GreenLight: Faster buses. Safer crossings. Smoother trips. All by fixing the signals Vancouver already has.

Vancouver doesn't need a flashy megaproject to make daily life better—we need government to do what only government can do: run the streets we already have. GreenLight is a practical, pro-worker plan that upgrades the "brains" of traffic lights so they respond to what's actually happening—starting with the busiest corridors where people will feel the change fastest. The goal is simple: faster, more reliable buses; safer, easier crossings for pedestrians and cyclists; and smoother trips for drivers and deliveries—with results within 2 years, bigger gains in 4 and movement city wide transformed by 2035.

GreenLight puts a new principle at the centre of street management: count people, not just cars. A bus isn't "one vehicle" it's dozens of people. So when a bus is in the queue, the system should treat it like 40 cars and give it priority so working people get where they're going on time. At the same time, GreenLight makes walking safer and more comfortable by reducing conflict at crossings and enabling pedestrian scrambles (an all-walk phase) at high-volume locations when it makes sense. This is how Vancouver becomes more transit-oriented and pedestrian friendly without punishing drivers: reduce wasted time, smooth out stop-and-go waves, and keep the city moving for everyone.

GreenLight accelerates the city's controller replacement program so Vancouver can finish by end-2035 not 2080, and it phases the work corridor-by-corridor so improvements show up quickly, not decades from now. A modern Traffic Control Centre will allow real-time adjustments and rapid pilots, supported by dedicated funding for universities to test ideas, measure results, and publish what works. The approach is "promise, plan, deliver": start with a few key corridors, prove the benefits, then scale citywide.

GreenLight is built for public trust. Any "AI" in the system is a tool, not an autopilot: it helps staff respond faster, but decisions are supervised, logged, and evaluated. Every pilot comes with a before-and-after public scorecard—travel times, bus reliability, crossing safety, and waiting times—so the city keeps what works and stops what doesn't. Vancouver can move past ideology and deliver measurable improvements that support community and belonging: less time stuck, safer streets, and a city that works better day by day.

Background

An intersection's "throughput" (how many people and vehicles it can move) is fundamentally constrained by geometry and time: geometry sets the physical space for movements (number and width of lanes, presence of turn bays, crosswalk length), while time sets how the signal cycle is divided (how many seconds each movement gets, plus the unavoidable “lost time” during yellow/all-red changes). Because widening streets to add lanes also lengthens pedestrian crossings and can increase clearance time, geometry and time are tightly linked—capacity gains in one place can be offset by new time demands elsewhere.

Even when an intersection has theoretical capacity, utilization can be misallocated in three common ways: (1) the timing plan doesn’t match real demand (green is given when nobody is there, while queues build where demand is high), (2) movements interfere with each other when they run at the same time, and (3) transit vehicles are treated equally to vehicles with fewer passengers. A classic example is pedestrians being served concurrently with through traffic: this often puts pedestrians in conflict with right-turning vehicles (and permissive left turns), creating safety risk, friction, and delay. Another is left turns without adequate storage: when left-turn demand exceeds the space available (or must “borrow” a through lane), it can block through traffic and still fail to clear within the allotted green, degrading the capacity of multiple movements at once. In Vancouver the street grid with many options for left turns on arterial roads between controlled intersections also contributes to reduced capacity.

Measuring demand changes the game because it lets the system allocate scarce green time to the movements that move the most people, increase safety and reduce the most delay. With sensors and connected controllers, the signal can “see” whether a queue exists, whether pedestrians are present, and whether a transit vehicle is approaching or waiting—then adjust timing within safe rules. That enables a practical people-moving model where, for example, a bus can be treated as equivalent to dozens of cars because it may carry roughly 40 seated passengers (often more with standees), so prioritizing a bus movement on a major corridor can increase overall person-throughput even if it slightly slows cross traffic.

Intersections perform best when they operate as a coordinated corridor, not as isolated devices. Coordination aligns timing so groups of vehicles (“platoons”) and priority movements are not released from one signal only to be stopped immediately at the next—preventing signals from working at cross-purposes and wasting green time on spillback (when a vehicle cannot proceed due to cars backed up from the next light or further) and stop-and-go friction. In a modern system, this coordination can still “count” a bus as worth 40 cars (or more) by recognizing when a bus is in the queue and granting targeted priority that fits inside a corridor plan, while also adapting pedestrian treatment—adding scrambles where pedestrian demand justifies it and using other pedestrian phasing tools where that yields better balance.

Current status

At Vancouver’s approximate 587 controlled intersections traffic controllers are typically coded with different signal timing plans that are active at different times of day and days of the week to best accommodate traffic conditions. In Vancouver an intersection is typically loaded with 5 weekday plans (Morning Peak; Afternoon Peak; Off-Peak; Evening; and Overnight), weekend plans, an emergency mode, and for some intersections, special events modes.

Coordination between intersections and along corridors can be accomplished with precise manual programming. This is in place on Pacific Boulevard and Georgia Street amongst others. Some intersections are ‘free’, or uncoordinated. Intersections may also be linked, often when signals are within 100m of each other. Coordinated intersections form a ‘traffic control signal system’.

Vancouver operates both fully signalized intersections, and pedestrian/bike signals. Each of those are then further classified to 3 types: fully actuated (every movement is allocated using vehicle, cyclist and pedestrian detectors); semi-actuated (maintains flow on a major street unless a vehicle, cyclist, or pedestrian is detected or indicated by a push-button on a minor street); and fixed time (all timings are pre-determined).

Vancouver began a signals upgrade project in 2018, seeking to purchase standards based controllers which are compatible with modern Transportation Management Systems including communications with a central system. The City explicitly says this is in response to the limits of late-1990s controllers that lack “flexible communications capabilities,” making them harder to integrate with central transportation management systems. The project envisioned real-time monitoring, data collection, and operations.

Current plans

An alternative to the traditional traffic signal controller is one that is responsive to changing traffic conditions. As part of the City’s strategy to upgrade the traffic signal network, the City intends to adopt an intelligent response system.

Intelligent Response has the following key features:

- Continuously “learns” what recurrent congestion looks like in the network, and automatically identifies patterns of non-recurrent congestion relative to this baseline for purposes of responsive plan selection.
- No need to configure and maintain volume-occupancy thresholds and related configuration.
- Is tolerant to failed detectors. In the event of a detector failure, the system can look at the surrounding conditions and continue to make informed decisions.
- Can provide its “reasoning” for all historical plan changes in terms of its natural language expert rules. In the case of any past decision, one can go back to identify the expert rules involved and the corresponding traffic conditions driving these rules.

The city plans to upgrade all controllers to modern standards by 2035, but has fallen short of its projected 30-45 controllers per year over the 2020-25 period averaging instead 16 controllers per year. At current pace, the project would be complete in 2080. A replacement rate of 16 a year reflects an asset replacement pace, folding in project costs largely into existing budgets.

Contracting

- A small contract was awarded in 2020 ($500k) to provide.
- A follow on contract was awarded in 2024 ($2.1MM)
- In 2025, the City Issued a Notice of Intent to acquire a software upgrade for its modern controllers. The city has approximately 80 existing ‘modern’ controllers, and plans to eventually replace 900 additional controllers.

Proposal

- Enable City-Wide Transit Signal Priority and decrease transit travel times by up to 18% by 2035, with most routes on major corridors implemented sooner.
- Support Vision-Zero by reducing pedestrian vehicle conflict points with intelligent traffic signals.
- Decrease Transit Travel times by up to 18%

How

- Accelerate controller upgrade program to be complete by the end of 2035.
  - Individual controllers are able to adapt timing in isolation.
- Strategically phase program to upgrade key corridors, to realize gains quickly.
  - As corridors are completed, roll out traffic system control improvements to optimize corridors.
  - Enable networked adaptation in signal timing in corridors before full system completion.
  - Upgrade the City of Vancouver’s Traffic Control Centre to take advantage of the corridor and system level upgrades, enabling real time adjustments of traffic signals manually and by an AI solution, and enabling short term experimental pilots in partnership with regional universities.
- Simultaneously:
  - Upgrade intersections with smart sensors which can tell the difference between a bus and a personal vehicle (enabling capacity balancing).
  - Remove ‘beg buttons’ for pedestrians where practical by implementing a sensor based solution which also conducts pedestrian counts (enabling capacity balancing).
  - Upgrade intersections to support pedestrian scrambles to increase pedestrian safety and capacity while supporting transit capacity.
  - Upgrade intersections to support left turn and right turn lights.
  - Study the transit, pedestrian and traffic impacts of limiting left turns at uncontrolled intersections on major corridors during specific hours.

Costing

Component	Quantity / coverage assumption	Low (CAD)	Mid (CAD)	High (CAD)
1) Controller replacements (accelerated to finish by end-2035)	815 controllers	$40.75M	$57.05M	$73.35M
2) Signal communications / networking	614 intersections	$4.90M	$9.20M	$15.40M
3) Corridor adaptive / “AI optimisation” package	300 corridor intersections	$7.50M	$13.50M	$21.00M
4) Bus detection + transit signal priority readiness	350 intersections	$5.30M	$7.00M	$8.80M
5) Pedestrian detection + “beg button” reduction where feasible (plus ped counts)	614 intersections	$3.70M	$7.40M	$12.30M
6) Pedestrian scramble capability (signal/phasing/hardware where needed)	60 intersections	$0.60M	$1.20M	$2.40M
6a) Curb cuts / curb ramps for diagonal scramble crossings (where needed)	16 intersections	$0.64M	$0.96M	$1.28M
7) Additional protected left/right turn capability (targeted)	250 intersections	$2.50M	$6.30M	$12.50M
8) Programmable LED blank-out left turn-restriction signs (tool, targeted)	150 locations, major corridors	$3.80M	$5.30M	$6.80M
9) Traffic Control Centre modernisation / new build / software	Citywide	$10.00M	$20.00M	$35.00M
10) University led pilots & evaluation fund	$778k/year × 9	$7.00M	$7.00M	$7.00M
11) Left-turn restriction study + pilots	Select corridors	$1.00M	$2.00M	$4.00M
Total Capital		**$87.69M**	**$136.91M**	**$199.83M**

Funding Source:

Drawing down $87-$200M in reserves from the following funds: Future Capital: Community Amenity, Capital Facilities and Infrastructure, and Pedestrian and Cycling and the Asset Management Reserve: Streets Capital Maintenance which totalled $1.01B at the end of 2024.