Assessment

12.3.18 The extent of the TA is defined by the following junctions:

- Ben Lomond Way/ Loch Lomond Shores Roundabout (internal);
- Ben Lomond Way, Old Luss Road, Balloch Road Roundabout;
- A811, Ben Lomond Way Roundabout;
- A82/ A811 Stoneymollan Roundabout;
- A811/ Carrochan Cres Roundabout;
- Pier Road/ Balloch Road Priority;
- Balloch Road/ Drymen Road/ Carrochan Road Priority; and,
- Drymen Road/ A811 Stirling Road Priority.

Year of Assessment

12.3.19 A year of opening assessment of 2030 was based on all development being operational in accordance with Transport Assessment Guidance 2012. Given the time between the traffic surveys carried out in 2017 and a year of assessment of 2030, a factor was applied to the 2017 surveys to reflect an increase in traffic over a period of 13 years.

Assessment Period

12.3.20 The assessment periods for the proposed development are:

- Weekday AM Network Peak (08:00-09:00);
- Weekday PM Network Peak (16:30-17:30); and,
- Weekend/ Saturday Network Peak (15:15-16:15).

Trip Generation

12.3.21 Trip generation has been based on the use of the TRICS V7.9.1 database for all proposed development land uses for both the weekday and weekend.

Trip Distribution

12.3.22 Development trips have been assigned to the network on the basis of the existing turning proportions of vehicles on the network. This was considered to be the most robust approach given the nature of trips associated with the existing activities at: Old Luss Road; Loch Lomond Shores; Pierhead; and the West Riverside car park (to become Zone A Station Square) and adjacent to WDC/ SUSTRANS planned Station Square Proposals.

Junction Analysis

12.3.23 Junction capacity assessments have been undertaken using industry standard software PICADY, for priority junctions and ARCADY, for roundabouts junctions.

12.3.24 Each junction included in the extent of assessment has been assessed during the Weekday AM and PM peak and Weekend (Saturday) peak under the following conditions: 2030 Baseline Traffic Flows; and 2030 Baseline + Proposed Development Traffic Flows.

12.3.25 The ARCADY and PICADY computer models can split the peak period under consideration into a series of 15-minute time segments in order to simulate the likely arrival pattern of traffic more effectively. Research indicates that the peak Ratio to Flow Capacity (RFC) values returned in any individual peak (i.e. the peak capacity and corresponding queue results) are likely to be observed over the central 15-30 minute period for the hour.

12.3.26 RFC values between 0.00 and 0.85 are generally accepted as representing stable operating conditions, values between 0.85 and unity represent variable operation (i.e. possible queues building up at the junction during the period under consideration and increases in vehicle delay moving through the junction). RFC values in excess of unity represent possible congested conditions.

Assessment Methodology Guidance

12.3.27 The assessment of the likely significant transport effects has been undertaken using established methodologies and has concentrated on examining the capacity of relevant local transport infrastructure to accommodate the proposed development. It has been undertaken in accordance with the guidance set out within the Institute of Environmental Assessment (IEA) document 'Guidelines on the Environmental Assessment of Road Traffic (Guidance Note 1)', 1993.

12.3.28 In line with IEA guidelines, further assessment will be undertaken on:

- Road links where traffic flows will increase by more than 30% (or the number of HGVs will increase by more than 30%); and,
- Any specifically sensitive areas where the traffic flows have increased by 10% or more.

12.3.29 Any non-road based transport infrastructure (e.g. national cycle roads) where likely effects from the proposed development have the potential to be significant.

Effect on Pedestrians

Severance

12.3.30 Severance is defined as the perceived division that can occur within a community when it becomes separated by a major traffic artery and describes a complex series of factors that separate people from places and other people. Such division may result from the difficulty of crossing a heavily trafficked road or a physical barrier created by the road itself.

Pedestrian & Cyclist Delay

12.3.31 The IEMA guideline note that changes in the volume, composition and or speed of traffic may affect the ability of pedestrians and cyclists to cross the roads. Typically, this increase in traffic levels result in increased pedestrian and/ or cyclist delay, although increased pedestrian and cycle activity also contributes. The guidelines do not set any thresholds, recommending instead that assessors use their judgement to determine the significance of effect.

Pedestrian & Cyclist Amenity

12.3.32 Pedestrian and cyclist amenity is defined as the relative pleasantness of a journey which, as with pedestrian and cyclist delay, is affected by traffic volumes and composition along with foot and cycle way width and pedestrian and cyclist activity. The guidelines suggest tentative thresholds of significance would be where the traffic flows are doubled or halved.

Fear and Intimidation

12.3.33 The IEMA guidelines note that a further effect of traffic may have on pedestrians is fear and intimidation, the impact of which is dependent on volumes of heavy vehicular traffic, its proximity to people or a lack of protection caused by such factors as narrow pavements.

Effect on Road Users

Driver Delay

12.3.34 The IEMA guidelines note that driver delay to non-development traffic can occur at several points on the network, although the effects are only likely to be significant when the traffic on the road network is predicted to be at or close to the capacity of the system: typically during commuter periods. Values for delay are determined through ARCADY, PICADY and LINSIG junction modelling software to obtain detailed output on a range of traffic parameters including flows and average delay.

Accidents and Safety

12.3.35 IEMA guidelines do not include any definition in relation to accidents and safety, suggesting that professional judgement would be needed to assess the implications of local circumstances, or factors which may increase or decrease the risk of accidents.

Assumptions and Limitations

12.3.36 The limitations of the TA methodology are:

- Trip generation rates have been taken for proposed development land uses operating as individual entities, and do not account for shared trips either between the existing and proposed land uses or the newly proposed land uses. Trip-sharing will occur and so the TA is robust in traffic impact terms, but may overestimate the effects on receptors;

- The full extent of development traffic trips has been assessed in a 2030 scenario and, as such, represents a worst-case assessment scenario. A future operational year of assessment could be anticipated to have higher baseline flows, against which the % impact of development traffic trips would be lessened. As above, this adds to the robustness of the TA in traffic impact terms, but may overestimate on receptors; and,

- The TA assumes a routing strategy for all development traffic trips which is based on the principles of making best use of the road hierarchy and seeking to minimise through-traffic trips in the village of Balloch. Whilst the external network routing is likely to be applicable in the future, the internal network and routing strategy may change in the future to account for refinement of the proposed parking locations and an associated internal access strategy. As such, this assessment may over or under-estimate the effects on receptors on internal/ access routes to the site.

Establishment of Effect Significance

12.3.37 Potential and residual effects will be defined in accordance with **Table 12-1**.

Table 12-1: Nature of Effects

Nature	Description
Beneficial	Meaning that they are expected to produce environmental benefits in transportation terms, i.e. where overall traffic flows or percentage HGV movements decrease, or there are improved facilities for pedestrians, cyclists or public transport users.
Negligible	Meaning that expected changes are too small to meaningfully measure, i.e. where changes in flows are typically less than 10%.
Adverse	Meaning that they are expected to produce environmental disbenefits in transportation terms, e.g. where overall traffic flows or percentage HGV movements increase, or there are reductions in facilities for pedestrians, cyclists or public transport users.

12.3.38 Beneficial and adverse effects will be further characterised in accordance with **Table 12-2**.

Table 12-2: Magnitude of Effects

Magnitude	Description
Minor	Slight very short or highly localised changes of no significance and/or where changes in traffic flows/patterns are between 10% and 30%.
Moderate	Limited change by extent, duration or magnitude which may be considered significant and/or where changes in traffic flows/patterns are between 30% and 60%.
Major	Considerable change by extent, duration or magnitude of more than local significance or in breach of recognised acceptability, legislation, policy or

Magnitude	Description
	standards, and/or where changes in traffic flows/patterns are greater than 60%.

12.3.39 Where predicted increases in traffic flows are lower than the percentage based thresholds, the IEMA guidelines suggest that the significance of effects can be stated to be low or insignificant and further detailed assessments are not required.

Approach to Cumulative Impact Assessment

12.3.40 A separate cumulative assessment is not being provided for traffic, transport and access due to agreement with WDC Road Officers that committed development flows were not required for the TA.

12.4 Baseline Conditions

Pedestrian Facilities

12.4.1 The proposed development site is accessible by foot along the existing main vehicular access routes to the site, as well as the NCN 7 towpath along the western side of the River Leven and west bank of the site, dedicated pedestrian routes through Lomond Shores and the footways and links to the John Muir Way. This section considers the following routes:

- Pier Road;
- Ben Lomond Way;
- Lomond Shores Internal Routes;
- Old Luss Road; and,
- John Muir Way.

Pier Road

12.4.2 Pier Road is an un-adopted private road providing primarily vehicle access to the Pierhead area (northern extents) of the proposed development site, where there is an operational slipway into Loch Lomond. As such, this route provides for functional access to the slipway and associated activities and, whilst a relatively direct route from Balloch into the site, the lack of footways on the route combined with dense brush and tree cover, is such that it has limited function as a walking route due to perceived safety and security issues. There is no lighting provided on this route, with the exception of the southerly extents adjacent to a handful of residential properties and the interface with Balloch Road.

Ben Lomond Way

12.4.3 Ben Lomond Way is the main vehicular access route into the Lomond Shores site from the western extents of the West Riverside component of the site. It provides an “Avenue-esque” connection from Balloch Road into Lomond Shores, as a function of strong landscaping defined by Beech hedges and a tree-lined, remote pedestrian route into Drumkinnon Woods and further north into the immediate Lomond Shores site. This is a well-lit, circa 2m wide pedestrian route and is favoured by many local people accessing the site and/ or the network of informal woodland trails through Drumkinnon Woods. This route links continuously with footways on Balloch Road and, whilst there are no controlled pedestrian crossing points, there is a dedicated, dropped-kerb with tactile paving to the east of Ben Lomond Roundabout. Further, there is a dedicated crossing location on Ben Lomond Way itself, just north of Ben Lomond Roundabout, providing continuous pedestrian access to Old Luss Road (north and south).

Loch Lomond Shores Internal Routes

12.4.4 Much of the Lomond Shores site is pedestrianised and facilitates movements on foot for all nature of users through large areas of the site. The main pedestrianised areas, remote from

vehicular routes, include: around the “bay” and beached area to the west of the Pierhead area; to the rear and frontage of the commercial units; the route which skirts the north-western boundary of the car park and connects to Old Luss Road to the west; and a network of raised board-walk paths through woodland to the north of the Lomond Shores main area.

12.4.5 Notwithstanding the board-walk paths, the main pedestrianised areas are generally wide and well surfaced and capable of accommodating a reasonable volume of two-way pedestrian flow. These are also well lit. At a minimum, for example to the rear of the retail units, the footway is circa 2m wide.

12.4.6 The board-walk paths through the woodlands to the north of the site are raised walk way of circa 2m wide and textured to avoid slipping hazards. Some of the routing is tight and angular but provide reasonable opportunity for passing.

12.4.7 Ben Lomond Way – internal to the Lomond Shores area – provides a continuous 2m footway along the southern side of the road, connecting the Ben Lomond Way/ Lomond Shores access roundabout with the Pierhead area of the site, and Pier Road. The route is lit on the northern side, where there is no continuous footway, albeit sections of the route are paved on the north side to facilitate access into the main pedestrianised area from a coach drop off area and a layby for disabled-users drop-off. CCTV security cameras are located on the route and orientated on the link into the main pedestrianised area of Lomond Shores and the service access area.

12.4.8 A dedicated, pedestrian crossing with barriers on the approach to the carriageway, is located to the south west of the commercial units, to allow onward connection to Drumkinnon Woods and the main entrance footway in to the site, on Ben Lomond Way.

Old Luss Road

12.4.9 Old Luss Road is located to the east of the Woodbank House site and to the south of the Lomond Shores area. Access from Lomond Shores to Old Luss Road is provided by the internal remote pedestrian footway to the north of the Lomond Shores car park: wooden bollards prevent vehicle access from Old Luss Road. Old Luss Road provides for onward pedestrian connections to the west towards the more rural Upper Stoneymollan and John Muir Way and, to the east, the suggested cycling section for the John Muir way.

12.4.10 The low volumes of traffic on the route, as a result of a “no-through-route” to vehicles to the north, gives rise to the route being used as a pedestrian link between Balloch and Cameron House and Duck Bay Marina to the north. A continuous footway is provided on the eastern side of the road, albeit foliage growth and lack of maintenance, is such that this largely overgrown and rough underfoot. This is not noted to be a deterrent to pedestrians who continue to make use of the relatively wide and reasonably surfaced carriageway, for walking (and cycling). There is no street lighting along the section of route between the Lomond Shores site and where the carriageway terminates to the north.

12.4.11 The southern extents of Old Luss Road provide reasonable quality, circa 2m wide and lit footways connecting to Ben Lomond Road Roundabout and Ben Lomond Way on the east. Lighting is more extensive on the east side of Old Luss Road, but with some lighting provision on the west side at the more southerly extents of the road.

John Muir Way

12.4.12 The John Muir Way is a coast to coast predominantly rural route and core path for walkers (and cyclists) which stretches 134 miles between Helensburgh in the west, through to Dunbar on the east coast of Scotland. The route is divided into 10 sections, with the Helensburgh to Balloch and Balloch to Strathblane sections, being of relevance to the proposed development site.

12.4.13 The John Muir Way comes into the proposed development site’s area of influence, via Upper Stoneymollan, over the A82 footbridge and linking to a single-track access road which skirts the southern boundary of the Woodbank House site. At the interface of this route with Old Luss Road, walkers are signed north towards the pedestrian link from Old Luss Road in to the Lomond Shores site. Thereafter, the route follows the internal pedestrian routes of Lomond Shores towards the west bank of the River Leven and follows this route south to Balloch Bridge. From here the route enters Balloch Castle Country Park on the east bank of the River Leven and meanders north and eastwards through Boturich, intercepts the A811 Stirling Road, and on towards Auchencarroch Road (providing connections to Gartocharn, Croftamie and Drymen).

Cycling Facilities

NCN Route 7

12.4.14 National Cycle Network (NCN) Route 7 links Sunderland in England to Inverness in the north. The 601mile route in its entirety forms part of the wider Lochs & Glens (north) cycle route which passes through two national parks - Loch Lomond & The Trossachs and Cairngorms. The route leaves Glasgow by following the River Clyde to Dumbarton and then heads to Inverness via Aberfoyle, Callander, Killin, Pitlochry, Kingussie, Aviemore and Carrbridge.

12.4.15 In relation to the proposed development side, NCN Route 7 follows the west bank of the River Leven and approaches the proposed development site from the south, via Sweeney's Cruises adjacent to Balloch Bridge. There is a main dedicated path – shared with walkers – but an alternative meandering unsurfaced route, which takes cyclists adjacent to the west river bank, through trees and scrub. This links directly to the Pierhead area and onwards to Loch Lomond Shores main.

West Loch Lomond Cycle Way

12.4.16 The West Loch Lomond Cycle Way starts at the Visit Scotland Visitor Centre in Balloch, adjacent to Balloch Bridge and Sweeney's Loch Cruises. It's an "easy" waymarked route suitable for most abilities of cyclist and follows part of the John Muir Way, along the west river bank of the proposed development site area. From the Pierhead area, cyclists are directed through the off-road shared pedestrian routes through Lomond Shores and west wards to Old Luss Road via the wide remote foot and cycleway to the north of the car park. From Old Luss Road, cyclists are directed along a route which skirts Loch Lomond side and, from Arden roundabout can continue adjacent to the A82 (off-road) or through an alternative route through the Carrick Golf Course. A short on-road section through the former Luss access road, takes cyclists through to Luss, thereafter, the route remains off-road as far north as Tarbet.

General Cycle Network

12.4.17 There are no other dedicated off-road cycle routes within the local urban area. Given the nature of the location and relatively low number of pedestrians, most routes highlighted above for the pedestrian environment will be used by both walkers and cyclists, with mutual acceptance of users on both parts. On-road cycle routes are limited, noting that the approach to the pedestrian crossing facility on Ben Lomond Way, appears to dedicate both lanes of the carriageway, to cycle priority. This is not noted elsewhere in the area and is therefore assumed to have been provided on the basis of this section of route being provided primarily for service vehicle access (and, potentially, relatively lower levels of vehicles). There is no continuum of this route noted elsewhere on the local network.

12.4.18 In the wider locality, including John Muir Way to the west and off-road routes through Whinny Hill Woods and Boturich to the east, routes are generally used by both walkers and cyclists – particularly, local mountain bikers and leisure cyclists.

12.4.19 Cyclists are able to use the recommended walking route for the John Muir Way as described above, however, an alternative cycling section is suggested on the Section 1 route maps which follows the NCN Route 7 trail. This remains an off-road section and directs cyclists towards the Cross Keys roundabout on the B832, and then east to Arden Roundabout (A82). Here the route links with a shared foot and cycle way, which skirts the A82, the west bank of Loch Lomond and continues south to link with Old Luss Road. From here, cyclists and walkers, can tie back into the dedicated route at Lomond Shores and continue west and south.

Public Transport

Balloch Railway Station

12.4.20 Balloch railway station is located approximately 100 metres to the south of the proposed development on Tullichewan Road. The station can be accessed via the established footpaths in the surrounding area. Sheltered cycle storage is available with 22 bicycle parking spaces. On-street parking is available from Tullichewan Road.

12.4.21 Train services run half hourly on Monday to Saturday from Balloch to Airdrie via Singer and Glasgow Queen Street. Sunday services run via Yoker and Glasgow Central and then alternately to Motherwell via Whifflet and to Larkhall on an hourly basis.

12.4.22 **Table 12-3** provides a summary of existing train services at Balloch Rail Station.

Table 12-3: Train Services Summary

Service	Destination	Journey Time (Minutes)	Frequency (Services Per Hour)
Monday to Saturday	Glasgow Queen Street	47	2
Monday to Saturday	Airdrie via Glasgow Queen Street	79	2
Sunday	Glasgow Central	46	2
Sunday	Larkhall	85	1
Sunday	Motherwell via Glasgow Central	83	1

Bus Services

12.4.23 Bus stops are located on both sides of Balloch Road adjacent to the proposed southern site boundary. Bus stops are serviced by the number 1/1A//1E bus services (First Greater Glasgow), which travels between Balloch and Glasgow, with 1A via Vale of Levien Hospital and 1E via Clydebank. Service 206 (First Greater Bus) runs from Haldane to Westcliff, via Balloch.

12.4.24 The 207, 305, 306 and 309 bus services (Garelochhead Coaches) also run from Balloch. The number 207 provides a circular service between Balloch and Alexandria. The 305, 306 and 309 bus services to Balloch to Alexandria, via Luss, Helensburgh and Balmaha respectively.

Table 12-4: Bus Services Summary

Service	Operator	Route	Nearest Bus Stop	Journey Time	Service
1/1A/1E	First Greater Glasgow	Balloch – Glasgow City Centre	Balloch Bus Terminus	85 to 99	4
206	First Glasgow	Balloch - Westcliff	Balloch Bus Terminus	46	4
207*	Garelochhead Coaches	Alexandria Circular	Loch Lomond Shores	49	1
305*	Garelochhead Coaches	Alexandria - Luss	Loch Lomond Shores	8	<1
		Luss - Alexandria	Loch Lomond Shores	16	<1
306*	Garelochhead Coaches	Alexandria - Helensburgh	Balloch Bus Terminus	9	<1
		Helensburgh - Alexandria	Balloch Bus Terminus	17	<1
309*	Garelochhead Coaches	Alexandria - Balmaha	Balloch Bus Terminus	21	<1
		Balmaha - Alexandria	Balloch Bus Terminus	13	<1

12.4.25 * From Sunday 17 July 2022., McColl's Travel Ltd will operate these services on behalf of Strathclyde Passenger Transport.

Vehicular Access

12.4.26 This section outlines the strategic and local vehicular access routes to the site. They include:

A82 Trunk Road

12.4.27 The A82 runs north – south and is one of two trunk roads through the National Park which is managed by Transport Scotland and therefore is one of the main access routes to the site. It provides access from the centre of Glasgow to Inverness via Fort William. For the most part, this route has a 60mph speed limit. In addition, there are proposals in place to upgrade the section between Tarbet and Inverarnan which aims to reduce congestion and improve traffic

flows. The National Park states that travel from central Glasgow would take approximately 40 minutes using the A82.

A811 Stirling Road

12.4.28 In addition to the A82, this trunk road provides key access through the National Park. It links Stirling in the east to the A82 in the west at Balloch, via Drymen. As a result, it provides a connection north to Perth, Dundee and Aberdeen. Generally, the speed limit is 60mph. The National Park notes that car journeys from Stirling are approximately 50 minutes using this route.

B857 (Renton Road / Bank Street / North Main Street / Luss Road)

12.4.29 The B857 connects the A82 in the south to the A811 Stirling Road in the north, running through Renton, Alexandria and Balloch parallel to the A82 and A813. As a result of its built-up surroundings, the B857 has a speed limit of 30 mph with 20mph speed limits in place adjacent to main school routes.

Carrochan Road (A813)

12.4.30 The A813 links the A82, north of Dumbarton at Bellsmyre, to Drymen Road in Balloch crossing the A811. It runs north – south on the east side of the River Leven, parallel to the A82 and B857. The speed limit on this route is predominantly 40mph speed limit, with sections of 30mph in built-up areas.

Balloch Road / Drymen Road

12.4.31 This road runs east – west, parallel to the A811 Stirling Road, through Balloch from A811 Stirling Road in the east to the roundabout with Old Luss Road / Ben Lomond Way in the west, crossing River Leven. It has a speed limit of 30mph.

Ben Lomond Way

12.4.32 This route provides access to the Loch Lomond Shores site from the northern arm of the roundabout with Old Luss Road / Ben Lomond Way and has a speed limit of 30mph. It runs north west from the roundabout to an internal roundabout at Loch Lomond Shores which provides access to the main car parks, before running north east towards Balloch Pier.

Pier Road

12.4.33 This is a private adopted road which runs northwards from Balloch Road to Ben Lomond Way. Signage at the Balloch Road junction states that, due to its private status, “Vehicles using this road do so at their own risk”.

Existing Traffic Flows

12.4.34 **Table 12-5** below provides a summary of the observed 2017 and estimated 2030 Base Flows for the local and strategic road network. A National Road Traffic Forecast (NRTF) factor has been applied to the 2017 Base Flow to estimate the 2030 Base Traffic Flows.

Table 12-5: 2017/ 2030 AADT Base Flows

Location	Two-Way Flows (All Vehicles)		HGV’s	
	2017	2030	2017	2030
A811 (East of Stoneymollan Roundabout)	16,542	18,808	9%	9%
Old Luss Road (South)	9,375	10,660	7%	7%
Ben Lomond Way	2,661	3,025	10%	10%
Balloch Road (South)	4,958	5,637	8%	8%
Pier Road	292	332	10%	10%
Balloch Road (Balloch Bridge)	4,070	4,628	23%	23%

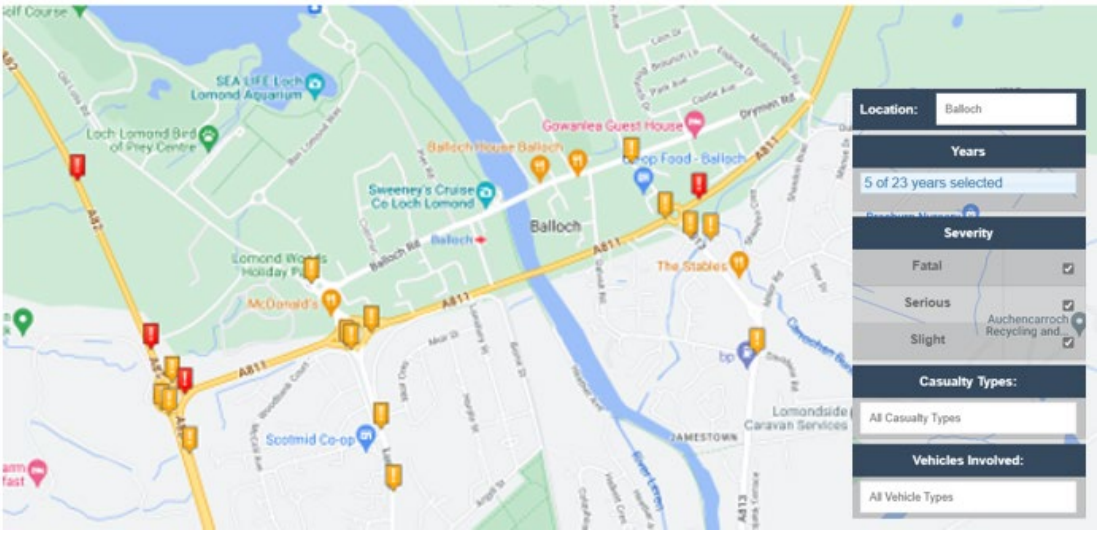
Location	Two-Way Flows (All Vehicles)		HGV's	
	2017	2030	2017	2030
Stirling Road (A811)	6,009	6,833	19%	19%
A813 Carrochan Road (South)	8,079	9,186	7%	7%
A811 (Lomond Bridge)	12,777	14,527	9%	9%
Luss Road	12,427	14,130	9%	9%
A82 (North of Stoneymollan Roundabout)	20,090	22,842	12%	12%
Old Luss Road (North)	242	275	13%	13%

12.4.35 The development site and its proposed access routes are integral to the existing commercial, retail and leisure development at Loch Lomond Shores, as well as access to the Loch Lomond (Pierhead) slipway and Maid of the Loch.

Existing Accident Data

12.4.36 Crashmap data was interrogated to provide a 5-year summary of the accident history on the local and strategic road network, within the scope of the proposed development site. The 5-year period is from 2017 to 2021, which covers the most recent data available.

Figure 12-1: Crashmap Data



12.4.37 **Figure 12-1** above, indicates that the five year accident data demonstrates a spread of slight and serious accidents on the local road network, which can be disaggregated to the following receptors as:

- Old Luss Road (South) – no reported incidents;
- Ben Lomond Way – no reported incidents;
- Balloch Road (South) – no reported incidents;
- Pier Road – no reported incidents;
- Balloch Road (Balloch Bridge) – no reported incidents;
- Stirling Road (A811) – one serious incident on approach to the Lomond Road Roundabout;

- A813 Carrochan Road (South) – no reported incidents on A813 Carrochan Road, but one slight incident within close proximity to existing residential access points and the A813 Carrochan Road/ A811 Stirling Road;
- A811 (Lomond Bridge) - two slight accidents are dispersed over this link, which suggest driver behaviour/ error as opposed to locational characteristics and constraints are an issue;
- Luss Road - two slight incidents reported along this section;
- A82 (North of Stoneymollan) – two serious incidents reported on the approach from the north to the Stoneymollan Roundabout, albeit more remotely. This section of route is notorious for queuing and delay as a result of exceptionally heavy traffic volumes, which may have contributed to the incidents and propensity for occurrence in this location; and,
- Old Luss Road (North) – one slight injury on approach to Ben Lomond Way roundabout.

12.4.38 Notwithstanding the noted incidents for the links above, the A82 Stoneymollan Roundabout – all approaches and circulatory, and Lomond Road Roundabout (A811/ Old Luss Road (South)) particularly on the A811 and Old Luss Road (South) approaches/ exits, all have a higher incidence of slight accidents. These are likely attributed to higher circulatory speeds, driver error and the higher volume of traffic on these links and junctions generally. The area is also expected to experience a higher prevalence of visitors to the area, who are less familiar with the network and routing/ destination points which may be a contributory factor.

Water-Based Transport

12.4.39 The Waterbus service operates on Loch Lomond and Loch Katrine, offering seven services which are used by cyclists and walkers. The Park offers this as a sustainable alternative to the car which can enhance the visitor experience. There is potential to develop upon the success of the Waterbus with the opportunity to enhance integration as part of a wider tourism and/ or access strategy.

12.4.40 Loch Lomond services offer alternative connections between Balloch, Luss, Balmaha and Tarbet amongst others. Generally, these run between April and October, although seasonality varies between services.

Summary of Receptor Sensitivity

12.4.41 The sensitivity of receptors has been defined as follows:

- Low – receptors which are lightly used (by all users or particularly by vulnerable road users) relative to other receptors within the study area;
- Medium – receptors which are used (by all users or particularly by vulnerable road users) to a roughly average level relative to other receptors within the study area; and,
- High – receptors which are heavily used (by all users or particularly by vulnerable road users) relative to other receptors within the study area.

12.4.42 Significance criteria are determined through referencing magnitude of change with sensitivity of receptors. The significance of traffic change varies depending upon the environmental impact criteria being considered.

12.4.43 The receptors considered in this assessment include those people making journeys within the relevant study area (or links) for each mode, and include those travelling by that mode, or travelling by other modes affected by the mode in question, on the following links:

- Old Luss Road (South) – medium sensitivity for all users;
- Ben Lomond Way – low sensitivity for all users;
- Balloch Road (South) – low sensitivity for all users;

- Pier Road – low sensitivity for all users;
- Balloch Road (Balloch Bridge) – low sensitivity for all users;
- Stirling Road (A811) – low sensitivity for all users;
- A813 Carrochan Road (South) – low sensitivity for all users;
- A811 (Lomond Bridge) – low sensitivity for all users;
- Luss Road – medium sensitivity for all users;
- A82 (North of Stoneymollan) – low sensitivity for all users; and,
- Old Luss Road (North) – low sensitivity for all users.

Baseline Evolution

12.4.44 Baseline traffic, transport and access conditions at the development site are expected to remain as per the existing situation, without the development proposals. The development site is integral to a wider existing commercial, retail and leisure development, which is anticipated to operate as per the status quo, without development intervention.

12.5 Embedded Mitigation

12.5.1 As detailed in **Chapter 2 – Site and Proposed Development**, a number of design features and embedded mitigation measures have been incorporated into the design and construction of the proposed development to avoid, prevent or minimise significant adverse environmental effects and to enhance beneficial effects. Embedded mitigation measures of relevance to this assessment are:

Construction Phase

12.5.2 The embedded mitigation measures incorporated within the proposed development are as follows:

Construction Environmental Management Plan (CEMP):

- Development and implementation of measures relating to: construction traffic routing, site access/deliveries, parking, contractor management, parking, fuels and materials storage, standard dust and noise suppression techniques and standard pollution presentation and control techniques. These measures will be set out within a Construction Environmental Management Plan (CEMP). Any other measures to be included in the CEMP would be identified as 'further mitigation' (not embedded) through the EIA;
- Any construction activities within a 5m strip along waterfronts will be subject to specific consideration within a CEMP to be agreed with the NPA prior to commencement; and,
- Adoption of standard construction industry working hours for noise generating activities.

Operational Phase

12.5.3 The embedded mitigation measures incorporated within the proposed development are as follows:

Design & Form-Based Mitigation

- It is intended that the proposed development will be fully accessible by sustainable modes of transport. The existing pedestrian and cycle network as it exists through the West Riverside site will be retained and enhanced as necessary to provide full connectivity to the wider network as well as all new internal elements of the site. The site will benefit from increased uptake of sustainable modes over the use of the private car, and it is anticipated that walking and cycling will be the go-to-mode of choice for those visitors using the

woodland lodges and overnight accommodation: by leaving their cars remote from the lodges, it is hoped this will reduce any unnecessary internal car trips;

- Bike hire is proposed as part of the Station Square and enhanced Tourist Information Office offering, which will further support internal movements by bike;
- Whilst the internal layout requires to be developed further as part of subsequent detailed design stages, it is intended that the existing cycle and walking routes will be widened to SUSTRANS standards for shared walking and cycling routes, where this is practicable to do so;
- Throughout the Station Square, Riverfront and Drumkinnon areas, the existing path network including the John Muir Way will be retained and enhanced as appropriate, albeit some relocating of certain sections may be required. It is expected that discussions will be held with SUSTRANS when the detail of these routes is considered. The existing north-south foot and cycle paths through the Riverfront Zone, will be enhanced with a series of east-west paths increasing access opportunities between Pier Road and the Riverfront area;
- The existing foot and cycle way from Loch Lomond Shores to Old Luss Road will be extended to provide a shared foot and cycle way, compliant with technical standards, on the north (development) side of the road, providing a direct walking and cycling link between the two sites;
- From the Woodbank House site, which is intended to be configured in accordance with Designing Streets Principles and will provide a continuous internal path network, a direct foot and cycle link will be provided to the Upper Stoneymollan Road/ John Muir Way; and,
- A signage and wayfinding strategy will be developed for the wider site once clarification on the preferred parking locations for site-based activities and land uses are confirmed. It is expected that a combination of enhanced signage and Variable Message Signing (VMS) will need to be installed at key approaches to the site from both the strategic and local road network, as well as internally within the site, to ensure effective vehicular movement for internal destinations and appropriate directions to the relevant car parking areas.

12.6 Potential Likely Effects

12.6.1 This section describes the potential effects associated with the development proposals in relation to construction and operational traffic.

Construction Phase

12.6.2 The transport, traffic and access impacts arising as a result of the proposed development are considered to be negligible as a result of incorporating the CEMP embedded mitigation. Moreover, the development will be built-out in discrete phases such that individual sections of the site will be subject to the effects of construction traffic at any one time. The scale of the effect of the development is minor negligible.

Operational Phase

12.6.3 Table 12-6 below includes a summary of the potential number of vehicular trips associated with the completed development proposals during a based on the trip rates described in detail in the Transport Assessment.

12.6.4 The flows represent the number of external trips generated by the site and do not include any reductions for internal trips i.e. trips shared between different land uses and working and living within the site.

Table 12-6: Estimated Number of Two-Way External Development Daily Trips

Development	Two-Way Daily Vehicular Flows	
	Weekday	Weekend
West Riverside & Woodbank House	1,433	1,958

12.6.5 **Table 12-7** below provides a summary of the potential changes in traffic on the local road network once the proposed development is fully operational.

Table 12-7: 2030 AADT With Development Flows

Location	Two-Way Flows (All Vehicles)	HGVs	% Change Over 2030 Base
A811 (East of Stoneymollan Roundabout)	19,841	9.4%	5%
Old Luss Road (South)	12,060	5.6%	13%
Ben Lomond Way	4,038	7.7%	33%
Balloch Road (South)	6,239	7.2%	11%
Pier Road	427	8.3%	29%
Balloch Road (Balloch Bridge)	5,268	21.3%	14%
Stirling Road (A811)	7,002	17.4%	2%
A813 Carrochan Road (South)	9,341	7.2%	2%
A811 (Lomond Bridge)	14,640	9.5%	1%
Luss Road	14,353	8.6%	2%
A82 (North of Stoneymollan Roundabout)	23,336	11.6%	2%
Old Luss Road (North)	506	13.5%	84%

12.6.6 Noting the % change in traffic from the baseline 2030 to the baseline with development flows and in accordance with the IEA guidelines, the following links will not be subject to further assessment:

- A811 (East of Stoneymollan Roundabout;
- Stirling Road (A811);
- A813 Carrochan Road (South);
- A811 (Lomond Bridge);
- Luss Road; and,
- A82 (North of Stoneymollan Roundabout).

12.6.7 The impacts on the roads listed above are less than 10% and, as such, traffic flow impacts are considered negligible. The scale of the effect of the development on the above links is minor negligible.

12.6.8 Old Luss Road (South) will experience an uplift in AADT flows by 13% as a result of the development traffic, but this remains less than the IEA guidelines requirement of a 30% increase

in traffic warranting further assessment. As such, this route will not be considered further. The scale of the effect of the development is minor adverse.

12.6.9 Noting the % change in traffic from the baseline 2030 to the baseline with development flows and in accordance with the IEA guidelines, the following links will be subject to further assessment:

- Ben Lomond Way; and,
- Old Luss Road (North).

Effect on Pedestrians and Cyclists

12.6.10 Ben Lomond Way and Old Luss Road (North) constitute the two main access routes into the site with an increase of traffic over 30%.

12.6.11 Old Luss Road (North) experiences an 84% uplift in traffic flow as a result of the development, but the existing nature of the road as a quiet, predominantly residential/ rural no-through-route, is such that the increase in flows are noted as a moderate adverse effect. The % impact is considered moderate, despite the modest levels of development that will be accessed from Old Luss Road. At present, whilst the section of Old Luss Road (north beyond the existing Loch Lomond Shores pedestrian access) is used for walking to Cameron House, Duck Bay and beyond, the area fronting the development site is not particularly conducive to walking and cycling as a result of poor lighting and lack of appropriate footways on either side of the carriageway. The development includes for provision of enhanced lighting, a connection will be provided between Loch Lomond Shores to Old Luss Road to provide a shared foot and cycle way, compliant with technical standards, on the north (development) side of the road, providing a direct walking and cycling link between the two sites and onwards to Balloch. Further, a connection will be provided within the Woodbank House site to the Upper Stoneymollan Road/ John Muir Way, thereby enhancing the environment overall for pedestrians and cyclists. Increased ambient surveillance in the area as a result of additional residential properties, lends itself to improving actual and perceived personal security for walkers and cyclists. The scale of the effect of the development is moderate beneficial.

12.6.12 Ben Lomond Way is the existing main access to the existing Loch Lomond Shores and provides the most appropriate direct access route into the proposed development site, both in terms of its proximity and ready access to the wider local and strategic road network, as well as its current form with a remote pedestrian and cycle path to the east. Ben Lomond Way experiences an 33% uplift in traffic flow as a result of the development proposals which will see the AADT traffic flow rise from 3,025 to 4,038 on the road in 2030. This is considered to pose a major adverse effect in terms of traffic flow, albeit this is a preferential position to potentially higher vehicle flows on Balloch Road (South) which has frontage residential properties and is a gateway route into Balloch main village from the west.

12.6.13 The existing pedestrian environment immediately adjacent to Ben Lomond Way is considered to be of a reasonable standard and, in terms of pedestrian amenity, the existing foot and cycle way is remote from the carriageway with a tree-lined avenue-type environment. As such, other road users are largely removed from the immediate road network and the environment is likely to remain relatively pleasant for walkers and cyclists. In addition, there are a number of pedestrian crossing routes approaching Ben Lomond Way, for which a number of access options or routing variations is possible. Given the limited need to cross Ben Lomond Way, largely as a function of no attractors on the west side of the carriageway, the existing pedestrian environment is expected to prevail with limited effects on severance, fear and intimidation and pedestrian amenity. A crossing point exists on the southern end of Ben Lomond Way and the Queen of the Loch pub/ restaurant, for which it is expected some severance and fear and intimidation impacts could be felt. Vehicle speeds are generally low in this area and will remain the case, if not lessened, by increased traffic volumes. It is suggested that pedestrian movements will require to be monitored incrementally as the development builds out in phases, to ascertain the trigger point for enhanced pedestrian crossing infrastructure. The scale of the effect of the development is minor adverse.

Effect on Road Users

12.6.14 Delay to drivers can be predicted through capacity assessments at key points on the local road network. The TA (**Appendix E**) includes detailed junction capacity assessment results for the access routes and network junctions within the scope of the TA and influence of the proposed development site. The detailed junction capacity assessments suggest that remedial junction measures are not required on the local or strategic road network as a result of the development proposals.

12.6.15 As discrete phases of development come forward for detailed development in conjunction with refinement of the parking management, access and routing strategy, then monitoring should be implemented to gauge the quantum of "actual" development traffic levels (over the assessments 'theoretical' basis) on key routes. This will allow any locational and route-specific interventions and mitigation to be more accurately tailored. The scale of the effect of the development is minor negligible.

12.7 Further Mitigation and Enhancement

Construction Phase

12.7.1 The further mitigation and enhancement measures incorporated within the proposed development are as follows:

Construction Environmental Management Plan (CEMP):

- Development and implementation of measures relating to: construction traffic routing, site access/deliveries, parking, contractor management, parking, fuels and materials storage, standard dust and noise suppression techniques and standard pollution presentation and control techniques. These measures will be set out within a Construction Environmental Management Plan (CEMP). Any other measures to be included in the CEMP would be identified as 'further mitigation' (not embedded) through the EIA;

- Any construction activities within a 5m strip along waterfronts will be subject to specific consideration within a CEMP to be agreed with the NPA prior to commencement; and,

- Adoption of standard construction industry working hours for noise generating activities.

Operational Phase

12.7.2 The mitigation measures incorporated within the proposed development are as follows:

An Outline Travel Plan

- Contained within the Transport Assessment an Outline Travel Plan incorporates actions and incentives and an ongoing programme of delivering sustainable travel options for the proposed development site. This includes several potential measures which could be implemented to support sustainable travel choices for future employees, through both induction processes and provision of a travel information pack for new starts. This would also include the provision of a Residential Travel Information Pack for the residential component of the site, which will be issued at point of occupation.

Monorail

- A monorail is incorporated into the development proposals to provide better connectivity between Zone A (Station Square) and Zone C (Pierhead). This will provide better connectivity between Balloch Village and Loch Lomond Shores, through provision of a safe, direct and convenient means of transport. During the winter months/ dark nights the existing Pier Road and walking routes adjacent to the River Leven (Riverfront area) are not conducive to walking as function of reduced personal security, and the overall distance. As such, the monorail will help support an evening economy at the existing and with-development scenarios.

Public Transport

- The proposed WDC plans for the Station Square enhancements on Balloch Road between the proposed new Station Square development (Zone A) and Balloch Railway Station, will help deliver enhanced access between the station and the proposed development site as well as the wider village of Balloch. It is also understood that revised parking arrangements are being considered for Balloch Rail Station as part of the wider "Balloch Village Parking Proposals" which are hoped to alleviate parking issues in the locality as well as encourage an uptake in rail usage;

- Discussions have been undertaken with ScotRail Abellio to seek to agree in principle the mutual benefits of promoting access to the development site by rail. Whilst any interventions are still in early developmental stages, these are presently anticipated to include:

  - Shared-ticketing: whereby rail and attraction-tickets can be purchased simultaneously, incorporating some form of discount for the passenger/ visitor;

  - The opportunity to promote the new West Riverside development as a destination, where branding/ wrapping the trains can be used as a marketing/ promotional incentive; and,

  - The potential for further studies into the need for enhanced rail services either by frequency and/ or selective station stopping to improve journey times.

Remote Lodge Accommodation Parking

- For accommodation land uses, except for the Woodbank House site, the arrivals and parking for this element can be managed from the point of booking, whereby visitors can be advised of the intended arrival and check-in arrangements. The intention is that accommodation-based-visitors and associated parking will be segregated from other land-uses and that parking will be provided remotely from the accommodation. Small buggies will be used to transport visitors and baggage to their holiday accommodation. This will reduce both unnecessary vehicular circulation at arrival and departure times but is also expected to reduce the use of cars for short-trips by guests throughout their stay: it will be more convenient to walk, cycle or use the mono-rail for shorter local and site-internal trips.

12.8 Residual Effects

12.8.1 The residual effects arising from the development proposals following the implementation of the mitigation measures are described below.

Construction Effects

12.8.2 Appointed contractors would be required to implement strategies and work plans to minimise the potential effects of construction works on pedestrians, cyclists and drivers. Notwithstanding this, there would be **negligible to short-term slight adverse residual effects (not significant)** on pedestrians and drivers in terms of severance, amenity and delay due to construction activity.

Operational Effects

12.8.3 The embedded design and operational mitigation measures proposed would ensure that the potential traffic impact associated with the development proposals can be satisfactorily accommodated. Junction capacity assessments suggest that there would some slight delay and congestion on some junctions within proximity to the site, due to development traffic, albeit not so much as to warrant remedial action to the junctions to increase capacity. The ongoing management of the eventual operational Travel Plan for the site, as well as the careful monitoring of usage of walking, cycling and vehicular access routes, will help ensure that any ongoing interventions for access and parking management are evaluated. Where measures are gauged to be less effective, then ongoing targets for improvement will help ensure appropriate initiatives and interventions are undertaken. The scale of the effect of the development is concluded to be **moderate beneficial (significant).**

12.8.4 The increases in the AADT traffic flow as a result of the development proposals are initially considered to be moderate adverse at Balloch Road (South) and Old Luss Road (North), albeit the operational mitigation, in conjunction with WDC streetscape improvements schemes (Balloch Road) will assist in an enhanced walking and cycling environment generally and are therefore considered beneficial within the wider context of the development proposals. The scale of the effect of the development is concluded to be **moderate beneficial (significant).**

12.8.5 The increases in the AADT traffic flow as a result of the development proposals are initially perceived to be substantial adverse at both Pier Road and Ben Lomond Way, the two main access points into the main West Riverside site. Given the existing status of Pier Road as private, the uplift in traffic flows are initially perceived as being substantial, however, in the wider context of improvements to the existing function of Pier Road and the wider "movement" environment, the development proposals are considered to deliver a moderate benefit to the locality overall. The traffic impacts at Ben Lomond Way in terms of pedestrians and cyclists' amenity are focused in an area of less sensitivity (limited residential area) as opposed to wider dispersal of more significant impacts on more sensitive residential and village centre areas. Further, monitoring of pedestrian and cycle movements on the key access routes will help identify trigger points for mitigation and/ or intervention as detailed stages of the development are progressed. The scale of effect of the development is concluded to be **moderate beneficial (significant)** at Pier Road, and **minor beneficial (not significant)** at Ben Lomond Way.

12.9 Monitoring of Residual Effects

12.9.1 Ongoing monitoring of traffic flows and walking and cycling on the key access routes into the development should be undertaken during build-out and completion stages to ascertain the appropriate trigger level for additional interventions. These are likely to include provision of designated pedestrian and cycle crossings, albeit their requirement and preferred location, would be based on actual operational data as opposed to the current theoretical data. It is expected that internal parking and routing operations will evolve as the application progresses to the detailed stage, and as such it would currently be abortive to include additional and, potentially surplus, infrastructure at the present time.

12.10 Summary

12.10.1 As a result of the proposed development and design measures, the effects of the development on the surrounding local and strategic road network, are not anticipated to result in substantial adverse effects. The embedded and operational mitigation is anticipated to greatly expand and enhance the walking, cycling and public transport environment within the immediate site and within the wider Balloch village. This is anticipated to materially change the local "road focussed culture in the area, in conjunction with the WDC Balloch Village, Station Square and Road/ streetscape proposals, which will see an uptake in the use of sustainable modes of travel within the local area more generally.

12.10.2 All construction traffic to and from the site will be controlled by a routing agreement which will ensure the correct road hierarchy is used and will prevent the use of residential roads by such vehicles, therefore resulting in a temporary slight adverse impact on road users, pedestrians and cyclists during this phase.

12.10.3 There would be increases in traffic flows within the Loch Lomond Shores/ development site as a result of the development proposals, more noticeably on roads Old Luss Road (North) and Ben Lomond Way, which constitute the main access roads and links into the site. The % increase in AADT flows as a result of development require to be put in context to the existing status quo, which lessens the overall impact to moderate on Old Luss Road (North). Ben Lomond Way requires to be subject to monitoring during the construction and operational phases, to determine any future requirement for associated intervention or mitigation to reduce pedestrian and cyclist delay and fear and intimidation. Increases elsewhere will be less noticeable and generally confined to peak periods.

12.10.4 Junction capacity impact assessments undertaken in the TA indicate that remediation and mitigation are not required to improve the capacity at local or strategic road junctions. Moreover, increasing capacity is understood to lead to an eventual increase in vehicles, which should be avoided wherever practicable.

12.10.5 The provision of the improved public transport, pedestrian and cycle routes through the site and to the surrounding areas of Balloch will, in conjunction with site-specific initiatives as well as the implementation of a Travel Plan and other ongoing Parking and Access Management strategies, potentially lead to an overall increase in the uptake and propensity of use for sustainable modes to the moderate benefit of all road users.

12.11 References

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