

Perth Transport Model

Frequently Asked Questions (FAQ)



Department of Transport
Main Roads Western Australia
Public Transport Authority

What is Transport Modelling?

A transport model is a tool for understanding and assessing the likely impacts of changes in the drivers of transport, such as transport supply, demographics, or land use. In this context, transport modelling can assist with decision-making about the future development and management of urban transport and land use systems.

What is the hierarchy of Transport Models?

There are four tiers in the hierarchy of transport models: strategic transport models, mesoscopic models, microsimulation models and micro-analytic models.

Strategic transport models operate at a regional level and provide a broad overview of the transportation system for long-term planning and policy analysis. Mesoscopic models focus on intermediate-scale dynamics within a specific area or corridor, capturing variations in traffic flow and travel patterns. Microsimulation models offer more detail by simulating individual vehicles and travellers, enabling accurate predictions of travel times and behaviour in complex traffic scenarios. Micro-analytic models provide detailed intersection analysis. Each modelling tier in the hierarchy serves a specific purpose within transportation planning and analysis.

Currently, there are two strategic transport models used by the Transport Portfolio – STEM managed by Department of Transport, and ROM24 managed by Main Roads. Mesoscopic, microscopic and micro-analytic transport models are typically developed on a project-by-project basis.

What is the Perth Transport Model (PTM) project?

The Perth Transport Model (PTM) project is a project to implement a new strategic transport model for the Perth metropolitan region that will be used for strategic transport modelling across the Transport portfolio. The PTM will incorporate tour-based modelling for forecasting person travel and commercial vehicle travel.

Why is the PTM necessary?

There are two core drivers for the development of the PTM:

- To move to a single strategic transport model, ensuring an alignment and consistency of approach across transport planning and infrastructure project decision-making; and,
- To adopt new modelling technologies that will support the changing demands placed on models, such as the ability to model scenarios that incorporate changes to travel behaviour and the adoption of emergent transport technologies.

Will the PTM supersede both ROM24 and STEM?

The PTM will supersede both STEM and ROM24, to become the single strategic transport demand model for use within the Portfolio.

How will the transition to the PTM take place?

There will be a transitional period of concurrent use of the PTM, STEM and ROM24, for validation and triangulation purposes. This will mitigate any teething issues with the PTM. An assessment will be made following the transition period on the phasing out of STEM and ROM24. During the phase out, past modelling scenarios undertaken in the STEM and ROM24 models can be revisited for consistency purposes.

How did the PTM project evolve?

In 2013 an independent Transport Modelling Review was undertaken by the Planning and Transport Research Centre (PATREC). The review sought to determine the way forward in meeting the transport modelling needs across different WA State Government agencies, and involved extensive consultation with the Department of Transport, Main Roads WA, the Public Transport Authority, the Department of Planning Lands and Heritage, local governments and the private sector.

The review recommended the development of an integrated Perth Metropolitan Area transport model.

Following from this review, the implementation of the new Perth Transport Model (PTM) system has been proposed as a key initiative to enable the modelling of the range of future year scenarios that need to be considered in strategic transportation planning.

The recommended option for the PTM was selected based on an options assessment process that considered the alignment of the identified options to the project objectives as well as current overarching government strategies and policies.

What additional capability will the PTM have?

The current trip-based modelling approach has been in place for more than 60 years. Updating the PTM to a tour-based approach will enable the PTM to better meet the increasing demands placed upon our current transport models.

The tour-based modelling approach models the inter-dependencies that exist between the trips that make up a tour. This leads to more realistic modelling of travel.

The PTM will model travel behaviour at the individual household and person-level. This enables the modelling of a broader range of planning strategies and policies, particularly those scenarios that impact on an individual's allocation of time for travel and other activities, such as Working From Home (WFH). The PTM will also be able to integrate with emissions modelling software.

Will the PTM be able to model all modes of transport?

Yes, the PTM will be able to forecast all road, Public Transport (PT), and active travel modes (walking and cycling). Active mode modelling will be suitable for assessing strategic travel patterns.

What will the geographic boundary of the PTM be?

The PTM will include the Metropolitan Regional Scheme (MRS) area, Mandurah and Pinjarra in the Shire of Murray.

What benefits will the new PTM deliver?

The new PTM will deliver a range of benefits:

- Ability to model different scenarios
The PTM will adopt a scenario-based framework that will enable the modelling of multiple scenario specific assumptions such as permanent Working From Home (WFH) to determine its potential impact
- Improved modelling of congestion
The PTM will lead to improved, and more realistic, modelling of congestion at a transport system level, including both road congestion and PT crowding
- Improved modelling of Public Transport
The PTM will lead to improved modelling of PT, including the ability to model PT patronage during peak periods, incorporating factors such as parking costs, fare structures, PT crowding, frequency, journey time variability, and improved park-and-ride and kiss-and-ride modelling



- Improved road traffic modelling
The tour-based approach for person-based and commercial vehicle travel will include the ability to model mid-block and intersection delays separately, and will incorporate factors such as electric vehicles, autonomous vehicles, ramp metering, peak-periods, and journey time variability
- Improved Commercial Vehicle (CV) modelling
The PTM will incorporate a tour-based commercial vehicle model which will better represent the multi-stop tour behaviour for commercial vehicles operating within the Greater Perth Metropolitan Area

What level of disaggregation will there be for Commercial Vehicles?

The PTM will adopt a five-class grouping of vehicles based upon the Austroads Vehicle Classification – cars, light commercial vehicles (Austroads Classes 1-2), rigid trucks (Classes 3-5) and articulated trucks (Classes 6-12). Consideration for an additional Container Truck class will be investigated.

What is the timeline for the implementation of the PTM?

The PTM is planned for implementation by mid-2026. The successful calibration and validation of the PTM is dependent upon the final data delivered from the Perth Area Travel and Household Survey (PATHS), which will be finalised by mid-2023.

How often will the PTM be updated?

The PTM will be updated on an annual basis, with model networks being updated annually, and other model aspects being updated as data is made available.

Which year will be the PTM Base Year?

The year 2021 has been chosen as the base year for the PTM. The choice of the base year is important as it sets the foundation for all future year scenarios in the PTM.

The availability of travel survey data was a key consideration in defining 2021 as the base year. The Perth Area Travel and Household Survey (PATHS) was conducted from May 2018 to September 2022. The PATHS was suspended from April 2020 to September 2020 during the Covid-19 pandemic. This resulted in two tranches of travel survey data: two years of pre-covid impacted data and two years of covid-impacted data, which provides insight into the impacts to travel behaviour post pandemic. In addition to being centred around the Covid-19 pandemic, the PATHS data collection was also centred around the 2021 Population Census. As a result of this confluence, there is available a data set of revealed travel preferences contemporary with the 2021 Population Census. The previous household travel survey for the Perth Metropolitan Area was conducted from 2002 to 2006.

In addition, the Commercial Vehicle Survey (CVS) was conducted during 2021, again confluent with the Population Census. The CVS captured a sample of commercial vehicle activity across the Perth Metropolitan Area. The previous CVS was conducted in 1996.

A considered approach will be undertaken to validate the PTM including:

- A detailed assessment on its ability to predict travel behaviour observed in 2021;
- Back-casting to 2016 to assess the PTM's ability to predict travel behaviour observed in 2016;
- During 2026-27, an assessment of the PTM's ability to predict travel behaviour observed during 2026.



A key feature of the PTM is its scenario-based framework that will enable the modelling of multiple scenario specific assumptions such as: levels of telecommuting and permanent WFH, and the penetration of autonomous vehicles. This will be an important feature given the level of uncertainty concerning the future.

Where can I get further information?

The key contact for the PTM project is PerthTransportModel@mainroads.wa.gov.au

