TRANSPORT AND INFRASTRUCTURE COUNCIL

Australian Transport Assessment and Planning Guidelines

A2 Glossary

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For enquiries or feedback about this publication please contact:

ATAP Steering Committee Secretariat
Australian Transport Assessment and Planning Guidelines
Commonwealth Department of Infrastructure and Regional Development
GPO Box 594 CANBERRA ACT 2601
Email: atap@infrastructure.gov.au

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1. Glossary 1 - General Definitions

Term	Definition
Accessibility	The accessibility of a location reflects the generalised cost (time, money, discomfort and risk) needed to reach desired goods, services, activities and destinations (together termed 'opportunities') from that location. It is normally expressed as an 'accessibility index' (for which various mathematical definitions exist) and is calculated within transportation models.
Appraisal	The process of determining the impacts and overall merit of a proposed option/ initiative, including the presentation of relevant information for consideration by the decision-maker. Undertaken in ATAP Framework steps 3 and 4.
Area	Defined geographic space and the transport system within it. Incorporates the pathways that enable the movement of people and freight between the diverse and multi-directional set of origins and destinations within the area. Most relevant in urban settings.
Assessment	A generic term referring to quantitative and qualitative analysis of data to produce information to aid decision-making. The term analysis is taken to have the same meaning.
Average Annual Daily Traffic (AADT)	Total number of vehicles passing a point on a road in a year divided by 365 (or 366 for a leap year).
Australian Local Government Association	National association that represents the interests of local government at the national level
Benefit	A measurable improvement in an outcome perceived as positive by stakeholders and contributes towards one or more transport system objectives.
Benefit evaluation	Process to confirm that the benefits established and defined in benefits planning are being achieved and that the operational service or asset is running smoothly. It can also be referred to as ex-post benefits evaluation.
Benefits management	Benefits management is the identification, definition, tracking, optimisation and realisation of benefits. Benefits management forms an integral aspect of the planning and delivery of initiatives. It has two key elements: benefits planning and benefits evaluation.

Benefits planning	Process to identify and define benefits from an initiative, and plan for benefits evaluation. It can also be referred to as 'ex-ante benefits realisation planning' or 'ex-ante benefits planning'.
Business Case	A document that brings together the results of all the assessments undertaken of a proposed initiative. It is the formal means of presenting information about a proposal to aid decision- making. It includes all information needed to support a decision to proceed with the proposal and to secure necessary approvals from the relevant government agency.
Congestion pricing	The policy of charging drivers a fee that varies inversely with the level of traffic on a congested roadway. The aim of congestion pricing is to ensure that, when roadway space is a scarce resource, it is allocated efficiently between competing users. It is also known as variable pricing and, in the US, as value pricing.
Corridor	The parallel or competing modal routes between two locations (e.g. road and rail routes between two capital cities, or between two parts of a city). A corridor is multi- modal where more than one mode operates, and uni-modal where only a single mode operates (e.g. in many rural areas). Also used in the term 'corridor preservation' to refer to the protection of land for the building of infrastructure in future.
Corridor/area strategy	A cooperative long-term plan that identifies the transport problems within a corridor or area and the potential initiatives and priorities to meet those problems.
Corridor/area study	Assessment of a single corridor or area using data collection and analysis. Provides information to support development of a corridor or area strategy.
Deficiency assessment	Comparison of the network and its components with specified benchmarks. May compare transport system performance or physical infrastructure with benchmarks.
Demand forecasting	Estimating transport demand in a particular year or over a particular period.
Distributional effect	A change (positive or negative) in the economic welfare of a group of individuals or firms caused by an initiative.

Dose-response relationship	The relationship between dose and response (effect) wherein all possible degrees of response between minimum detectable response and a maximum response are producible by varying the dose, e.g. how exposure to pollution gives rise to physical effects. Dose-response assumes that a response to a toxic agent can be measured, and the effects increase in some kind of a relationship with the dose. for instance, the effect of the number of speed cameras (the dose) and changes in the social cost of road casualties (the response).
Environmental Impact Statement (EIS)	A detailed written statement analysing the environmental impacts of a proposed action, adverse effects of the initiative that cannot be avoided, alternative courses of action, short-term uses of the environment versus the maintenance and enhancement of long-term productivity, and any irreversible and irretrievable commitment of resources. Also known as an Environmental Effects Statement.
Escalation index	A number by which a base-year real price must be multiplied in order to obtain the real price in the year of the index.
Evaluation	The specific process of reviewing the results and performance of an initiative after it has been delivered. Undertaken in ATAP Framework step 7.
Ex-ante	Period relating to before commencement of delivery of an initiative.
Ex-post	Period from delivery of an initiative to end of service/life of an initiative
Goal	Goals are statements that describe the fundamental economic, social and environmental outcomes that a jurisdiction is aiming to achieve through its activities across all sectors (not just transport). Goals sit above objectives, and above transport.
Infrastructure	Civil engineering structures that have been built to facilitate the movement of people and/or goods for various social and business reasons.
Infrastructure targets	Quantity and standard of infrastructure that is desired at some future time.
Initiative	An initiative consists of the preferred option/solution to an identified transport problem. It could consist of an investment (capital) / infrastructure option, or a reform (non-investment / non-infrastructure) option. It should be the result of a structured process of identifying and assessing a problem, confirming that addressing the problem is a priority, and a rigorous assessment of a wide range of options. The term ‘project’ is also often used to refer to an initiative

Intelligent transport systems	Integrated application of modern computer and communications technologies to transport systems to improve transport safety, use of infrastructure, transport operations and the environment.
Inter-modal	Involving transfer of passengers and/or freight between transport modes (e.g. road to rail).
Jurisdiction	Australian Government, state or territory government, local government, or a combination.
Link	Homogeneous segment of a route, including a specific location. Could consist of a number of features of a route: an intersection, a midblock section between intersections, a crossing facility, an inter-modal facility, etc.
Local (or follower) infrastructure	Services and facilities with localised service catchments. The local services that flesh out a city's urban structure. While vital to community wellbeing and business efficiency, and for place making, local infrastructure neither shapes development patterns nor provides an overarching structure for settlement and industry development. It provides services into a suburb or neighbourhood once the area has been enabled by investment in higher order infrastructure initiatives. Not city shaping.
Maintenance	Incremental work to restore infrastructure to an earlier condition or to slow the rate of deterioration. Distinct from construction and upgrading.
Multi-modal	Has several meanings. Can refer to passenger or freight movements that use more than one transport mode (e.g. road and rail). A 'multi-modal' focus means an approach to addressing transport problems that considers the full range of potential solutions across all modes.
National Land Transport Network	Single integrated network of land transport linkages of strategic national importance. Based on national and inter-regional transport corridors (including connections through urban areas), connections to ports and airports, and other rail/road inter-modal connections that together are of critical importance to national and regional economic growth, development and connectivity.
Network	Collection of routes that provide interconnected pathways between multiple locations for similar traffics. Can be multi-modal (typically comprising several uni-modal networks) or uni-modal.
Network assessment	Assessment of a whole network using data collection and analysis. Provides information to support development of network and corridor or area strategies.

Non-infrastructure options/solutions	Initiatives that make better use of existing infrastructure and avoid the need for large capital expenditures. Also referred to as reform or non-investment options/solutions.
Objective	A statement of a desired outcome that has not yet been attained. Objectives are specific statements of outcomes that a jurisdiction is aiming to achieve through its transport system. Achieving transport system objectives should be the primary aim of transport strategies, policies, plans and initiatives. Objectives should be set across the various levels of planning (jurisdiction, markets, city, region, network, corridor, area, route, link). They should be consistent and integrated with each other, and with the transport system objectives.
Off-network	Initiatives located off the designated national network.
On-network	Initiatives located on the designated national network.
Option	An option is one of a range of ways that a problem can be addressed and solved, including base case options such as do nothing and do minimum. Options can involve both land use and transport. They can include reform/non-investment options and investment/infrastructure options. The process of identifying a preferred solution to a problem should commence with the identification of a wide range of options, which are then subjected to rigorous assessment.
Options assessment	The assessment of alternative options for solving an identified problem.
Outcome	The economic, social or environmental state, or condition, of a system or sub-system (e.g. level of economic activity, degree of safety on a road; or the level of climate change; or the level of noise alongside a particular road).
Output	The result of an activity or process, e.g. a built piece of infrastructure, a published plan
Performance indicator	Measure that enables monitoring of performance in terms of progress towards a specific defined objective/outcome. Usually based on a transport attribute that is relevant to transport users (e.g. travel time, safety, reliability) or to the community in general (e.g. sustainability). Should be expressed in neutral terms so that there is no in-built bias as to how desired performance might be achieved.
Performance target	Level of performance outcome / objective that is sought for a specific defined performance indicator.

Planning horizon	The year, or time period, into the future at which a planning exercise is focused. Long term planning can range from 30 to 50 year horizons, whilst at the other end of the scale short-term planning may be focused on a 1-3 year time frame.
Policy	High level strategic policy choices (both transport and non-transport related) made by governments as direction-setting decisions. They are made at senior levels of government, involving the minister(s) with responsibility for transport, but typically include other ministers and the cabinet.
Post-completion evaluation (PCE)	Review of a completed set of actions to determine whether the desired or forecast ends have been realised, and to explain the reasons for the outcomes. Aim is to discover lessons for the future.
Problem	A problem is any aspect of transport system performance where the actual economic, social or environmental outcome falls short of the desired outcome, creating a gap between actual and desired outcomes. Problems prevent the achievement of goals and objectives. Priority problems should be identified, described and thoroughly assessed. A good understanding of a problem is necessary before the best solution to the problem can be identified. In ATAP, it is used as a generic term that covers related terms such as issue, deficiency and need. It can also be used to refer to case where an opportunity has not been achieved. The concept was referred to by the term 'challenge' in NGTSM.
Program	Suite of appraised initiatives to be delivered within a specified time frame and sequence.
Public-private partnership (PPP)	Projects that are undertaken jointly by the private and public sectors.
Reliability	The probability that a system will perform its intended function under stated conditions for a stated period of time. Adapted from ISO 15686-3. As a quality attribute of a transport service, on-time performance.
Risk	A state in which the number of possible future events exceeds the number of events that will actually occur, and some measure of probability can be attached to them (Bannock et al, 2003, p.338).
Route	Physical pathway connecting two locations for a particular mode. In land transport, consists of a continuous length of infrastructure (road, rail line). In shipping and aviation, delineated by operating or regulatory or administrative practices (shipping lane, air route).
Solution	A solution is an option that solves an identified problem. The preferred solution is the option considered best overall.

Strategic merit/ strategic fit	Extent to which the outcomes produced by a proposed initiative align with objectives and policies of the government as set out in strategy and other documents.
Strategic Merit Test (SMT)	An assessment that provides a first-order determination of the 'strategic merit or fit' of solving an indentified problem, and/or the proposed initiative to solve the problem. Part of the process of early-stage filtering of options, identifies proposals that should proceed to the next stage of appraisal, proposals that require further scoping, and proposals that should be abandoned because they lack strategic fit. Also includes checks to ensure that the initiative has been properly formulated and is feasible.
Strategic (city shaping) infrastructure	Transport infrastructure that has the power to alter/shift relative accessibility across a city area, influencing location decisions of households and businesses and shaping settlement patterns. They are city shaping.
Strategic planning	High-level planning involving fundamental direction-setting decisions. Narrows down the types of options that will be pursued. Involves consideration of present and future environments. Asks questions such as: 'Are we doing the right thing?' 'What are the most important issues to respond to?' and 'How should we respond?' Balances many competing considerations including value judgements, subjective assessments and political considerations. Involves iteration, stakeholder consultation and analysis.
Structural (district) infrastructure	The higher order/level facilities and network elements/nodes that form the structure of a sub-region or district. It includes arterial roads and district public transport connections. These items are distinguished by their district level service catchments and their cost. Not city shaping.
Sustainability	Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.
System planning	System planning is the strategic planning process for the entire transport system and its components. It must feature integration between transport and land use, and consistency and integration across planning levels (jurisdiction(s), markets, city and region, network, corridor and area, route and link).
Traffic	Transport use in general regardless of mode and unit of measurement, e.g. passengers, cars, trains.
Transport system	For a particular jurisdiction (or a multi-jurisdictional setting), comprises the following elements:

	1. Relevant transport networks - sets of routes that provide interconnected pathways between multiple locations for similar traffics 2. Transport user sub-system - people, goods and vehicles/wagons/etc using the network 3. Regulatory and management sub-system - regulatory regime and systems for managing the traffic that uses the network (including access arrangements, registration and licensing, traffic management centres and intelligent transport systems) 4. Transport operating environment - e.g. land use development patterns that generate traffic on the transport network 5. Physical environment - e.g. geographic features, climate, air quality, and 6. Social environment - e.g. accessibility, amenity, livability.
Urban form	The nature or density of development. All major cities in Australia are essentially low density, especially in their residential areas, although recently the city centres have been developed to high density.
Urban structure	The spatial relationships between cities and their services and activities; that is, whether the activities are arranged in linear relationships and are highly centralised or whether the city is structured as an interconnected set of nodes around which development is arranged.

2. Glossary 2 - Traffic Types

Term	Definition
Diverted traffic	Freight, passengers or vehicles that switch from one mode, route, time of day, origin or destination, to another as the result of an initiative.
Existing traffic	Freight, passengers or vehicles that use the infrastructure in question in both the Base and Project Cases (in contrast with diverted and generated traffic). The quantity of existing traffic is, by definition, the same in the Base and Project Cases.
Generated traffic	Altogether new (freight, passenger or vehicle) demand resulting from an initiative - that is, it would not exist but for the initiative. Note that economists use the term generated demand to cover new and diverted demand together. The ATAP Guidelines have adopted the planners' terminology of using 'generated' to refer only to new demand.
Induced traffic	The sum of diverted traffic and generated traffic. Part T1 of the Guidelines defines it as the impacts of transport improvements in encouraging some people to switch routes, modes or time of travel to take advantage of the improved travel times and service levels. In addition, induced demand can refer to the tendency of some people to travel more, or travel further, when travel conditions are improved. In the demand model, induced demand can arise from changes in any of the following: route choice, the time of day travel occurs, mode choice, trip distribution (i.e. choice of trip destination), trip generation (i.e. the number of trips undertaken), land use changes and the location decisions of both households and businesses.

3. Glossary 3 - Appraisal

Term	Definition
Adjusted cost-benefit analysis (CBA)	The adjusted CBA technique is a hybrid of the CBA and multi-criteria analysis techniques. It produces an alternative ranking of initiatives with objectives given different weights from the weights implicit in standard CBAs. Adjusted CBA retains the dollar measuring rod of standard CBA. The relative significance of particular benefits and costs is altered by adjusting them using subjectively determined weights.
Appraisal period	In a CBA, the number of years over which costs and benefits are estimated and discounted. It consists of the construction period plus the asset life of the main asset created by the initiative.
Asset life	The period of time over which an asset is expected to be in service and used to create benefits. A default value of 30 years is generally used for major initiatives.
Base Case	A CBA is always a comparison between two alternative states of the world — the Base Case and the Project Case. The Base Case is the state of the world without (i.e. in the absence of) the proposed initiative. The Project Case is the state of the world with the proposed initiative or option.
Base year	The year to which all values are discounted when determining a present value.
Benefit–cost ratio (BCR)	Ratio of the present value of economic benefits to the present value of economic costs of a proposed initiative. Indicator of the economic merit of a proposed initiative presented at the completion of cost-benefit analysis. Commonly used to aid comparison of initiatives competing for limited funds.
Central scenario	The main set of CBA results presented. Sensitivity tests make variations to the central scenario. Variables in the central scenario should, as far as possible, be at 'expected values' (mean of the probability distribution).
Consumer sovereignty	The principle that consumers themselves are the best judges of their own economic preferences.
Consumers' surplus	The surplus of consumers' willingness-to-pay over and above what they actually pay for a given quantity of a good or service. It is measured as the willingness-to-pay area under the demand curve above the price paid.

Cost-benefit analysis (CBA)	An economic analysis technique for assessing the economic merit of a proposed initiative by assessing the benefits, costs and net benefits to society of the initiative. Aims to value benefits and costs in monetary terms wherever possible and provide a summary indication of the net benefit.
Deadweight loss	The net loss in social welfare when the benefit generated by an action is less than the resource cost. For an increase in output, it is the gain in willingness-to-pay minus the additional resource cost, where the latter exceeds the former. For a decrease in output it is the resource cost saved minus the loss of willingness-to-pay, where the latter exceeds the former.
Default values	Standard unit costs that can be applied across the board to obtain an estimate of costs, if more appropriate values for a particular situation are not available. Employing a default value is usually preferable to the alternative of giving it a zero value.
Depreciation	The amount that an asset reduces in value due to wear and tear or environmental factors. (Economic): A decline in the value of an asset over time due to general wear and tear or obsolescence. (Financial): The allocation of the cost of an asset over a period of time for accounting and tax purposes.
Discount rate	The interest rate at which future values are discounted to the present and vice versa to account for the observation that a dollar tomorrow is worth less than a dollar today (i.e. the time value of money).
Discounted cash flow (DCF)	An analytical technique for converting a monetary impact at one point in time to a monetary impact at another so as to allow for the time value of money; the family of project performance measures (including IRR, NPV and BCR) are based on the foregoing technique.
Discounting	The process of converting money values that occur in different years to a common base year. Dollars in each year are converted to present value dollars.
Economic efficiency	A measure of the extent to which economic gains (referred to as increases in social welfare) have, or could, be achieved. Economic efficiency is improved whenever the gainers from a change could compensate the losers out of their gains and still have some gain left over. Maximum economic efficiency is said to be obtained when no further changes of this type are possible, i.e there are no unexploited opportunities to improve everybody's welfare.

Economic impact analysis	A form of economic analysis aimed at establishing the effect that an initiative will have on the structure of the economy, or on the economic welfare of groups of people or firms. Usually expressed in terms of employment and income effects, broken down by economic sector and/or region. It is different from cost-benefit analysis and serves a different purpose.
Economic warrant	An initiative is warranted on economic grounds if the present value of benefits exceeds the present value of costs and first-year rate of return exceeds the discount rate. These values and rates are calculated as part of a cost–benefit analysis.
Elasticity	A mathematical measure used in economics to describe the strength of a causal relationship between two variables. An elasticity value can be interpreted as the percentage change in the dependent variable in response to a one per cent change in the independent variable.
External cost	The cost of an externality – the cost imposed on third parties, including time lost from delays, non-internalised accident risks and environmental impacts. Valued at resource costs or willingness-to-pay.
Externality	An effect that one party has on another that is not transmitted through market transactions. An example is noise pollution from vehicles: those operating the vehicles disturb other parties such as nearby residents, but a market transaction between these parties is absent. It is generally assumed that the party generating the externality ignores it in their decision-making.
Financial analysis	The evaluation of the benefits and costs, measured in cash-flow terms, to a single entity.
Financial cost	Cash-flow expenses incurred by purchasing resources through markets at market prices.
First-year rate of return (FYRR)	Benefits minus operating costs in the first full year of operation of an initiative, divided by the present value of the investment costs, expressed as a percentage. The first-year rate of return is used to indicate the optimum timing of initiatives
Generalised cost	The sum of money price and user cost. Synonymous with private generalised cost.

Hurdle BCR	Minimum acceptable or cut-off benefit–cost ratio that a proposed initiative must attain before it can be considered for funding.
Impact	A generic term for any specific effect of an initiative. Impacts can be positive (a benefit or reduction in a cost) or negative (a cost or a reduction in a benefit).
Incremental BCR	Ratio of the present value of increase in benefit to the increase in investment cost that results from switching from one option to the adjacent, more expensive option. The incremental BCR is used to choose between different options for a particular initiative, having different levels of investment cost.
Infrastructure operating costs	The costs of providing the infrastructure after the initiative has commenced operation, e.g. maintenance, administration and operating costs of a facility.
Internal rate of return (IRR)	The discount rate that makes the net present value equal to zero. IRR must be greater than or equal to the discount rate for an initiative to be economically justified.
Investment costs	The costs of providing the infrastructure before the initiative has commenced operation, e.g. planning and design, site surveying, site preparation, investigation, data collection and analysis, legal costs, administrative costs, land acquisition, construction costs, consequential works, construction externalities. For the CBA, these should all be expressed in resource cost terms. Costs already incurred at the time of undertaking the CBA are excluded.
Market failure	When markets allocate resources inefficiently, they are said to exhibit market failure. There are four main causes: abuse of market power, typically markets where there is a monopoly or oligopoly; unpriced externalities, where the market does not take into account impacts on third parties; public goods, which are non-rivalrous and non-excludable; and asymmetry of information or uncertainty, where one side of the market systemically knows more than the other.
Money price	The money price paid to use a transport service (e.g. fare, toll, road user charge).
Multi-criteria analysis (MCA)	A loose collection of tools to assist decision-making where the impact of an initiative is assessed across a range of criteria.
Mutually exclusive	In the CBA context, the term is used to refer to options where a choice to adopt one option precludes adoption of another option.

Net Present Value (NPV)	The combined discounted present value of one or more streams of benefits and costs over the appraisal period. The term 'net' signifies that it is calculated as benefits minus costs.
Nominal prices	A value or price at a given time. Nominal prices rise with inflation. In contrast, a real price is a price from which the effect of inflation has been removed.
Non-monetised impacts	Benefits and costs for which a CBA has not assigned a monetary value.
Numéraire	The numéraire is the common unit of value into which all economic impacts are converted so that they may be later summed, e.g. Australian dollars.
Opportunity cost	Same as resource cost.
Option value	The value that consumers place on being able to keep an option available, even though they may never in fact choose it. For instance, habitual air travellers may be willing to subsidise a competing train service in order to be in a position to use it if the need arises.
Parameters	Quantitative values applied consistently in appraisals. They are usually unit costs of impacts, but may be otherwise. The parameters in the ATAP Guidelines consist of unit costs (e.g. costs per crash), non-monetary quantitative values (e.g. average number of vehicle occupants) and other values such as the discount rate or asset life.
Payback period	The period required for an initiative's net recurrent benefits to equal its initial capital cost.
Perceived cost	The subset of private generalised cost that is actually perceived by the user. For example, car drivers may perceive time but not all vehicle operating costs. Valued at market prices.
Price year	The year of the prevailing prices used in the analysis for the valuation of impacts.
Private cost	Cost incurred by an individual transport user or service provider. Excludes external costs.
Private generalised cost	The sum of money price and user cost, Synonymous with generalised cost.

Producer surplus	Producer surplus is the difference between the price at which a producer is willing to supply a particular good or service and the price the producer actually receives.
Project case	A CBA is always a comparison between two alternative states of the world — the Base Case and the Project Case. The Base Case is the state of the world without (i.e. in the absence of) the proposed initiative. The Project Case is the state of the world with the proposed initiative or option.
Real prices	Prices that have been adjusted to remove effects of inflation. They must be stated for a specific Base Year, e.g. 2012 dollars.
Residual value	The value of an asset at the end of the appraisal period. Residual values are used in CBA calculations involving long-lived assets whose life extends beyond the end of the appraisal period.
Resource correction	An amount added to or subtracted from a consumers' surplus change based on perceived costs to obtain the benefit or cost to society as a whole. It is needed where perceived and resource costs differ.
Resource cost	The value forgone by society from using a resource in its next best alternative use. Reflects market prices where there is an absence of market failure. Where market failure exists, appropriate adjustments are required to estimate the true resource cost. Synonymous with opportunity cost and social cost.
Road user costs	Costs of operating vehicles on roads, including time costs. Crash costs may or may not be included.
Sensitivity analysis	Changing a variable, or a number of variables, in the central scenario for a model or analysis to discover how the change affects the output or results.
Shadow price	Shadow prices are imputed where the market price does not reflect the marginal value or the opportunity cost of a good or service.
Social generalised cost	The full cost to society to complete the door-to-door journey from origin to destination - the sum of user cost and external cost. Valued at resource cost or willingness-to-pay.
Social welfare	The economic wellbeing of society as a whole or the nation.
Social cost	Same as resource cost.

Sunk cost	A cost that cannot be retrieved by resale in the market. More specifically, a sunk asset is one which, once constructed, has no value in any alternative use. Bridges and railway tunnels are typically sunk assets. Sunk costs incurred in the past should be excluded from a CBA.
Transfer payment	A sum of money that changes hands without any net change in social welfare, that is, one person's gain is another person's loss. Most taxes, subsidies, fares and tolls are transfer payments.
User cost	All private costs (in addition to the money price) incurred by a transport user in undertaking a door-to-door journey between origin and destination - waiting time, time in transit, unreliability, walking time, vehicle operating costs, parking, internalised crash risk, any health impacts, damage to freight, passenger discomfort, pick-up and delivery costs for freight. Quality attributes such as time and reliability need to be expressed in dollar terms based on user valuations.
Vehicle operating cost	The costs of operating a vehicle, including fuel, oil, tyres and repair and maintenance costs. It may include capital costs of vehicles or depreciation.
Willingness-to-pay (WTP)	The maximum amount consumers are willing to pay for a given quantity of a particular good or service (rather than go without it). It indicates the value that consumers place on a given quantity of a good or service. The *marginal* WTP for a given quantity is the height of the demand curve at that quantity. The *total* WTP is measured as the total area under the demand curve up to a given quantity. Total WTP (TWTP) is comprised of consumers' surplus plus the total money price paid by consumers' times the quantity consumed.

4. Glossary 4 - Transport Modelling Definitions

Term	Definition
Accessibility	An indication of the proximity of a person, site or zone to a particular activity or group of activities. It is also defined as the ease or difficulty of making trips to or from each zone.
Aggregate data	Data that relates to a mass or group of people, vehicles or area. The collective properties of the variable are of interest.
AON assignment	The AON (all-or-nothing) assignment technique by which minimum travel time paths are computed for each zone pair and all flows between these pairs are loaded onto these paths.
Capacity restraint	A traffic assignment technique that takes into account the build up of congestion with increased traffic volumes. It adjusts the link travel times according to the prevailing flows.
Centroid connector	Imaginary links that represent the street network within a zone. They 'connect' trips from a zone to the modelled network.
Destination	The point or area of termination of a trip.
Disaggregate data	Data at the level of individual persons, households, etc.
Employment	The number of employees, or jobs, in relation to the zone of work. This may be stratified by employment type e.g. retail, manufacturing, etc.
External trip	A trip that has either an origin or destination, but not both, in the study area.
Equilibrium assignment	An assignment process by which all used routes between zone pairs have equal and minimum costs, while all unused routes have greater or equal costs.
Generalised cost	This cost is usually a linear additive function of some, or all, of the following costs: travel time between zones, access and wait times, ride time, distance between zones, fares, fuel costs and parking charges.
Gravity model	A model that distributes the number of trips between all trip-producing zones and trip-attracting zones.

Home	A group of rooms or a single room occupied or intended for occupancy as separate living quarters by a family, group of persons or by a person living alone.
Home-based trip	A trip that has its origin or destination at the home end. It may be a person trip, vehicle trip, walk trip, bicycle trip or public transport trip.
Household	A person or persons living in the one home.
Incremental assignment	The process by which flows between all zone pairs are loaded onto the network in pre-specified steps.
Internal trip	A trip that has both its origin and destination in the study area.
Link	A section of a highway or public transport network defined by a node at each end.
Logit model	Also known as the 'multinomial logit model', it calculates the proportion of trips that will select a specific mode or activity.
Minimum path	The route between a zone pair that has the least cost (time, distance, generalised) in comparison to all other possible routes.
Minimum path tree	All the minimum paths between zone pairs that emanate from an origin zone.
Modal split	The division of trips between different modes of travel (private transport, public transport).
Node	A numbered point on a network representing a centroid or a junction of two or more links.
Non home-based trip	A trip that has neither origin nor destination at the home end. It may be a person trip, vehicle trip, walk trip, bicycle trip or public transport trip.
Origin	The point or zone at which a trip begins.
Person trip	Any trip made by a person.
Screenline	An imaginary line, usually along physical barriers such as rivers, railway lines or roads. Screenlines split the study area into a number of parts. Traffic classification counts, and possibly interviews, may be conducted along these lines to compare or calibrate data and models.
Travel time	The time taken to travel between two points.

Trip	A one-way movement from an origin to a destination for a particular purpose. It may be a person trip, a vehicle trip, walking trip or public transport trip.
Trip assignment	The process by which the flows between zones derived from the trip distribution process are allocated to the minimum path routes through a network.
Trip attraction	Usually used to describe trip ends connected with non-residential land uses in a zone. Also defined as the non-home end of a home-based trip or the destination of a non-home-based trip.
Trip distribution	The process by which the total numbers of trips originating in each zone are distributed among all the possible destination zones.
Trip end	Either a trip origin or trip destination.
Trip generation	The process by which the total number of person trips beginning, or ending, in a zone are determined, based on demographic, socio-economic and land use characteristics.
Trip matrix	A two dimensional matrix that represents the demand for travel among all zones in a study area for individual or grouped purposes, modes or types.
Trip production	Usually used to describe trip ends connected with residential land uses in a zone. Also defined as the home end of a home-based trip, or the origin of a non-home- based trip.
Trip purpose	This can be defined as work trips, school trips, recreational or social trips and shopping trips.
Zone	A portion of the study area with homogenous land use, socio-economic and demographic characteristics.
Zone centroid	An assumed point in a zone that represents the origin or destination of all trips to or from that zone. Generally, it is the weighted centre of trip ends, rather than the geometrical centre of a zone.

5. Glossary 5 - Transport System Terminology

5.1 Interpreting the elements of the transport system

The elements of the transport system are defined in Box 1 below. This part of the Glossary provides a detailed interpretation of these elements in various settings. This interpretation should be adopted when applying the ATAP Guidelines.

5.1.1 Non-urban settings

The non-urban setting can be considered in terms of the interstate case and the intrastate case.

Interstate case

The interstate case may involve a connection between two capital cities (such as Melbourne and Sydney) or between a capital city and a regional centre on the National Land Transport Network (such as Melbourne and Albury).

Figure 1 shows an interstate corridor that runs between capital cities A and B (such as Melbourne and Sydney). Regional city R lies along the corridor between the capital cities. The corridor between A and B contains two uni-modal routes:

7. Route 1 - Road 1 (between A and B)
8. Route 2 - Rail 1 (between A and B).

AusLink network planning would have determined that these two routes are part of the National Land Transport Network. In most interstate corridors, a substantial proportion of the total transport task originates at, or moves to, centres along the corridor rather than end-to-end.

Corridor planning is a multi-modal exercise resulting in a corridor strategy. The strategy for the corridor between A and B sets the context for further, more detailed route and link planning.

The next step is route planning undertaken for Route 1 and Route 2, in the context of the multi-modal corridor strategy. Route planning can involve an entire route or segments of a route (see discussion of link planning below).

Box 1: Transport system elements

The Framework incorporates the following definitions of the transport system and its elements:

1. A ***link*** is a homogeneous segment of a route. An inter-modal facility where people or freight are transferred from one mode to another is also categorised as a link – and is sometimes referred to as a ***node*** in the network.

2. A ***route*** is a physical pathway connecting two locations for a particular mode. Transport services are operated along these pathways. In land transport, the pathway consists of a continuous length of infrastructure. Shipping lanes and air routes are delineated by operating or regulatory or administrative practices rather than by infrastructure. The route concept is the basis for the definitions of higher elements in the hierarchy.

3. A ***corridor*** comprises the parallel/competing modal routes between two locations, such as road and rail routes between two capital cities. A corridor is multi-modal where two or more modes operate and is uni-modal where just a single mode operates (mainly in rural areas). It also includes the adjoining land uses.

4. An ***area*** consists of a defined geographic space and all the transport routes within it. An area focus, rather than a corridor focus, is often required in urban (transport and land use) planning to best account for the highly complex interactions in urban settings such as intersecting routes and dispersed population, activities, trip origins and trip destinations).

5. A ***network*** incorporates all of the routes that provide inter-connected pathways between multiple locations for similar traffics. Networks can be multi-modal or uni-modal. A multi-modal network typically comprises several uni-modal networks. Examples include:

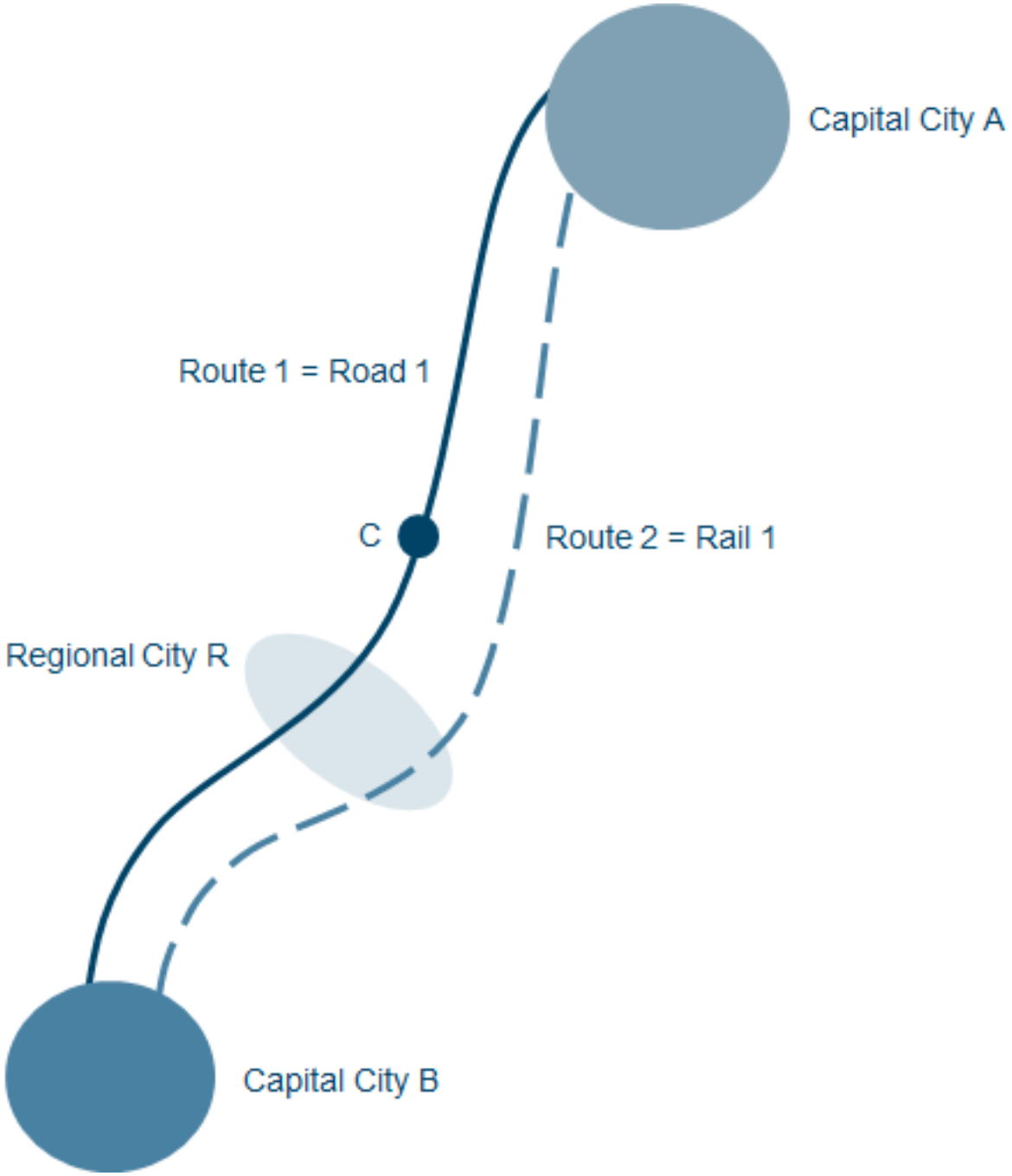
    - The *National Land Transport Network* (multi-modal) – which comprises the national highway network and the interstate mainline rail network and serves longer-distance traffic of national significance
    - The *Intrastate Transport Network* (multi-modal) – which comprises the rural arterial road network and rural intrastate rail network and serves longer-distance non-urban traffic within a state or territory
    - The *Urban Transport Network* (multi-modal) – which includes the urban arterial road network, public transport network and cycling network and serves traffic within a city.

Planning at each level considers demand factors (land use, population, economic and social activities) and supply factors (infrastructure) relevant to the level.

Initiatives can span various planning levels. For example, an initiative could occur within a link (such as adding a road turning bay or rail crossing loop), across the whole link or multiple links (such as a road passing lane) or across an entire route (such as road duplication or rail signal upgrading between Melbourne and Sydney, or over-dimensional vehicle routes through or around urban areas).

A ***transport system*** for a jurisdiction (or a multi-jurisdictional setting) comprises all relevant transport networks, user, regulatory and management sub-systems, the transport operating environment and physical and social environments.

Figure 1 Interstate setting



Where a new route is required, route planning considers alignment options, including detailed planning for the preferred alignment. This leads to purchasing land for future development of the new route.

Link planning is then undertaken for each link, with Priority Links usually nominated for attention first, in light of funding limitations. A link is a homogenous segment of a route and is therefore smaller than a route. A route will contain a collection of links - for example, in Figure 1, the segment of Route 1 between R and C might be defined as ‘Link RC’.

Intrastate case

The approach used in the interstate case above can easily be applied to the intrastate setting. Instead of A and B being capital cities, they may be regional cities or centres within a state or territory, or a capital city and a regional centre within a state or territory. Routes 1 and 2 are a primary state or territory arterial road and a rail line, neither of which are on the National Land Transport Network.

Many intrastate settings will not involve multiple modes in a corridor. For example, they may incorporate transport to more remote parts of a state or territory that are generally served only by road. The corridor would then be uni-modal, possibly with parallel competing road routes.

5.1.2 Urban setting

Corridors are most commonly used for non-urban settings because the transport routes between major centres of population and activity are usually long and continuous. Corridors are typically long and thin, with most movements occurring along a single axis (such as north–south).

In urban settings, considering an area, rather than a corridor, is more appropriate as population and activities are spread out in all directions. As a result, ‘areas’ contain highly dispersed travel origins and destinations, with intersecting routes. The degree of complexity and interaction is therefore greater than in non-urban settings. Concentrating on areas allows complex interactions to be best considered in an integrated and interrelated manner.

The complexities of transport patterns in urban areas also mean that detailed urban travel demand and transport analysis models are required in urban policy and planning. The models are usually much more complex than those used for non-urban transport policy and planning.

Figure 2 presents a stylised sketch of a capital city. For the metropolitan area (Area U), policy and planning work would consist of:

1. Classification of infrastructure hierarchies - such as freeway versus arterial versus local roads, collector roads versus non-collector local roads, freight versus passenger rail lines
2. Policy issues such as the role of land use planning and travel demand management.

Planning should then occur for urban sub-areas. Figure 2 shows some of the sub-areas in the urban area. Figure 3 then shows Sub-Area 1 in more detail. This sub-area has two urban corridors that intersect (Corridor NS and Corridor EW), with each corridor consisting of several routes (see Table 1).

Area planning occurs for Sub-Area 1 in the context of complex interactions occurring within the sub-area and the broader metropolitan area. Route planning should be undertaken for each route, with activities for new routes involving the consideration of alignment options and identification of the preferred alignment.

Each route can be broken into links - for example, Road 1 has Link ab and Link bc. Some links may be nominated as Priority Links (as noted in the discussion of the non-urban setting). A Link Plan is produced for each link.

The same process is then repeated for all other sub-areas and the elements within them.

5.1.3 Regional setting

Referring back to Figure 1, planning is also required for regional city R. This requires area planning, in the context of the national corridor AB. The concept of routes and links will apply equally in this setting.

Another example of area planning is planning for a region (such as the integrated region planning that has occurred for South-East Queensland).

5.1.4 Inter-modal

Inter-modal interchanges will occur at various points throughout the network, where people or freight switch from one mode to another during the journey.

5.1.5 Local setting

The above approach may also be applicable at the local government level, with some modification.

Figure 2 Urban setting

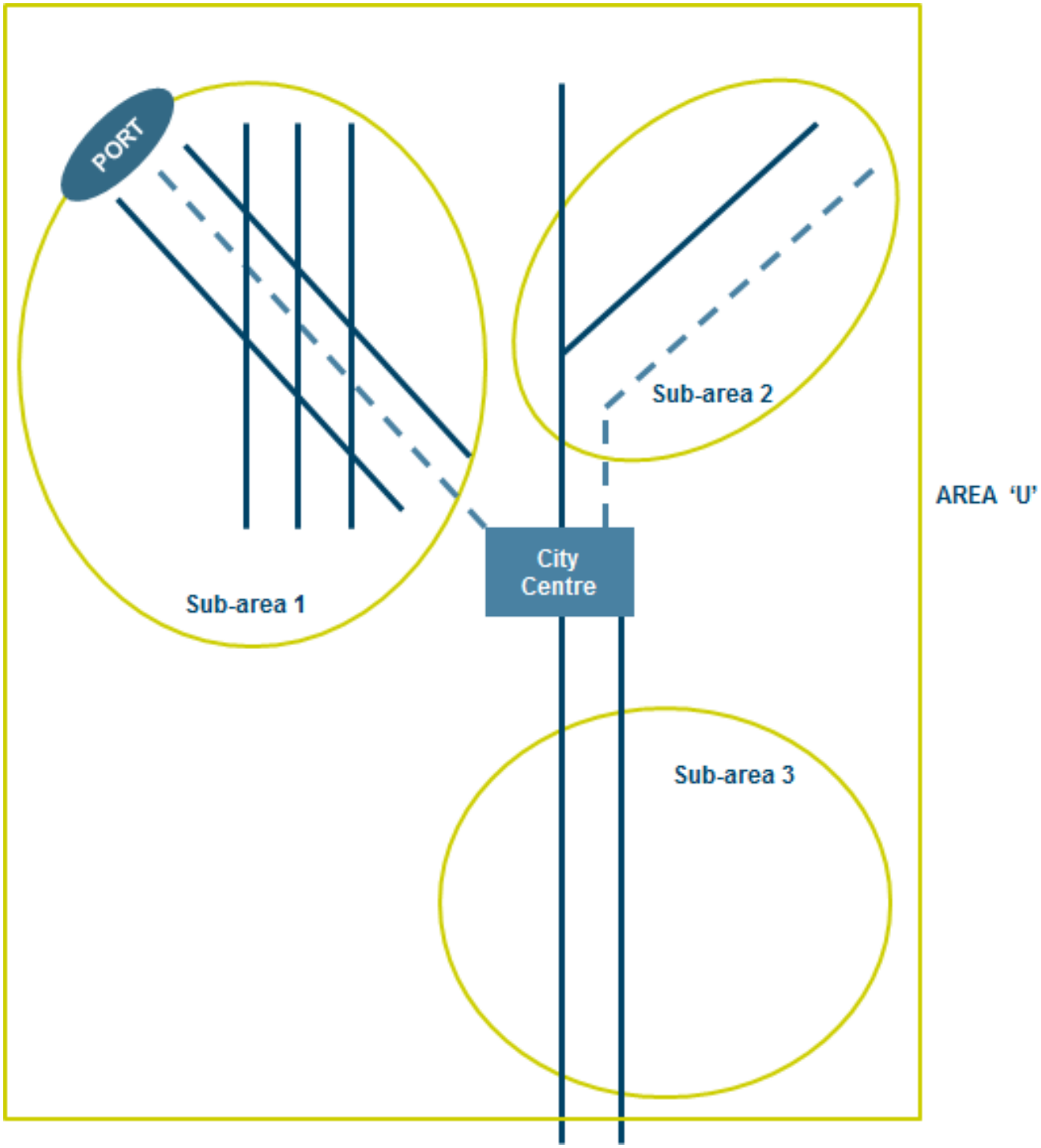


Figure 3 Sub-area 1

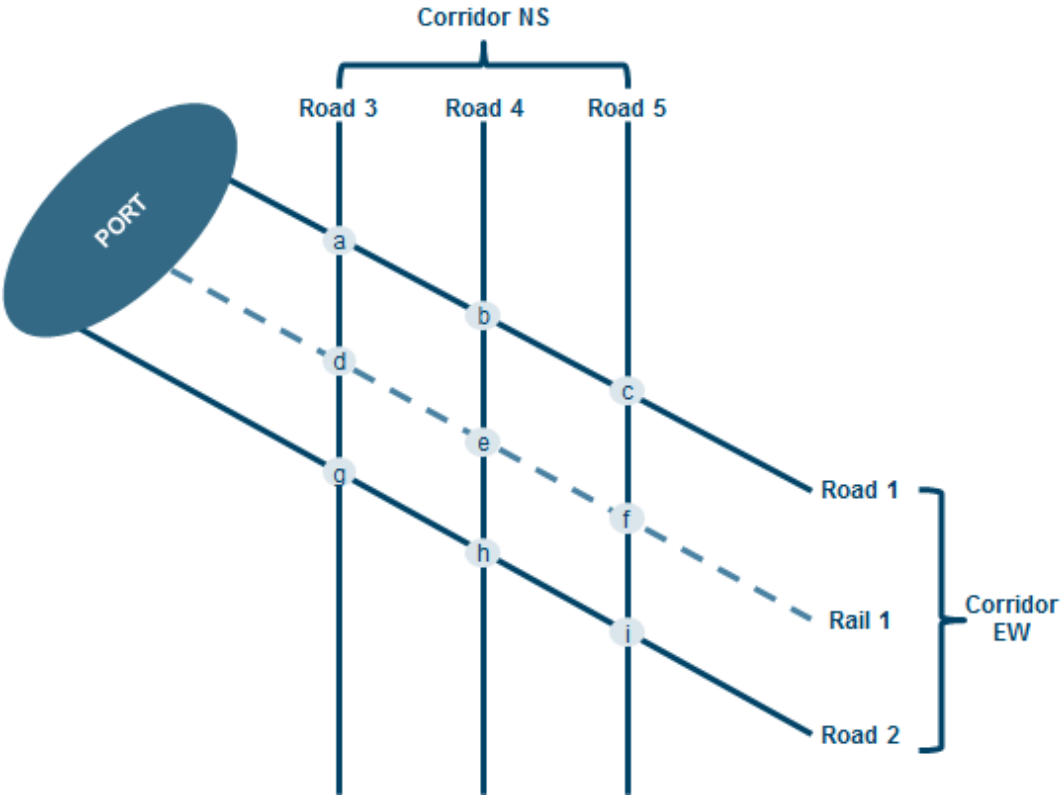


Table 1 Routes in Corridor NS and Corridor EW

Route type	Corridor NS	Corridor EW
Road routes	Road 3, Road 4, Road 5	Road 1, Road 2
Rail routes		Rail 1

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