

What additional driving could change

SUMO mesoscopic scenarios | Conditional planning evidence

This simulator tests Magnolia Bridge, Dravus and Emerson Place separately, with Fort Street-Commodore available as a fourth physical connection. Every growth case is compared with the **same closure and reference demand**. The estimates below are modeled differences, not observed or validated forecasts.

Growth comparisons: cumulative time lost

Illustration at **1,000 additional occupied homes**. Columns add 4,000, 8,000 or 24,000 one-way vehicle trips/day through explicit household assumptions. These are separate native runs. They are not a forecast of zoning buildout.

For scale, 8,000 additional trips/day is 13.1% of the assumed Magnolia reference volume, or 11.3% of all modeled traffic including 15th/Elliott through trips. These are daily trips, not cars owned.

Traffic condition	Reference driver-hours	+4,000 trips added hours	+8,000 trips added hours	+24,000 trips added hours
All crossings open	2,366	+1,651	+3,205	+13,900
Magnolia Bridge closed all day	30,490	+9,482	+20,642	+138,970
W Dravus Street closed all day	3,867	+1,418	+3,172	+18,304
Emerson Place bridge closed all day	2,928	+1,741	+3,771	+15,651

Driver-hours count time beyond each trip's open-network free-flow travel time, including waiting to enter, queues and detours. The totals include existing and added Magnolia trips through 02:00 the next day. They exclude independent through drivers on 15th/Elliott. A positive difference is additional burden.

Added trip minutes for existing drivers

The +8,000-trip illustration below matches the same existing trips by identity, requested departure and endpoints. Values are full-day means by direction, not peak-period maxima.

Traffic condition	Inbound minutes added	Outbound minutes added	Unfinished matched pairs
All crossings open	+4.9	+0.1	0
Magnolia Bridge closed all day	+23.7	+4.9	0
W Dravus Street closed all day	+4.0	+0.6	0
Emerson Place bridge closed all day	+5.7	+0.2	0

Unresolved means unfinished trips remain at 02:00. Eventual trip-delay differences cannot be reported for those groups. Their elapsed burden is still included above; a difference between two unfinished elapsed times is not a lower bound on eventual added delay.

Outages and household inputs

One-hour closures at three times of day

Each row below uses 1,000 added homes and the +8,000-trip illustration. “Reference” has the identical one-hour closure and no added household traffic. These are illustrative outages, not announced works.

Crossing closed	Outage	Added driver-hours	Unfinished trips at 02:00 reference / growth
Magnolia Bridge	08:00-09:00	+3,890	0 / 0
Magnolia Bridge	12:00-13:00	+3,491	0 / 0
Magnolia Bridge	17:00-18:00	+3,841	0 / 0
W Dravus Street	08:00-09:00	+3,571	0 / 0
W Dravus Street	12:00-13:00	+3,239	0 / 0
W Dravus Street	17:00-18:00	+3,426	0 / 0
Emerson Place bridge	08:00-09:00	+3,358	0 / 0
Emerson Place bridge	12:00-13:00	+3,808	0 / 0
Emerson Place bridge	17:00-18:00	+3,337	0 / 0

Unfinished counts in this table cover all requested native vehicles, including independent through traffic; they show whether the simulated network cleared by the horizon. The driver-hour metric still covers Magnolia trips only. CSV origin-wait hours expose time spent waiting to enter the modeled roads; do not add them again to the loss total.

Independent household assumptions

Additional vehicle trips = occupied homes x residents/home x daily one-way person trips x car share / people per car. Cars owned, people, homes and daily trips are different quantities. All profiles assume one person per car when a car trip occurs.

Travel profile	Residents / home	Person trips / day	Car share	Vehicle trips / 1,000 homes
Everyone uses the bus	3	2	0%	0
Mostly transit	2	2	25%	1,000
Mixed travel, smaller households	2.5	2	40%	2,000
Mixed travel, larger households	3	2	2/3	4,000
Everyone drives alone	4	2	100%	8,000
Everyone drives, more daily trips	4	3	100%	12,000
High occupancy, everyone drives alone	6	4	100%	24,000

The website also tests 500 and 2,000 occupied homes. The outer 2,000-home case adds 48,000 daily vehicle trips. It intentionally assumes six residents per home, four trips each and solo driving for everyone; it is a stress case, not an expected household or licensed-driver composition.

How to use this evidence

What the computation does establish

All 143 cases in this brief run in Eclipse SUMO 1.27.1 mesoscopic mode, with half-second clocks and ten-second map averages. Native audits account for every requested vehicle, preserve unfinished and not-yet-inserted trips, and require no teleports, removals or forbidden new closure entries. Physical collisions are not modeled. Growth and reference use matched existing trips; the closure cases use identical demand inputs.

Native road queues have finite storage, signal control and route updates. A controlled test verifies that a full receiving road stops turn discharge during green and that flow resumes after release. The model does not represent a car physically blocking a turn inside a junction. Fort-Commodore remains available; there is no invented northern exit inside Magnolia.

What remains uncertain

Reference traffic: 60,900 expected Magnolia vehicle trips/day plus 10,000 illustrative through trips on 15th/Elliott. These are provisional inputs, not a common-day calibrated traffic count set. Added trips follow provisional daily timing and geographic shares. Inbound entry waiting can dominate the result and depends on the two external boundaries; it is not a measured queue inside Magnolia.

Road operations: the imported network has 2,941 ordinary directed edges and 32 generated fixed signals. Signal plans, lane restrictions, stop controls and turning geometry are not field verified. Incorrect priority can reduce capacity; incomplete bus-lane restrictions can overstate general-traffic capacity.

Behavior: the model keeps scheduled car trips even when queues become extreme. It does not predict trip cancellation, departure-time shifts, new transit service, or household adaptation. No bus-capacity benefit is demonstrated by the zero-added-car endpoint.

Range interpretation: seven travel profiles and three housing totals yield eleven distinct added-trip totals across thirteen traffic cases. These are parameter scenarios using one random seed, not 143 independent replications or a probability/confidence interval. Computational checks are not field validation; the modeled range need not contain the real outcome.

A proportionate request to decision-makers

Request a crossing-specific operational and resilience review before relying on a single corridor-wide growth estimate: current simultaneous turning counts and queue observations; verified signal phases and lane use; individually closed Magnolia, Dravus and Emerson crossings; Fort-Commodore fallback demand; and a transparent household/car-use sensitivity range. Evaluate both directions over the whole day, including queues that remain after a peak.

This work identifies conditional sensitivity and data needs. It does not prove a catastrophe, an exponential relationship, or that the city's methods are wrong. Those claims require evidence beyond these simulations.

Reproduce and inspect

Simulator: yourfriendlynephew.com/magnolia-crossing-simulator/

The site provides comparison CSV, native audits, the release manifest and METHOD.md. These sources define the numbers in this brief. Earlier queue-engine reports should not be presented as SUMO results.

Network SHA-256: 645e3f2fb054a4ba757b2def966d0ea1d10a3eead6009e692219536c399887ba

Comparison SHA-256: fdc9360eab8e75cb4d65ef665ffa2d9936f0e8454dd39fb8bec41ddb96d0c1b8