

EXECUTIVE SUMMARY

Strategic Development Plan Update

The Aberdeen City & Shire Strategic Development Planning Authority (SDPA) are preparing an update to the Strategic Development Plan (SDP). To support the SDP, a Cumulative Transport Appraisal (CTA) was undertaken to provide an evidence base that would:

- understand the potential cumulative impact development may generate across the transport network, focussing on Aberdeen and the main commuter corridors; and
- identify where further transport interventions may be required to mitigate impacts and help support development growth.

Study Approach

Guidance

The study was undertaken in line with DPMTAG and STAG, which provide an objective-led approach to ensure transport objectives and options are considered that address the specific problems, opportunities, issues and constraints identified within the study area. Transport and development policies were reviewed to guide the approach and transport planning objective setting process.

Transport & Land Use Modelling

The Aberdeen Sub Area Model 2014 (ASAM14) was utilised to prepare scenarios to represent committed transport infrastructure and services (such as the AWPR and Kintore rail station), and the scale and distribution of development allocations across Aberdeen City and Aberdeenshire.

Further (uncommitted) transport interventions from an earlier CTA study (undertaken during 2010) were also represented within the modelling to understand if these schemes are sufficient to accommodate the SDP, or if further intervention is required.

ASAM14 formed the main appraisal tool, with model outputs providing Key Performance Indicators (KPI's) to analyse traffic, public transport and active travel impacts and understand underlying regional and local level problems. The study area was divided into corridors, based on predicted 'hotspots', providing a consistent basis for identifying and comparing impacts across scenarios.

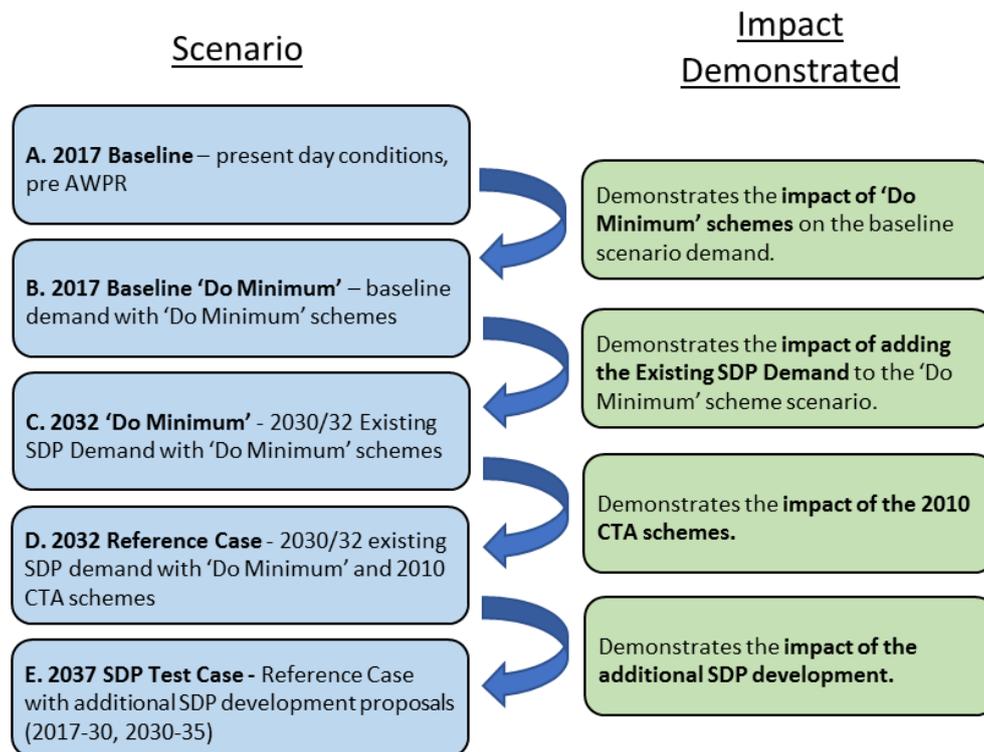
Regional development, population and employment forecasts were provided by the Transport, Economic Land Use Model of Scotland (TELMoS14), with local site details provided by the SDPA.

Development Inputs & Scenarios

Development inputs amounted to an additional 38,000 households, 55,000 population and 34,000 jobs delivered regionally between 2017 and 2032. Further development growth inputs associated with the emerging SDP allocations provided a further 5,500 households, 11,000 population and 6,000 jobs over the longer term to 2037.

Development growth allocations were compared against a Baseline scenario that reflected 'current day' traffic and travel conditions during 2017, representing the benefits of recently delivered infrastructure, such as the Diamond Bridge, but pre-delivery of the AWPR.

Transport scheme and development proposals were combined, generating five scenarios to demonstrate and compare both transport and development orientated impacts, as shown below.



Understanding the Problems, Opportunities, Issues and Constraints

Analysis of key network impacts, identifying problem and opportunities, informed the setting of transport planning objectives and ultimately aided the identification of transport solutions.

Regional Impacts – Travel Growth, Mode Share, Journey Times & Accessibility

Forecasting indicates a considerable growth in road trips over time, as motorists access the network travelling to/from new development sites – with a 20% increase in road trips to 2032, and a further 2%-3% growth to 2037. More significant growth is associated with goods vehicles.

The modelling suggests that the range of 2017/32 Do Minimum, 2032 Reference Case and previous 2010 CTA multi-modal transport measures represented does not offer a means of fully accommodating the forecast road-based traffic growth at the regional level. The future transport network will therefore need to accommodate a much higher level of traffic which may present issues for constrained areas.

Total public transport trips are predicted to reduce slightly over time, particularly for bus patronage. Such trends potentially reflect higher car ownership/availability, the attractiveness of new road infrastructure and the distribution of some development in peripheral/rural locations, which are easier to access by car. Although scenario testing suggested an encouraging take-up in bus passengers through the introduction of orbital services, the overall decline in passengers may present challenges for the viability of some services.

In contrast, rail patronage is predicted to rise by 12% with Kintore Station and rail revolution service enhancements in place, and further by 15% and 18% as development is build-out through to 2032 and 2037. Strong rail growth presents opportunities to extend rail offerings and provide alternatives to the private car.

The considerable rise in car trips impacts mode share, with public transport proportions falling from 11% in 2017 to 9% by 2037 - in contrast to the aims of local and regional policy.

The proportion of car trips under 5km was used to indicate the potential for modal shift towards active modes. This suggested that it may be harder to encourage active travel from development sites, as these motorists were shown to travel longer distances than forecast for the City and Shire in general (with an average of 12% of trips <5km, compared to 28% and 13% in the City and Shire respectively).

The cycle network shows that while some national and local routes are reasonably well placed to connect with development, these are fragmented in places, and do not provide full access to key destinations. Solutions are required to capture active travel trips and overcome these constraints.

Road journey times to key destinations were shown to improve by 10%-15% with investments, such as the AWPR in place. Public transport times also improve due to rail service enhancements and decongestion benefits, but to a lesser extent of around 4%. Over the longer term, many of these road and bus-based public transport time-savings are shown to be eroded as development is built out, particularly for some radial movements that cross over pinch-points. Longer distance and cross city journey times via the AWPR and A90 Balmedie to Tippetty routes are generally maintained.

Although the range of 2010 CTA scheme proposals (such as a new crossing at the Bridge of Dee) counteract some of these impacts, road journey times are forecast to return towards current day levels. Public transport travel times are maintained, although these time-savings are dependent on the (theoretical) introduction of new orbital bus services (which are not currently committed).

Accessibility analysis suggests that 45% of the City's and 3% of Aberdeenshire's population can use public transport to access key destinations within 60 minutes (compared to 100% and 60% by private car for the City and Shire respectively). Therefore, out with the rail network, and some city centre journeys, public transport journey times remain relatively uncompetitive compared to the private car, particularly for peripheral or cross city movements. This imbalance is a key problem, as it is likely to provide further challenges to encourage greater public transport mode share.

Regional Impacts – Traffic Volumes & Congestion

The modelling initially demonstrates a rise in overall traffic volumes (of around 10% in the City and 2% in the Shire (vehicle kms)), as motorists are attracted to travel via new committed (Do Minimum) road infrastructure - particularly the AWPR, which will provide a faster, but often longer distance alternative route. The Reference Case scheme proposals generate a slight increase in traffic of around 2%.

However, the delivery of these committed (Do Minimum) schemes also generates a notable drop in overall traffic congestion within the City and Shire, by approximately 10% to 20% respectively - which is expected to produce a significant improvement to network conditions.

A further, more substantial rise to traffic volumes (of around 25% in both the City and Shire) is forecast as development is built out to 2032, with an additional 2%-4% growth by 2037. This level of growth subsequently erodes scheme time savings, and on average, returns network efficiency and average traffic speeds towards pre-AWPR levels. Reference Case interventions provide some further congestion relief, but are similarly off set by the impact of subsequent development and traffic growth. This level of regional traffic growth - which generates congestion, reducing speeds, and ultimately impacting network efficiency, is a key problem to be addressed.

Road Safety: The predicted rise in traffic volumes tends to point towards a general increase in the risk of accidents. Conversely, new road schemes, such as the AWPR and A90 Balmedie to Tipperty may also bring safety benefits, by providing higher quality infrastructure and diverting traffic from areas with a higher interaction with active modes.

Environment: The higher overall traffic volumes forecast, particularly goods vehicles, also raise the potential for further Greenhouse Gas emissions, other pollutants, noise and vibration. Future vehicle technology improvements may help address these issues in the longer term.

Local Corridor Impacts – Traffic Volumes & Congestion

Road network conditions were considered at a corridor level, with problem ‘hotspots’ also identified.

Central Aberdeen Corridors: All Central corridors are shown to be relatively congested at peak times. The AWPR is forecast to significantly improve network operations, but as development and traffic levels grow over the longer term 2032 and 2037 scenarios, many scheme benefits are eroded, with congestion returning towards, or in some corridors above pre-AWPR levels.

While further (Reference Case) scheme proposals generate time savings for specific corridors, they do not address all forecast traffic growth efficiently, with some upstream and downstream impacts identified in corridors with new infrastructure.

Traffic operational conditions are forecast to deteriorate to a notable extent within:

- Aberdeen City Centre, particularly Market Street and College Street;
- Bridge of Dee upstream/ downstream intersections
- South Anderson Drive, particularly connecting with the A93
- A944 Lang Stracht and Westburn Road connections with Anderson Drive
- St Machar Drive, Berryden and King Street routes;
- Persley Bridge, Haudagain and North Anderson Drive; and
- Parkway access points;

Air Quality: Although relief is provided by transport schemes, traffic volumes are shown to increase within the City’s three Air Quality Management Areas to above 2017 levels by 2037, with congestion and lower traffic speeds also suggesting less efficient driving conditions. These indicators generally suggest a likely rise in vehicle tailpipe pollutants, generating further air quality issues in these areas.

AWPR and Peripheral Corridors: More varied impacts are predicted within peripheral corridors, mainly because of the AWPR generating significant changes to traffic patterns on connecting routes. Corridors are subsequently impacted by congestion as development builds out, with traffic operational problems exacerbated in the 2032 and 2037 scenarios.

Motorists are likely to experience some congestion at AWPR access points, with delays forecast over the longer term at the A947, A96, A944 and Cleanhill intersections at peak times. Some local issues are also identified at Kingswells North, and to a lesser extent Stonehaven. New infrastructure proposed at Kingswells North, the A96 and A947 generate benefits, but may not accommodate all forecast traffic growth, with pinch-points continuing nearby along the corridors. Note the AWPR mainline is shown to be relatively unaffected, continuing to provide shorter journey times overall for longer distance movements (with the issues identified relating to some local access movements).

Aberdeenshire Corridors: Congestion is forecast during peak times at the A90 connections at Ellon and also at Toll of Birness, with operational conditions shown to deteriorate within the 2032 and

2037 development scenarios. Congestion is also identified at several A96 roundabouts, constraining access along this key route. Note there is a commitment to dual the A96 by 2030, but there is currently no firm alignment between Huntly and Aberdeen. This infrastructure may alleviate some of the impacts identified.

Traffic volumes are shown to rise along rural corridors, with the modelling suggesting motorists becoming increasingly delayed at a number of major road access points, such as A90 South (near Fordoun and Drumlithie) and A947 connections (near Newmachar) over the longer term.

Local Corridor Impacts – Bus, Rail and Park & Ride Operations & Capacity

Bus operations in congested corridor areas may also be affected where no public transport priority measures are available – impacting passenger journey times and timetable reliability.

Passenger forecasting demonstrated the ‘Rail Revolution’ measures provide the additional service capacity to reduce overcrowding and attract and accommodate additional passenger demand. When realised, the reserve capacity provides an opportunity for facilitating modal shift to rail.

However, the increased demand for rail travel was shown to pressurise car parking capacity at several stations, namely Dyce, Huntly, Portlethen, Stonehaven and potentially Laurencekirk. Overloaded parking may discourage rail use, and can lead to local parking issues surrounding stations. Conversely, the modelling suggests that the region’s bus-based park and ride sites have sufficient capacity, but tend to be underutilised.

Objective Setting

Through the consideration of problems, opportunities, issues and constraints, regional and local level Transport Planning Objectives were established. The regional objectives for the study are to:

- Improve the efficiency and reliability of the transport network in the study area;
- Achieve a reduction in journey times for all modes to key destinations in the study area;
- Increase the proportion of travel undertaken by sustainable modes within the study area;
- Reduce the negative environmental impact of transport within the study area; and
- Reduce the rates and severity of traffic accidents within the study area.

The Local objectives set each add further detail to these, concentrating on specific problem areas, such as Aberdeen City Centre congestion and air quality, and rail station car parking capacity.

Option Generation and Sifting

Option generation was undertaken to identify a range of potential interventions that best met the Transport Planning Objectives and potentially alleviate the problems and/or address the opportunities identified. A sifting exercise removed options that did not contribute to achievement of the objectives or that presented significant deliverability challenges.

Several options originated from Strategies/ Plans, earlier studies, or are being assessed or taken forward through separate projects, with varying degrees of evidence available to support proposals.

The following table summarises the general nature and location of transport interventions that may potentially be required to mitigate predicted transport impacts and help accommodate the delivery of the Strategic Development Plan. Transport options include a range of public transport, active travel, road and multimodal interventions.

SUMMARY OF POTENTIAL TRANSPORT INTERVENTION OPTIONS FOR APPRAISAL

Aberdeen City Centre Masterplan public transport access and priority infrastructure	
Bus, High Occupancy Vehicle and goods vehicle priority measures along key corridors	
Enhanced bus service provision, bus stop review and optimisation of services with new infrastructure	
Package of cross city bus connections and feeder services to connect with key locations, new development and park and ride interchange	
Additional rail station car parking capacity at Dyce, Stonehaven, Portlethen, Laurencekirk and Huntly Rail Stations. Improved interchange at Inverurie Station	
New rail stations to the north and south of Aberdeen	
Range of active travel infrastructure initiatives improving accessibility	
Package of behavioural change initiatives encouraging car-sharing and active travel	
Monitoring and evaluation of travel conditions to optimise performance of network and new transport investments	
Road Junction Improvements and Corridor Capacity Enhancements	Aberdeen City Centre
	Radial Routes: Wellington Road/ A956, Persley Bridge & Parkway, Parkhill, A96 Dyce Drive, A944/ B9119, Bridge of Dee
	Anderson Drive Corridor
	A90 North/ Ellon, A90 South, and A947 corridors
	Dualling the A96 between the east of Huntly and Aberdeen
Road Traffic Signalisation Measures	Bridge of Dee, Stoneywood Road, A96, Airport, Portlethen corridors
	AWPR Cleanhill, A944 and Kingswells North Intersections, following monitoring and evaluation period

Solutions will also initially need to consider the current uncertainties affecting the study area – in particular, how the recent oil and gas downturn and potential recovery now underway may impact growth; combined with how travel patterns and congestion change from the shortly anticipated delivery of significant transport investment.

A first step would be to closely **monitor and evaluate** the future network to understand travel patterns and potentially **optimise** new infrastructure and services, ensuring any additional solutions are targeted at the most significant and forthcoming issues. This will be particularly pertinent in areas close to new infrastructure and major residential and business activity.

With the scale of growth forecast, and the limited land availability to support new transport infrastructure, or potentially expand the footprint of existing networks, encouraging public transport and active travel where possible, will also potentially help mitigate predicted impacts.