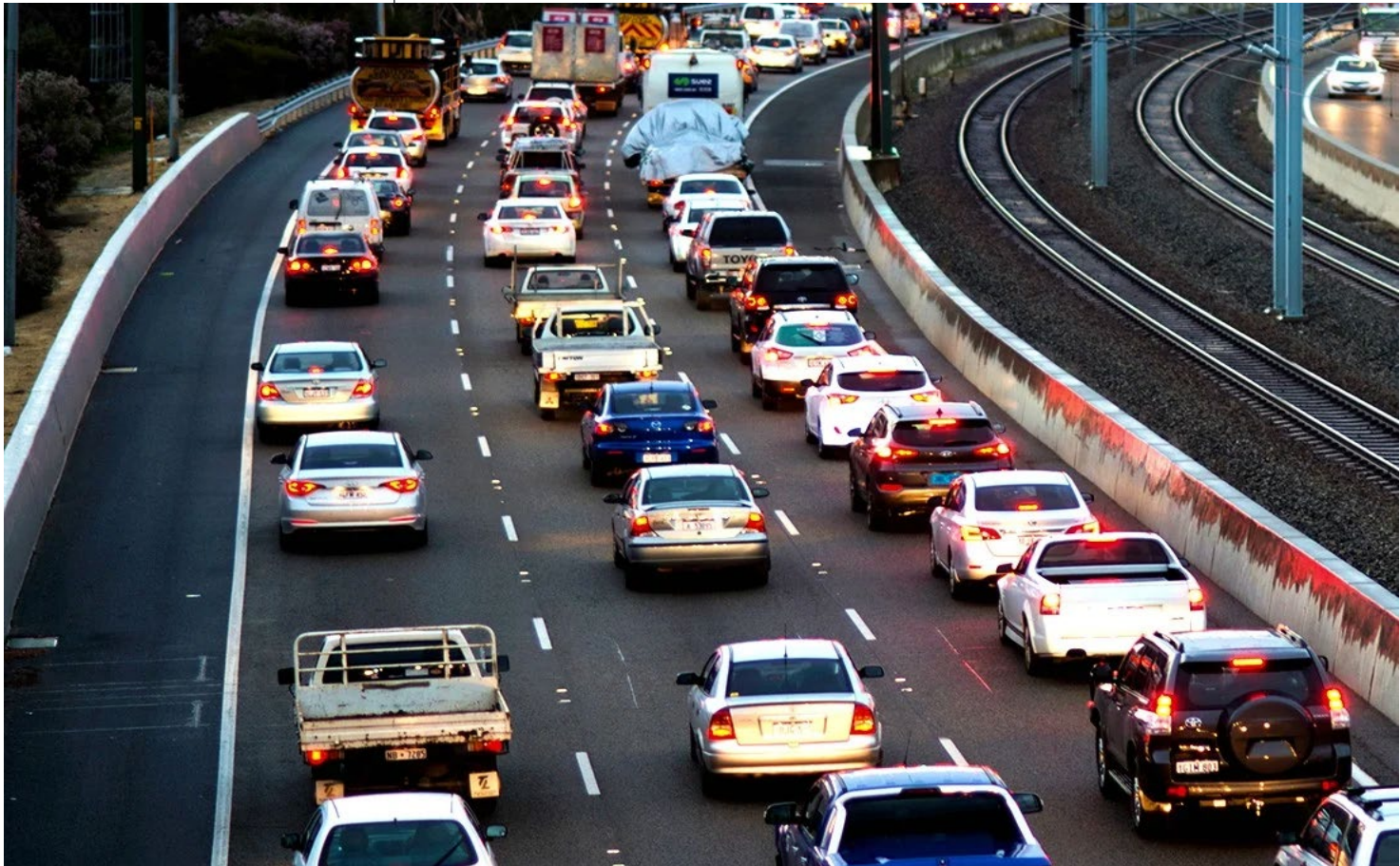


Technical Note on assessing the impacts of COVID-19 for business cases

This document applies to all agencies
within the NSW Transport cluster

April 2023



[Title]

Document control

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Versions

Version	Amendment notes
1.0	June 2021, the first release
2.0	April 2023, aligned to TfNSW modelling of COVID-19 impacts in the medium and long term with release of Strategic Travel Model 3.9 and updated NSW Common Planning Assumptions (CPA)

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1. Background

This document provides guidance for the consideration of COVID-19 in business cases and cost benefit analysis (CBA) and potential impact on long term transport trends. It expands on the advice provided in the *Transport for NSW Cost-Benefit Analysis Guide* and the *Transport for NSW Economic Parameter Values*.

This document updates and replaces the original *Technical Note on assessing the impacts of COVID-19 for business cases* released in June 2021. Since that release, there have been developments in demand forecasting that require an updated approach to considering the impact of COVID-19 on project business case and economic appraisal headline results.

This guidance document has been developed by Transport for NSW (TfNSW) and reflects the outcomes of TfNSW-led research projects, as well as discussions and workshops with other State and Federal Government Departments and Working Groups. The approaches and recommendations provided are intended to align with population forecasts provided by the Department of Planning and Environment (DPE), the NSW Government Common Planning Assumptions Group (CPAG), and research projects undertaken in partnership with TfNSW.

This document provides recommended approaches for undertaking COVID-19 sensitivity testing scenarios. However, it is not intended to enforce strict compliance with a particular approach where it does not support sensible analysis. Deviation from this guidance should be accompanied by calculating results with both the recommended and preferred approaches and explaining the difference.

The following chapters provide a technical overview and user guide, and are intended for users with a presumed high level of knowledge of demand modelling and transport economics.

Project teams should consult with TfNSW Economic Advisory for advice and feedback on their COVID-19 sensitivity testing approach, and to confirm the latest publicly available data or transport models on estimating these impacts. The Economic Advisory team can be contacted by emailing EconomicAdvisory@transport.nsw.gov.au.

For assistance with modelling methodology scoping and support for project cases, The Model Planning Team (Advanced Analytics and Insights, CST) can be contacted via Model.Selection@transport.nsw.gov.au at any stage in your project development.

2. CBA Sensitivity Tests of New Projects

2.1 The release of Travel Zone Projections (TZP22) and Sydney Strategic Travel Model (STM3.9)

The most recent iteration of TZP22 and STM3.9 includes post-COVID-19 population and travel behaviour impacts. As such, projects that are based off STM3.9 should only consider quantitative sensitivity tests if location specific working from home (WFH) data is available and expected to lead to materially different transport demand or movements than what is projected in the core transport demand modelling, or if project specific land uses are developed for the project study area.

STM3.9 incorporates the potential impacts of COVID-19 through:

- Higher rates of WFH compared to pre COVID, particularly in tertiary professions with office-based work
- More local travel associated with WFH – trip chains that were previously centred around office locations are now made around peoples home or neighbourhoods
- Customer sentiment towards public transport (not applied in STM3.9, but possible)
- Changes to tertiary student travel patterns, with less travelling to lectures if some of them are delivered remotely
- Air travel demand (SALTM) adjustments.

2.2 CBA sensitivity test requirements

Projects with transport modelling informed by the Sydney Strategic Travel Model (STM3.9) released December 2022, have already include long-term COVID-19 impacts. These will form the project core analysis and additional COVID-19 impact sensitivity testing is not required unless WFH data is available and is expected to be materially different from modelled outputs, or if project-specific land uses are developed for the project study area. Additional CBA sensitivity is not expected to add value for projects that follow State-wide assumptions of population, employment, land use and WFH patterns.

It is recommended that the project team should investigate the applicability of Common Planning Assumptions and assumptions regarding WFH rates. Projects in locations that have a significantly higher or lower WFH propensity (e.g., based on industry or occupation data) should undertake a sensitivity test to inform the robustness of project economic benefits.

3. CBA Sensitivity Testing Approach for Transitional Projects

Projects that are based on transport modelling prior to STM3.9 (released December 2022) are considered as 'transitional projects.' These projects are required to continue to use the approach of conducting a sensitivity test with the Economic Appraisal report to assess the potential impact of COVID-19. Either in-model adjustments or out of model adjustments are accepted.

3.1 Impact on cost-benefit analysis

Reduced population growth rates

The reduction in projected population growth rates in the base case reduces pressure on the transport network, lowering overall trip numbers and congestion at an aggregate level. This has the potential to slightly reduce the majority of transport user benefits and externalities measured in CBA.

Increase in working from home rates and workplace flexibility

The increase in working from home reduces commuter trips, particularly for public transport users and to key employment centers such as Sydney CBD, Parramatta, North Sydney, and Macquarie Park, in the AM and PM peak periods. Increased flexibility for employees can also have the potential to increase inter-peak trips, and certain non-commute trips such as entertainment and education related trips, particularly in suburban and outer metropolitan areas away from major employment centers. The increase in population working from home would

therefore also have the potential to slightly reduce many transport user benefits measured in CBA. As most demand modelling is carried out for peak periods rather than the whole-day, increased flexibility or 'peak-spreading', if material would require an adjustment to the expansion factors used in the CBA to avoid understating transport benefits. It is important in this instance to use project specific expansion factors (peak time to weekday) to avoid this type of misrepresentation of transport benefits.

Changes in mode preference

The impact of COVID-19 may have resulted in a change in mode preference away from public transport and towards private vehicle trips. This impacts the base case and may result in additional road trips and fewer public transport trips, impacting user benefits and externalities.

Additional intra-zonal and active transport trips

Additional local, intra-zonal and active transport trips may occur as a result of additional working from home, and changes in destination preference as a result of COVID-19. These trips may result in positive externality impacts in the base case (e.g. reduced environmental impacts from vehicles, increased private health benefits from active travel).

3.2 Out of model adjustment

Out of model adjustment refers to adjusting the economic model rather than the transport demand modelling (which is typically an input to the economic model). This should be done if re-running transport demand modelling is not practical and there is an expected material impact on the CBA headline results. These out of model sensitivity tests should reflect the potential impacts of COVID-19 on the benefit streams assessed in the CBA. Impacts that can be quantified and included in the CBA modelling include:

- Impacts of lower population growth
- Mode shift between road and public transport
- Increased working from home
- Other impacts

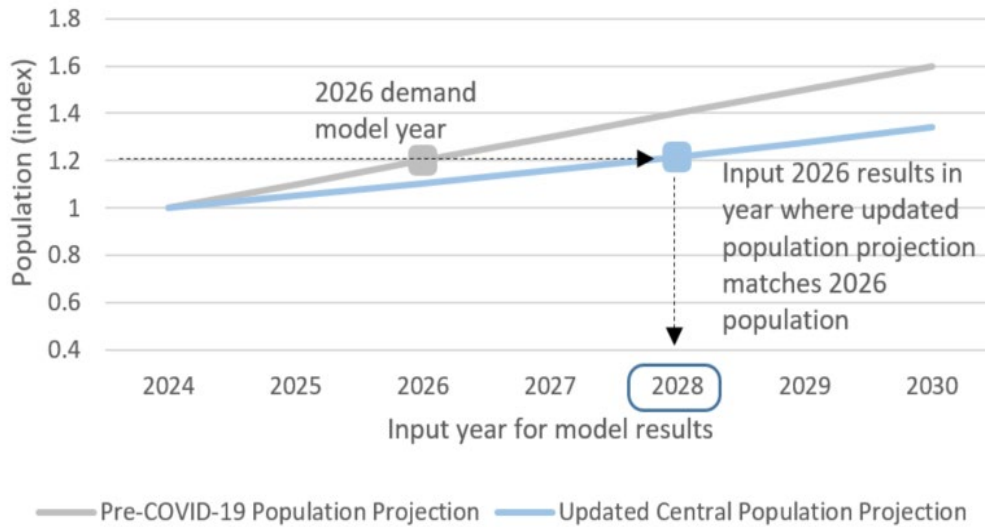
The key, or most material, impacts are expected to be the impacts of population growth changes and increased working from home. The sections below describe how these can be accounted for in the sensitivity analysis.

3.2.1 Impacts of lower population growth

Approach 1:

Estimate the NPV and BCR with a delay in realisation of benefits, corresponding to delay in population growth. The recommended approach for implementing this is to transpose modelled results from the original year to a year which better matches the updated population forecast. For example, 2026 results may instead be modelled as occurring in 2028, and CBA cash flows can be adjusted accordingly.

Figure 1 Transposing demand model results to match updated population predictions (indicative only)



Analysis by TfNSW Economic Advisory, 2023

Approach 2:

Alternatively, the following data from Centre for Population’s COVID Population Statement forecasts can be used to estimate the appropriate updated model year for cash flow modelling. The table contains adjustment factors for district level or more generalised adjustment factors, for example Greater Sydney Region or NSW total. The appropriateness of using district level adjustment factors or using more generalised adjustment factors depends on the scope of the demand modelling area used for project forecasts.

Table 1: Population projection adjustments, indexed to pre-COVID-19 figures

Region	2016	2021	2026	2031	2036	2041
Central City District	1.000	0.910	0.835	0.832	0.841	0.846
Eastern City District	1.000	0.967	0.905	0.888	0.885	0.889
North District	1.000	0.975	0.942	0.936	0.929	0.927
Rest of NSW	1.000	1.003	1.013	1.032	1.053	1.078
South District	1.000	0.970	0.924	0.914	0.926	0.910
Western City District	1.000	0.953	0.913	0.876	0.828	0.804
GSC Newcastle	1.000	0.994	0.999	1.013	1.029	1.047
GSC Wollongong	1.000	1.004	1.020	1.055	1.092	1.132
Greater Sydney Region	1.000	0.953	0.899	0.884	0.873	0.865
Regional NSW	1.000	1.000	1.009	1.029	1.051	1.075
New South Wales Total	1.000	0.971	0.939	0.934	0.933	0.934

Source: Department of Planning and Environment, 2019 and 2022 common planning assumption projections. LGA projections corresponded to District geographies. For additional information please contact EconomicAdvisory@transport.nsw.gov.au

3.2.2 Increased working from home

An accurate representation of the impact of increased population working from home is difficult to achieve with out of model adjustments as there are several influential factors that cannot be incorporated into the calculation, for example, origin-destination information.

The approach below is for a high-level estimation and, if used, the economic appraisal report should include caveat that the actual impact of working from home may be different to the results presented in the report.

There are several factors to consider when estimating the impact from people working from home:

Ability to work from home

It should be noted that working from home rates can vary significantly depending on the employment location. There are a number of occupations that do not have the capability to allow employees to work from home. This can be for reasons including jobs that have a manual labour component or require a physical presence. As an example, industrial precincts will likely have a large number of businesses that operate in this fashion. Alternately, office dominant locations would likely have a higher propensity to allow employees to work from home.

Current projections indicate a trend towards increased ability to work from home at an aggregate level with 41% of the employed with the potential to WFH in 2026 and 49.5% of the working population with the potential to WFH in 2036. Some occupations have the current ability

to work from home 100% of the time while other professions may be unlikely to develop the ability to work from home.

Propensity to work from home

Some people and professions may have the ability to work from home but may still choose not to. The propensity is measured between 0 and 1. This guideline recommends assuming a propensity value of 1. I.e., those that have the capability to work from home, will do so. This is consistent with current STM3.9 transport demand modelling assumptions.

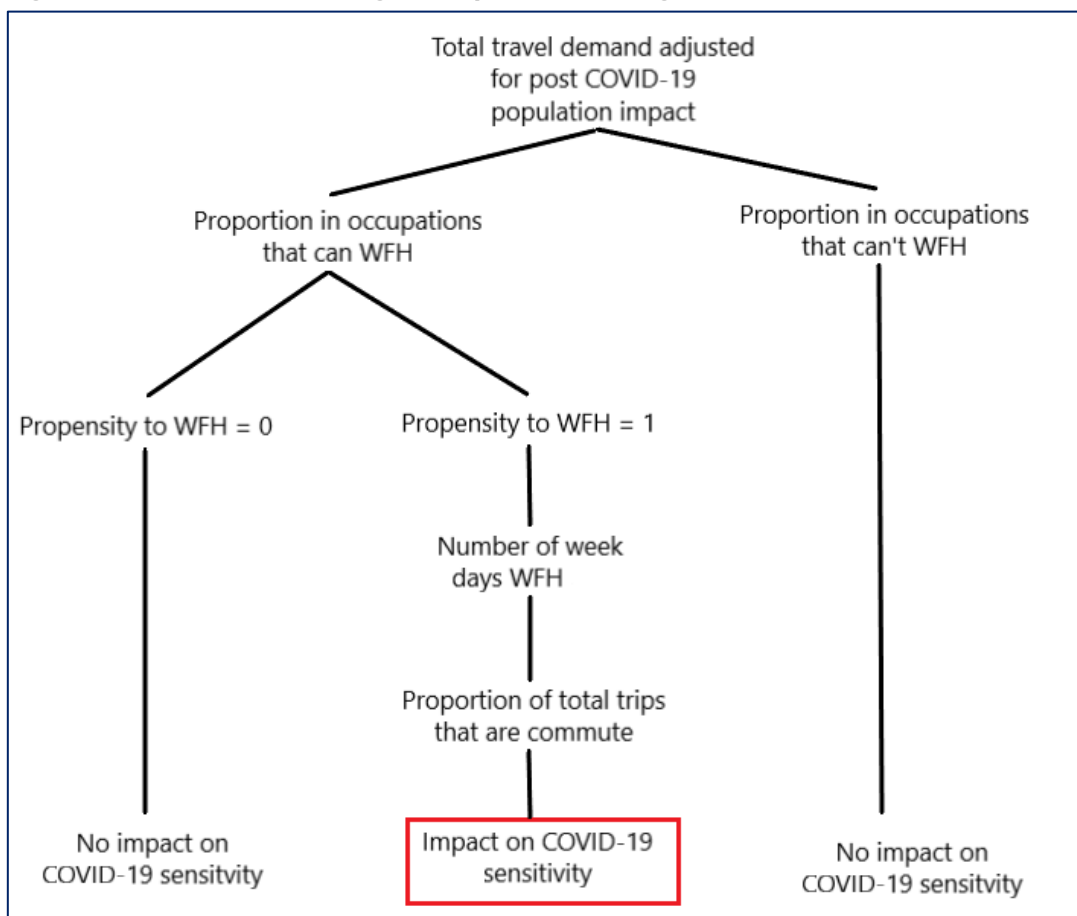
Proportion of days that will be worked from home

The number of days worked from home can range anywhere from 1-5 workdays per week. This is subjective and different personal situations will impact the number of days that people are likely to work from home. This guideline recommends a mid-point assumption of 2 days worked from home per typical work week, indicating that on any workday, 40% of those who can work from home, will do so. This is consistent with current transport modelling assumptions.

Proportion of total trips that are for commute purpose

It is expected that the proportion of people working from home on any given day will not impact all trips, but only those which are used to commute to and from work. Prior to COVID, commute trips typically comprise 17.4% of total trips within Greater Sydney (Transport for NSW, 2020).

Figure 2: Process to assessing the impact of Working from Home



Analysis by TfNSW Economic Advisory, 2023

The recommended out of model adjustment for the impact on travel demand of increased working from home as a result of COVID-19 is a **2.85% reduction in 2026**, and if required for inclusion, a **reduction of 3.45% in 2036**. A breakdown of the assumptions behind this calculation are included in **Table 5**.

Table 2: Out of model work from home adjustment

Item	Impact	2026	2036
A	Occupations with the ability to work from home	41%	49.5%
B	Propensity to work from home	1	1
C	Number of days WFH per work week ¹	2 out of 5 weekdays	2 out of 5 weekdays
D	Proportion of trips that are for commuting ²	17.4%	17.4%
E	Trip reduction as a result of increased working from home (A*B*C*D)	2.85%	3.45%

Analysis by TfNSW Economic Advisory, 2023

3.2.3 Mode shift between road and public transport

Increase road user impacts (benefits and disbenefits); decrease PT user impacts (benefits and disbenefits) over near horizon to accommodate short-term change in mode preferences.

These impacts can be modelled as a percentage increase (or decrease) in the total value of each benefit stream based on the change in trip volumes for road and public transport networks within the area assessed, relative to pre-pandemic levels.

3.2.4 Other impacts

The above list of impacts is not exhaustive and may not reflect impacts that may have a material impact on certain individual projects. This chapter provides recommended approaches for undertaking 'out of model' COVID-19 sensitivity testing. However, strict compliance with only the impacts discussed in this document is not required or recommended where it does not support sensible analysis.

Other impacts that are not discussed in this document, which may influence the value for money case for a project, may still be used in sensitivity testing. Where this is done, the impacts and approaches should be accompanied by evidence to support their validity.

4. References

Centre for Population. (2022). *Data and Forecasts*. Retrieved from <https://population.gov.au/>

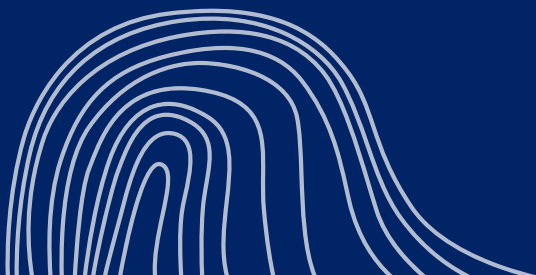
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TfNSW Economic Advisory. (2021). *Transport for NSW Technical Note on assessing the impacts of COVID-19 for business cases*. Sydney, NSW: Group Finance & Investment.

Transport for NSW. (2020). *Household Travel Survey Report: Sydney 2018/19*. Sydney: Transport for NSW.

¹ Assumption – consistent with COVID-19 Strategic Demand Modelling (TfNSW Advanced Analytics and Insights, 2022)

² (Transport for NSW, 2020)



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