

VISSIM Calibration Settings

Last Updated: 03-30-21
Source: PTV Vissim 2020 User Manual

Type of Setting	Parameter Grouping	Parameter Name	Default Settings (per Vissim v. 2020.00-11)	Recommended Parameter Range	Typical Parameters Adjusted during Calibration	Parameter Description
GLOBAL	Simulation Settings	Simulation resolution; Time steps (seconds)/Simulation second	10.00	5 to 10	Yes	The simulation resolution has an impact on the behavior of vehicles, pedestrians, and the way they interact. A higher simulation resolution allows vehicles to make decisions based on the car following and lane change logic at a higher frequency.
		Simulation Speed, Simulation second/second	10	Value 1.0: the simulation is run in real-time Value 2.0: The simulation is run at double real-time speed, etc. Maximum option: Runs the simulation at the maximum speed	No	Corresponds to a time lapse factor. It indicates simulation seconds per real-time second. The simulation speed does not affect the simulation results. The simulation speed can be changed during the simulation run.
	Traffic Settings	Vehicle Composition (Veh Type; DesSpeedDistr; RelFlow)	100: Car, 50:50 km/h, 0.980 200: Car, 50:50 km/h, 0.020	Adjust to represent field conditions	Yes	Adjust relative flows to represent field conditions
		Pedestrian Composition (Ped Type; DesSpeedDistr; RelFlow)	100: Man, 1022:IMO-M 30-50, 1.000 Woman 1023:IMO-F 30-50, 1.000	Adjust to represent field conditions	Yes	Adjust relative flows to represent field conditions
	Base Settings	Vehicle Fleet		Use "WisDOT Defaults inpx" as default	Yes	Adjust to represent field conditions
		Vehicle/Pedestrian Types	Car, HGV, Bus, Tram, Pedestrian, Bike	Adjust to represent field conditions	Yes	Vehicle/pedestrian type allows you to form a group of vehicles/pedestrians with the same technical driving/walking characteristics
		Vehicle/Pedestrian Classes	Car, HGV, Bus, Tram, Bike Man, Bike Woman, Man, Woman, Woman & Child, Wheelchair	Typically separate into passenger cars and heavy trucks, but may use any of the FHWA 13 vehicle classes	Yes	By default, the data for all vehicle and pedestrian classes is entered together, but you can show the data for certain vehicle classes and/or pedestrian classes separately in the evaluation.
		Functions (Maximum and Desired Acceleration/Deceleration)	-	Use "WisDOT Defaults inpx" as default	No	Impacts how fast or slow a vehicle will accelerate/decelerate. Generally more critical on steeper grades.
		Distributions (vehicle characteristics, function and distribution)	-	2D/3D Model - Use "WisDOT Defaults inpx" as default, adjust to match field conditions as appropriate	Yes	Allows you to define the specific vehicles (Volkswagen Golf, Audi A4, etc.) that are included in the vehicle fleet.
		Vehicle Characteristics function and distribution		Speed Distribution: left turn 12.4 to 18.6 mph; right-turn 7.5 to 15.5 mph		Adjust to represent field conditions
LOCAL	Car Following	Look ahead distance min. (feet)	0.00	Typically not modified	No	Minimum distance that a vehicle can see forward in order to react to other vehicles either in front or to the side of it (within the same link). The minimum look-ahead distance is important when modeling lateral vehicle behavior. If several vehicle can overtake within a lane, this value needs to be greater than 0.00. If several vehicles can overtake within a lane, you can enter a greater look ahead distance to prevent any vehicle from running a red light (when doing so, do not change the number or Observed vehicles as this can lead to unrealistic simulation).
		Look ahead distance max. (feet)	820.21	Typically not modified	No	Maximum distance that a vehicle can see forward in order to react to other vehicles either in front or to the side of it (within the same link). May want to extend if modeling rail traffic with block signals.
		Look ahead distance. Observed vehicles	Arterial: 4 Freeway: 2	4	Yes	The number of observed vehicles or number of certain network objects affects how well vehicles in the link can predict other vehicles' movements and react accordingly. Higher value means vehicles can better react to multiple network objects in the network
		Look back distance min. (feet)	0.00	Typically not modified	No	Defines the minimum distance that a vehicle can see backwards in order to react to other vehicles behind (within the same link). The minimum look-back distance is important when modeling lateral vehicle behavior. If several vehicles can overtake with a lane, this value needs to be greater than 0.00. This way you make sure the cars drive in an orderly fashion when two or more vehicles, than specified in the Observed vehicles attribute, on the same route want to position themselves at a stop line. This applies in particular to bicycles.
		Look back distance max. (feet)	492.13	Typically not modified	No	Defines the maximum distance that a vehicle can see backwards in order to react to other vehicles behind (within the same link). You can reduce the maximum look-back distance in close-meshed networks (e.g., many connectors over a short distance). This may positively affect the simulation speed.
		Temporary lack of attention duration (s)	0.00	0.00 to 1.00	No	The period of time when vehicles may not react to a preceding vehicle (they do react, however, to emergency braking). With increasing values, the capacity of the affected links decreases.
		Temporary lack of attention probability	0%	0 to 5%	No	Frequency of the lack of attention. With increasing values, the capacity of the affected links decreases.
		Smooth closeup behavior	Selected	Typically not modified	No	If this option is checked, vehicles slow down more evenly when approaching a stationary obstacle. If this option is not selected, the following vehicle uses the normal following behavior until the speed of the preceding vehicle drops to less than 3.28 feet/second and it comes almost to a halt. The later approach behavior can include a temporary acceleration.
		Standstill distance for static obstacles	Not Selected, 1.64 ft if selected	Typically not modified	No	Standstill distance upstream of static obstacles such as signal heads, stop signs PT stops, priority rules, conflict areas. Not valid for stop signs in parking lots. The attribute Smooth closeup behavior must be selected. If this option is not selected, the vehicles use a normally distributed random value [0.5;0.15]. If this option is selected, the vehicles will use the given value.
			Wiedemann 74 Car following model (applicable for arterials)	Wiedemann 74-Average standstill distance (feet)	6.56 ft	3.28 to 9.84 ft.
		Wiedemann 74-Additive part of safety distance	2.00	1 to 3.75 ft	Yes	Value used for the computation of the desired safety distance. Higher value means larger standstill distance and lower capacity
		Wiedemann 74-Multiplic. Part of safety distance	3.00	2 to 4.75 ft	Yes	Value used for the computation of the desired safety distance. Greater value equals greater distribution (standard deviation) of safety distance. Higher value means larger standstill distance and lower capacity

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Car Following (Cont)	Wiedemann 99 Car following model (applicable for freeway/highway)	Wiedemann 99-CC0 (Standstill Distance) (feet)	4.92 ft	Basic segment: 4.0 to 5.5 Weaving/Merge/Diverge: >4.92	Yes	The average desired standstill distance between two vehicles, it has no variation. Higher value means larger standstill distance and lower capacity
		Wiedemann 99-CC1 (Headway Time) (s)	0.90	Basic segment: 0.7 to 3.0 Weaving/Merge/Diverge: 0.9 to 3.0	Yes	Time distribution of speed-dependent part of desired safety distance. Higher value means more cautious driver and lower capacity
		Wiedemann 99-CC2 ('Following' Variation) (feet)	13.12 ft	Basic segment: 6.56 to 22.97 Weaving/Merge/Diverge: 13.12 to 39.37	Yes	Restricts the distance difference (longitudinal oscillation) or how much more distance than the desired safety distance a driver allows before he intentionally moves closer to the car in front. Higher value means more cautious driver and lower capacity
		Wiedemann 99-CC3 (Threshold for Entering 'Following')	-8.00	Typically not modified	No	It controls the start of the deceleration process (i.e., the number of seconds before reaching the safety distance.) At this stage the driver recognizes a preceding slower vehicle.
		Wiedemann 99-CC4 (Negative 'Following' Threshold)	-0.35	Typically not modified	No	Defines negative speed difference during the following process. Low values result in a more sensitive driver reaction to the acceleration or deceleration of the preceding vehicle.
		Wiedemann 99-CC5 (Positive 'Following' Threshold)	0.35	Typically not modified	No	Defines positive speed difference during the following process. Low values result in a more sensitive driver reaction to the acceleration or deceleration of the preceding vehicle.
		Wiedemann 99-CC6 (Speed dependency of Oscillation)	11.44	Typically not modified	No	Influence of distance on speed oscillation while in the following process. If the value is 0, the speed oscillation is independent of the distance. Larger values lead to a greater speed oscillation with increasing distance.
		Wiedemann 99-CC7 (Oscillation Acceleration) (ft/s ²)	0.82 ft/s ²	Typically not modified	No	Oscillation during acceleration
		Wiedemann 99-CC8 (Standstill Acceleration) (ft/s ²)	11.48 ft/s ²	Typically not modified	No	Desired acceleration when starting from standstill (limited by maximum acceleration defined within the acceleration curves).
		Wiedemann 99-CC9 (Acceleration with 50 mph) (ft/s ²)	4.92 ft/s ²	Typically not modified	No	Desired acceleration when starting at 80 km/h, approximately 50 mph, (limited by maximum acceleration defined within the acceleration curves).
LOCAL (CONT)	Lane Change	General behavior	Free lane selection	Free lane selection or Slow lane rule	No	Free lane selection: vehicles may overtake on each lane Slow lane rule: allows overtaking on freeways or similar links according to the rules in road traffic Regardless of option selected, you can model the general behavior more realistically using the settings under Cooperative lane change
		Maximum deceleration - Own (ft/s ²)	-13.12 ft/s ²	-15 to -12	Yes	Upper bound of deceleration for own vehicle. Higher absolute value means more aggressive lane changing behaviors
		-1 ft/s ² per distance - Own (feet)	Arterial: 100 Freeway: 200	100 to 250	No	This reduces the Maximum deceleration with increasing distance from the emergency stop distance linearly by this value down to the Accepted deceleration .
		Accepted deceleration - Own (ft/s ²)	-3.28	-2.5 to -4	No	Lower bound of deceleration for own vehicle for a lane change
		Maximum deceleration - Trailing (ft/s ²)	-9.84 ft/s ²	-12 to -8	No	Upper bound of deceleration for trailing vehicle. Higher absolute value means more aggressive lane changing behaviors
		-1 ft/s ² per distance - Trailing (feet)	Arterial: 100 Freeway: 200	50 to 250	No	This reduces the Maximum deceleration with increasing distance from the emergency stop distance linearly by this value down to the Accepted deceleration .
		Accepted deceleration -Trailing (ft/s ²)	Arterial: -3.28 Freeway: -1.64	-1.5 to -2.5	No	Lower bound of deceleration for trailing vehicle for a lane change
		Waiting time before diffusion (s)	60.00	99999.00	Yes	The maximum amount of time a vehicle can wait at the emergency stop distance for a necessary change of lanes. When this time is reached, the vehicle is removed from the network. Higher value means more tolerance on vehicles waiting at the emergency stop distance for necessary lane changes.
		Min. headway (front/rear), (ft)	1.64	1.5 to 6	No	The minimum distance between two vehicles that must be available after a lane change, so that the change can take place. A lane change during normal traffic flow might require a greater minimum distance between vehicles in order to maintain the speed-dependent safety distance.
		To slower lane if collision time is above (s)	11.00	0 to 0.5	No	Defines the minimum distance to a vehicle in front, in seconds, which must be present on the slower lane, so that an overtaking vehicle switches to the slower lane. Only applicable for Slow lane rule or Fast lane rule .
		Safety distance reduction factor	0.60	0.1 to 1.0	No	This factor is taken into account for each lane change. During the lane change, Vissim reduces the safety distance to the value that results from the following multiplication: Original safety distance * safety distance reduction factor . The default value of 0.6 reduces the safety distance by 40%. Once a lane change is completed, the original safety distance is taken into account again.
		Maximum deceleration for cooperative braking (ft/s ²)	-9.84	-32.3 to -3	No	Specifies to what extent the trailing vehicle is braking cooperatively, so as to allow a preceding vehicle to change lanes into the same lane they are traveling in. The higher the value, the stronger the braking and the greater the probability of changing lanes.
		Overtake reduced speed areas	Not Selected	Typically not modified	No	If this option is selected, vehicles immediately upstream of a reduced speed area may perform a free lane change. The vehicle will acknowledge any reduced speed area of the lane they changed into and adjust their speed accordingly. If the option is not selected (default), vehicles never start a free lane change directly upstream of a reduced speed area and they completely ignore the reduced speed areas on the new lane.
Advanced merging	Selected	Adjust to match field conditions	Yes	If this option is selected, more vehicles can change lanes earlier, therefore capacity increases		
Vehicle routing decisions look ahead	Selected	Typically not modified	No	If this option is selected, vehicles leaving the route identify new routing decisions on the same link in advance and take them into account when choosing the lane. For routing decisions further downstream that vehicles should identify in advance, the option Combine static routing decisions (under *Attributes of static vehicle routing decisions) must be selected.		

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LOCAL (CONT)	Lane Change (Cont)	Cooperative lane change	Not Selected	Adjust to match field conditions	Yes	If this option is selected, trailing vehicles will make necessary lane change to facilitate the lane change of a leading vehicle	
		> Maximum speed difference (mph)	6.71	Typically not modified	No	Applicable only if Cooperative lane change has been selected. Identifies the maximum possible speed difference.	
		> Maximum collision time (s)	10.00	Typically not modified	No	Applicable only if Cooperative lane change has been selected. Identifies the maximum collision time (time a vehicle can travel before reaching a preceding vehicle or network object that has an impact on its desired speed)	
		Rear correction of lateral position	Not Selected	Typically not modified	No	This causes the vehicle to be aligned to the middle of the lane at the end of the lane change, instead of at an angle in the original lane. This can affect the capacity. Only performed if the Keep lateral distance to vehicles on next lane(s) option is selected under "Lateral" behavior.	
		> Maximum speed (mph)	1.86	Typically not modified	No	Speed up to which the correction of the rear end position should take place. Lateral correction of the rear end position is not performed for faster vehicles.	
		> Active during time period from "x sec" until "x sec" after lane change start	1.00 until 10.00	Typically not modified	No	Time after the start of the lane change at which the lateral movement of the rear end position should start until time after the start of the lane change at which the lateral movement of the rear end position should end.	
	Lateral	Desired position at free flow	Middle of lane	Typically not modified	No	Lateral orientation of a vehicle within its lane while it is in free traffic flow	
		Keep lateral distance to vehicles on next lane(s)	Not Selected	Typically not modified	No	If this option is selected, the vehicles consider the position and therefore the lateral orientation of vehicles on adjacent lanes and keep the Lateral min. distance . For this purpose, vehicles even adjust their lateral orientation on their own lane and swerve out of the way. If this option is not selected, vehicles on adjacent lanes are ignored even if they are wider than their lanes, except when they perform a lane change. Note: using this option can reduce the simulation speed significantly.	
		Diamond shaped queuing	Not Selected	Typically not modified	No	If this option is selected, queues take into account a realistic shape of vehicles with vehicles positioned offset, such as bikes. Vehicles are internally represented not as a rectangle, but as a rhombus.	
		Consider next turning direction	Not Selected	Typically not modified	No	Enables more intelligent lateral behavior in case of non-lane-bound traffic. If the option has been selected, a vehicle with this driving behavior does not pass another vehicle on the same lane if this might cause a collision at the next turning connector. To achieve this, attributes that enable passing on the same lane must be selected. Note the option Consider next turning direction has precedence over option Desired position at free flow .	
		Collision time gain (s);	2.00	Typically not modified	No	Minimum value of the collision time gain for the next vehicle or signal head, which must be reached so that a change of the lateral position on the lane is worthwhile and will be performed. Calculated based on the desired speed of the vehicle. Smaller values lead to a livelier lateral behavior, since vehicles also have to dodge sideways for minor improvements.	
		Minimum longitudinal speed (mph):	2.24	Typically not modified	No	Minimum longitudinal speed which still allows for lateral movements. The default value (2.24 mph) ensures that vehicles can also move laterally if they have almost come to a halt already.	
		Time between direction changes (s):	0.00	Typically not modified	No	Defines the minimum simulation time which must pass between the start of a lateral movement in one direction and the start of a lateral movement in the reverse direction. The higher this value, the smaller the lateral movements of vehicles. These lateral movements only take place if overtaking on the same lane is permitted. (Does not affect the lateral movement for a lane change.)	
		Default behavior when overtaking vehicles on the same lane or on adjacent lanes	Overtake on same lane	Overtake left (default) - Not Selected Overtake right (default) - Not Selected	Typically not modified	No	When modeling traffic that is not lane-bound, you can allow vehicles to overtake within a lane. Left: vehicles are allowed to overtake on a lane to the left; Right: vehicles are allowed to overtake on a lane to the right.
			Minimum lateral distance (ft)	Distance standing at 0 mph: 0.66 ft Distance driving at 30 mph: 3.28 ft	Typically not modified	No	Minimum distance between vehicles when overtaking within the lane and keeping the distance to vehicles in the adjacent lanes. Distance Standing at 0 mph is the lateral distance of the passing vehicle; Distance driving at 30 mph is the lateral distance of the passing vehicles.
		Exceptions for overtaking vehicles of the following vehicle classes		No exceptions listed	Typically not modified	No	Behavior for specific vehicle classes that deviates from the default behavior when overtaking vehicles on the same lane. When modeling traffic that is not lane-bound, you can select vehicle classes which may be overtaken within a lane by vehicles of the defined driving behavior set.
	Signal Control	Reaction after end of green	Behavior at amber signal	Continuous Check	Not typically modified	No	Defines the behavior of vehicles when they approach an amber light. Continuous check: driver of vehicle continuously decides whether to continue driving or whether to stop. Vehicles assume that the amber light will only be visible for another two seconds. They then decide continuously, with each time step, whether they will continue to drive or stop. A vehicle will not brake, if its maximum deceleration does not allow it to stop at the stop line, or if it would have to brake for more than 15 ft/s ² . The vehicle will brake, if at its current speed, it cannot drive past the signal head with two seconds. Both braking and stopping are possible for cases that lie in between these two scenarios. One decision: The decision made is maintained until the vehicle crosses the stop line. Calculated using the probability factors.
			Probability Factors	Alpha: 1.59 Beta 1: -0.26 Beta 2: 0.27	Only applicable is One decision model is selected, Not typically modified	No	Used to calculate the probability (i.e., whether a driver stops at an amber light or not). $p = \frac{1}{1 + e^{-\alpha - \beta_1 v - \beta_2 a}}$ The following settings make a vehicle continue driving for longer when there is an amber light and occasionally even make it run a red light: The One decision option is selected, Alpha is greater than the default value 1.59; Beta1 is greater than the default value 0.27; and Beta2 is greater than the default -0.26 but less than 0.00.
		Reaction after end of red	Behavior at red/amber signal	Go (same as green)	Not typically modified	No	Used to define country-specific or regional behavior at red/amber signal. Options are Stop (same as red) or Go (same as green) ; where Stop (same as red) means the Go signal is green (the response time is effective from the time step the signal changes to green) and the Go (same as green) means the Go signal is red-amber (the response time is effective from the time step the signal changes to red-amber).
			Reaction time distribution	Blank	Typically not modified	No	Reaction time of a vehicle to the Go signal. It causes a time delay between the time step when the signal switches to Go and the time step when the first vehicle upstream of the corresponding stop line starts to move. If no time distribution is selected, the default time is 0 seconds.
		Reduced safety distance close to a stop line	Factor	0.60	0.60	Yes	Higher value reduces the safety distance between vehicles close to the signal stop bar
			Start upstream of stop line (ft)	328.08	Not typically modified	No	Distance upstream of the signal head
	End downstream of stop line (ft)		328.08	Not typically modified	No	Distance downstream of the signal head	

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LOCAL (CONT)	Connector-level	Emergency Stop (feet)	16.4 ft per lane	Adjust to match field conditions	Yes	Distance before the downstream connector where vehicles can make last chance lane changes
		Lane change (feet)	656.20	>656.20	Yes	Distance before the downstream connector where vehicles begin to make lane changes
		Lane change per lane	Not Selected	Adjust to match field conditions	Yes	If this option is selected, the entered lane change attribute value is multiplied by the number of lane changes which a vehicle requires to reach the connector
	Point-level	Speed distributions (mph)	Linear distributions	Adjust to represent the field conditions	Yes	The distribution function of desired speeds is a particularly important parameter, as it has an impact on link capacity and achievable travel times. If not hindered by other vehicles or network objects (e.g., signal controls), a driver will travel at his desired speed. Desired speed distributions are defined independently of vehicle or pedestrian type.
		Time distributions (mph)	Linear distributions	Not typically modified	No	You can use dwell time distributions for: 1) standstill time on parking lots 2) waiting times at toll counters through stop signs or 3) for PT stops to allow adequate time for passengers to board and alight the bus/transit vehicle.