

Operational Modelling Guidelines v2.0

2020 Updates

Owner	Johann Brits, Manager Traffic and Road Network Performance
Custodian	Hannah Saunders, Operational Modelling & Visualisation Manager
Document Number	D20#1064587
Issue Date	January 2021

This Operational Modelling Guidelines v2.0 has the following amendment history:

Section	Software	Nature of Amendment
1.0	N/A	First release
2.1	N/A	Confirm alignment of MRWA principles to support of innovation and collaboration.
2.1	N/A	Clarification that the guidelines are specifically for operational modelling; it is the decision of the Main Roads Project Manager to use these guidelines
2.2	N/A	New Section: explanation of an operational model
2.10	N/A	Table with Austroads' Vehicle Classification
2.10	N/A	New Pedestrian Guidelines: Guidelines for Pedestrian Crossing Facilities at Traffic Signals
General	SIDRA	Guidelines were updated for the latest released version of SIDRA (9)
General	SIDRA	Images are updated
4.2	SIDRA	This section was deleted. Information can be found in the SIDRA User Guide
4.3	SIDRA	Approach distance measurement and Area Type Factor were clarified
4.3	SIDRA	Table 4-2: Recommended Movement Classes By Main Roads was updated
4.3	SIDRA	Merge analysis was added to the guidelines (SIDRA 9)
4.3	SIDRA	Modelling requirements for saturation flow estimation, short lane capacity and Merge analysis were clarified
4.3	SIDRA	Signal timing requirements for metered roundabout were clarified.
4.3	SIDRA	Modelling requirements for pedestrian zone and signal timing were clarified (SIDRA 9)
4.3	SIDRA	Modelling requirements for peak flow period / factor were clarified
4.3	SIDRA	Pedestrian protection modelling method was added
4.3	SIDRA	Modelling requirements for zebra crossing were added (SIDRA 9)

4.3	SIDRA	Gap acceptance section was expanded
4.3	SIDRA	Table 4-6: Gap Acceptance and Opposing Vehicle Factors was updated
4.3	SIDRA	Modelling requirements for vehicle movement signals were clarified.
4.3	SIDRA	Signal timing, phase transition and filtering right-turn modelling requirements were clarified.
4.4	SIDRA	Modelling requirements for Staged Crossing at Two-way Sign Control were updated based on new templates in SIDRA 9
4.5	SIDRA	Calibrate Overview and Validations section were expanded
4.6	SIDRA	Network Data section was clarified
General	LinSig	Interchange information added
General	LinSig	Bus and pedestrian information expanded
General	LinSig	Guidelines expanded with best practice learned and improved techniques for modelling WA road networks.
General	LinSig	Network modelling information expanded and integrated in the main sections
General	LinSig	Proposed modelling information expanded and integrated in the main sections
3.2	LinSig	Updating MRWA values information added when working with an established model
3.2	LinSig	<i>Use separate capacities for long and short lanes</i> requirement added
3.3	LinSig	Exit arms should be added starting at the opposite direction
3.3	LinSig	Multiple intersections modelling requirements clarified
3.3	LinSig	Long and short lanes modelling methods expanded with figures added
3.3	LinSig	Short lane length measurement methods clarified with figures added
3.3	LinSig	Entry lane cruise time information added
3.3	LinSig	Radius measurement figure added
3.3	LinSig	Nearside/Offside examples expanded to include bus lane and interchange
3.3	LinSig	Saturation flow at interchanges information added
3.3	LinSig	Multiple lanes information clarified that multiple <i>long</i> lanes should be avoided
3.3	LinSig	Modelling double pocket figure updated with improved techniques
3.3	LinSig	Advanced settings moved to main Network Inputs section
3.3	LinSig	Lane connectors information on isolated intersection and network modelling placed under the section
3.3	LinSig	Turning connectors information added

3.3	LinSig	Bus lane modelling information updated
3.3	LinSig	Two-staged crossing information added
3.4	LinSig	Bus flow information expanded
3.4	LinSig	Matrix estimation tool GEH should be less than 2.0
3.4	LinSig	Matrix estimation tool information expanded
3.4	LinSig	Review of the assigned traffic information expanded
3.4	LinSig	Connector information related to network modelling placed under main connector section
3.4	LinSig	Pedestrian flow information expanded
3.5	LinSig	Signal information related to network modelling placed under main signal section
3.5	LinSig	Modelling pedestrian delay time clarified with added figure
3.5	LinSig	Pedestrian protection type selection clarified
3.5	LinSig	Shared lane modelling (Aggro arrow and filtered right turn) information expanded
3.5	LinSig	Modelling late start and early cut off clarified with added figures
3.5	LinSig	Double cycle modelling information added
3.5	LinSig	Cycle time for network modelling information added
3.5	LinSig	Phase length optimisation strategy and process information expanded
3.5	LinSig	Cycle time selection and optimisation information expanded
3.5	LinSig	Offset information expanded
3.5	LinSig	Demand dependency guidance expanded with more techniques and different worked examples
3.6	LinSig	Some give way parameters requirements clarified
3.10	LinSig	Model validation requirements clarified
3.11	LinSig	Model outputs information expanded with MRWA requirements added
3.11	LinSig	Average delay calculation methods added
General	Vissim	Guidelines were updated for released version VISSIM 2020
5.2	Vissim	A minimum requirement for warm-up and cool-down periods is amended to "a minimum of two times of the longest travel time or 15 minutes (whichever is greater)"
5.2	Vissim	Table 5-2 Desired acceleration attributes for HV types is amended.
5.2	Vissim	Table 5-3 Recommended power and weight distributions is amended with less heavy vehicle engine categories
5.2	Vissim	Table 5-4 Recommended colour distribution is amended
5.2	Vissim	Figure 5-5 is removed and Chapter 5.2.3.5 Vehicle type attributes is added

5.2	Vissim	Table 5-6 Recommended car following model parameters is added for <i>Additive part of safety distance</i> and <i>multiplic. part of safety distance values</i> , considering observed saturation flow
5.2	Vissim	Further recommended driving behaviour parameters and attributes are listed (<i>Cooperative lane change</i> , <i>Observe adjacent lane(s)</i> , and <i>Minimum lateral distance values</i>)
5.3	Vissim	Recommended value of lane change parameters is amended to 500m
5.3	Vissim	A separate chapter 5.3.3.3 is added for diverging section coding
5.3	Vissim	Table 5-8 Vehicle reduced speed range is amended to include recommended reduced speed profiles for short vehicle type
5.3	Vissim	The appropriate length for reduced speed areas is recommended (2 to 5m) and Figure 5-16 added to show an example of reduced speed areas at an intersection
5.4	Vissim	Table 5-10 (Recommended Conflict Area Parameters) is added
5.4	Vissim	A new chapter 5.4.3 is added for ramp metering
5.5	Vissim	Recommended bus dwell time parameters (Table 5-11) is amended
5.5	Vissim	Information on bus overtaking lane coding is added with Figure 5-19 (Bus overtaking lane coding with Overtake only public transport active)
5.5	Vissim	Recommended vehicle route attribute "CombineStaticRouting Decision" is discussed and figure 5-22 (example of static routing decisions) is added
5.6	Vissim	Additional information on traffic volume validation requirement (" <i>Even if the model outputs meet the traffic volume validation criteria for the entire network, the modeller should check and ensure that turning volumes at critical intersection(s) achieve GEH less than 5.</i> ")
5.6	Vissim	5.8.2.2 (Node) is replaced by chapter 5.8.1.2 (Intersection Assessment)
5.6	Vissim	Chapters were removed
5.6	Vissim	5.8.2.4 (Links) is removed and new chapters 5.8.1.3 and 5.8.1.4 are added for route assessment and critical section assessment, considering consistency with evaluation outputs stipulated in table 5-15
General	Aimsun	Guidelines were updated based on Aimsun 20 features
6.2	Aimsun	Included coordinate system guidance
6.3	Aimsun	Added coding of slopes
6.3	Aimsun	Revised guidance on turning speeds
6.3	Aimsun	Added further guidance on the usage of turn penalty functions
6.3	Aimsun	Added guidance on the usage of super nodes
6.3	Aimsun	Added ramp metering guidance

6.3	Aimsun	Revised guidance on pedestrian considerations
6.3	Aimsun	Revised guidance on priority rules
6.3	Aimsun	Revised guidance on public transport
6.3	Aimsun	Revised guidance on use of scripts
6.4	Aimsun	Revised guidance on traffic demand profile
6.5	Aimsun	Revised guidance on dynamic user equilibrium
6.5	Aimsun	Revised guidance on stochastic route choice
6.6	Aimsun	Revised guidance on travel time validation
6.7	Aimsun	Added additional presentation method
General	Appendix A	Images are updated
General	Appendix A	Data collection list was added
General	Appendix A	Traffic Signal Modelling Component section was added
A.2.2	Appendix A	Intersection Diagnostic Monitor Data Section was removed.
Attachment A.1	Appendix A	SCATS Event History File section was moved to the main body of the document.
A.2.3	Appendix A	Average Signal Timing Calculation section was expanded
A.2.4	Appendix A	Pedestrian Demand Estimation Section was combined with relevant information from Attachment A.1
A.3.2	Appendix A	Late Start Section was moved
General	Appendix A	Minimum Green section was added
A.3.1	Appendix A	Vehicle Intergreen Times section was expanded and combined with Attachment A.2.
A.3.3	Appendix A	Pedestrian Timings section was expanded and combined with Attachment A.3
A.3.3.1.4	Appendix A	Pedestrian Protection modelling requirements for WA was clarified.
A.4.6	Appendix A	Trailing Right Turn section was deleted
A.4.6.1	Appendix A	Yellow Trap Section was moved.
A.5	Appendix A	SCATS Linking and Offset section was updated based on TrafficMap information
A.5.5	Appendix A	Section was deleted.
A.5.5.1	Appendix A	Example was updated
A.4	Appendix A	Attachment A.4 was deleted
General	Appendix A	Attachment A.1 An Example of Phase Sequence Chart was added
General	Appendix C	Appendix C Title updated
General	References	References Updated